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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 5, 1980 Volume 991 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(1) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Nov. 27, 1979.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,280,392, Re. S.N. 096,060, Filed Nov. 20, 1979, Cl. 357/38, ELECTRONIC SEMICONDUCTOR DEVICE OF THE FOUR-LAYER JUNCTION TYPE, Hansjochen Benda, Owner of Record: *Siemens-Schuckertwerbe Aktiengesellschaft, Erlangen, Germany,* Attorney or Agent: Herbert L. Lerner, et al., Ex. Gp.: 254

3,799,199, Re. S.N. 096,492, Filed Nov. 21, 1979, Cl. 137/625.4, DEVICE FOR MIXING TWO COMPONENTS, Dieter Rumpff, et al., Owner of Record: *Krauss Maffei Aktiengesellschaft, Munich, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 341

4,047,827, Re. S.N. 094,591, Filed Nov. 15, 1979, Cl. 408/76, ACCESSORY SUPPORT PLATES FOR A MAGNET BASE DRILL, Everett D. Hougen, Owner of Record: *Inventor,* Attorney or Agent: Arthur Raisch, et al., Ex. Gp.: 324

4,062,310, Re. S.N. 094,517, Filed Nov. 15, 1979, Cl. 112/280, COOLING DEVICE FOR SEWING MACHINES, Hermann Gauch, et al., Owner of Record: *Union Special GmbH, Stuttgart, West Germany,* Attorney or Agent: John A. Schaerli, et al., Ex. Gp.: 353

4,069,743, Re. S.N. 093,036, Filed Nov. 9, 1979, Cl. 91/375 R, CONTROL UNITS FOR VEHICLE POWERSTEERING MECHANISMS, Battista Bertanza, Owner of Record: *Riva Calzoni, S.P.A., Milan, Italy,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 341

4,086,257, Re. S.N. 093,631, Filed Nov. 13, 1979, Cl. 260/403, PHOSPHATIDYL QUATERNARY AMMONIUM COMPOUNDS, Barry D. Sears, Owner of Record: *Inventor,* Attorney or Agent: Richard P. Crowley, Ex. Gp.: 117

4,105,609, Re. S.N. 092,621, Filed Nov. 8, 1979, Cl. 260/23 H, DEACTIVATION OF CATALYSTS OF THE ZIEGLER TYPE USED FOR THE PREPARATION OF POLYETHYLENE IN HIGH PRESSURE, HIGH TEMPERATURE PROCESSES, Jean-Pierre Machon, et al., Owner of Record: *Societe Chimique des Charbonnages, Paris la Defense, France,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 144

4,114,188, Re. S.N. 094,160, Filed Nov. 14, 1979, Cl. 364/415, APPARATUS FOR INDICATING UTERINE ACTIVITY IN LABOUR, Michael Charles Carter, et al., Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: G. Lloyd Knight, et al., Ex. Gp.: 236

4,116,902, Re. S.N. 093,357, Filed Nov. 13, 1979, Cl. 264/22 TN, POLYURETHANE-MODIFIED ALKYD RESIN, Robert R. Harris, et al., Owner of Record: *International Minerals & Chemical Corp., Libertyville, Ill.,* Attorney or Agent: Howard J. Barnett, et al., Ex. Gp.: 144

4,125,001, Re. S.N. 094,170, Filed Nov. 14, 1979, Cl. 66/9 R, MULTI-GAUGE KNIT FABRIC WITH INLAY, David J. J. Bryars, Owner of Record: *Austen Bryars of London, Inc., Greensboro, N.C.,* Attorney or Agent: Clifton T. Hunt, Jr., Ex. Gp.: 353

4,139,023, Re. S.N. 095,510, Filed Nov. 19, 1979, Cl. 138/96 T, PIPE THREAD PROTECTOR, William M. Turley, Owner of Record: *Inventor,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 243

4,148,042, Re. S.N. 093,571, Filed Nov. 13, 1979, Cl. 346/155, ELECTROGRAPHIC COPIER WITH ONE-PIECE BELT AND STYLI, Jon Coyle Mutton, et al., Owner of Record: *Tektronix Inc., Beaverton, Oreg.,* Attorney or Agent: William D. Haffner, et al., Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Feb. 5, 1980

3,865,688	4,153,799	4,165,656	4,170,388
3,974,753	4,154,637	4,165,702	4,170,506
4,034,379	4,154,738	4,166,258	4,170,534
4,079,396	4,155,903	4,166,311	4,170,579
4,082,099	4,156,066	4,166,331	4,171,134
4,096,321	4,156,606	4,166,745	4,171,371
4,101,508	4,156,614	4,166,836	4,171,391
4,114,630	4,157,920	4,167,251	4,171,672
4,133,330	4,160,631	4,167,443	4,171,713
4,133,835	4,161,626	4,167,468	4,171,782
4,138,890	4,162,338	4,167,632	4,171,957
4,140,873	4,163,549	4,167,777	4,172,060
4,144,337	4,163,823	4,167,906	4,172,196
4,144,533	4,163,867	4,168,302	4,172,352
4,146,649	4,163,892	4,168,322	4,172,435
4,146,780	4,164,835	4,169,222	4,172,594
4,148,914	4,164,845	4,169,328	4,172,687
4,149,528	4,165,186	4,169,720	4,173,612
4,151,197	4,165,468	4,169,817	4,174,218
4,153,510	4,165,619	4,169,993	

Disclaimers

3,279,034.—*Karl B. Kaiser,* Rockford, Ill. INDEXABLE CUTTER BLADE. Patent dated Oct. 18, 1966. Disclaimer filed Oct. 15, 1979, by the assignee, *The Ingersoll Milling Machine Company.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,980,339.—*David D. Heald,* San Mateo; *John C. McKinnell,* Bakersfield; and *Mitchell A. Lekas,* Concord, Calif. PROCESS FOR RECOVERY OF CARBONACEOUS MATERIALS FROM SUBTERRANEAN DEPOSITS. Patent dated Sept. 14, 1976. Disclaimer filed June 25, 1979, by the assignee, *Geokinetics, Inc.*

Hereby enters this disclaimer to claims 12 and 28 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-15-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking: Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	7-24-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

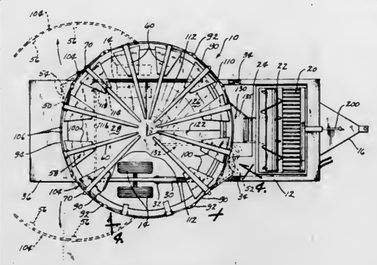
Re. 30,200
HAY STACKING MACHINE

Donald L. Henke, Creston, Nebr., assignor to Veda, Inc., Long Lake, Minn.

Original No. 4,022,004, dated May 10, 1977, Ser. No. 546,385, Feb. 3, 1975. Application for reissue May 10, 1977, Ser. No. 795,666

Int. Cl.[2] A01D *87/12*

U.S. Cl. 56—346 **55 Claims**



1. A hay stacking machine, comprising:
a platform having a top surface for the building of a hay stack thereon, said platform having a depression;
support means for supporting said platform above a supply of hay;
transport means for picking said hay up from said supply and moving said hay to said platform surface over said depression;
a frame positioned around the periphery of said platform,
a plurality of radially extending compression arms vertically pivotally connected to said frame and adapted to move between downwardly and inwardly extending positions to upwardly and inwardly extending positions, and
power means for yieldably maintaining pressure through said arms on hay on said platform and means for rotating said frame with said arms engaging said hay for moving hay into a layer and over said depression in said platform surface whereby said moving layer of hay sweeps up said hay moved to said platform surface and forms a stack from the bottom thereof with said compression arms pivoting upwardly as the stack increases in height.

Re. 30,201
METHOD AND APPARATUS FOR START-SPINNING A THREAD ON AN OPEN-END SPINNING UNIT OF AN OPEN-END SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, D-7341 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, D-7334 Suessen, both of Fed. Rep. of Germany

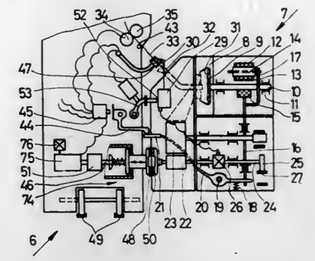
Original No. 3,987,610, dated Oct. 26, 1976, Ser. No. 528,471, Nov. 29, 1974. Application for reissue Aug. 16, 1978, Ser. No. 934,009

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1973, 2360296; Aug. 6, 1974, 2437762

Int. Cl.[2] D01H *1/12, 1/34, 15/00*

U.S. Cl. 57—263 **15 Claims**

4. An apparatus for start-spinning a thread on an open-end spinning unit of an openend spinning machine, having amobile start-spinning unit with means for returning an end of the thread to a spinning rotor, for placing said end of the thread on a ring of fibres located in said spinning rotor and for drawing off the start-spun thread again, as well as means for reducing the speed of said spinning rotor relative to its operating speed, and means which intervene in drive means providing the feed of the sliver forming said fibre ring for the purpose of reducing the rate of said formation of said fibre ring, in which said start-spinning unit contains a driving wheel which, through



adjustment, can be coupled with a corresponding drive wheel of the drive means associated to the open-end spinning unit for the feed of said sliver.

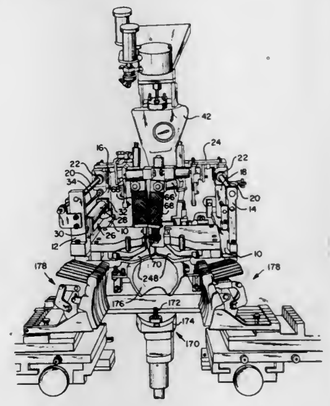
Re. 30,202
CEMENT APPLYING MECHANISM

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Original No. 3,901,181, dated Aug. 26, 1975, Ser. No. 499,822, Aug. 23, 1974. Application for reissue Feb. 1, 1978, Ser. No. 874,184

Int. Cl.[2] B05C *11/10, 5/02*

U.S. Cl. 118—705 **4 Claims**



1. A cement applying mechanism comprising: a [nozzle] *pair of laterally spaced nozzles* mounted for movement in [a] rearward [direction] *directions* in [a] cement applying [stroke] *strokes* between [an] initial [location] *locations* and [a] final [location] *locations* and mounted for swinging movement about [an] upright [axis] *axes*; cement flow directing means in [said] *each* nozzle, through which cement may be extruded from *each* said nozzle, extending radially from [said] *its associated* axis; *means mounting each nozzle for inward-outward movement; stop means limiting the extent of inward movement of the nozzles;* means for moving the [nozzle] *nozzles* through said cement applying [stroke] *strokes*; means so constraining the [nozzle] *nozzles* that said cement flow direct-

ing means [is] *are* directed laterally of said rearward [direction] *directions* and outwardly from [said axis] *their associated axes* during movement of the [nozzle] *nozzles* in said cement applying [stroke] *strokes* from said initial [location] *locations* to [an] intermediate [location] *locations* between said initial and final locations; [and] *means yieldably urging the nozzles outwardly at the beginning of the cement applying strokes;* means operative when the [nozzle has] *nozzles have* reached said intermediate [location] *locations* to so swing the [nozzle] *nozzles* rearwardly and inwardly about [said axis] *their associated axes* that said cement flow directing means [is] *are* directed generally rearwardly from [said axis] *their associated axes* when the [nozzle has] *nozzles have* arrived at said final [location] *locations; and means, effective when the nozzles are between their associated intermediate and final locations, to cease the outward urging of the nozzles and to cause the nozzles to be urged inwardly to extents determined by said stop means.*

Re. 30,203

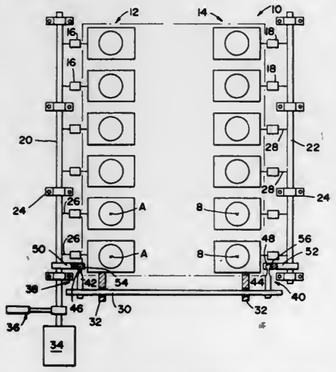
FUEL CONTROL CROSS SHAFT

Alvin W. Montgomery, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,091,785, dated May 30, 1978, Ser. No. 706,715, Jul. 19, 1976. Application for reissue Oct. 26, 1978, Ser. No. 955,084

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—140 R **6 Claims**



1. In an internal combustion engine comprising a pair of pluralities of equal numbers of cylinders with said pairs of pluralities of cylinders being aligned side by side, and including a fuel injector pump for each of said cylinders, an improved system for controlling each of said pumps to operate simultaneously and to deliver a generally equal amount of fuel to each respective cylinder, comprising:

a pair of control shafts, one aligned parallel to each of said pairs of pluralities of cylinders generally perpendicular to the axes of each of said cylinders and spaced laterally therefrom;

a pair of pluralities of fuel injector pump control link means, each of said pairs of pluralities of link means being movable responsive to rotation of a respective one of said control shafts, each of said link means controlling fuel injection from a respective one of said pumps to a respective corresponding cylinder;

a cross shaft extending from adjacent a respective *end of* one of said control shafts to adjacent a respective *end of the* other *of said control shafts* thereof *in coplanar relation therewith*, and mounted to rotate about a longitudinal axis thereof;

means for controlling rotation of said cross shaft about a longitudinal axis thereof; and means communicating said cross shaft with *the ends of* each of said control shafts to cause an equal rotation of each of said control shafts about a longitudinal axis thereof responsive to a rotation of said cross shaft and about a longitudinal axis thereof.

Re. 30,204

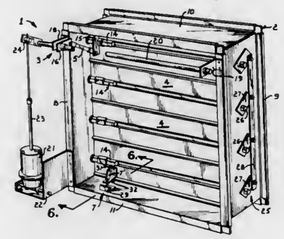
CONTROL DAMPER

James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Original No. 3,996,952, dated Dec. 14, 1976, Ser. No. 614,593, Sep. 18, 1975. Application for reissue Nov. 9, 1978, Ser. No. 959,437

Int. Cl.[2] F16K *17/38*

U.S. Cl. 137—77 **8 Claims**



1. A control damper for a fluid conduit, said control damper comprising:

a. a housing defining a control opening;

b. at least one vane mounted in said housing and having opposed side portions and movable between a fluid flow permitting position and a position closing the control opening;

c. resilient means mounted on said housing and connected to said vane for urging same into the position closing the control opening;

d. means mounted on said housing and connected to said vane for moving same between the flow permitting position and the position closing the control opening and having a fusible portion thereby allowing said resilient means to move said vane into the position closing said control opening in the event of temperature above the melting point of said fusible portion;

e. means mounted on said vane and said housing for retaining said vane in the position closing the control opening after melting of said fusible portion, said means for retaining said vane in said closing position after melting of said fusible portion including:

1. a stop member mounted on said housing adjacent said vane;

2. a fusible link having opposite ends;

3. a first holder member mounted on said vane and having one end of said fusible link connected thereto; and

4. a second holder member mounted on said vane and having the other end of said fusible link connected thereto, said second holder member being resilient and retained in a position to clear said stop member during movement of said vane and movable to a position in engagement with said stop member upon melting of said fusible link.

Re. 30,205

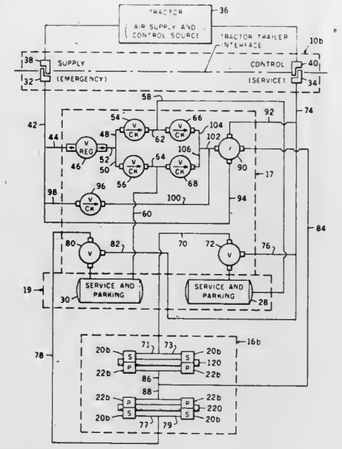
VEHICLE BRAKE SYSTEM

Michael L. Carton, Chesterfield, and Larry C. Huetsch, Mehlville, both of Mo., assignors to Wagner Electric Corporation, Parsippany, N.J.

Original No. 3,992,064, dated Nov. 16, 1976, Ser. No. 637,644, Dec. 4, 1975. Application for reissue May 8, 1978, Ser. No. 903,886

Int. Cl.[2] B60T *13/28*

U.S. Cl. 303—7 **15 Claims**



1. A vehicle brake system comprising:

an air receiving portion including means for receiving air from a supply source;

a valve portion connected to the air receiving portion including a first plurality of one-way check valve means separated for independently operating on the air received and for securing the air operated on from returning to the receiving portion;

a storage portion connected to the valve portion including a storage means separated for independently receiving the air from the first separated valve means, respectively, and for storing the air received;

a second plurality of one-way check valve means, corresponding to the first valve means, separated in the valve portion and cooperatingly connected to the separated storage means, respectively, for selecting air from one of the storage means, for independently operating on the selected air, for securing the selected air from returning to its respective storage means and for further securing the selected air from passing to another of the storage means; and

a brake portion including service brake means connected for receiving air from the storage means and also including parking brake means connected for receiving the selected air from the storage means.

Re. 30,206

SEALS AND METHOD OF MANUFACTURE THEREOF

John G. Ferguson, and Geoffrey D. Waters, both of Bristol, England, assignors to Rolls Royce (1971) Limited, London, England

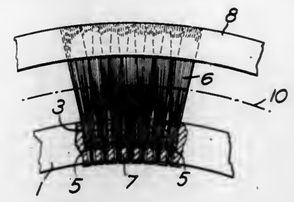
Original No. 3,917,150, dated Nov. 4, 1975, Ser. No. 524,379, Nov. 15, 1974. Application for reissue May 10, 1977, Ser. No. 795,668

Claims priority, application United Kingdom, Nov. 23, 1973, 54518/73

Int. Cl.[2] F16J *15/48;* **B23K** *31/02*

U.S. Cl. 415—174 **28 Claims**

1. A method of manufacturing a seal element comprising the steps of making a brush having a plurality of tightly packed bristles secured to and projecting from a surface of a backing member, clamping the free ends of the bristles between a pair of clamping members, integrally [joining] *fusing* the clamping members and the tips of the bristles, and subsequently removing the backing member and the ends of the bristles attached thereto.



Re. 30,207

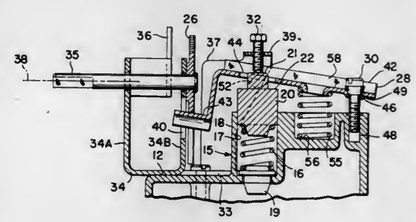
MEANS FOR CALIBRATING PRESSURE SWITCHES AT EXTRA-LOW PRESSURE SETTINGS

Lawrence A. Kolze, Bensenville, and William H. Jones, Villa Park, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 3,846,600, dated Nov. 5, 1974, Ser. No. 408,787, Oct. 23, 1973. Continuation of Ser. No. 737,293, Nov. 1, 1976. Application for reissue Jun. 19, 1978, Ser. No. 916,992

Int. Cl.[2] H01H *35/34*

U.S. Cl. 200—81 R **8 Claims**



14. A calibration mechanism in a pressure switch of the type having a spring-biased plunger arrangement adjustable to sense different pressures to which said pressure switch responds, said mechanism comprising:

(a) means for establishing and calibrating normal "low to high" pressure settings of said pressure switch, said "low to high" pressure setting means including lever means for adjusting said plunger and selectively operative cam means in association with said lever means to provide a "low to high" range of settings, wherein said lever means includes a lever adapted for pivotal movement at only one end thereof with respect to said pressure switch, said lever having the opposite end thereof engaging said cam means, as a follower with portions thereof intermediate said ends contacting said plunger;

(b) means biasing said lever in a direction for engaging said cam means;

(c) means pivotally mounting said one lever end to said pressure switch, said pivot means including adjustable means operable, upon adjustment, to move the fulcrum of said lever with respect to said plunger for varying the spring biasing of said plunger; and

(d) wherein said biasing means acts on said lever intermediate said pivot means and said cam follower and wherein said cam follower, said biasing means and said pivot means are disposed in straight line relationship throughout the range of movement of said lever.

PLANT PATENTS

GRANTED FEBRUARY 5, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,499

DISTINCT CULTIVAR OF APPLE TREE: COOP 16

Edwin B. Williams, Lafayette; Jules Janick; Frank H. Emerson, both of West Lafayette, all of Ind.; Daniel F. Dayton, Urbana, Ill.; L. Fredric Hough, Bloomsbury, and Catherine H. Bailey, Englishtown, both of N.J., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Nov. 6, 1978, Ser. No. 964,578

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct apple tree as shown and described, resembling 'Golden Delicious', but particularly characterized by resistance to scab, waxy skin, good storage quality, maturity with 'Golden Delicious' approximately one week after 'Delicious' and four and one-half weeks after 'Prima'.

4,500

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,225

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Iowa and particularly characterized by the combined features of single, violet-shaped flowers having an intensive blue-violet color; strong and upright flower stems rising from the center of the plant so as to carry the bouquet centrally and well above the foliage; and by its vigorous growth and compact habit.

PATENTS

GRANTED FEB. 5, 1980

ERRATA

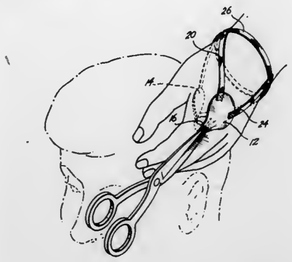
For CLASS	See PATENT NO.
138–097	4,186,475
433–201	4,186,486
433–020	4,186,487
433–008	4,186,488
252–008.55 D	4,187,073
422–063	4,187,077
430–040	4,187,103
430–057	4,187,104
430–336	4,187,105
430–001	4,187,106
430–252	4,187,107
430–203	4,187,108
430–002	4,187,109
430–544	4,187,110
430–002	4,187,111
430–285	4,187,112
430–533	4,187,113
430–510	4,187,114
048–197 R	4,187,148
435–294	4,187,149
252–402	4,187,213
528–051	4,187,215
548–226	4,187,227
548–260	4,187,229
549–087	4,187,231
548–069	4,187,232
585–467	4,187,255
525–471	4,187,256
525–445	4,187,257
525–157	4,187,258
525–219	4,187,259
525–263	4,187,260
525–243	4,187,261
430–110	4,187,329
430–103	4,187,330
430–328	4,187,331
525–503	4,187,368
526–128	4,187,385
179–107 FD	4,187,413
179–175.35	4,187,414
179.175.3 F	4,187,415
367–093	4,187,487
367–013	4,187,488
367–121	4,187,490
367–125	4,187,491
367–127	4,187,492
367–135	4,187,493

PATENTS

GRANTED FEBRUARY 5, 1980

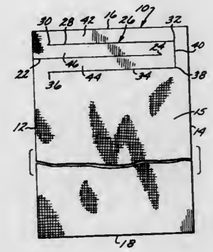
GENERAL AND MECHANICAL

4,186,442
HAIRDRESSER'S HAND PROTECTOR
James W. Kilgore, P.O. Box 33626, Seattle, Wash. 98133
Filed Apr. 3, 1979, Ser. No. 26,533
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—20 **5 Claims**



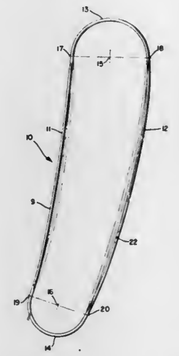
1. A hairdresser's hand protector comprising an elongated flexible pad having opposite end portions adapted to cover respectively areas on the palm and back sides of the hand contiguous to the crotch of two mutually adjacent fingers and connected by an intermediate portion narrower in width than said end portions and adapted to fit in the crotch between said fingers with the end portions drawn toward the wrist, and harness means including a wrist band and tension element connecting said wrist band to said pad end portions at transversely spaced locations on the latter respectively on the palm and back sides of the hand so as to stretch out the end portions across and lengthwise of the hand.

4,186,443
DISPOSABLE BIB
Agnita Britzman, 1440 E. Fourth St., Long Beach, Calif. 90802
Filed Aug. 21, 1978, Ser. No. 935,678
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—49 R **6 Claims**



1. A disposable bib, comprising:
a flexible sheet having first and second sides and top and bottom edges, including a bib section and a strap section formed adjacent said top edge, said strap section having a transverse first slit extending in from said one side thereof and terminating in a first end spaced from said second side, a U-shaped slit including first and second legs disposed on opposite sides of said first slit and a cross slit between said first and second legs, said cross slit being spaced intermediate said first end and said second side, said slit legs terminating in respective second and third ends spaced from said first side whereby said slits cooperate to form a first side strap between said first slit and said second slit leg, a second strap between said first slit leg and said top edge and a yoke between said first slit leg and said first slit, said first and second side straps and said yoke forming a continuous neck strap when said second side strap is pulled away from said bib section.

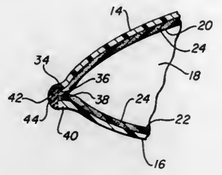
4,186,444
COAT SLEEVE FORM
John F. Erdman, R.D. #2, Quakertown, Pa. 18951
Filed Mar. 24, 1978, Ser. No. 889,875
Int. Cl.[2] D06C *5/00*
U.S. Cl. 223—72 **1 Claim**



1. A form for shaping a coat sleeve having a predetermined size, said form being capable of being utilized for display purposes, to assist in removing and preventing wrinkles and to prevent sagging and folds of the sleeve during storing, comprising a rod configured as a re-entrant, oval, elongated hoop having a pair of generally straight, side portions between curved end portions, the side portions generally conforming in shape with front and back crease lines of the sleeve, the rod having a memory and being of a spring type material that exclusively exerts a spring force on the rod, the memory and spring force causing the hoop to return to the configuration after the hoop having been deformed less than the elastic limit of the rod, the rod being heat treated methyl methacrylate molded to the configuration so that ends of the rod are secured together, the hoop form being such that outer edges of said side portions are spaced from each other by more than separation between front and back crease lines of the sleeve interior so that the spring force of the rod causes the side portions to exert outwardly directed forces against the crease lines while the form is inserted in the sleeve between the crease lines, end portions of the hoop being approximately semicircular and respectively proximate the shoulder and wrist ends of the sleeve while the form is inserted into the sleeve, the end portion proximate the shoulder having a greater radius than the end portion proximate the wrist end, the ends of the two semicircular end portions being approximately tangent to the ends of the side portions abutting against them so that there is a smooth transition between each of said side and end portions, said rod being hollow to form a tube, the ends of the tube being secured together by a plug held in situ against the interior wall of the tube, said plug including barbs at both of its ends, the barbs at the different ends projecting in opposite directions into the interior wall of the tube to hold the plug in situ, said barbs having an extent into the tube so that they do not extend beyond the exterior wall of the tube, plural sets of barbs being provided on at least one of the plug ends at differing longitudinal positions of the plug, a substantial separation being pro-

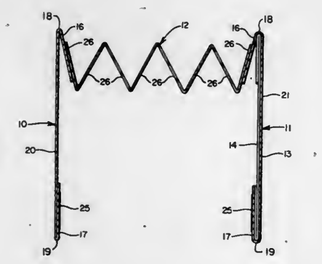
vided along the length of the plug between adjacent, oppositely directed barbs so that the dimensions of the hoop can be controlled as the plug is inserted into the tube and rods of the same length can be used for sleeves of differing dimensions.

4,186,445
DISPOSABLE COSMETIC GLOVE
Phyllis H. Stager, 7619 Chattington, Dallas, Tex. 75240
Continuation-in-part of Ser. No. 782,004, Mar. 28, 1977, Pat. No. 4,122,554. This application Mar. 3, 1978, Ser. No. 882,432
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—164 **7 Claims**



1. A disposable article to place in contact with the body for use in applying a cosmetic or therapeutic substance to the skin including a substrate and a therapeutic or cosmetic composition carried by substrate, said substrate comprising a first lamina of a lotion impervious thermoplastic resin and a second lamina of a lotion absorbent expanded polymeric material bonded to said first lamina.

4,186,446
ADJUSTABLE PAPER CAP
Thomas P. Maney, 535 Greenglade Ave., Worthington, Ohio 43085
Filed Jun. 28, 1978, Ser. No. 920,209
Int. Cl.[2] A42B *1/22*
U.S. Cl. 2—197 **3 Claims**

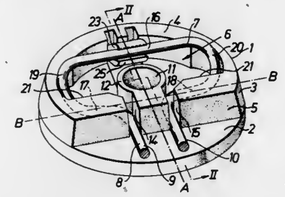


1. An adjustable cap comprising first and second elongated side panels with respective opposite ends adapted to be disposed in coexistensive relationship with each panel having opposed upper and lower longitudinally extending edges, each of said first and second panels having respective upper and lower marginal edge portions folded relatively inwardly at each respective longitudinally extending edge into superposed relationship between said two panels, said upper marginal edge portion being free to swing about its longitudinally extending edge toward the opposite side panel,

said second panel being formed with a front section and a rear section extending in longitudinally aligned relationship with adjacent ends of the front and rear sections telescopically interconnected to permit relative longitudinal displacement thereof for selective size adjustment, each of said front and rear sections having their opposite ends connecting with a respective end of said first panel, and

an elongated crown formed from flexible sheet material with a plurality of longitudinally extending pleated panels and having an outermost pleated panel at each side thereof secured to an inwardly facing surface of a respective upper marginal edge portion of said first and second side panels, each outermost pleated panel projecting in a direction opposite to the inwardly projecting upper marginal edge portion with at least portions of respective surfaces thereof disposed in coextensive relationship, said pleated panels disposed in coplanar relationship to said side panels when said crown is collapsed to a fully folded configuration.

4,186,447
EAR PROTECTOR ATTACHMENT FOR A HELMET
Tore G. Palmaer, S-330 30 Gnosjö, Sweden
Filed Jun. 19, 1978, Ser. No. 916,547
Claims priority, application Sweden, Jul. 1, 1977, 7707662
Int. Cl.[2] A42B *3/00; 2 209;174;6;422;423;424*
U.S. Cl. 2—423 **4 Claims**



1. A device for holding an ear defender, said device comprising a housing having a space therein to accommodate a loop forming part of a supporting member for an ear defender, said space being defined by a bottom wall, a rear wall and a front wall of said housing, said front wall having notches, formed therein to receive parts of the supporting member connected to the loop, the loop having two journalling parts arranged in line with each other which are arranged in a groove on the inside of the front wall to provide journalling axis for the supporting member, a lever pivotably journalled with one end being arranged to receive a transverse spring section of the loop, said spring section being arranged to press against the lever which is adapted to be moved through a dead center condition between two positions, the supporting member being pivotable about its journalling axis between the distinct positions.

4,186,448
DEVICE AND METHOD FOR TREATING AND HEALING A NEWLY CREATED BONE VOID
John H. Brekke, 4921 Pike La., Rte. #1, Duluth, Minn. 55811
Continuation-in-part of Ser. No. 677,752, Apr. 16, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,417
Int. Cl.[2] A61F *1/24;* **A61B** *17/18*
U.S. Cl. 3—1.9 **8 Claims**

4. A device for treating and healing a newly created bone void comprising:

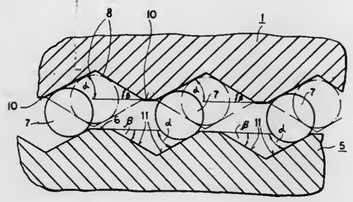
(a) a one piece body member formed of a biodegradable material,

(b) said body member having a form sufficient to fill and cover a bone void, and

(c) having enclosed interconnected randomly positioned and randomly sized and shaped voids therein each void connecting with the others and communicating with the exterior of the body through which voids blood is attracted by capillary action for saturation of the body with blood said voids occupying about 90% of the volume of the body and said body having a wetting agent incorporated therewith, whereby a bone void filled and covered by the body member is healed as the body member biodegrades.



4,186,449
SWIVEL JOINT
Eduard Horvath, Vienna, Austria, assignor to Otto Bock Orthopadische Industrie KG, Duderstadt, Fed. Rep. of Germany
Filed Mar. 31, 1978, Ser. No. 892,260
Claims priority, application Austria, Apr. 4, 1977, 2337/77
Int. Cl.[2] A61F *1/08, 1/04*
U.S. Cl. 3—2 **9 Claims**



1. A swivel joint, especially for artificial leg limbs, said joint comprises:

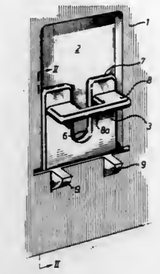
two relatively rotatable members having a pivotal axis;

thrust bearings interposed between said members and enabling relative rotation of said members from a neutral position in opposite senses; and

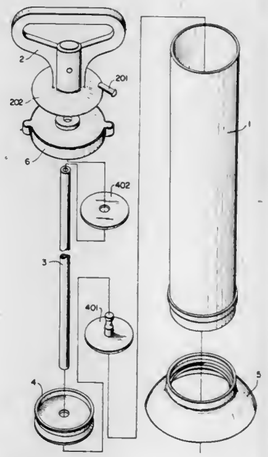
an elastic restoring element connected to said members and resisting relative rotation of said members, said element comprising a compression spring bearing at one end on a sleeve axially slidable and non-rotatable in a first of the relatively rotatable members and bearing on ramps of the second rotatable member via balls which engage one end face of the sleeve so that the distance between the sleeve and the adjacent member of the swivel joint can be varied during a relative rotation of the two members of the swivel joint and the spring stress will vary with said distance.

4,186,450
BIDET ARRANGEMENT
Ralf H. S. Rosenberg, and Morgan H. O. Ferm, both of Göthenburg, Sweden, assignors to IFÖ Sanitar AB, Bromolla, Sweden
Filed Sep. 25, 1978, Ser. No. 945,714
Claims priority, application Sweden, Sep. 28, 1977, 7710824
Int. Cl.[2] A47K *3/22*
U.S. Cl. 4—6 **4 Claims**

1. A bidet arrangement, comprising a seat which is supported by a wall of a restroom and swingable between an upper, vertical, position and a lower, horizontal, position in which the bidet function can be performed by the insertion of a hand shower nozzle into the space below a central opening in the seat, characterized in that a member (8), substantially perpendicular to the plane of the seat, in the upper position of the latter provides a horizontal support surface capable of absorbing part of the body weight of a standing person, means being provided to lock the seat in its upper position when it is used to support a standing person.



4,186,451
PLASTIC SANITARY PUMP
Chen-Min Ruo, No. 48 Shin Fu Rd., Panchiao City, Taipei, Taiwan
Filed May 25, 1978, Ser. No. 909,522
Int. Cl.[2] E03D *11/00, 5/09*
U.S. Cl. 4—255 **4 Claims**



1. A sanitary pump comprising:

a tubular cylinder having upper and lower openings at each end thereof;

a flexible sealing cup surrounding the lower cylinder opening;

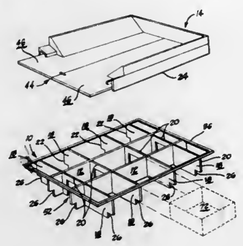
piston means slidably mounted within said cylinder, said piston means comprising a lower rigid washer plug having a flat annular body and a vertically extending centrally positioned post, an upper rigid annular washer having a centrally positioned aperture fitted over said post and a flexible annular piston

element sandwiched between said lower washer plug and said upper washer;

a hollow piston rod, said piston means vertical post being mounted within said hollow piston rod and being maintained in place by welding the vertical post to said hollow piston rod;

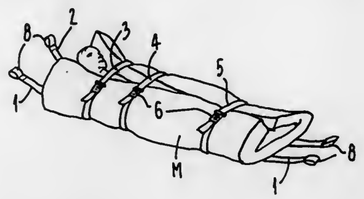
a handle, said handle being attached to an upper end of said piston rod;
a disc, said disc being positioned under said handle and mounted for movement with said handle for preventing water from reaching a user's hand; and
a cap mounted on and partially closing said cylinder upper opening, said cap including at least one air outlet and a central aperture for guiding said piston rod.

4,186,452
ADJUSTABLE BED SUPPORT PEDESTAL
Ronald Underwood, 1415 W. North St., #718, Anaheim, Calif. 92801
Filed Jul. 31, 1978, Ser. No. 929,574
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—58 **1 Claim**



1. An adjustable bed support pedestal which comprises:
(a) At least two longitudinal substantially vertical planar support members having a length substantially equal to the length of the bed to be supported and arranged in spaced, parallel relationship with one another within the perimeter of the bed to be supported, each of the longitudinal support members having at least two vertically extending slots extending partially therethrough in spaced parallel relationship wherein at least one longitudinal support member is composed of: Two substantially vertical, planar members in spaced, parallel, end to end relationship with one end of one facing one end of the other; and a bridge member extending between and attached to the facing ends of the planar members and having a top surface co-planar with the top surface of transverse support members, longitudinal support members, and a rail assembly, and having a vertical dimension less than that of the planar members, whereby an opening is provided below the bridge member;
(b) At least two transverse, substantially vertical planar support members extending outwardly at substantially right angles to a longitudinal support member from an inside end inside the longitudinal support member to an outside end at the perimeter of the bed to be supported and arranged in spaced parallel relationship with one another, each of the transverse support members having a vertically extending slot extending partially therethrough near its inside end and adapted to intersect with a corresponding slot in the longitudinal support member so that the top surfaces of the transverse and longitudinal support members are co-planar and the bottom surfaces of the longitudinal and transverse support members are co-planar wherein the inside end of a first transverse support member intersecting one longitudinal support member is in spaced, opposed, parallel relationship with the inside end of a second transverse longitudinal support member and including as an additional element a bridge member extending between and attached to the inside ends of the first and second transverse support members and having a top surface co-planar with the top surfaces of the transverse support members, longitudinal support members, and a rail assembly, and having a vertical dimension less than that of the transverse support members, whereby an opening is provided below the bridge member;
(c) A rail assembly extending between the outside edges of the longitudinal and transverse support members beneath the perimeter of the bed to be supported and resting in grooves provided in the support members adjacent the outside ends thereof so that the top surface of the rail assembly is co-planar with the top surfaces of the longitudinal and transverse support members;
(d) Means attached to the outer perimeter of the rail assembly for securing a valance thereto, which comprises one portion of a male-female track assembly, the other portion of the assembly being attached to the valance, and wherein the valance securing means comprises the female portion of the male-female track assembly;
(e) A substantially planar bed support member having a length and width substantially equal to the length and width of the bed to be supported and adapted to be positioned beneath the bed in a generally horizontal position and upon the top surfaces of the transverse support members, the longitudinal support members, and the rail assembly; and
(f) A storage bin slidably disposed between support members and beneath the rail assembly.

4,186,453
RESTRAINT PACKAGE
John E. Burns, Seaford, and Martin J. Van Lith, Kew, both of Australia, assignors to Alfred Hospital, Victoria, Australia
Filed Mar. 21, 1978, Ser. No. 888,781
Claims priority, application Australia, Mar. 22, 1977, PC9510
Int. Cl.[2] A62C *7/00*
U.S. Cl. 5—82 R **8 Claims**

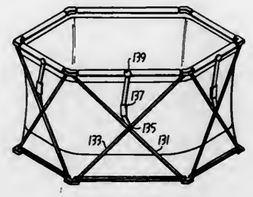


1. A package for a restraint having a plurality of elongate bands, comprising a base member and an overlying cover member interconnected to form an envelope for containing the restraint in a predetermined configuration, said cover member having openable portions defined by weakening lines formed in the cover, and manually engageable means attached to each said portion to facilitate manual opening of said portions along said weakening lines which upon said manual opening expose at least the ends of said bands for withdrawal from the envelope.

4,186,454
PORTABLE PLAYPEN
Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240
Filed Sep. 20, 1978, Ser. No. 944,143
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—99 R **10 Claims**

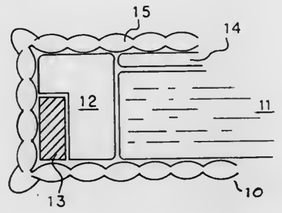
1. A multi-sided playpen having a frame structure comprising
a plurality of upper corner hinge brackets between adjacent sides of said playpen;
a plurality of substantially centrally hinged railings;
means for pivotally connecting the ends of said railings to said upper corner hinge brackets so as to substantially form a multi-sided structure;

a plurality of lower corner hinge brackets between adjacent sides of said playpen;
a plurality of X-shaped structures equal in number to the sides of said playpen, each of said structures being pivoted substantially at their center points;



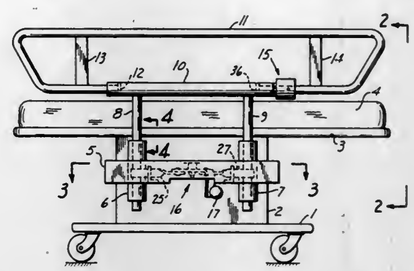
means for pivotally connecting the free ends of each of said X-shaped structures to adjacent said upper and lower bracket members so as to form said multi-sided playpen; and
releasable locking means connected between each of X-shaped structures and said centrally hinged railings.

4,186,455
COMPOSITE WATER BED MATTRESS
Moroni Fox, Jr., 1568 Stonemore Cir., Salt Lake City, Utah 84121; Moroni Fox, Sr., 2760 Claybourne Cir., Salt Lake City, Utah 84109, and Dana G. Fox, 4467 Nancy Dr., Salt Lake City, Utah 84120
Filed Feb. 8, 1978, Ser. No. 876,132
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **20 Claims**



1. In a mattress construction having a conventional thickness;
a water mattress comprising a flexible bladder for holding a body of water;
a peripheral restraining member for providing lateral support in all directions for said water mattress, said restraining member comprising:
an encircling flexible foam restraining member having a substantially vertical surface adjacent said bladder and having a height at least as great as said bladder when said bladder is filled with water, said foam restraining member forming a cavity for said water mattress,
a peripheral rigid box-like member in contact with the outer surface of said foam restraining member remote from said bladder, said rigid box-like member having a height no greater than the height of said bladder when said bladder is filled with water,
a foam cushion superposed upon the upper surface of said rigid box-like member to a height substantially level with the upper surface of said foam restraining member.

4,186,456
RAIL SYSTEM FOR BED OR STRETCHER
David F. Huempfner, Kewaunee, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Jul. 14, 1978, Ser. No. 924,777
Int. Cl.[2] A47C *7/00*
U.S. Cl. 5—428 **14 Claims**



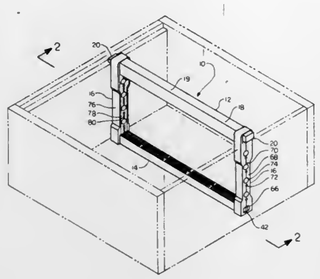
1. A patient restraining rail system for joining to a bed or the like comprising: a rail support with an anchoring member having end portions; an outwardly pivoting generally C-shaped rail telescopically connected to the anchoring member's end portions at pivot joints with the anchoring member extending across a gap in the rail; means attached to the support for adjusting the location of the rail's pivot axis; and a spring biased lock with an element attached to each of the anchoring member and rail to hold the rail in a particular pivotal position relative to the anchoring member.

4,186,457
PEDIATRIC WATER MATTRESS
Robert J. Amelung, St. Louis, Mo., assignor to Aqua-Babe Corporation, St. Louis, Mo.
Filed Dec. 20, 1978, Ser. No. 971,330
Int. Cl.[2] A47C *27/08;* **A61G** *7/04*
U.S. Cl. 5—452 **9 Claims**



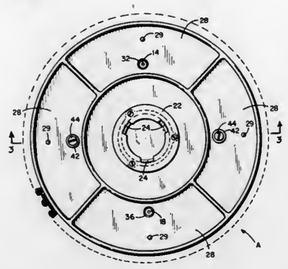
1. A pediatric water mattress for infant therapeutic usage, comprising, a pair of inner liners sealed together around their periphery for forming an inner chamber and provided for holding a supply of water, a pair of outer liners also sealed together around their perimeter for forming an outer chamber and being larger than the pair of inner liners, said inner liners formed water chamber being located within the said outer chamber, said outer chamber arranged for holding some minimal quantity of air, a valve means connected through both an inner and outer liner for use for introducing a supply of water into the said inner chamber, a check valve connecting through the outer liner and for use for investigating the contents of the outer air chamber, and guard means connecting around the perimeter of the said outer liner to restrain any infant located upon the mattress wherein said guard means extends upwardly above the said liner to which it attaches, and said guard means being coextensive with the perimeter of the liner to which it connects.

4,186,458
KNOCKDOWN BEEHIVE FRAME
James P. Caviglia, III, 17300 Ave. 324, Visalia, Calif. 93277
Filed Apr. 27, 1978, Ser. No. 900,614
Int. Cl.[2] A01K *47/02*
U.S. Cl. 6—10 16 Claims



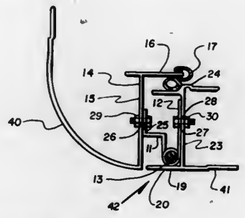
8. An improved beehive frame comprising:
an elongated substantially rigid top member formed for horizontal disposition and having top member interconnector means on each end thereof;
an elongated substantially rigid bottom member formed for horizontal disposition and having bottom member interconnector means on each end thereof;
a pair of elongated substantially rigid side members formed for vertical disposition and having side to top interconnector means on their lower ends;
each of said top interconnectors on said top member being releasably interconnectable with a different one of said side to top interconnectors on said side members and each of said bottom interconnector means on said bottom member being releasably interconnectable with the side to bottom interconnectors on a different one of said side members, whereby said top member, said bottom member, and said side members are interconnectable into a rigid rectangular frame structure and permit knockdown of said frame structure into said individual members by release of said interconnections;
said top interconnector means includes an ear projecting from an end of said top member in longitudinal alignment therewith and having a reduced dimension defining a shoulder between said ear and said top member main body at the proximal end of said ear and means defining a hanger surface at the distal end of said ear disposed to rest upon a surface to support said top member in a generally horizontal position, and first-locking components; and
said side to top interconnectors include receptacles for said ears, said receptacles having a leading portion and a trailing portion separated by a depth less than the longitudinal extension of said ears whereby when said ears are inserted in said receptacles with the leading portion of said receptacles engaging said shoulder at the proximal end of said ears, the distal end of said ears, and particularly said hanger surface, extends beyond the trailing portion of said receptacle, and second locking components interconnected with said receptacle and disposed to engage and interlock with said first locking components, said locking components being manually manipulable to release said interlock.

4,186,459
CARPET BRUSH ATTACHMENT FOR A FLOOR TREATING MACHINE
Richard F. Wulff, Maple Plain, Minn., assignor to Advance Machine Company, Spring Park, Minn.
Filed Nov. 2, 1978, Ser. No. 957,014
Int. Cl.[2] A47L *11/162;* A46B *13/02*
U.S. Cl. 15—180 6 Claims



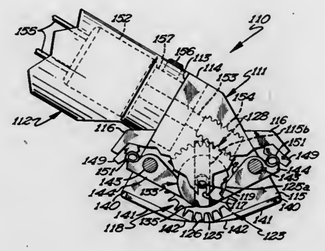
1. A carpet brush attachment for a floor treating machine comprising:
(a) a circular surface engaging plate normally horizontally disposed and support for the machine on a surface,
(b) said plate having a circular hub extending axially and vertically therefrom for connection with a source of power for rotation of said plate,
(c) a multiplicity of spaced extensions formed on said circular plate adjacent the outer edge thereof and spaced radially outwardly from said circular hub and parallel to the longitudinal axis of said hub,
(d) a ring brush having an inner diameter greater than the diameter of said plate and surrounding said plate,
(e) said ring brush having spaced holes adjacent the inner edge thereof through which said extensions freely extend for contact of said ring brush by said extensions for rotating said ring brush when said plate is rotated and allowing said brush to move upon said extensions and rest floating by on a carpeted surface with the plate upon the surface and supporting the machine to which the brush is attached.

4,186,460
SLEEPER BOX HINGE
J. Clyde Artman, 4045 Gun Club Rd., Murrysville, Pa. 15668
Filed Dec. 19, 1977, Ser. No. 861,853
Int. Cl.[2] E05D *11/00, 5/06*
U.S. Cl. 16—137 3 Claims



1. A sleeper box hinge comprising:
a. a frame member;
b. a swinging member attached to the frame member;
c. a self-lubricating pin fit at the location of the frame member and swinging member, to facilitate the free rotation of the swinging member about the frame member;
d. a side wall member dimensioned on the side of a sleeper box and attached to the frame member, said side wall member having a first side perpendicular to its second side;
e. a flexible clip-on seal attached to the first side and located furtherest away from the second side; and
f. means for closing a sleeper box door so that water and air are prevented from passing through a rubber seal, as well as stopping the door when opened at the desired position, and attached to the swinging member.

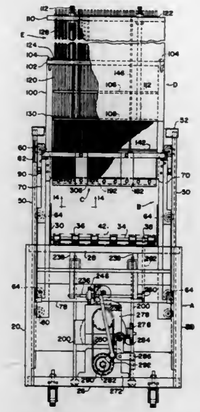
4,186,461
HAND SUPPORTED SKINNING DEVICE
Lyndon R. Leining, Austin, Minn., assignor to Geo. A. Hormel & Company, Austin, Minn.
Filed Apr. 17, 1978, Ser. No. 897,140
Int. Cl.[2] A22B *5/16*
U.S. Cl. 17—21 7 Claims



1. A hand held power skinning knife for skinning animals such as hogs and the like, comprising:
a housing,
a handle mounted on said housing and projecting therefrom,
an elongate blade mounted on said housing and extending transeversely thereof and having a cutting edge,
an elongate, revolvable roll assembly mounted on said housing and extending transversely thereof, said roll assembly including a plurality of toothed wheels having teeth projecting outwardly therefrom in close proximity to the cutting edge of said blade and cooperating with the latter to grip a portion of an animal skin therebetween,
a second elongate blade mounted on said housing and extending transversely thereof and having a cutting edge positioned in close proximity to the teeth of said assembly, said blades having their cutting edges disposed in opposed relation with respect to each other,
a driven element connected with said toothed wheels,
a revolvable drive element mounted on said handle and engaging said driven element, and
reversible power means engaging said drive element for revolving the roll assembly in opposite directions whereby a a portion of animal skin gripped between the roll assembly and one of said blades will be progressively pulled against the cutting edge of one of said blades to cut a strip of skin from the animal carcass.

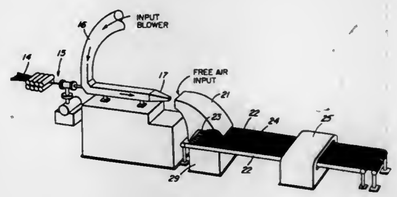
4,186,462
TENDERIZER
Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio
Filed Aug. 13, 1976, Ser. No. 714,026
Int. Cl.[2] A22C *9/00*
U.S. Cl. 17—25 10 Claims

1. An apparatus for treating a comestible product, such as, meat comprising: a conveyor for conveying a product to be processed; a first carriage having a multiplicity of closely spaced aligned apertures; discrete assemblies each comprising a rod member slidable in each of the aligned apertures of said first carriage and operatively connected thereto by overload release means; a long thin product piercing instrumentality connected to a first plurality of said rod members with their piercing ends facing said conveyor; a plate-like member at the side of said first carriage facing said conveyor and normally spaced from said first carriage and connected to a second plurality of said rod members and having apertures therein through which said intrumentalities extend; power means for reciprocating said first carriage towards and from said conveyor to cause said instrumentalities to pierce a product on said



conveyor; a second carriage arranged to move in coordination with movements of said first carriage; a member connected to said second carriage to engage a product being pierced by said instrumentalities; and means for locking said second carriage in position with said member connected thereto engaged with the product while said instrumentalities are being withdrawn from the product.

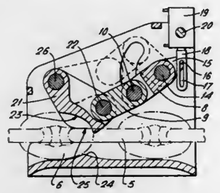
4,186,463
APPARATUS FOR MAKING BIAXIALLY ORIENTED NONWOVEN FABRICS AND METHOD OF MAKING SAME
Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.
Division of Ser. No. 506,843, Sep. 17, 1974, Pat. No. 3,969,561.
This application Dec. 22, 1975, Ser. No. 643,553
Int. Cl.[2] B29C *13/00*
U.S. Cl. 19—304 7 Claims



1. Apparatus for making a biaxially oriented nonwoven fabric having areas of high fiber density and low fiber density wherein a majority of the fibers in said low fiber density areas are oriented in a substantially cross direction and a majority of the fibers in said high fiber density areas that lie directly adjacent said low fiber density areas are oriented in a direction substantially parallel with the contours of the configuration of said low fiber density areas comprising:
high velocity fluid jet propelling means for carrying discretely separated textile-length fibers in a fluid-borne stream;
a curved distributor chamber having an opening on the bottom thereof for receiving said fluid-borne stream and being workably disposed with said propelling means;

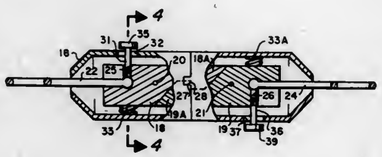
a moving air-permeable conveyor screen disposed under said chamber;
a plurality of equidistantly spaced-apart finger-like striping bars disposed across said moving screen;
a vacuum means disposed under said moving screen and said chamber for aiding said fluid-borne stream to locate its fibers on said screen in a particular manner; and,
a means for collecting a biaxially oriented striped nonwoven fabric, said means disposed at the end of said moving conveyor screen.

4,186,464
CHAIN STOPPER
Harry S. Sandoy, Kolbjornsvik, Norway, assignor to Pusnes Mek, Verksted A/S, Pusnes, Norway
Filed Apr. 24, 1978, Ser. No. 899,240
Claims priority, application Norway, Apr. 28, 1977, 771497
Int. Cl.[2] F16G *15/04;* B63G *21/18*
U.S. Cl. 24—116 R **2 Claims**



1. In a chain stopper comprising a framework; a chain track extending through said framework for receiving said chain; a pawl pivotably attached at one of its ends to said framework and comprising two parts pivotably connected to each other in the fashion of a toggle link which remains substantially unbent in the chain-stopping position of said pawl and is actuated to a bent position when said chain is released; and an arm pivotably attached at one of its ends to the other end of said pawl and pivotably attached at its other end to said framework, said arm having a bearing part resting against and substantially conforming to the surface of said chain when said pawl is in its chain-stopping position; the improvement wherein the pivot axis of pivotable attachment of said pawl to said framework and the pivot axis of pivotable attachment of said arm to said framework are on opposite sides of a plane which is perpendicular to said chain track and which extends through the axis of pivotable attachment of said arm to said pawl.

4,186,465
SAFETY LOCK
Jim L. Manning, P.O. Box 1504, Apache Junction, Ariz. 85220
Filed Mar. 28, 1978, Ser. No. 891,133
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—201 HH **8 Claims**



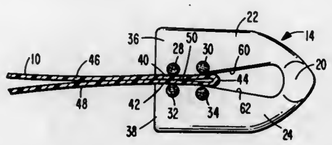
1. A locking device comprising, in combination
first and second sleeves each having center openings extending along a longitudinal axis;
first and second bar members each having longitudinal axes connecting first and second ends and being positioned within the center openings of said first and second sleeves respectively to extend along the longitudinal axes thereof, the first and second bar members being fastened within the respective sleeves by pivot means permitting pivoting of the bar member within the sleeve;
each bar member including a lip forming a surface adjacent the first end thereof, said surface being positioned normal to the pivot means and extending laterally of the longitudinal axis of the bar member; and
a first operator engaging the first bar member and extending external to the associated sleeve for pivoting the bar member about the supporting pivot means whereby the ends of the first and second sleeves adjacent the bar member lips can be placed together and the first bar member pivoted to overlap the lip surfaces and lock the bar members and attached sleeves together.

4,186,466
METHOD FOR MAKING FLAME RETARDANT-WATER REPELLENT COIL ZIPPER
Robert Schleifstein, Freehold Township, Monmouth County, N.J., assignor to Coats & Clark, Inc., Stamford, Conn.
Continuation-in-part of Ser. No. 820,564, Aug. 1, 1977, Pat. No. 4,111,647. This application Mar. 15, 1978, Ser. No. 886,632
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C09K *3/28;* A44B *19/00*
U.S. Cl. 24—205.13 C **7 Claims**

1. A method of imparting fire retardancy and water repellency to a polyester coil zipper comprising:
(A) applying by a pad process from about 1 to about 20% (owg) of a fire retardant and from about 1 to about 10% (owg) of a water repellent simultaneously in an aqueous solution or dispersion to said coil zipper; and
(B) drying and curing the thus-treated zipper,
said water repellent being a perfluoro-containing polymer and said fire retardant being:

where x = 0 or 1.

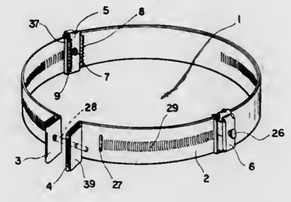
4,186,467
WELDED THERMOPLASTIC STRINGER FOR SLIDE FASTENER AND METHOD OF MANUFACTURE
Charles T. Lawrence, Saegertown, Pa., assignor to Textron, Inc., Providence, R.I.
Filed Aug. 22, 1977, Ser. No. 826,543
Int. Cl.[2] A44B *19/04*
U.S. Cl. 24—205.16 R **8 Claims**



1. A stringer for a slide fastener comprising
a tape of longitudinally folded polymer film material forming respective overlying folded portions,
a train of thermoplastic coupling elements each including a head portion and a pair of leg portions extending in generally the same direction from opposite sides of the head portion,
each pair of said leg portions extending over the respective folded portions on opposite sides of the tape at one longitudinal edge of the tape,

said leg portions terminating in heel portions which are joined by welds to the respective folded portions of the tape,
said folded portions being joined together by welds therebetween at the locations of the welds between the heel portions and the tape,
said leg portions of each coupling element having respective inside surfaces which diverge from the welds toward the opposite sides of the head portion,
said tape having a longitudinal portion at its one longitudinal edge between the diverging inside surfaces of the leg portions spaced from the welds and having portions between adjacent coupling elements free of the welds,
said polymer film including a layer of polymer having a high degree of molecular orientation extending transversely to the tape so that lines of molecular orientation in the film extend continuously across the tape between adjacent coupling elements through the longitudinal portion to the one longitudinal edge.

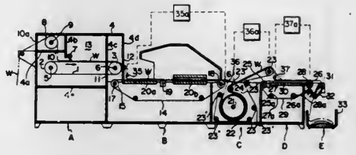
4,186,468
RING CLAMP AND METHOD OF MAKING SAME
Michel H. Zaniewski, Avenue Ferdinand de Lesseps, 34110 Frontignan, France
Filed May 2, 1978, Ser. No. 902,162
Claims priority, application France, May 2, 1977, 77 13790
Int. Cl.[2] A44B *21/00;* F16L *33/00*
U.S. Cl. 24—243 B **5 Claims**



1. A clamp comprising:
a pair of flexible and relatively inextensible sheet-metal strips each having a pair of strip ends and normally formed into an annulus with one strip end of one strip spaced angularly from one strip end of the other strip and each other strip end lying against the inner face of the other strip intermediate the strip ends thereof;
a sheet-metal buckle on said other end of each of said strips and having a pair of bend-over ends embracing and slidably receiving the other strip intermediate said strip ends thereof;
means for drawing said one strip ends angularly together and, when said strips are snugly fitted around an object to be clamped, thereby pressing each of said buckles tightly against said object and locking each of said buckles to the strip normally slidable therein.

4,186,469
APPARATUS FOR FULLING FABRIC
Shigeki Kondo, Inagi, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 779,832, Mar. 21, 1977, abandoned. This application May 31, 1978, Ser. No. 911,084
Int. Cl.[2] D06C *17/00;* D06B *13/00*
U.S. Cl. 26—19 **9 Claims**

1. An apparatus for fulling a wool-containing fabric in the form of a pliable sheet, said apparatus comprising:
a cooling station;
a moisture applying station positioned downstream of said cooling station, taken in a feed direction through the apparatus;
a drying station positioned downstream of said moisture applying station, taken in said feed direction;
first endless belt means for conveying a wool-containing fabric in the form of a pliable sheet in said feed direction through said cooling station;
said cooling station including means for cooling said fabric sheet to a temperature below 0° C.;
second endless belt means, separate from said first endless belt means, for receiving the cooled fabric sheet from said first endless belt means, and for conveying said fabric sheet in said feed direction through said moisture applying station;
said first endless belt means having a discharge end positioned vertically above an inlet end of said second endless belt means, such that said fabric sheet falls downwardly from said first endless belt means onto said second endless belt means;
tension detection lever means, positioned to contact said fabric sheet at an area thereof between said discharge end of said first endless belt means and said second endless belt means, for detecting varying tension of said fabric sheet;

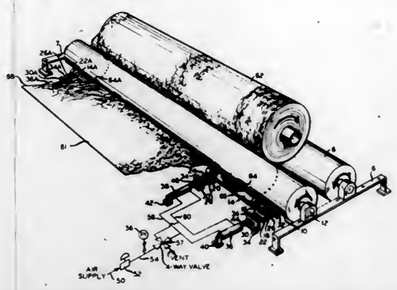


control means, operatively connected to said tension detection lever means, for controlling the speed of movement of said second endless belt means in response to the amount of tension detected by said tension detection lever means such that said fabric sheet is maintained substantially tensionless during passage through said moisture applying station;
said moisture applying station including first steam jet means for jetting steam at a temperature lower than 100° C. against said fabric sheet on said second endless belt means;
said moisture applying station further including second steam jet means, separate from said first steam jet means and downstream thereof, taken in said feed direction, for jetting steam at a temperature above 100° C. against said fabric sheet on said second endless belt means; and
said drying station including means, separate from said second endless belt means, for conveying said fabric sheet through said drying station, and for therein drying said fabric sheet.

4,186,470
APPARATUS USEFUL IN CONTROL OF EDGE UNIFORMITY IN NONWOVEN FABRICS
Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 723,394, Sep. 15, 1976, Pat. No. 4,113,827. This application Jun. 27, 1978, Ser. No. 919,586
Int. Cl.[2] D04H *18/00, 1/46*
U.S. Cl. 28—112 **2 Claims**

1. Apparatus comprising:
a crosslapper for forming a nonwoven fabric,
a needle loom for needling said fabric,
at least three rolls for forming nips positioned for receiving and compressing each edge of a crosslapped, needled fabric wherein at least one first roll has a fixed axis and

two second rolls have a movable axis and are positioned at each edge of the fabric, the axes of the second rolls are



positioned adjacent and approximately parallel to the axis of the first roll and

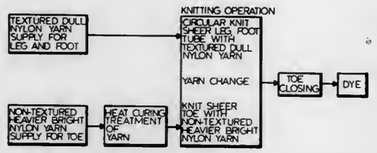
means for forcing the second rolls against the first roll.

4,186,471

METHOD OF MAKING HOSIERY

Nicholas Wehrmann, and Charlie L. Williams, both of Wilkesboro, N.C., assignors to Ithaca Textiles, Inc., Wilkesboro, N.C.

Filed Jun. 12, 1978, Ser. No. 914,588
Int. Cl.[2] D06B *3/30*
U.S. Cl. 28—154 **12 Claims**



1. A method for producing a circular and post-knit dyed, sheer nylon hosiery product having the appearance when worn of an overall substantial uniformity in color and sheerness in its leg, foot and toe portions together with reinforcement properties in the toe portion thereof, said method comprising:

(a) circular and tubuar knitting a sheer leg and foot portion from a supply of textured relatively dull, nylon yarn of a selected weight;

(b) executing a yarn change and circular and tubular knitting a sheer toe portion from a supply of strand heat cured, substantially non-textured relatively bright nylon yarn of a selected weight sufficiently heavier than the weight of said leg and foot yarn to provide corresponding reinforcement and dye properties in said toe portion enabling the hosiery product as worn to exhibit both a reinforced toe portion and an overall appearance of substantial uniformity in color and sheerness throughout said leg, foot and toe portions;

(c) closing said toe portion; and

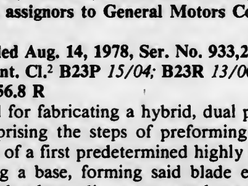
(d) dyeing the resulting hosiery product with selective dyes to produce a hosiery product as worn having both a reinforced toe portion and an overalll appearance of substantial uniformity in color and sheerness throughout said leg, foot and toe portions.

4,186,472

SUPPORT ELEMENT FOR CONTROLLED DEFLECTION ROLL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zürich, Switzerland

Filed May 22, 1978, Ser. No. 908,170
Claims priority, application Switzerland, Jun. 2, 1977, 6774/77
Int. Cl.[2] B21B *31/32*
U.S. Cl. 29—113 AD **6 Claims**



1. A pressure element for a controlled deflection roll, comprising:

a substantially cylindrical piston section intended to be guided in a cylinder bore having a cylinder chamber of a stationary support;

a contact section merging with said piston section and intended to bear against an inner surface of a roll shell rotatable about the support;

a contact surface provided for the contact section;

said contact surface comprising a section of a cylinder surface and provided with at least three hydrostatic bearing pockets;

said bearing pockets being provided with channels for flow communicating said bearing pockets with a surface of the piston section located in the cylinder chamber of the related cylinder bore;

said piston section having a lengthwise axis and a peripheral surface;

at least one of said channels possessing at least one portion which extends from a location at least near to said peripheral surface of the piston section at an inclination with respect to the lengthwise axis of said piston section and towards a location situated closer to said lengthwise axis; and

said channel portion having a mouth disposed at least near to the peripheral surface of the piston section and at a location situated essentially furthest from the plane of the axes of the contact surface and the piston section.

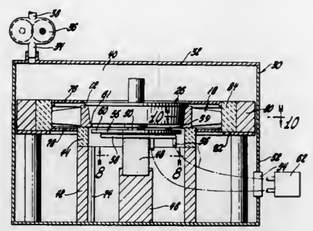
4,186,473

TURBINE ROTOR FABRICATION BY THERMAL METHODS

Kenneth R. Cross, Lebanon, and Bruce A. Ewing, Martinsville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 14, 1978, Ser. No. 933,262
Int. Cl.[2] B23P *15/04;* **B23R** *13/00*
U.S. Cl. 29—156.8 R **2 Claims**

1. A method for fabricating a hybrid, dual property wheel assembly comprising the steps of preforming a plurality of blade elements of a first predetermined highly solidified alloy material having a base, forming said blade elements into a bladed ring with a large diameter central opening, thereafter machining said opening to precise inside diameter on the bladed ring, preforming a metal disc with a controlled OD, fitting the bladed ring to the outer diameter of the metal disc to form front and rear face joint lines, radio frequency power heating said joined disc by placing a radio frequency induction power concentrator coil assembly adjacent the disc to cause the disc to constitute the secondary coil of a step-down transformer thereby to produce selective heating to cause it to thermally grow into radially pressed contact with the inside diameter at an interface therebetween, maintaining the outer surfaces of said radially pressed disc and bladed ring and the interface thereof under continuous vacuum and supplying



radio frequency power to said disc to heat it by induction heating to maintain a diffusion bond temperature between said disc and said bladed ring whereby the parts are maintained at a process diffusion temperature sufficient to cause bond metal growth across the interface between the joined parts.

4,186,474

METHOD OF MAKING HEAT EXCHANGER COIL

Louis P. Hine, Alameda, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 7, 1976, Ser. No. 693,587
Int. Cl.[2] B23K *1/06, 1/08*
U.S. Cl. 29—157.3 A **6 Claims**

1. In the method of making a fin and tube heat exchange coil comprised of parallel aluminum fins with aligned apertures therein, aluminum hairpin tubes extending through the apertures and with their bight portions at one end of the coil and their open ends extending beyond the last fin at the other end of the coil, aluminum return bends telescopically fitted in the open ends of some of said hairpin tubes at said other end of the coil, and copper inlet tube means and copper outlet tube means fitted telescopically in the open ends of others of said hairpin tubes at the other end of the coil, the steps of:

assembling the parts recited above, with the copper inlet tube means and the copper outlet tube means each having a generally U-shape and disposed with their legs remote from their telescopically connected ends extending through a plane corresponding to the level of the surface of a solder bath when said other end of the coil is immersed in a solder bath to a predetermined depth; and

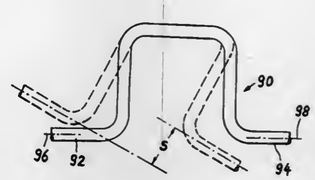
immersing said other end of said coil to said predetermined depth in an ultrasonic solder bath to effect soldering of the telescopic joints situate in the bath thereby forming bonds between the aluminum return bends and the aluminum hairpin tubes and between the copper inlet and outlet tubes and the aluminum hairpin tubes.

4,186,475

METHOD AND MEANS FOR RAPID REPLACEMENT OF DAMAGED PIPE SECTIONS

Arne Jönsson, Torshalla, Sweden, assignor to NYBY Bruk AB, Sweden

Division of Ser. No. 427125, Dec. 21, 1973, abandoned. This application Nov. 4, 1976, Ser. No. 738,900
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1972, 2263002
Int. Cl.[2] B23P *7/00*
U.S. Cl. 138—97 **1 Claim**



1. A method for rapidly repairing damaged portions of conduits and pipes which are difficult or impossible to weld, such as oil pipes, in particular on oil tankers, and long-distance heating pipes, water, gas or similar supply pipes, in particular of large diameter, said method comprising storing replacement pipe sections in the vicinity of the pipe to be repaired, each replacement pipe section having two substantially straight end portions and a generally U-shaped intermediate section formed by a plurality of substantially right-angular bends, and the method further comprising:

cutting out the damaged portion of a pipe to be repaired such that the pipe ends so formed are offset parallel to each other,

plastically deforming two interior bends of said U-shaped intermediate segment by equal angular amounts in the same direction so that facing legs of said U-shaped segment remain parallel until the two straight end portions are offset parallel to each other by an amount equal to that of the pipe ends of the damaged pipe,

inserting the plastically deformed replacement pipe section between the pipe ends of the damaged pipe, and

establishing a sealed connection between said straight end portions and the pipe ends of the damaged pipe by quick-connect coupling unions.

4,186,476

METHOD FOR PRECISE FITTING OF MOTOR VEHICLE FRONT END SHEET METAL

Alex C. Mair, and Stephen A. Mair, both of Bloomfield Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.

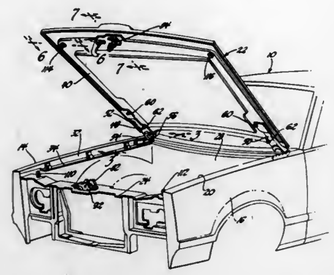
Filed Sep. 13, 1978, Ser. No. 942,052
Int. Cl.[2] B23P *11/00;* **B23Q** *3/00;* **B62D** *25/10*
U.S. Cl. 29—407 **3 Claims**

1. In a motor vehicle body having a front end assembly including a pair of laterally spaced fenders, a header extending transversely between the fenders, a hood, a pair of hinges mounting the rearward end of the hood on the fenders to permit pivotal movement of the hood between open and closed positions, a striker at the forward end of the hood cooperable with a latch mounted on the header to latch the hood in the closed position, and adjustable screws mounted on the header to engage and support the forward undersurface of the hood, a method of precisely aligning and centering the outer appearance surfaces of the hood relative the adjacent appearance surfaces of the fenders and header comprising the steps of:

attaching the striker to the hood at a precise transverse and vertical position relative the outer appearance surfaces of the hood;

machining the undersurface of the hood engageable by the

adjustable screws to a precise vertical height relative the outer appearance surface of the hood;
attaching the hood latch to the header at a precise vertical and transverse location relative the outer appearance surfaces of the fenders and header;



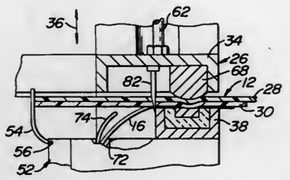
adjusting the adjustable screws to a precise vertical height relative the outer appearance surfaces of the fenders and header;
and attaching the hood hinges to the hood and the fenders at locations establishing a precise longitudinal location of the hood relative the fenders and header.

4,186,477

CASH REGISTER BAG SEALING SYSTEM AND METHOD

Susan E. Cary, Rte. 2, Box 112, Morgan Rd., Hollywood, Md. 20636, and Jesse C. Bunch, 815 Thayer Ave., #1630, Silver Spring, Md. 20910

Filed May 12, 1978, Ser. No. 905,194
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 **23 Claims**



1. A cash register system including a cash register for totaling a plurality of transactions and providing a receipt therefor, said receipt being expelled from said cash register, wherein the improvement comprises:
(a) means for sealing a bag in sealable relation subsequent to said totaling of said plurality of said transactions, said sealing means being coupled to said cash register; and,
(b) means for securing said receipt to said bag substantially simultaneous with said bag sealing, said securing means being secured to said sealing means.

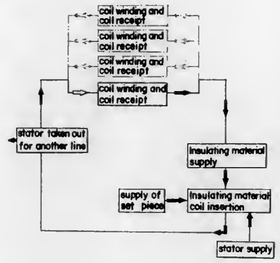
15. A method of sealing a sealable bag coupled to a cash register and coupling said bag to a receipt ejected from said cash register, including the steps of:
(a) inserting said bag within a sealing mechanism coupled to said cash register;
(b) locating said bag adjacent said receipt;
(c) simultaneously sealing said bag and securing said receipt to said bag.

4,186,478

METHOD OF MANUFACTURING STATORS FOR ELECTRICAL MACHINES OR THE LIKE AND APPARATUS EMPLOYED THEREFOR

Tokuhito Hamane, Hirakata; Kinoshita Toshio, Katano, and Masafumi Kihira, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 17, 1978, Ser. No. 870,082
Claims priority, application Japan, Jan. 18, 1977, 52-4582
Int. Cl.[2] H02K *15/04*
U.S. Cl. 29—596 **10 Claims**



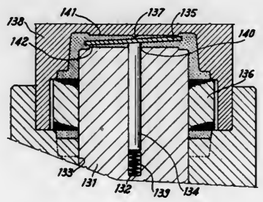
1. An apparatus for manufacturing stators of electrical machines and the like which comprises:
a plurality of coil inserting jigs;
a jig transporting means having a plurality of coil receiving portions for transporting said jigs in parallel and a further portion for receiving said jigs from said coil receiving portions and transporting them in series;
a plurality of coil winding means, one along each of said coil receiving portions of said jig transporting means for winding coils and placing them on said jigs;
an insulating material inserting means at a position along said further portion of said jig transporting means for inserting insulating material into said coil inserting jigs; and
a coil inserting means at a position along said further portion of said jig transporting means downstream of said inserting means for inserting the coils and pieces of insulating material from said jigs into stator cores.

4,186,479

PROCESS FOR MANUFACTURING ROTORS FOR IN-OUT ELECTRIC MOTORS

Giorgio Gutris, 231.6.2 Avenida de 27 de Enero, Premia de Mar, Spain

Filed Jun. 8, 1977, Ser. No. 804,754
Claims priority, application Italy, Jun. 16, 1976, 24353 A/76
Int. Cl.[2] H02K *15/02*
U.S. Cl. 29—598 **7 Claims**



1. A process for manufacturing a rotor for an in-out electric motor, said rotor being of the type including ferromagnetic elements, a shaft and a cup-like shield connecting said ferromagnetic elements to said shaft, said process comprising:
defining a mold including a mold cavity having a longitudinal axis and a bore extending coaxially of said longitudinal axis;

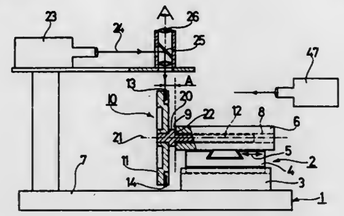
positioning within said mold cavity ferromagnetic elements of a rotor to be formed, such that said ferromagnetic elements extend coaxially of said longitudinal axis of said mold cavity;
providing an assembly of a shaft of the rotor to be formed and a discoidal head rigidly fixed to said shaft;
positioning said assembly within said mold cavity, such that said shaft extends into said bore with minimal play therebetween and extends coaxially of said ferromagnetic elements and of said longitudinal axis of said mold cavity, such that a remaining free space portion within said mold cavity defines the configuration of a to be cast metal component at least a part of which constitutes a portion of a shield of the rotor to be formed, and such that said discoidal head will at least partly be incorporated within said metal component;
maintaining said assembly in a desired axial alignment within said mold cavity, such that said shaft remains coaxial with said ferromagnetic elements and with said longitudinal axis of said mold cavity, by virtue of said shaft within said bore and by exerting on said assembly oppositely directed linear forces extending in a single straight line only, said single straight line extending parallel to said longitudinal axis of said mold cavity; and
casting metal within said remaining free space portion within said mold cavity, while maintaining said desired axial alignment of said assembly, thereby forming said metal component at least partially enclosing said discoidal head, and joining said shaft to said ferromagnetic elements while maintaining said shaft and said ferromagnetic elements coaxial with each other.

4,186,480

METHOD OF MANUFACTURING A ROTATABLE MAGNETIC HEAD ARRANGEMENT

Wolfgang Binder Kriegelstein, and Erich Berger, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,282
Claims priority, application Austria, Dec. 22, 1976, 9536/76
Int. Cl.[2] G11B *5/42*
U.S. Cl. 29—603 **4 Claims**



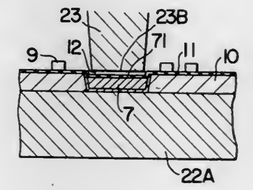
1. A method of manufacturing a rotatable magnetic head arrangement for recording and/or playback apparatus for signals having a wide frequency spectrum such as video signals, in which at least one magnetic head comprising a plate-shaped magnetic circuit having a tape contact face, an operative gap and a coil window and a coil passing through the coil window, is provided on a disc-shaped carrier in a given position with respect to a reference surface provided on the carrier and extending at right angles to its axis of rotation, which comprises: fixing a reference level for the operative gap of a magnetic head at a given distance from the reference surface on the carrier which falls essentially in the central area of the operative gap of the magnetic head viewed in the gap width, and then with reference to this level removing so much material by means of a laser beam directed on the tape contact face of the magnetic head at the area of the operative gap first from a major surface of the plate-shaped magnetic circuit bounding the operative gap in the direction of the gap width and then from the oppositely located major surface over the whole gap height, that the gap width of the operative gap is reduced to a given size by the formation of two oppositely located groove-shaped recesses.

4,186,481

METHOD FOR FABRICATION OF REAR CHIP FOR HALL EFFECT MAGNETIC HEAD

Takaharu Noguchi; Takao Ketori; Kohji Tamura, all of Yokohama; Tetsu Oi, Tokyo, and Yutaka Miyoshi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 5, 1978, Ser. No. 939,210
Claims priority, application Japan, Sep. 5, 1977, 52-105824
Int. Cl.[2] G11B *5/42*
U.S. Cl. 29—603 **1 Claim**



1. In a method for fabricating a rear chip for a Hall effect magnetic head, comprising steps of producing a rear core substrate block with a multiplicity of Hall elements embedded therein in predetermined spacial relation to each other, producing a rear core block with a multiplicity of rear core protrusions, securing said rear core block onto said rear core substrate block through a member of non-magnetic material in such a manner that said rear core protrusions are in opposed relation with said Hall elements respectively, and cutting into a multiplicity of rear chips the assembly including said rear core substrate block and said rear core block; the improvement further comprising steps of forming a plurality of rear core supports between said rear core protrusions respectively in such a manner that the bottoms of said rear core supports are in the same plane as the bottoms of said rear core protrusions, securing said rear core block to said rear core substrate block in such a manner that the width of the bottom of each of said rear core protrusions is substantially equal to the width near a Hall output terminal of each of said Hall elements along the control current flow therein and that the bottom of each of said rear core protrusions is in opposed relation to each of said Hall elements, said rear core supports preventing any pressure from being applied to said Hall elements, and removing said rear core supports.

4,186,482

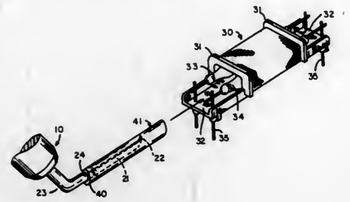
TOOL AND METHOD FOR INSTALLING FLEXIBLE TUBING IN A MULTI-CAPSULE REED RELAY SWITCHING ASSEMBLY

James V. Koppensteiner, Chicago; Khaja M. Jameel, Glen Ellyn; Charles K. Kubik, Brookfield, and George Len, Arlington Heights, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 2, 1978, Ser. No. 947,978
Int. Cl.[2] H01H *11/00*
U.S. Cl. 29—622 **6 Claims**

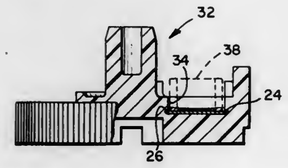
1. A tool for inserting a flexible tube including inner and outer walls between two or more parallel and spaced apart glass encapsulated reed switches of a reed relay switching assembly, said tool comprising:
a rigid, horizontal member including a rectangular central portion and a billhook shaped frontal portion;
said tool slidably inserted into said tubing, said central portion adapted to vertically elongate said tubing and said

billhook upon application of manual pressure to said tubing outer wall partially penetrating said tubing inner wall



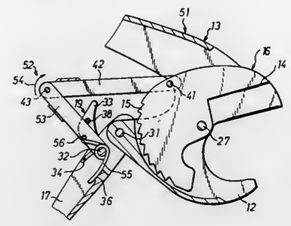
allowing for insertion of said tubing between said reed switches.

4,186,483
POTENTIOMETER CONTACT AND ROTOR ASSEMBLY
David E. Laube, Banning, Calif., and Loran R. Simpson, Ames, Iowa, assignors to Bourns, Inc., Riverside, Calif.
Filed Jan. 30, 1978, Ser. No. 873,306
Int. Cl.[2] H01R *9/00*
U.S. Cl. 29—630 B **2 Claims**



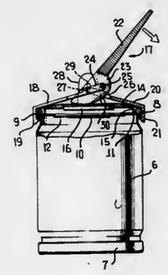
1. A method of fabricating a potentiometer contact wiper and rotor assembly comprising the steps of:
forming progression-locator holes in a support strip;
forming wiper support plates in a portion of said support strip in one-to-one relationship to said progression-locator holes;
forming tab strips in another portion of said support strip;
defining first projecting interference tabs in relation to said tab strips;
forming at least one radius-truncated cone projection in each of said wiper support plates;
forming at least one radius-truncated cone projection in each of said tab strips;
welding a multiwire contact strip to said wiper support plates and said tab strips at said radius-truncated cone projections;
cutting said multiwire contact strip at said wiper support plates;
shearing said wiper support plates from said tab strips so as to leave a projecting strip of said multiwire contact strip to form wiper blanks;
forming a contact row in said projecting strip of each of said wiper blanks;
forming a wiper contact spring in said potentiometer contact wiper by progressive bending of said projecting a strip into an acute angle in each of said wiper blanks;
locating said potentiometer contact wiper by means of said progression-locator holes;
shearing said contact wiper from said support strip so as to form second projecting interference tabs;
inserting said potentiometer contact wiper into a rotor blank having a slot;
retaining said potentiometer contact wiper in said rotor blank by
forcing said potentiometer contact wiper into said slot in said rotor blank so as to bend up said first and second projecting interference tabs causing an interference fit between said projecting interference tabs and said slot in said rotor blank.

4,186,484
CUTTING HAND TOOL
Minoru Tanaka, Higashi-Osaka, Japan, assignor to Hanazono Kogu Kabushiki Kaisha, Higashi-Osaka, Japan
Filed May 31, 1978, Ser. No. 911,148
Claims priority, application Japan, Sep. 22, 1977, 52-128521[U]
Int. Cl.[2] B23D *21/06*; B26D *3/16*
U.S. Cl. 30—92 **7 Claims**



1. A cutting hand tool comprising a stationary handle having a receiving portion at its head, a movable handle pivoted at its one end to the head of the stationary handle and extending in opposed relation to the stationary handle so as to be grasped by the hand, a pivoted element pivoted to the head of the stationary handle and having a cutting blade opposed to the receiving portion and a toothed segment opposed to the movable handle and having teeth arranged circumferentially of the pivoted element at specified spacing, ratchet means pivoted to the movable handle and engageable with the toothed segment of the pivoted element to intermittently advance the pivoted element in a cutting direction when the movable handle is grasped, an advancing means including a first link and a second link coupling the movable handle to the pivoted element, the advancing means being provided with means for elastically biasing and quickly advancing the pivoted element in the cutting direction before the ratchet means engages the toothed segment of the pivoted element.

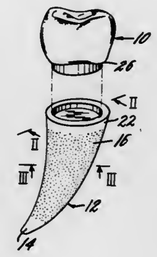
4,186,485
OPENER HAVING SEAM GRIPPING MEANS
Donald J. Bainton, Kenilworth, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Jul. 12, 1978, Ser. No. 923,884
Int. Cl.[2] B67B *7/30*
U.S. Cl. 30—410 **8 Claims**



1. An opener particularly adapted for opening prescored end units of cans secured to can bodies by an end seam, said opener

comprising a retainer adapted to overlie an end unit of a can and having means for interlocking engagement with an end seam of a can, a separately formed cover carried by said retainer for overlying an end unit, a blade depending from said cover for movement therewith relative to said retainer and being centered relative to said retainer for alignment with a score in the end unit to be opened, said blade having a circular free edge and actuator means connected to said retainer and said cover for applying a force on said cover urging said cover axially away from said retainer toward an underlying end unit.

4,186,486
DENTAL PROSTHESIS
Maurice Gordon, 15 Stuyvesant Cir. West, South Setauket, N.Y. 11733
Filed Nov. 4, 1977, Ser. No. 848,596
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—201 **7 Claims**



1. A dental prosthesis comprising a root portion and a crown portion, said root portion comprising a root shaped structure of non-metallic, pliable material suitable for shaping by use of dental tools, said structure having outer surfaces, an inner hollow cavity and openings connecting said surfaces and said cavity, and a bone growth stimulating biochemical matrix in said openings and said cavity.

4,186,487
ORTHODONTIC ARCH WIRE
Melvin Wallshein, 8645 Bay Pkway., Brooklyn, N.Y. 11214
Filed May 2, 1977, Ser. No. 792,866
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—20 **41 Claims**



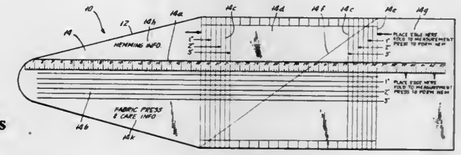
1. An orthodontic arch wire having a longitudinal axis, comprising:
at least one strand having first and second cross-sectional dimensions, one cross-sectional dimension being greater than the other, said at least one strand being spirally wound along said longitudinal axis so that adjacent turns of said spiral are separated from each other and such that said greater cross-sectional dimension of said at least one strand spirally winds longitudinally along said arch wire,
said separation between adjacent turns of said at least one strand defining a substantially helically winding void space along said longitudinal axis, at least a portion of each helically winding void space being empty and devoid of wire material throughout the length of the wound arch wire, and
said wound arch wire having a maximum common outer dimension no greater than approximately 0.045 inches and said at least one strand being made from a material sufficiently elastic to permit bending of the wound arch wire along the length thereof and to provide predetermined stiffness over a long length thereof so as to serve as an orthodontic arch wire.

4,186,488
ORTHODONTIC BRACKET WITH MULTI-LAYER BASE
Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214
Filed Nov. 11, 1977, Ser. No. 850,718
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—8 **11 Claims**



1. An orthodontic bracket comprising:
a substantially non-resilient bracket member having a base and an arch wire receiving opening formed in a surface of said bracket; and
a generally ring-shaped mounting layer of resilient material secured to said base of said bracket member and adapted to be mounted to a tooth or the like, said mounting layer having peripheral edges which extend at least adjacent to the periphery of said base of said bracket and a void space interior of said peripheral edges which underlies said base of said bracket.

4,186,489
MEASURING, PRESSING AND HEMMING DEVICE
Adele Vigilante, 81 Stevenson St., Lynbrook, N.Y. 11563, and Louise V. Vicesuinci, 147-26 Sanford Ave., Flushing, N.Y. 11355
Filed May 25, 1978, Ser. No. 909,288
Int. Cl.[2] A41H *1/00*
U.S. Cl. 33—2 H **1 Claim**



1. A measuring guide device for facilitating the performance of operations upon planar piece goods comprising: a planar blank of flexible material having a surface adapted to accept printing; a guiding pattern printed upon said surface, said pattern including a measuring ruler extending along a first generally centrally disposed axis, said measuring ruler including two parallel longitudinally extending lines enclosing indicia lines, a first axis hemming guide formed by a plurality of lines parallel and adjacent to the axis of said ruler and mutually spaced at substantially equal increments, a pair of second axis hemming guides extending transverse to and intersecting said first axis hemming guide, each including a plurality of parallel lines spaced at substantially equal increments, each of said pair of hemming guides being spaced apart a distance such that a substantial rectangular clear area is formed therebetween, a single diagonally oriented line extending across said guiding pattern at a 45° angle relative to each of said first and second axes, and interconnecting said paid of second axis hemming guides; whereby a plurality of folding, hemming and pressing operations may be performed at the edges of a single rectangular piece of goods without substantial shifting thereof for each individual operation, and a biasing fold may be made at a proper angle relative to a hemmed edge.

4,186,490

TAPE-TYPE LINEAR MEASURING INSTRUMENT

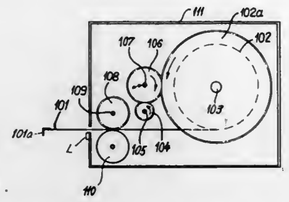
Michel C. A. Quenot, Ornans, France, assignor to Stanley-Mabo, France

Filed Jun. 13, 1978, Ser. No. 915,218

Claims priority, application France, Jun. 16, 1977, 77 19054; Jun. 16, 1977, 77 19055

Int. Cl.[2] G01B *3/12, 5/02*

U.S. Cl. 33—139 **29 Claims**



1. A tape-type linear measuring instrument comprising an instrument case, a measuring tape, a winding drum for said measuring tape, means for winding and unwinding said tape on or from said winding drum, a speed reducer having a high speed shaft and a lower speed shaft, a wheel coupled with the low speed shaft of said speed reducer and engaging said measuring tape so as to rotate in synchronishm with translational movement of said tape, an electronic pick-up comprising a movable element coupled with the high speed shaft of said speed reducer and provided with reference marks disposed at spaced intervals and a pick-up element for sensing passage of said reference marks, an electronic counter connected with and responsive to said pick-up, and means for digitally displaying the reading of said counter.

4,186,491

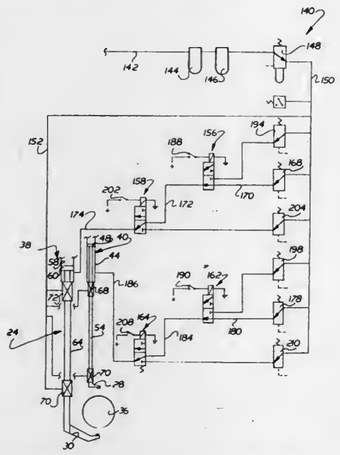
GAUGE ASSEMBLY

Jerome R. Shawke, Hudson, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 16, 1978, Ser. No. 887,207

Int. Cl.[2] G01B *7/02, 7/12*

U.S. Cl. 33—143 L **10 Claims**



1. A gauge assembly for use in measuring a workpiece, said gauge assembly comprising upper and lower gauge members which are movable relative to each other, said upper gauge member being movable between a raised position spaced apart from the workpiece and a lowered position engaging an upper portion of the workpiece, said lower gauge member being movable between a lowered position spaced apart from the workpiece and a raised position engaging a lower portion of the workpiece, first fluid pressure responsive means connected with said upper gauge member for moving said upper gauge member between its raised and lowered positions, second fluid pressure responsive means connected with said lower gauge member for moving said lower gauge member between its raised and lowered positions, first control means for directing to said first pressure responsive means a first fluid pressure to effect movement of said upper gauge member from its lowered position to its raised position, for directing to said first pressure responsive means a second fluid pressure which is less than said first fluid pressure to effect movement of said upper gauge member from its raised position to its lowered position, and for directing to said first pressure responsive means a third fluid pressure which is less than said second fluid pressure to effect engagement of the workpiece by said upper gauge member with a predetermined gauging force, and second control means for directing to said second pressure responsive means a fourth fluid pressure to effect movement of said lower gauge member from its raised position to its lowered position, for directing to said second pressure responsive means a fifth fluid pressure which is greater than said fourth fluid pressure to effect movement of said lower gauge member from its lowered position to its raised position, and for directing to said second pressure responsive means a sixth fluid pressure which is greater than said fifth fluid pressure to effect engagement of the workpiece by said lower gauge member with a predetermined gauging force.

4,186,492

DIAL MEASUREMENT GAUGE

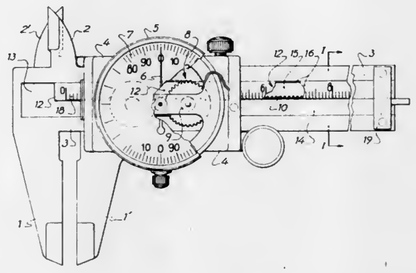
Giovanni Gattesco, Crissier, Switzerland, assignor to Tesa, S.A., Renens, Switzerland

Filed Nov. 6, 1978, Ser. No. 958,114

Claims priority, application Switzerland, Nov. 9, 1977, 13634/77

Int. Cl.[2] G01B *5/02*

U.S. Cl. 33—147 T **3 Claims**



1. A dial measurement gauge comprising:

(a) a linear slideway;

(b) a fixed feeler rigidly connected with said linear slideway;

(c) a rack formed of a first profiled means comprising a toothing therealong, said rack fastened along the slideway;

(d) a slide block movable along the slideway;

(e) a movable feeler, said feeler rigidly connected to the slide block;

(f) a reading dial rigidly connected to the slide block, said reading dial having a movable pointer;

(g) a gear transmission multiplier mechanism fastened to the slide block, said gear mechanism engaging the rack for controlling the movable pointer of said reading dial;

(h) a linear depth feeler gauge connected to the slide block, said depth feeler gauge movable along the slideway opposite the toothing of the rack; and

(i) a second profiled means rigidly assembled to said first profiled rack forming means for covering the exposed side of the toothing thereof over at least its entire length, said second profiled means bearing with free sliding action against said depth feeler gauge.

4,186,493

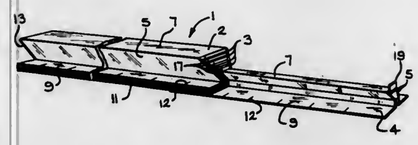
TELESCOPING CARPENTER'S SCALE

Amir U. Khan, c/o The International Rice Research Institute, P.O. Box 1237, Islamabad, Pakistan; Habib U. Khan, 705 Waite Rd., Maumee, Ohio 43537, and Ahamed A. Amid, 299 Rivers End, Gahanna, Ohio 43230

Filed Aug. 16, 1978, Ser. No. 934,177

Int. Cl.[2] G01B *3/08*

U.S. Cl. 33—161 **3 Claims**



1. A straight edge comprising a plurality of longitudinal members positioned together in a telescoping relationship, one of said members defining an outer member and another of said members defining an inner member, each of said members having at least one longitudinal edge, said edges forming a substantially straight edge throughout the telescoping range of said members and graduation means along said edges for indicating a measurement, each of said longitudinal members having sidewalls, a top wall connecting said sidewalls and at least one base portion extending outwardly from one of said sidewalls, said base portions terminating in said longitudinal straight edges, said outer member having an end wall that extends from said top wall to said base portion of said outer member to substantially enclose one end of said straight edge, said inner member having a projection located on an end thereof spaced apart from said end wall of said outer longitudinal member, said projection extending from said end of said inner member in a direction toward said top wall of said outer member, and wherein each longitudinal member except said outer longitudinal member has a tab located at the end of such member closest to said end wall of said outer member, said tabs extending upwardly from said ends of said members and abutting said top wall of the adjacent outer one of said longitudinal members.

3. A straight edge comprising at least three longitudinal members positioned together in slidable telescoping relationship to move between extended and collapsed positions, one of said members defining an outer member, another of said members defining an inner member and the remainder of said members defining intermediate members between said inner and outer members, each of said members having at least one longitudinal edge, said edges forming a straight edge through the telescoping range of said members, graduation means along said edges for indicating a measurement, means for limiting telescoping of said members in one direction to confine said intermediate and inner members within said outer member when in the collapsed position, tab means on each of said members extending between each two adjacent members for limiting telescoping of said members in the other direction to the extended position, said tab means between each two adjacent members projecting in opposite directions to abut when said members are telescoped to the extended position, and a projection located on said inner member, said projection facilitating extending the straight edge from the collapsed position to the extended position.

4,186,494

DEVICE FOR ACCURATE MEASUREMENT OF THE SHAPE OF A SUBSTANTIALLY CYLINDRICAL SURFACE

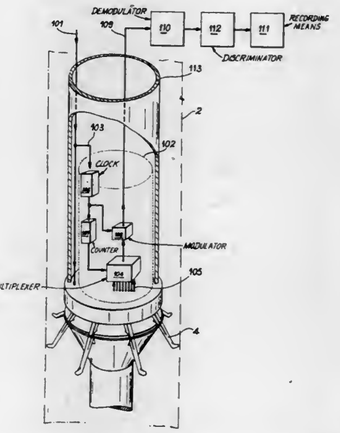
Peruchon Edouard, and Pierre Rabischong, both of Montpellier, France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Mar. 6, 1978, Ser. No. 883,794

Claims priority, application France, Mar. 10, 1977, 77 07111

Int. Cl.[2] G01B *7/12, 7/28*

U.S. Cl. 33—178 E **10 Claims**



1. A device for measuring the precise shape of a substantially cylindrical surface comprising a plurality of feeler arms connected to a central frame and disposed at uniform angular intervals around said frame and electrical detectors for measuring the position of the free end of each feeler arm as well as means for maintaining each arm in contact with the cylindrical surface to be measured, means of electromagnetic type for placing said feeler arms in a withdrawn position and means for displacing all the feeler arms together in a common movement relative to said surface, wherein the detectors for measuring the position of each feeler arm end are electrical means for taking differential measurements of the positions of said feeler arm ends, these electrical means being connected to means for multiplexing and modulating signals delivered by the electrical means for taking differential measurements, said mutiplexing and modulating means being coupled with means for demodulating the modulated signals which are connected to recording means through a discriminator.

4,186,495

APPARATUS FOR FREEZE DRYING OF GAS, ESPECIALLY COMPRESSED AIR

Horst Remberg, Berliner Str. 5, 4043 Holzheim, and Werner Frischmann, Wilhelmshohe 37a, 5810 Witten-Stockum, both of Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,109

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654253; Dec. 14, 1976, 2656483; Dec. 21, 1976, 2657858; Jan. 12, 1977, 2701006

Int. Cl.[2] F26B *13/30*

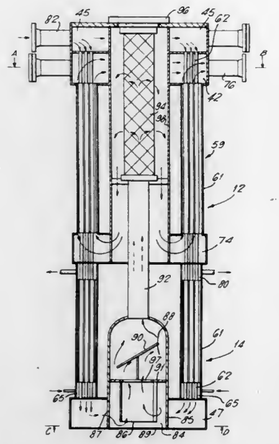
U.S. Cl. 34—92 **50 Claims**

1. Apparatus for freeze drying of gas, particularly compressed air, comprising a gas to gas heat exchanger and a gas to refrigerant heat exchanger each in a substantially vertical arrangement,

each exchanger having a first and a second volume in heat exchange relationship but without fluid communication with each other and each volume having an upper portion and a lower portion,

the gas to gas heat exchanger having an inlet to a first header for warm gas to be dried, the first header being in fluid communication with the upper portion of the first volume, a first connection for fluid communication with the lower portion of the first volume, a second header for cooled gas, the second header being in fluid communication with the lower portion of the second volume, and an outlet from a third header for warm dried gas, the third header being in fluid communication with the upper portion of the second volume,

the gas to refrigerant heat exchanger having a first connection for cool gas to be dried, the first connection being in fluid communication with the upper portion of the first volume of the gas to refrigerant heat exchanger, a second connection for dried cooled gas, the second connection

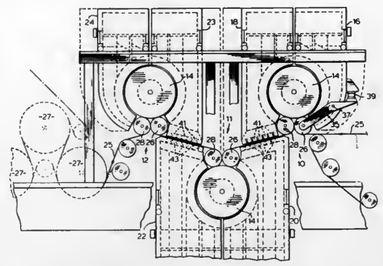


being in fluid communication with the lower portion of the first volume, an inlet for refrigerant, the inlet being in fluid communication with the lower portion of the second volume, and an outlet for refrigerant, the outlet being in fluid communication with the upper portion of the second volume,

the first header of the gas to gas heat exchanger being in fluid communication with the first connection of the gas to refrigerant heat exchanger being in fluid communication with the second header of the gas to gas heat exchanger, at least the gas to gas heat exchanger having exchanger elements which consist of an outer pipe and an inner core pipe located therein, and means including metal sheet meander-shaped in cross-section being arranged in heat contact with at least one of the outer pipe and the inner core pipe for increasing heat transfer.

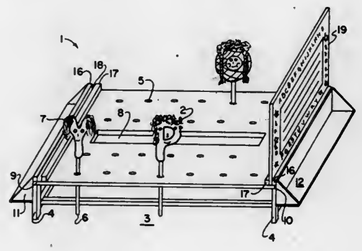
4,186,496
WEB DRIER SECTION
Zoltan Beke, Lasalle, and George W. Kukla, Dollard des Ormoux, both of Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada
Continuation of Ser. No. 777,770, Mar. 15, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,222
Int. Cl.[2] F26B *13/08*
U.S. Cl. 34—114 **6 Claims**

1. A drier for a fragile, light weight paper web, having at least two drier drums in spaced apart relation, hood means positioned about portions of the periphery of the respective drums and extending oppositely in spaced apart relation from each other to provide a web draw passage located between the opposed hood means, having an off-going web guide and an on-going web guide located at the ends of the passage a plurality of floater header means located on opposite sides of the web passage in aligned mutually opposing relation extending substantially the full length of the passage, having air jet means directed substantially normally to the opposed surfaces of the web, and return flow air passage means spaced along the passage to receive exhaust air therefrom to provide in operation a



balanced air cushion open draw applying substantially balanced web-stabilizing pneumatic forces to the opposite surfaces of the web to permit high speed passage thereof in non-fluttering relation along the draw passage.

4,186,497
ASSEMBLY FOR FACILITATING TEACHING READING
Bernadette C. Legoria, 606 Farris Dr., Hammond, La. 70401
Filed Feb. 13, 1978, Ser. No. 877,008
Int. Cl.[2] G09B *1/10*
U.S. Cl. 35—35 R **1 Claim**



1. An assembly of teaching aids utilized in reading instructions comprising in combination:

(a) a learning station;

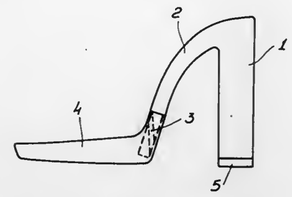
(b) twenty-six (26) alphabet doll models having upper portions shaped like different alphabet letters, said alphabet doll models shaped like vowels are constructed having a common design pattern and wherein said alphabet doll models shaped like consonants are constructed having a different common design pattern, said alphabet doll models are color coded to the initial sounds of color words;

(c) twenty-six (26) hand puppet models, said hand puppet models are color and pattern coded to match their corresponding alphabet doll models; and

(d) at least three (3) different character doll models.

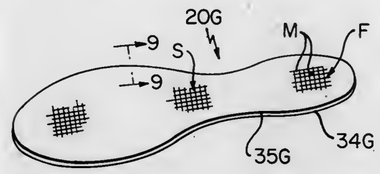
4,186,498
SOLE WITH HIGH HEEL FOR WOMAN FOOTWEAR, CONSISTING OF A PLASTIC MATERIAL MONOBLOCK HAVING A RIGID AND A FLEXIBLE PART
Ida Weber, Lugano, Switzerland, assignor to B.M.C.-Brevets-Marques-Chaussures S.A., Zug, Switzerland
Filed Nov. 3, 1977, Ser. No. 848,093
Int. Cl.[2] A43B *13/04, 13/28*
U.S. Cl. 36—32 R **1 Claim**

1. An integral sole, shank and heel monoblock for women footwear comprising a sole portion, a high heel portion and a shank portion between the sole portion and the heel portion, the shank and the heel portion consisting of rigid plastic material, the sole portion consisting of flexible plastic material, the end of the shank portion opposite the end which is integral



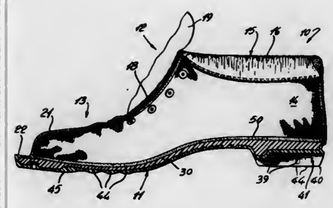
with the heel portion having been provided with through-holes in oblique direction with resect to the shank, the flexible plastic material of the sole portion having filled the through-holes.

4,186,499
CONSTRUCTION FOR ABSORBING ODORS CAUSED BY PERSPIRATION AND METHOD OF MAKING SAME
Anthony J. Massok, Jr., Richmond, and James P. Nolan, Chester, both of Va., assignors to Dayco Corporation, Dayton, Ohio
Filed May 22, 1978, Ser. No. 908,047
Int. Cl.[2] A43B *13/38, 13/40*
U.S. Cl. 36—44 **19 Claims**



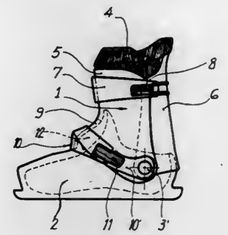
1. A shoe insole for absorbing odors caused by foot perspiration comprising, a fabric having a plurality of members comprising an exposed surface thereof, each of said members comprising an odor-absorbing material, said odor-absorbing material consisting of a carbonaceous material, said members being freely accessible on said exposed surface to said perspiration thereby assuring unimpeded action by the odor-absorbing material thereof, and a substrate fixed against said fabric on the surface thereof opposite from said exposed surface.

4,186,500
MOLDED CROSS-COUNTRY SKI BOOT
Otto Salzman, Dorval, Canada, assignor to Tyrol Shoe Co. Ltd., Montreal, Canada
Filed Apr. 27, 1978, Ser. No. 900,662
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—117 **9 Claims**



1. A cross-country ski boot comprising a sole section and an upper section, said sole section and at least the lower marginal area of said upper section being integrally formed of plastics material, said upper section having a toe portion in a front part thereof and a heel portion in a rear part thereof, a foot entrance opening above said heel portion, securement means associated with said foot entrance opening to secure a foot in said boot, a liner within said upper section over an inner face of said sole section and upper section, said sole section being molded on a sole plate insert having a higher stiffness property than said plastics material to impart stiffness and torsional rigidity to said sole while permitting flexing on said sole along an area transverse to the longitudinal axis of said sole section intermediate a front foot and a rear heel portion of said sole to permit said heel portion of said boot to be lifted off a surface while said toe portion of said boot is immovably secured to said surface.

4,186,501
SKI BOOT
Georges P. J. Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France
Filed Nov. 16, 1977, Ser. No. 852,367
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—121 **9 Claims**



1. A ski boot comprising at least two parts including a lower part comprising a foot section and an upper part, means pivotably connecting the upper and lower parts, said upper part comprising a leg section including at least one part, said upper part including at least one deformation region constituted by the provision of at least one slot open from the lower periphery of the leg section and defining at least one flexible tongue to permit the two parts of the boot to cooperate with each other, and resilient means for controlling the deformation of said region, said resilient means having two states, including a first state in a position of the boot suitable for skiing in which the resilient means ensures the locking, at least towards the rear of the upper part on the lower part, and a second state in a position of the boot suitable for walking in which due solely to the operation of the resilient means, it allows at least partial elimination of the cooperation between the deformation region provided on said upper part and the lower part, as well as elimination of the aforesaid locking.

4,186,502
SCENT DISPERSING BOOT
Lloyd B. Foster, Sturgeon Bay, Wis., assignor to The Bootmakers of Sturgeon Bay, Inc., Sturgeon Bay, Wis.
Filed Apr. 10, 1978, Ser. No. 894,818
Int. Cl.[2] A43B *23/00*
U.S. Cl. 36—136 **8 Claims**

1. An improved boot construction, wherein the improvement comprises a scent dispersing means comprising:

a pocket on the exterior of said boot, and

a resilient absorbent pad adapted to be impregnated with scent and held within said pocket,

said pocket having ventilating means communicating between said pad and the exterior of said boot,

said pocket being located in a portion of said boot that

flexes as the wearer walks, said flexing of said pocket causing said pad to alternately compress and relax,



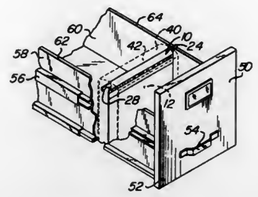
thereby causing air to circulate around said pad and through said venting means to disperse scent outside said boot.

4,186,503
GREETING CARD DISPLAY ASSEMBLY AND METHOD
Paul Fontana, 2819 Jackson St., San Francisco, Calif. 94115
Filed Aug. 28, 1978, Ser. No. 937,476
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—124.4 **7 Claims**



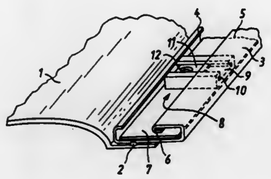
1. A greeting card display assembly, comprising:
(a) a plurality of straight slats of progressively decreasing lengths, each of said slats including
(i) a substantially flat top side,
(ii) a substantially flat bottom side, and
(iii) a through hole extending from said top side to said bottom side and centrally located along the length of the slat;
(b) a vertical center post extending successively through said centrally located holes of said slats such that
(i) the largest one of the said slats is nearest to the bottom of said post with the remaining slats successively decreasing in size upwardly along the length of said post,
(ii) said slats are rotatable about said post for positioning in a common plane through said post to simulate a Christmas tree in two dimensions and in angularly differing planes through said post to simulate a Christmas tree in three dimensions, and
(iii) any two adjacent slats are positioned relative to one another so that their confronting sides extend horizontally and slidably engage one another for holding a greeting card therebetween; and
(c) means for supporting said post in a vertically extending position.

4,186,504
DISPLAY MARKER DEVICE
John R. Avery, 523 Detroit St., Denver, Colo. 80206
Filed Oct. 31, 1977, Ser. No. 847,060
Int. Cl.[2] B42F *21/00*
U.S. Cl. 40—359 **1 Claim**



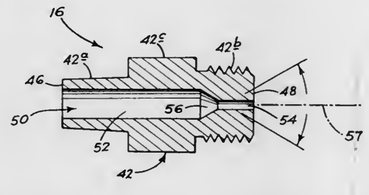
1. A single device for providing an advertising display while supporting a bound volume and acting as a book marker, comprising:
a display body being a sheet of flat, thin material insertable between pages of the bound volume, said sheet having an elongated open ended sleeve formed along one edge, said sheet having an advertising display arranged along at least a portion of one or both sides of said sheet;
an elongated support member positioned in said sleeve, said support member having a length so that ends thereof extend beyond ends of said sheet to removably engage a rigid supporting structure so that the bound volume is supported over said elongated support member by the rigid supporting structure;
at least one flat, thin, transparent sheet sealed to an outer surface of said display body and having an openable edge so that said transparent sheet forms a pocket for receiving and enclosing an advertising display therein, said thin, transparent sheet being substantially contiguously adjacent said display body when no advertising display is housed in the pocket and said thin, transparent sheet being contiguously adjacent the advertising display when the advertising display is housed in the pocket with the advertising display being contiguously adjacent said outer surface of said display body, the combined thickness of said sheet and said display body being minimized so that the combined display body and sheet is insertable between pages of the bound volume to both support the bound volume and serve as a book marker.

4,186,505
TAB-STRIP FOR FILING SYSTEMS
Kurt Brändel, Berlin, Fed. Rep. of Germany, assignor to Standard Sichtgerate GmbH, Fed. Rep. of Germany
Filed Apr. 17, 1978, Ser. No. 897,153
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716746
Int. Cl.[2] B42F *21/04*
U.S. Cl. 40—360 **22 Claims**



1. A tab-strip for filing material comprising
a strip body adapted to be attached to the filing material, said strip body having elongate front and second edges, said front edge including a guide groove facing the rest of the tab-strip,
at least one label element, said strip body having means for directly temporarily fixing said label element to said strip body independently of any other label elements if such label elements are present, said label element being generally rectangular in shape and having a length such that it fits loosely between said elongate front and second edges, and having a diagonal length greater than the distance between said edges, said label element also having a height which forms a tight fit in said groove,
guide means on said label element, and
at least one label positionable in said guide means, said label having a handle accessible through said label element, said label being movable by said handle between one of at least two positions in said label element.

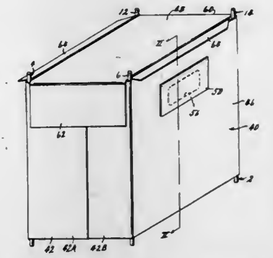
4,186,506
PERCUSSION CAP NIPPLE
Daniel E. Pawlak, deceased, late of Issaquah, Wash., and by Catherine J. Pawlak, personal representative, Bellevue, Wash., assignors to Michaels of Oregon Co., Portland, Oreg.
Filed Mar. 20, 1978, Ser. No. 890,617
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—83 **1 Claim**



1. A nipple usable to ignite a propellant charge in a firearm of the type employing percussive ignition caps, said nipple comprising,
an elongate body including, adjacent one end, a substantially cylindrical cap-receiving section, the outer surface of which is dimensioned to receive such caps slidingly thereon, and adjacent the other end, a mounting section, said body further including, adjacent said one and other ends, one and other end faces, respectively, which are planar and occupy substantially parallel planes,
a first cylindrical wall expanse extending from said one end face, substantially perpendicular thereto, axially through a major portion of said nipple, defining a first, larger-diameter chamber therein,
a second cylindrical wall expanse extending from said other end face, substantially perpendicular thereto, axially through a minor portion of said nipple, defining a second, smaller-diameter chamber therein, and
a conical wall expanse which tapers radially inwardly, along the axial direction approaching said other end face, at an angle of between about 25° and about 35° relative to the longitudinal axis of said nipple, said conical wall expanse defining a conical chamber joining said first and second chambers, said conical chamber having a volume greater than, and a longitudinal dimension less than, that of said second chamber.

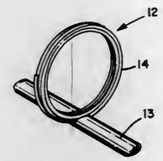
4,186,507
PORTABLE DUCK BLIND
Arvil L. Stinnett, 712 S. 104th St., Edwardsville, Kans. 66113
Filed Aug. 24, 1977, Ser. No. 827,116
Int. Cl.[2] A01M *31/00*
U.S. Cl. 43—1 **1 Claim**

1. A portable duck blind comprising:
a. a frame of skeleton, generally rectilinear form of a size to house a hunter when in its extended use position, but being constructed of relatively pivoted elements whereby to be collapsible to a generally flat configuration for convenience of storage and transportion, comprising a pair of generally rigid, planar end walls each consisting of a pair of corner posts rigidly interconnected by cross bars extending horizontally therebetween, and a pair of side walls consisting of at least two pivoted bars extending between each pair of corresponding corner posts of said end walls, each of said pivoted bars being formed of a pair of sections pivotally joined together at their contiguous ends, and pivotally connected at their distal ends respectively to said corresponding pair of corner posts, the axes of all three of said pivotal connections being parallel with each other, and transverse to said pivoted bars and said corner posts,
b. A short stub bar rigidly affixed to each of said corner posts at each end of each of said pivoted bars, whereby to



extend in overlapping, aligned relation to the adjacent section of the associated pivoted bar when said section is disposed at right angles to the adjacent corner post,
c. locking means releasably securing said frame in said extended use position, said locking means comprising a tubular sleeve mounted for sliding movement along each of the sections of each of said pivoted bars, whereby to be movable into or out of snugly encircling relation to the associated stub bar, and
d. a cover consisting of an enclosure having side, end and top walls removably applicable over said frame when said frame is in said extended use position, whereby to form an enclosure capable of housing a hunter therewithin, said cover being formed of pliable sheet material whereby when it is removed from said frame, it may be folded into a relatively small package.

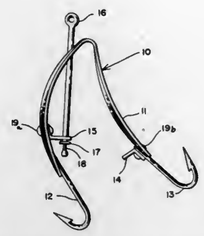
4,186,508
LINE GUIDE FOR FISHING ROD
Arthur M. Howald, Perrysburg, Ohio, assignor to Shakespeare Company, Columbia, S.C.
Filed Nov. 14, 1978, Ser. No. 960,701
Int. Cl.[2] B32B *9/00*; A01K *87/04*
U.S. Cl. 43—24 **12 Claims**



1. A monolithic line guide and mounting foot for a fishing rod comprising a circular laminate of wound resin-impregnated graphite fibers and linear foot laminate of resin-impregnated graphite fibers heat-welded to one side of said circular laminate in substantial parallelism to the axis thereof, some of

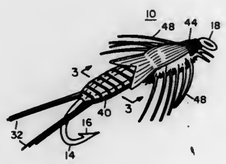
the graphite fibers of said circular laminate underlying said foot and others overlying said foot.

4,186,509
EXPANDABLE FISH LURE
Willard S. Maloney, 4360 SW. 4th St., Miami, Fla. 33134
Filed Apr. 17, 1978, Ser. No. 896,715
Int. Cl.[2] A01K *83/02*
U.S. Cl. 43—36 **9 Claims**



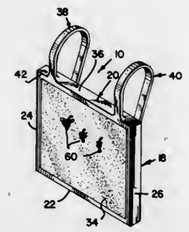
1. An expandable fish lure adapted to be coupled to a fishing line comprising:
a pair of substantially flat sides having a fish lure appearance in order to attract fish;
means coupled to both of said sides for biasing said sides apart;
a pair of fish hooks, each carried by one of said sides at one extremity thereof;
locking means including a rigid shaft coupled to said fishing lure for locking said sides together against the tension of said biasing means, said locking means further including means permitting releasing of said sides responsive to movements of said shaft axially with respect to said fishing line, said locking means including two locking plates positioned between said sides, a first one of said locking plates coupled to a first one of said sides and having a hole therein for receiving said shaft, a second one of said locking plates coupled to the second side and having a hole therein for receiving said shaft, and wherein said holes in said first and second plates are aligned when said shaft is extending through both of said holes; and wherein said shaft includes a shoulder spaced from one extremity thereof, said shoulder having a dimension greater than said hole in said first plate to prevent said one extremity from moving through said hole in said first plate.

4,186,510
FLAT-BODIED NYMPH HOOK
Neil B. Kimerer, Jr., Linden Hall, Pa. 16801
Filed Mar. 8, 1978, Ser. No. 884,555
Int. Cl.[2] A01K *85/08*
U.S. Cl. 43—42.25 **9 Claims**



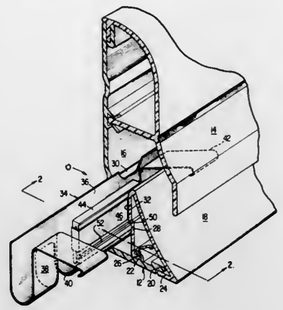
1. A flat-bodied fishing lure comprising in combination:
a hook eye;
a shank element attached to said hook eye and extending therefrom to form a flat plane, said shank element comprising in combination:
two diverging arms connected to said hook eye,
two parallel arms connected to said two diverging arms,
two converging arms connected to said parallel arms, one end portion of said converging arms in contact with one another,
two parallel contiguous arms connected to said two converging arms,
said two parallel contiguous arms being adjacent to one another;
fly thread circumferentially wrapped about said two parallel contiguous arms, integrally connecting said two parallel contiguous arms;
a curved hook attached to one of said parallel contiguous arms;
a hook point attached to said hook.

4,186,511
FISH LURE HOLDER
Alan W. Slacter, 2840 Webster Ave. South, St. Louis Park, Minn. 55426
Filed Nov. 4, 1977, Ser. No. 848,409
Int. Cl.[2] A01K *97/06*
U.S. Cl. 43—57.5 R **4 Claims**



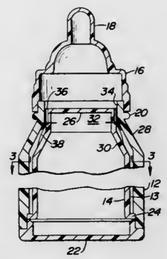
1. A fishing lure box adapted to be secured to the side of a boat for retaining lures having fish hooks in a position readily accessible to the fisherman, the boat having a gunnel about the sides thereof, comprising:
(a) a frame having a substantially planar base member having a top and bottom end and front and rear surfaces and a top wall extending outward from said planar base at said top end;
(b) a lure support member formed of elastomeric material affixed to said front surface of said base member so that said hook of said lures may be inserted within said elastomeric material; and
(c) a resilient clip arm having a first end affixed to said top wall of said base member, said arm extending upward from said top wall such that said frame may be positioned beneath the gunnel and curving away from said top wall and generally toward said rear surface of said frame member with a relatively large radius of curvature to provide adequate clearance between said clip arm and the exterior surface of the gunnel, said clip arm then extending downward and toward said rear surface of the base member, said clip arm having an unstressed state in which the free end of said arm is biased against said rear surface and a stressed state wherein the boat side is disposed between the free end of said arm and rear surface of said base material so that the frame is positively engaged against the inside of the boat wall with said top wall below the gunnel.

4,186,512
ELECTRIFIED INSECT TRAP HAVING SHORT CIRCUITING MEANS
Fred W. Berg, Stamford, Conn., assignor to Shock-M-All, Inc., Valley Stream, N.Y.
Filed Sep. 29, 1977, Ser. No. 837,923
Int. Cl.[2] A01M *1/22*
U.S. Cl. 43—98 **11 Claims**



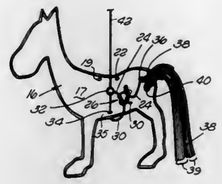
1. An electrified insect trap, comprising:
a first member;
a second member detachably secured to said first member;
means mounted within said first member and engageable with said second member, for establishing an electrical potential when said second member is attached to said first member and for short circuiting said electrical potential when said second member is detached from said first member; and
said means comprising at least two electrical conductors in a spaced apart unobstructed relationship when said second member is attached and secured to said first member thereby permitting an insect to contact both of said conductors simultaneously whereby a lethal shock is imparted to said insect.

4,186,513
TOY NURSING BOTTLE
Seymour Blum, Rockville Center, N.Y., assignor to H-G Toys, Inc., Long Beach, N.Y.
Filed Jun. 26, 1978, Ser. No. 918,871
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—1 D **7 Claims**



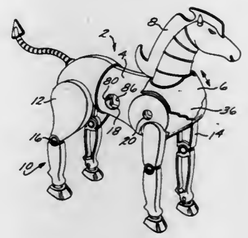
1. A toy nursing bottle comprising inner and outer shells separated by an annular space, a cap on said outer shell, the interior of said cap communicating with the space between the shells by at least one notch on at least one of the shells, a pair of ribs on one of said shells, said ribs being adjacent to and on opposite sides of said notch, one end of each rib being adjacent one end of said notch, the distance between the ribs being at least as great as the distance across the notch.

4,186,514
SLIP-KNOT PINATA
Ramiro Oquita, 6014 Chandler Dr., San Diego, Calif. 92117
Continuation-in-part of Ser. No. 873,804, Jan. 31, 1978, which is a continuation-in-part of Ser. No. 758,215, Jan. 10, 1977, Pat. No. 4,092,718, which is a continuation-in-part of Ser. No. 617,602, Sep. 29, 1975, Pat. No. 4,015,364. This application Jul. 14, 1978, Ser. No. 925,006
Int. Cl.[2] B65D *5/36;* **A63H** *33/00*
U.S. Cl. 46—11 **9 Claims**



1. A pinata, comprising:
first and second mutually cooperating walls;
means for suspending said pinata and for releasably holding said walls in assembled relation to define a substantially enclosed chamber, whereby a plurality of small items may be carried in said chamber, said suspending and holding means including a first elongated flexible member, said member being disposed in a releasable locking arrangement for holding said walls in said assembled relation and for releasing said walls from said assembled relation whereby a plurality of said items may be released from said chamber; and
a plurality of elongated flexible members associated with said pinata externally of said chamber, means, including one of said plurality of elongated flexible members, for releasing said first flexible member from said locking arrangement in response to the application of a force to a part of said latter means.

4,186,515
TOY HORSE VEHICLE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Dec. 22, 1977, Ser. No. 863,213
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—22 **16 Claims**



1. A versatile toy assembly capable of being combined into various toy configurations such as a simulated horse or a centaur comprising;
a body member configured to simulate the body of a horse;
support means removably connected to the body member;
a pivotal connection assembly attached to the interior of the body member;
a joint assembly configured and positioned on the body member to represent respectively the withers and breast of a horse with an upper cavity containing a pair of magnetizable members, and

a pair of removable appendage members configured to simulate respectively a horse's neck and head and the upper torso, head and upper arms of a humanoid, each appendage member having complimentarily magnetizable connectors for co-action with the joint assembly magnetizable members, the joint assembly is connected to the pivotal connection assembly to permit movement of an attached appendage member relative to the body member.

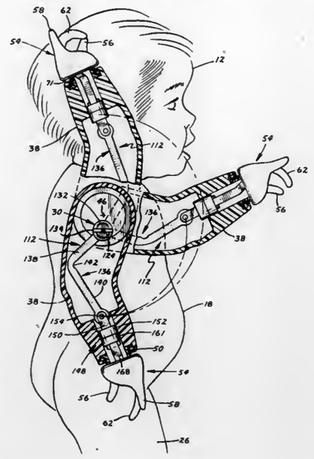
4,186,516
POSABLE DOLL
Burt Ensmann, Flushing, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.
Filed Mar. 13, 1978, Ser. No. 886,236
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—107 **8 Claims**



1. A toy doll including a torso, a first leg freely pivotally mounted on said torso for relatively free unrestrained pivotal movement between at least two predetermined positions, a second leg pivotally mounted on said torso in relatively tight frictional engagement therewith permitting movement of the second leg to any of a plurality of positions with respect to the torso, said second leg being maintained in its relative position with respect to said torso by the frictional engagement therebetween; and a support stand for said doll including means for holding said first leg on said support stand in a relatively fixed position whereby movement of said stand will cause said torso and the second leg held thereon to pivot with respect to said first leg to one of said predetermined positions.

4,186,517
DOLL WITH ARM-ACTUATED FINGERS
James O. Kuhn, New York, N.Y.; James J. Wright, Loveland, and Howard N. Bollinger, Cincinnati, both of Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 7, 1978, Ser. No. 875,729
Int. Cl.[2] A63H *3/46*
U.S. Cl. 46—119 **21 Claims**

1. A doll comprising a torso, a first arm connected at one end to said torso for pivotal movement about a first shoulder axis, a first hand mounted at the other end of said arm including at least one flexible finger, and first actuating means responsive to pivotal movement of said arm for flexing said finger as said arm is swung about said shoulder axis, a second arm connected at one end to said torso for pivotal movement about a second shoulder axis, a second hand mounted at the other end of said second arm including at least one flexible finger, and second actuating means responsive to pivotal movement of said second arm for flexing said finger on said second hand independently of the finger on said first hand as said second arm is swung about said shoulder axis.



4,186,518
KICKING DOLL WITH DETACHABLE TRIGGER MEANS
Patrick Luke, Kowloon, Hong Kong, assignor to Mego Corporation, New York, N.Y.
Filed Oct. 25, 1977, Ser. No. 844,643
Int. Cl.[2] A63H *13/04*
U.S. Cl. 46—128 **8 Claims**



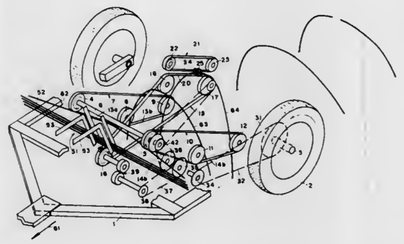
1. A doll with an intermittently movable leg, comprising a torso having a front and a back, a hollow interior, and an opening communicating the latter with the exterior of said torso; means for mounting said movable leg on said torso for pivoting between a rest position in which said leg depends from said torso and an elevated position, in a trajectory extending frontwardly and upwardly relative to said torso; a main gear connected to said leg for joint pivoting; a toothed rack mounted in said interior of said torso for movement between a retracted and an extended position; a gear transmission including at least one intermediate gear interposed between and meshing with said rack and said main gear for converting the movement of said rack into the pivoting of said main gear; and means for moving said rack between said positions thereof, including trigger means separate from and detachably connected to said torso and having a housing and a shaft supported in said housing and extending beyond the same and, when said trigger means is connected to said torso, into said interior of the latter through said opening to contact and move said rack upon actuation of said trigger means.

4,186,519
CB VEHICLE TOY
David F. Repka, Rte. 2, Box 321, Midlothian, Tex. 76065
Filed Aug. 19, 1977, Ser. No. 826,165
Int. Cl.[2] A63H *17/32*
U.S. Cl. 46—202 **8 Claims**



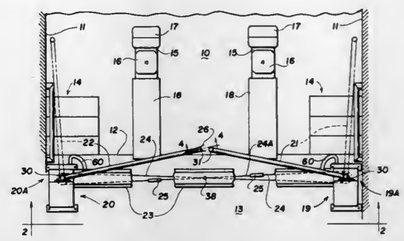
1. A toy comprising, in combination:
a toy vehicle;
an electrical power source;
a microphone, switchable between on and off, for converting sounds into electrical signals;
a speaker for converting electrical signals into sound; and
an electrical amplifier for simulating a CB radio, switchable between on and off, comprising a means for transmitting electrical signals from the microphone to the speaker when the circuit is on and the microphone is on.

4,186,520
LOW LEVEL CULTIVATION TUNNELS
Yekutiel Alper, and Amikam Margolin, both of Rishon le'Zion, Israel, assignors to The State of Israel, Ministry of Agriculture, Jerusalem, Israel
Filed May 30, 1978, Ser. No. 910,919
Int. Cl.[2] A01G *13/02*
U.S. Cl. 47—1 R **12 Claims**



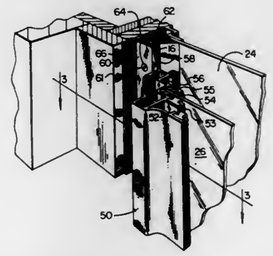
1. Apparatus for forming and mounting in position wire arch supports for low level cultivation tunnels comprising in combination:
a. a support chassis adapted to be coupled to drive means for displacing said apparatus in a given direction and rate,
b. arch forming means carried by said chassis for forming arch supports from arch wire blanks, and
c. arch displacing means carried by said chassis for imparting to each arch a displacement having a first component at said given rate and being directed opposite to said given direction and substantially normally to the plane of the arch and a second component directed downwardly and in the plane of the arch.

4,186,521
SAFETY GATE FOR VEHICLE WHEEL ALIGNMENT PIT INSTALLATIONS
Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141
Filed Jun. 2, 1978, Ser. No. 911,762
Int. Cl.[2] E05F *15/20, 17/00*
U.S. Cl. 49—30 **6 Claims**



1. Safety gate means at the floor level for blocking access of a vehicle or person to the edge of a vehicle service floor pit, said gate means comprising: biparting gate sections; a pair of towers positioned spaced apart from each other but adjacent the edge of the floor pit, a gate section being pivotally supported by each tower for movement between aligned positions blocking access to the edge of the floor pit and separated positions projecting away from each edge in a direction to the suspended over the floor pit for exposing the edge of the floor pit between said towers; gate sections supporting posts pivotally mounted in each tower; drive means connected to each post; reversible power operated means in one of said towers operably connected to the gate supporting post therein; driven means extending between said towers and interconnecting said drive means for said posts, said driven means being adjacent the floor level and traversing the space between said towers for effecting simultaneous movement of said gate sections between said aligned and separated positions; and control means in said one of said towers connected to said power operated means, said control means including means for determining the direction of movement of said gate sections by operation of said reversible power operated means, gate section position limit switches in one of said towers responsive to the position of the adjacent gate section to determine the full aligned and separated positions of both of said gate sections, and manual switch means to initiate the operation of said control means.

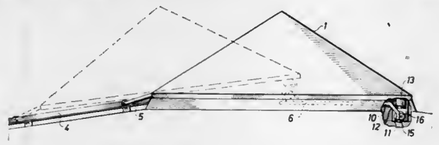
4,186,522
STORM WINDOW FRAME
Jimmy W. Hooks, Carrollton, Tex., assignor to Home Craftsman Company, Inc., Irving, Tex.
Filed Jul. 31, 1978, Ser. No. 929,708
Int. Cl.[2] E05C *7/02*
U.S. Cl. 49—63 **10 Claims**



1. An improved storm window structure for assembling outwardly of existing window jambs, said storm window being

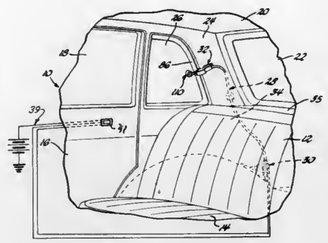
of the type having a plurality of sash receiving tracts integrally formed within a window frame channel and secured to an existing window frame jamb for creating a sealed dead air space therebetween, said improvement comprising a window frame channel having a plurality of sash receiving tracks staggered in a tapering configuration in axial alignment with an inwardly extending flange portion comprising a leg element which leg element includes a substantially coplanar flange portion disposed outwardly thereof in generally parallel spaced relationship with said sash receiving tracks for being received directly against the planar jamb of an existing window for securement and sealing thereagainst and the creation of a dead air space therebetween.

4,186,523
SKYLIGHT OPERATING MEANS
Tore G. Palmaer, S-330 30 Gnosjo, Sweden
Filed Jun. 19, 1978, Ser. No. 916,549
Claims priority, application Sweden, Jan. 9, 1977, 7709837
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—209 **5 Claims**



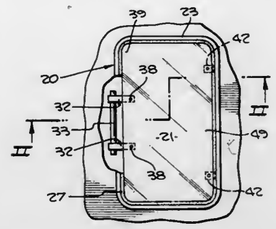
1. A drive system for a movable closure member movable along rail sets carried on opposed sides of the frame of a structure, said drive system, comprising a rail set on each side of at least one pair of opposed sides of the said frame, each said rail set including first and second laterally offset toothed sections, each said first section having a horizontally extending segment and a downwardly extending segment, each said second section having a vertically extending segment and an upwardly extending segment, a portion of said downwardly and upwardly extending segments being juxtaposed in side-by-side relation; an electric motor carried by said closure member for movement therewith and having a drive shaft extending transversely of said rail sets; a first gear wheel mounted at each end of said drive shaft coaxial therewith and cooperable with the respective first sections of said rail sets; a second and smaller gear wheel mounted eccentrically on each said first gear within the periphery thereof and cooperable with the respective second sections of said rail sets, each said second gear being arranged on its associated first gear such that they have a substantially common point of tangency; and the respective rail sets and first and second gear wheels being dimensioned relative to each other such that during activation of the electric motor and closure member is initially raised vertically during engagement of the second gears with the vertical segments of said rail sets, is advanced partially vertically and partially longitudinally during engagement of said second and first gears respectively with the upwardly extending and downwardly extending segments of said rail sets, and is advanced longitudinally during engagement of said first gears with the horizontal segments of said rail sets; said dimensioning being selected to insure that transfer of the driving force of said first and second gear wheels from one to the other takes place when the point of common tangency of said gears falls within the portions of said upwardly and downwardly extending segments juxtaposed in side-by-side relation.

4,186,524
POWER ACTUATOR FOR PIVOTABLE WINDOW
Paul F. Pelchat, Canton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 14, 1978, Ser. No. 896,309
Int. Cl.[2] E05F *11/00*
U.S. Cl. 49—324 **3 Claims**



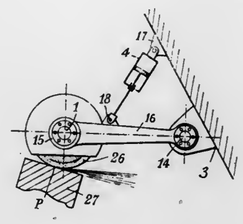
1. A remotely controlled and powered actuator to move a free edge portion of a vehicle window between open and closed positions about an opposite hinge-mounted edge portion comprising:
reversible electric motor means and circuit means associated therewith, including switch means for selectively activating the motor alternately in either direction from a switch location remote from the motor;
gear means including a small gear driven by said electric motor and a larger gear meshed therewith, having an internally threaded hub portion and permitted to rotate but not move axially with respect to the threaded hub portion;
an elongated jack screw threadably extending through the hub portion and movable axially therefrom by means of the rotation of threaded hub portion of the larger gear;
a sheathed motion and linear force transmitter of elongated configuration, including a relatively flexible cable with one end securely attached to said jack screw;
an arcuately shaped and rigid rod member having a ball-shaped end with its opposite end securely attached to the other end of the cable;
a curved housing means defining a curved tunnel therein for housing and guiding said rod member in movement back and forth in said tunnel;
said housing means being fixedly mounted adjacent the free edge of the vehicle window so that the ball end of the rod member extends toward the plane of the vehicle window;
a connector assembly mounted to the free edge of the vehicle window and including a flat surface on which said ball end may slide and rotate thereagainst as the window moves between opening and closing positions;
said connector assembly further including means to positively secure the ball end including a ferrule encircling said arcuate rod by an opening smaller than the ball end diameter and a cap member extending over the ferrule to hold it and said ball end against said flat surface, said cap member having an opening through which said rod extends sufficient to permit adequate lateral sliding movement in any direction of the ball end and ferrule caused by changes in the angular relationship between the plane of the window and the axis of the arcuate rod but insufficient to permit movement of said ferrule therethrough.

4,186,525
REMOVABLE CLOSURE PANEL AND RELEASABLE SPRING HINGE MEANS THEREFOR
Elmer R. Carvalho, Claremont, Calif., assignor to D G Shelter Products Company, City of Industry, Calif.
Filed Apr. 24, 1978, Ser. No. 899,111
Int. Cl.[2] E05C *21/02*
U.S. Cl. 49—465 **9 Claims**



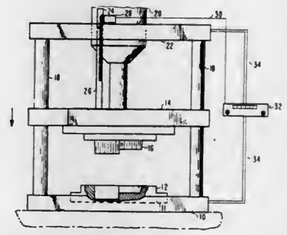
1. A hinge construction for a panel serving as a removable closure for an opening defined by a frame having support surfaces for edge margins of said panel and resilient compressible gasket means between said edge margins and said support surfaces, comprising in combination:
means providing a recess on said frame defined by a downwardly directed lip beneath said support surfaces;
a securement means extending through the panel edge margins in lateral spaced relation to said recess means;
leaf spring means carried by said securement means and having a spring edge portion receivable in said recess for hinging relation therewith in one position;
and means adjustable on said securement means and adapted to contact said spring means for moving said spring means into said hinged relation with said recess means in said one position and for releasing said spring means in another position.

4,186,526
HIGH-SENSITIVITY CONTROL-SYSTEM FOR IRONWORK GRINDERS
Michel Harmant, Neris-les-Bains, France, assignor to Etablissements Zelant, Gazuit, Societe Anonyme, Montlucon, France
Filed Dec. 30, 1977, Ser. No. 865,872
Claims priority, application France, Jan. 7, 1977, 77 00344
Int. Cl.[2] B24B *49/08*
U.S. Cl. 51—33 R **2 Claims**



1. A device for controlling the grinding pressure of a grinding wheel for grinding a surface of a product, comprising: a support, an arm pivotally suspended from said support substantially free of play, a grinding wheel rotatably supported at the free end of said arm, a mechanism for transmitting rotational movement to said wheel, a cylinder-piston unit having a cylinder, a piston in said cylinder and two chambers on opposite sides of said piston, said cylinder-piston unit being pivotally connected to said arm at a point along the length of the arm and also being pivotally connected to said support at a point forming with said point on said arm and the pivotal connection of said arm to said support a triangle, and means for controlling the bearing pressure of the grinding wheel on the surface, said means including means for establishing a differential pressure between said two chambers, a feed pump for said cylinder-piston unit, a hydraulic circuit connected to said pump for supplying pressure to said chambers of said cylinder-piston unit, said hydraulic circuit having a first branch leading to one of said chambers and a second branch leading to the other chamber, one of said branches comprising regulating valves, a pressure limiting valve and a flow limiting choke valve, and the other branch comprising a two-piston distributor, a differential valve, a flow limiting choke valve, a pressure regulating sequential valve and an electrohydraulic valve for operating said pressure regulating sequential valve.

4,186,527
APPARATUS FOR SHAPING ELECTRODES
Marten C. Hausermann, Addison, and Elmer P. Hausermann, Bensenville, both of Ill., assignors to Hausermann Abrading Process Company, Addison, Ill.
Filed Aug. 7, 1978, Ser. No. 931,609
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—58 **4 Claims**



1. An improved apparatus for forming electrical discharge machining electrodes said apparatus being of the type including a first platen, a second platen mounted in superimposed relation and adapted to be driven vertically with respect to said first platen, a die member having an abrasive surface mounted on one of said platens, a workpiece member mounted on the platen opposite the platen on which said die member is mounted in working alignment with said die member, means for applying horizontal oscillatory rotary motion to said first platen, vertical drive means for infeeding said workpiece member and said die member into contact with each other while said oscillatory rotary motion is being applied to thereby abrasively shape said workpiece member to the form of said die member, and wherein said improvement comprises
means for sensing the relative vertical position of said die member with respect to said workpiece member and generating an output signal representing said relative vertical position;
means for providing a first predetermined reference signal representing a first relative vertical position and corresponding to a preselected maximum vertical distance between said die member and said workpiece member;
means for providing a second predetermined reference signal representing a second relative vertical position and corresponding to a vertical distance between said die member and said workpiece member of substantially zero;
means for providing a third predetermined reference signal representing a third relative vertical position and corresponding to a preselected penetration of said workpiece member by said die member;
means coupled to said sensing means, and to said first, second and third reference signal means for comparing the output signal of said sensing means with said first, second

and third reference signals and for generating first, second and third output signals when the output of said sensing means is equal to said first, second and third reference signals respectively;

said vertical drive means being adapted for infeed and outfeed operation at at least two drive rates; and

means coupled to said comparing means for cyclically controlling the operation of said vertical drive means to infeed said die member and said workpiece member at a first relatively higher rate until the output signal of said sensing means is equal to said second reference signal, at a second relatively slower rate until the output signal of said sensing means is equal to said third reference signal, and to outfeed said die member and said workpiece at said first relatively higher rate until the output signal of said sensing means is equal to said first reference signal.

4,186,528

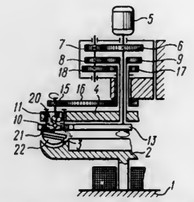
MACHINE FOR TREATING SPHERICAL SURFACES OF PARTS WITH MAGNETO-ABRASIVE POWDER

Petr I. Yascheritsyn, Leninsky prospekt 18, kv. 102; Faddei J. Sakulevich, pereulok Dalny 3; Leonty A. Olender, ulitsa Ya. Kolasa, 67, kv. 14, and Alexandr A. Kosobutsky, ulitsa R. Ljuxemburg, 161, kv. 5, all of Minsk, U.S.S.R.

Filed May 23, 1978, Ser. No. 908,672

Int. Cl.² B24B *5/00*

U.S. Cl. 51—161 **2 Claims**



1. A machine for treating spherical surfaces of parts with magnetoabrasive powder in a magnetic field comprising: a circular horizontal channel whose generatrix has the form of a portion of a circumference, said channel serving as a magnet; a rotor arranged above said circular channel; a drive for said rotor; spindles secured around the circumference of said rotor above said circular channel; means for imparting to each of said spindles a rotary and, simultaneously, precessional motion, the precession center lying mostly on the line of centers of the generatrix of the circular channel; a magnet secured on the lower end of each spindle and adapted for fastening a part to be treated to said spindle; and a magnetoabrasive powder contained in said circular channel.

4,186,529

PROGRAMMABLY CONTROLLED METHOD FOR GRINDING END CUTTING TOOLS AND THE LIKE

Stanley E. Huffman, Clover, S.C., assignor to S. E. Huffman Corporation, Clover, S.C.

Division of Ser. No. 810,776, Jun. 28, 1977, Pat. No. 4,115,956. This application Apr. 17, 1978, Ser. No. 896,987

Int. Cl.² B24B *1/00*

U.S. Cl. 51—288 **7 Claims**

1. The method of machine grinding a workpiece such as a cutting tool with a grinding wheel comprising the steps:

(a) installing the workpiece in the workpiece holder of the machine and positioning the central axis of the workpiece with respect to fixed reference X, Y, Z axes appropriate to the first grinding operation to be performed thereon and fixing the workpiece in such position;

(b) incrementally and independently and by N/C, positioning the workpiece during grinding thereof relative to the following axis:

(i) rotatively, with respect to an axis extending through the workpiece as a first axis;

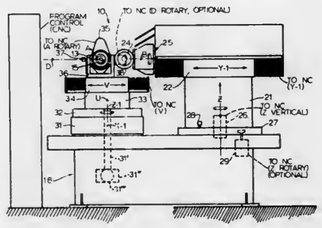
(ii) linearly, with respect to a second horizontal linear axis at all times disposed below said workpiece axis and fixed perpendicular thereto;

(iii) linearly, with respect to a third horizontal linear axis at all times disposed below said second axis and fixed relative thereto;

(iv) rotatably, with respect to a fourth vertical axis intersecting said third axis and perpendicular to said second axis; and

(v) linearly, with respect to a fifth horizontal axis intersected by and perpendicular to said fourth vertical axis;

(c) installing the wheel on the spindle of a motor drive supported by the wheel support structure and positioning said wheel support structure around a sixth fixed vertical axis to a rotated wheel support structure position appropriate to the grinding to be performed and fixing said



wheel support structure in such position with respect to rotation about said sixth axis; and

(d) incrementally and independently and by N/C positioning the wheel during grinding of said workpiece relative to the following axes passing through said wheel support structure:

(i) linearly, in a vertical direction with respect to said sixth vertical axis;

(ii) linearly, in a horizontal traverse, with respect to a seventh horizontal axis intersecting and perpendicular to said sixth axis; and

(iii) rotatively, in a vertical sweep, with respect to an eighth horizontal axis parallel to said seventh axis; and

(e) synchronizing said N/C workpiece and wheel positioning by N/C programs whereby said N/C positioning with respect to any number of said axes may take place simultaneously as and when required during the grinding of said workpiece.

4,186,530

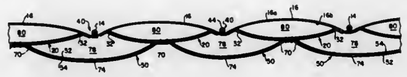
TRIPLE WALL PANEL UNIT FOR AIR SUPPORTED STRUCTURE

Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air Tech Industries Inc., Clifton, N.Y.

Continuation-in-part of Ser. No. 696,635, Jun. 16, 1976, Pat. No. 4,065,889. This application Dec. 19, 1977, Ser. No. 861,845

Int. Cl.² E04B *1/34*

U.S. Cl. 52—2 **7 Claims**



1. A collapsible unit for an air supported structure comprising:

an outer wall,

a pair of elongated first panel members attached along their edges adjacent one another to one surface of said outer wall to define a first space between each of said first panel members and said outer wall,

a second elongated panel member attached to the respective surfaces of said pair of first panel members facing outwardly from said one surface of said outer wall and spanning the two adjacent edges of said pair of first panel members to define a second space between said first and said panel members,

first means on each of said members of said pair of first panel members along a substantial portion of the length thereof adjacent a respective edge of each of said panel members of said pair of first panel members for venting as the panel unit is collapsed at least a part of the air contained in each of said first spaces to said second space, and

second means on said second panel member along a substantial portion of the length thereof which lie along a path generally confronting said first means for venting as the panel unit is collapsed the air originally contained in said second space and the air which is transferred from said first spaces to said second space as the panel unit is collapsed.

4,186,531

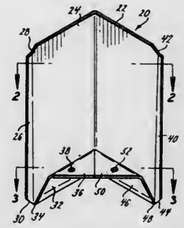
FASCIA-PROTECTING DRIP-DIVERTING DEVICE

Anton Okolischan, 9475 Trillium Dr., Crestwood, Mo. 63126

Filed May 30, 1978, Ser. No. 910,369

Int. Cl.² F04D *13/00*

U.S. Cl. 52—11 **16 Claims**



1. A fascia-protecting, drip-diverting device which has an upper portion, a lower portion, and a stop, said upper portion being thin so it is adapted to be telescoped upwardly into the narrow space between a fascia and a gutter which is disposed immediately adjacent said fascia, said lower portion being thicker, stiffer and stronger than said upper portion so it is adapted to withstand the forces which must be applied to said fascia-protecting drip-diverting device to cause said upper portion to telescope upwardly into said narrow space between said fascia and said gutter, said stop being adapted to limit the extent to which said upper portion is telescoped upwardly into said narrow space between said fascia and said gutter, said fascia-protecting drip-diverting device being dimensioned so the bottom of said lower portion is disposed below the level of the bottom of said fascia when said stop limits the extent to which said upper portion is telescoped upwardly into said narrow space between said fascia and said gutter, whereby said bottom of said lower portion is adapted to cause drips to move downwardly below the level of, and then fall away from, said bottom of said fascia without engaging said fascia.

4,186,532

UNDERWATER OBSERVATORY

Morris S. Kahn, P.O. Box 8388, St. Thomas, V.I.

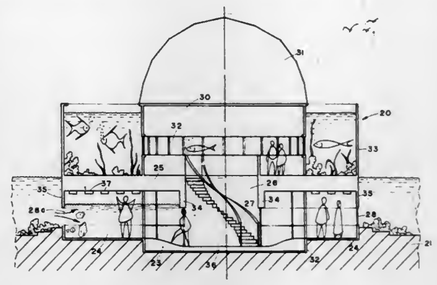
Filed Dec. 6, 1977, Ser. No. 858,059

Claims priority, application Israel, Dec. 7, 1976, 51059; Dec. 8, 1976, 51069

Int. Cl.² B63B *35/00*

U.S. Cl. 52—169.1 **9 Claims**

1. An off-shore underwater observatory comprising a lower, submerged observation gallery fitted with at least one observation window and having a ceiling with an opening through which the observation gallery is accessible, and a body of water acting as ballast on top of the gallery such that the combined weight of the structure and the water exceeds the



buoyancy and holds the observatory in position without any anchorage, said body of water being arranged as an aquarium and an upper observation gallery being provided adjacent thereto.

4,186,533

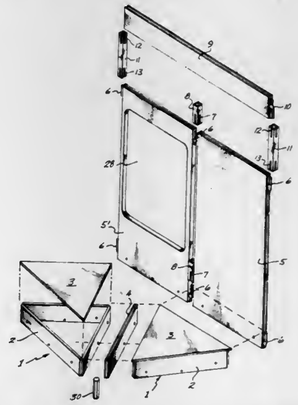
MODULAR BUILDING STRUCTURE

David C. Jensen, 81 W. Cordova St., Vancouver, B.C., Canada (V6B 1C8)

Filed May 16, 1977, Ser. No. 796,974

Int. Cl.² E04F *1k/00*; E04B *1/00*

U.S. Cl. 52—184 **2 Claims**



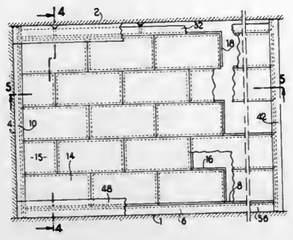
1. A modular floor system comprising a plurality of floor components each of which includes a base of equilateral triangle shape and a sheet material top of substantially the same shape supported by said base with the edges of said top substantially coplanar with the sides of said base, spacers secured to said floor components for maintaining each of said components with at least one of its sides spaced from, parallel to and in alignment with a side of another of said components, each of said spacers being of a height at least as great as the combined heights of an adjacent floor component base and the top supported thereby for preventing shifting of such top relative to such base, said spacers and said floor components forming a plurality of gaps of hexagon cross section at the apexes of floor components, and a plurality of plugs of hexagon cross section substantially filling said gaps.

4,186,534

PARTITION WALL CAPABLE OF BEING DISMANTLED

Rene-Jean M Le Coze, 10 Rue du Dr. Lettry, 56100 Lorient, France

Filed Apr. 5, 1978, Ser. No. 893,689
Claims priority, application France, Apr. 5, 1977, 7710274
Int. Cl.² E04B *2/74*; E04C *1/10*
U.S. Cl. 52—241 **8 Claims**



1. A partition wall structure capable of being dismantled for a room having a floor, ceiling and lateral walls, the partition wall structure comprising in combination an outer framework comprising a horizontal lower rail for placing on the floor, a horizontal upper rail for location adjacent the ceiling and a vertical upright for placing against one of said walls; an assembly in a vertical plane of adjoining generally rectangular panels located within the framework and adjoining the upper rail and the lower rail and adjoining the upright, there being a plurality of the panels in vertically adjoining relation to each other between the upper rail and lower rail and plurality of panels in adjacently adjoining relation to each other, the panels forming therebetween vertical joints which are in laterally staggered relation to each other from one joint to the next higher or lower joint, each panel defining four edges, means defining tongues and grooves which are unitary with the edges of the panel before assembly in said assembly of panels and respectively fitting with corresponding grooves and tongues of adjoining panels in said assembly to interlock the panels perpendicularly of said plane; means interlocking perpendicularly of said plane the upper rail and lower rail with the adjoining panels of said panels and means interlocking perpendicularly of said plane the upright with the adjoining panels of said panels, the upper rail being vertically movable in said framework relative to the upright; the panels being held together to form a wall structure which is coherent and resistant with regard to forces perpendicular to said plane by means consisting of said interlocking tongues and grooves of the panels and of pressure-applying expansible means for applying vertically downward pressure on the upper rail and thereby vertically clamping the panels against one another and against the lower rail, the pressure-applying expansible means being carried by the upper rail for bearing against the ceiling.

4,186,535

SHEAR LOAD RESISTANT STRUCTURE

Virgil R. Morton, Redondo Beach, Calif., assignor to Verco Manufacturing, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 805,523, Jun. 10, 1977, abandoned. This application Aug. 23, 1978, Ser. No. 936,176
Int. Cl.² E04C *2/32*
U.S. Cl. 52—250 **13 Claims**

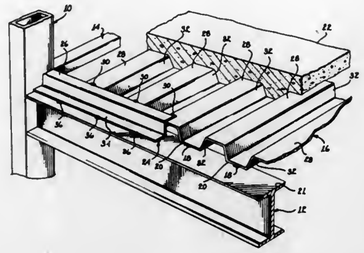
1. A diaphragm for translating horizontal shear loads imposed thereon through a supporting load bearing member to vertical load resisting members in buildings, said diaphragm comprising in combination:

a. a fluted deck, said fluted deck including webs alternately interconnecting top and bottom flutes terminating at opposed open ends defined by the extremities of said webs, said top flutes and said bottom flutes, said fluted deck having the opposed open ends supported by a load bearing member;

b. first welds for rigidly securing the ends of each of said bottom flutes of said fluted deck to the supporting load bearing member;

c. load translation means transversely located with respect to the flutes of said fluted deck for structurally interconnecting the top flutes of said deck with one another and with the load bearing member;

d. second welds for rigidly securing the ends of each of said top flutes of said deck directly to said load translation means; and



e. third welds for rigidly securing the load bearing member directly to said load translation means;

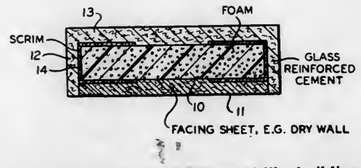
whereby, said load translation means inhibits relative movement between and buckling of said top and bottom flutes of said fluted deck due to horizontal shear loads imposed upon said diaphragm and said load translation means translates the horizontal shear loads from said diaphragm to the load bearing member and ultimately to the vertical load resisting members.

4,186,536

COMPOSITE BUILDING MODULE AND METHOD FOR MAKING SAME

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Filed Mar. 9, 1978, Ser. No. 884,921
Int. Cl.² E04C *2/20*
U.S. Cl. 52—309.12 **14 Claims**



1. Process for making a composite panel-like building module having a rigid foam core encapsulated in a shell of reinforced cementitious material having a facing member on one main face thereof, comprising:

a. providing a first mold having a bottom and side walls;

b. disposing a facing member face down in the bottom of the mold;

c. placing scrim reinforcing material on top of the facing member with excess scrim extending outwardly from the periphery of the facing member;

d. foaming a foam core in situ on the facing member and scrim to a selected height;

e. providing a second mold having a bottom and side walls wherein the area of the bottom wall of the second mold is greater than that of the first mold and the height of the side walls of the second mold is greater than said selected height;

f. depositing a layer of wet cementitious material and fibers in the bottom of the second mold.

g. folding the excess scrim around the foam core produced in step (d) and placing the core and facing member in the second mold on the bottom layer with the facing member face up and with the periphery thereof spaced from the side walls of the second mold;

h. depositing wet cementitious material and fibers in the free space around the core and facing member to be substantially flush with the face of the facing member; and

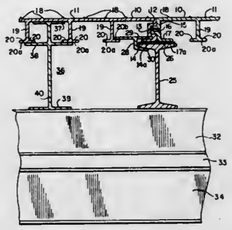
i. curing the wet cementitious shell and removing the thus formed module from the second mold.

4,186,537

TRANSVERSE INTERLOCK FLOORS FOR TRUCKS AND THE LIKE

Elton E. Mountz, Morgantown, Pa., assignor to Morgan Trailer Mfg., Morgantown, Pa.

Filed Aug. 23, 1978, Ser. No. 936,034
Int. Cl.² E04B *5/10, 5/14*; B62D *27/06*
U.S. Cl. 52—483 **12 Claims**



1. A floor construction for the body of a vehicle comprising

(A) a plurality of floor planks transversely disposed in edge to edge relation,

each of said planks comprising a top plate with downwardly extending side walls,

the side walls of each plank having interengaging portions for preventing horizontal movement of contiguous planks,

said top plate having between said side walls reinforcing ribs extending downwardly therefrom,

said side walls and said ribs having horizontal flanges;

(B) transverse supporting beams in supporting relation to said floor planks beneath the horizontal side wall flanges of contiguous planks; and

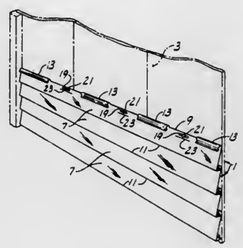
(C) members for holding said planks in engagement with said beams having portions in engagement with a flange of a side edge, a flange of a rib and a flange of a transverse supporting beam.

4,186,538

PANEL OF SIDING

Maxie G. Marcum, Jr., Ballwin, Mo., assignor to Aluminum Industries, Inc., Manchester, Mo.

Filed May 10, 1978, Ser. No. 904,555
Int. Cl.² E04D *1/34, 3/361*
U.S. Cl. 52—521 **4 Claims**



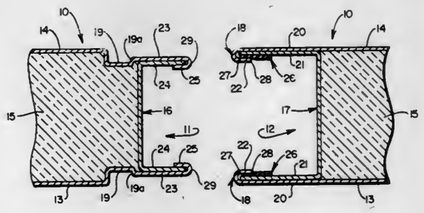
1. An elongate panel of siding adapted to be mounted generally horizontally on the wall of a building, said panel being of thin sheet metal or the like and having two opposing faces, one constituting an inside face which faces said wall and the other constituting an outside face which faces away from the wall, said panel further having upper and lower longitudinal edges, upper hook means comprising a plurality of separate hooks spaced at intervals along the upper edge of the panel and bent down from the upper edge on the outside face of the panel, each of the hooks terminating at an edge below the upper edge of the panel, a plurality of elongate horizontal slots spaced below the upper edge of the panel between the hooks at a level generally above that of the terminal edges of the hooks for receiving fasteners to secure the panel to the wall, slits below the slots for preventing deformation of the panel below the slit when the panel is secured to the wall via the fasteners, and lower hook means along the lower edge of the panel on the inside face thereof for engaging the upper hooks of a panel therebelow on the wall thereby to mount the panels on the wall with the panels secured thereto by fasteners extending through said slots and with the lower hook means of the upper one of the panels interengaged with the upper hooks of the lower one of the panels.

4,186,539

INTERLOCKING MODULAR BUILDING PANEL WITH SEALING STRIP

William M. Harmon, Worthington; Lindell R. Holtzmeier, Athens, and Toshiaki Yamamoto, Columbus, all of Ohio, assignors to United McGill Corporation, Columbus, Ohio

Filed Feb. 9, 1978, Ser. No. 876,499
Int. Cl.² E04C *1/14*
U.S. Cl. 52—580 **6 Claims**



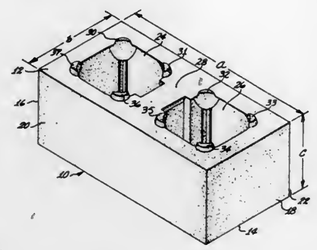
1. A modular building panel comprising a structurally rigid, elongated panel having opposed, longitudinally extending, marginal edge portions of mating tongue and socket configuration which are each adapted to interfit edgewise with a mating marginal edge portion of an adjacent panel, said opposed marginal edge portions having respective bead and groove conformations extending longitudinally thereof and configured to interlockingly interfit, said groove formed in the tongue-forming marginal edge portion and opening outwardly with respect to a surface of the panel, said socket-forming marginal edge portion having spaced sidewalls defining a channel therebetween for receiving a tongue marginal edge portion, one of said sidewalls having a terminal edge strip formed along an outer longitudinally extending edge thereof and folded inwardly of the channel in superposed relationship to a surface of the sidewall and forming said bead for interlocking with a groove, and an elongated, flat sealing strip formed from an elastomeric material carried by and disposed in longitudinally extending relationship to said one sidewall at the inwardly facing surface thereof, said sealing strip being of a predetermined width having a longitudinally extending marginal edge portion disposed in underlying relationship to said sidewall terminal edge strip and forming a cooperative fluid-sealing interengagement with the tongue-forming marginal edge portion of another panel when assembled therewith and having the respective bead and grooves thereof disposed in interlocked engagement, said sealing strip extending substantially the length of the panel.

4,186,540

INTERLOCKING CEMENTITIOUS BUILDING BLOCKS

Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 799,725, May 23, 1977, Pat. No. 4,107,894, which is a continuation-in-part of Ser. No. 736,724, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 582,378, Apr. 30, 1975, abandoned. This application May 8, 1978, Ser. No. 903,731
The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—593 **23 Claims**



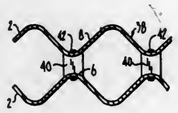
1. An interlocking building block comprising:
(a) a cementitious body of rectangular configuration having an upper horizontal surface and a lower horizontal surface;
(b) a spaced pair of passages formed through said body so as to extend between the upper and lower surfaces thereof, said passages formed with square in horizontal cross sectional configurations and opening onto the lower surface of said body to provide eight open corners arranged in a predetermined array in the lower surface of said body;
(c) eight corner spanning shelves each located in a different corner of said pair of passages at the upper surface of said body, each of said shelves supported on an integral corner corbel so as to extend in cantilever fashion toward the center of its respective one of said passages; and
(d) eight projections each integrally formed to extend upwardly from a different one of said shelves so as to be arranged on the upper surface of said body in the same geometric array as said open corners are arranged in the lower surface of said body.

4,186,541

HIGH STRENGTH CORRUGATED METAL PLATE AND METHOD OF FABRICATING SAME

Eugene W. Sivachenko, 6851 Waverly, Redding, Calif. 96001

Division of Ser. No. 699,289, Jun. 24, 1976, Pat. No. 4,099,359.
This application May 8, 1978, Ser. No. 904,044
Int. Cl.[2] E04B *2/28;* **E04C** *2/32*
U.S. Cl. 52—630 **8 Claims**



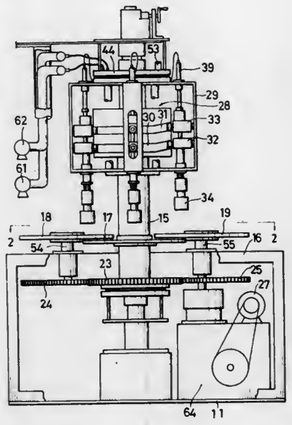
1. A high strength corrugated plate assembly comprising in combination first and second corrugated metal plates, each plate having a plurality of generally sinusoidally shaped, alternating peaks and troughs, troughs of the first plate being in alignment with peaks of the second plate, a plurality of spaced apart tubular spacers disposed between the first and second plates having ends in contact with the first and second plates so as to maintain proximate peaks and troughs of the plates aligned and spaced apart, the ends of the tubular spacers having a contoured configuration shaped to conform to the respective contours of the peaks and the troughs of the plates engaged thereby so as to provide a snug engagement between the spacer ends and the plates, and securing means for each spacer extending into the interior thereof for firmly securing the plates to the spacers and thereby to each other by biasing the plates against the spacer ends.

4,186,542

APPARATUS FOR VACUUM-SEALING A VIAL

Kenzi Oyagi, Kyoto, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 15, 1978, Ser. No. 915,774
Claims priority, application Japan, Jun. 17, 1977, 52/72685
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—88 **9 Claims**



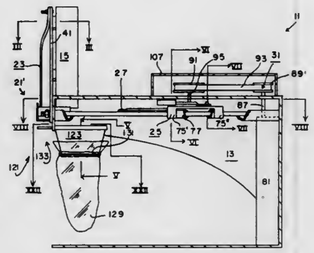
1. An apparatus for vacuum-sealing a vial comprising:
a base having a shaft fixed therein;
a table on said base supporting a vial temporarily closed by a rubber stopper;
a first rotary means for carrying the vial along said table around a vertical axis;
a vertically movable enclosing means above said table and movable downwardly for air-tightly enclosing therein the mouth of the vial and holding the vial securely on the table;
a rubber stopper suction head vertically movable within the enclosing means for engaging the rubber stopper and applying a vacuum thereto for withdrawing it from the vial; said enclosing means and suction head being movable around said vertical axis;
a cylindrical cam fixed to said shaft;
a first cam follower movable around said shaft and engaging with the cylindrical cam and connected to said enclosing means for moving the enclosing means vertically;
a second cam follower movable around said shaft and engaging with the cylindrical cam and connected with said suction head for moving said suction head vertically within the enclosing means in timed relation to the vertical movement of the enclosing means;
a first evacuating means adapted to communicate with the enclosing means;
a second evacuating means communicating with the rubber stopper suction head for applying vacuum to the stopper in timed relation to the evacuation of the enclosing means; and
a valve device for communicating the enclosing means with the first evacuating means and for communicating the rubber stopper suction head with the second evacuating means independently of each other in timed relation to the lowering of the rubber stopper suction head and of the enclosing means;
whereby, while the vial is carried by the first rotary means, the enclosing means air-tightly encloses therein the mouth of the vial, and when the rubber stopper suction head is lowered the rubber stopper is drawn against it, and then said suction head elevates to remove the rubber stopper from the mouth of the vial, and the enclosing means is evacuated in timed relation to the evacuation of the rubber stopper suction head, thereby permitting the evacuation of the vial within the enclosing means for a predetermined time, and the rubber stopper suction head is then lowered to close the vial with the rubber stopper.

4,186,543

FOOD PROCESSOR

Charlie D. Lyell, Martin, Tenn., assignor to Sharon N. Lyell, Martin, Tenn., a part interest

Filed May 11, 1978, Ser. No. 904,801
Int. Cl.[2] B02C *1/02, 18/02;* **B65B** *63/00*
U.S. Cl. 53—515 **11 Claims**



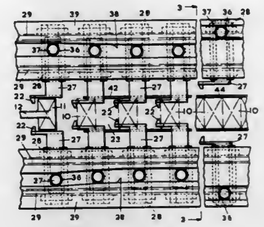
1. A food processor comprising a frame, food hopper means removably attached to said frame and having an upwardly directed input opening for receiving the food preparitory to being processed and a downwardly directed discharge opening, food support means disposed subjacent said food discharge opening for restingly engaging the lowermost portion of food contained within said hopper means, means for swingably attaching said food support means to said frame with said food support means being free to swing between a first position that is in alignment with said food discharge opening and a second position that is displaced from said food discharge opening, a carriage assembly slidably attached to said frame for slidable movement within a horizontal plane toward and away from said food hopper means, a food processable element removably attached to said carriage assembly for workingly engaging at least a portion of the food, drive means coupled to said carriage assembly for causing reciprocating movement thereof with said food processable element being arranged to cyclically pass beneath said food discharge opening, and ejector means coacting with said carriage assembly and said food support means for ejecting particles of processed food downwardly away from said food processable element by causing said food support means to be moved between said first and second position thereof, said ejector means including bias means for yieldably urging said food support means toward said first position thereof, said ejector means including means associated with said carriage assembly for engaging and cyclically driving said food support means from said first position to said second position thereof, said bias means returning said food supporting means to said first position thereof.

4,186,544

WRAPPING MACHINES

Reginald F. Johnson, Lea, near Gainsborough, England, assignor to Baker Perkins Holding Limited, Peterborough, England

Filed May 25, 1978, Ser. No. 909,467
Int. Cl.[2] B65B *11/38*
U.S. Cl. 53—537 **6 Claims**



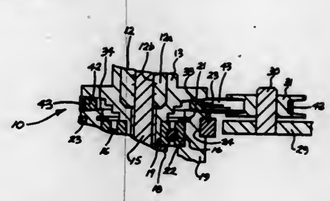
1. A wrapping machine comprising an intermittently rotating wrapping wheel having individual pockets for receiving in succession an article to be wrapped and a wrapper, the wrapping wheel being operative during its rotation to fold the wrappers partially around the articles and to bring the pockets, each containing a partially wrapped article, in succession to a transfer station, a continuously moving chain conveyor carrying a series of pushers, said pushers being arranged to move through the pockets of the wrapping wheel in succession as the pockets reach and while the pockets are stationary at the transfer station, to withdraw the partially wrapped articles from the pockets and traverse them in succession through a final wrapping station, stationary folder blades at said final wrapping station which extend generally parallel to said chain conveyor adjacent the two ends of the articles and which engage portions of the wrapper projecting from the ends of each article to complete the wrap of said articles, said pushers being constituted by pairs of fingers mounted on said chain conveyor adjacent opposite ends of the articles, said fingers engaging the partially wrapped articles to feed them in succession along a stationary support, and a control mechanism operative to move the fingers of each pair inwardly towards one another to positions clear of said stationary folder blades during passage of the articles past the folder blades.

4,186,545

CLUTCH-BRAKE MECHANISM

Marion E. Hutchison, 1241 Ackermant, Waterloo, Iowa 50703

Filed Nov. 25, 1977, Ser. No. 854,773
Int. Cl.[2] A01D *69/08*
U.S. Cl. 56—113 **4 Claims**



1. A clutch mechanism for a rotary mower comprising:
a first circular member having a pair of tapered circular surfaces thereon being rigidly attached to a drive shaft;
a second circular member having a pair of tapered circular surfaces thereon being rotatably journaled to said first circular member;
a mower blade rigidly attached to said second circular member;
means for selectively frictionally engaging the first and second circular members in a first position thereof for

substantially preventing rotation of one of said circular members with respect to the other of said circular member and moveable to a second position for allowing said circular members to rotate with respect to each other, said engaging means including a ring disposed around said first and second circular members and loosely abutting said tapered circular surfaces, a belt disposed around said ring, whereby a relatively small amount of energy will be required to engage and disengage said first and second circular members with respect to each other; and

means for controlling the movement of the engaging means between said first and second positions, said controlling means includes biasing means for biasing the engaging means into the second position thereof whereby said blade will be disengaged from turning with said drive shaft thereby providing a fail-safe function, said controlling means further including a pulley means for engagement with said belt and means for moving said pulley means to selectively tighten or loosen said belt whereby when said belt is tight against said ring said first and second circular members will turn together so as to transmit rotation from the drive shaft to said blade and when belt is loose, said blade will not be turned by said drive shaft.

4,186,546

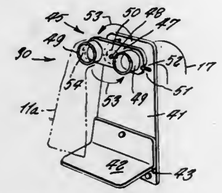
DISPOSABLE BAG MOUNTING FOR A LAWN MOWER

Manuel Machado, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 18, 1978, Ser. No. 935,016

Int. Cl.[2] A01D *35/22*

U.S. Cl. 56—202 **3 Claims**



1. A lawn mower and disposable bag combination, comprising a disposable bag and a lawn mower with a platform on its rear for supporting said bag thereupon, a duct from an inverted dome around a grass clipping chamber of said mower extending upwardly, and a duct end aligned with a mouth of said bag, said platform being rearwardly downwardly pivotable about a hinge against an action of a spring loaded pin, a rotatable plate about a central stationary pin, a nozzle at each opposite end of said rotatable plate, said bag and a second disposable bag each fitted on said nozzles, a detent for retaining said rotatable plate in position for said nozzles successively to align with said duct end, and a wound up spring for rotating said rotatable plate.

4,186,547

MACHINE FOR HARVESTING SOFT FRUIT

Roland J. E. James, Kirkenel Farm, Ashford Carbonell, England

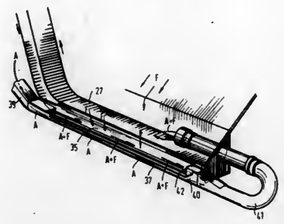
Filed May 22, 1978, Ser. No. 908,550

Claims priority, application United Kingdom, May 23, 1977, 21629/77

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **8 Claims**

1. A machine for harvesting soft fruit and of the kind comprising a frame, ground engaging wheels for supporting said frame, traction means for driving said frame over the ground along a row of soft fruit bushes, a picking zone defined by said frame, guides for guiding branches of each bush into said picking zone as the machine traverses the bush, shakers for engaging the branches in said picking zone and shaking fruit therefrom, and fruit collecting and conveying means below said picking zone for collecting fruit shaken from the branches, wherein the fruit collecting means comprises a longitudinally extending open top channel into which fruit can fall and means for providing a flow of air along the channel to convey fruit along the channel, comprising an air flow source, an inlet



orifice at or near one end of the channel operatively connected to said source and directed towards the opposite end of the channel, and an outlet orifice at or near said opposite end of the channel and air flow means for drawing air away from the channel operatively connected to said outlet orifice.

4,186,548

BEARING FOR THE SPINNING ROTOR OF AN OPEN-END SPINNING ASSEMBLY

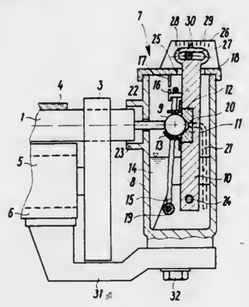
Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Uberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 890,414

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716573

Int. Cl.[2] D01H *1/12, 7/12;* **F16C** *1/24, 19/12*

U.S. Cl. 57—58.89 **19 Claims**



1. Bearing arrangement for a rotor shaft of an open-end spinning assembly or the like of the type having a spinning assembly component which vibrates with rotation of the rotor shaft; said bearing arrangement comprising:

a ball wettable by lubricant and engageable with an end of the rotor shaft to axially support the rotor shaft,

step bearing housing means including retainer means for retaining said ball,

and supporting means for supporting the entire step bearing housing means on the component of the spinning assembly or the like which vibrates with rotation of the rotor shaft, wherein operational vibrations of said component are transmitted to said ball by way of vibrational movement of said supporting means and the entire step bearing housing means to thereby improve lubrication of said shaft and ball.

4,186,549

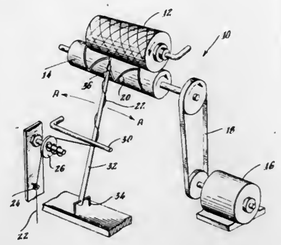
PACKAGING OF SELF-TWIST YARNS

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Filed May 30, 1978, Ser. No. 910,463

Int. Cl.[2] D02G *3/28;* **D01H** *5/28, 7/92*

U.S. Cl. 57—293 **7 Claims**



1. In an apparatus for packaging a self-twist yarn strand having nodes of zero twist along its length and opposite twist on either side of each node, said apparatus being provided with means for feeding said self-twist yarn strand onto a take-up device, said feed means including

guide means located adjacent to the surface of said take-up device to guide the strand along the surface of said take-up device, and

tension-applying means for applying tension to said strand as it is guided along the surface of said device,

rotation-minimizing means located between the tension-applying means and the take-up device for minimizing rotation of the nodes of said yarn strand and concurrent loss of twist in said yarn strand as it is guided onto said take-up device, said rotation-minimizing means including an elongated guide rod between said tension applying means and take-up device about which said yarn strand is wrapped.

4,186,550

PROGRAMMER FOR ELECTRIC HOUSEHOLD APPLIANCES

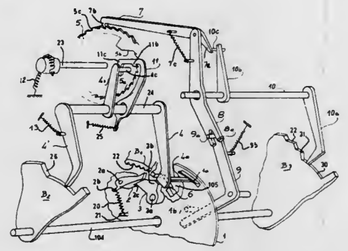
Edouard Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France

Filed Jun. 6, 1978, Ser. No. 912,967

Claims priority, application France, Jun. 20, 1977, 77 19063

Int. Cl.[2] G04F *3/02, 8/00*

U.S. Cl. 58—21.13 **4 Claims**



1. A programmer for electric household appliances comprising a reversing cam, a motor for continuously rotating said reversing cam, a programming cam assembly comprising a toothed driving cam and at least one programming cam driven by said driving cam, engageable and disengageable driving connection means between said reversing cam and said driving cam, a timing wheel, means forming a driving connection between said reversing cam and said timing wheel and control means for controlling engagement and disengagement of said driving connection means, said driving connection means including a first lever and a pawl each povotally mounted on said reversing cam, said pawl having a first position in which it drivingly engages the teeth of said driving cam and said first lever being engageable with said pawl to displace said pawl from said first position, said control means including a fixed plate formed with an opening, said first lever having a part received in said opening when said pawl is in driving engagement with the teeth of said driving cam, a second lever having a portion movable into said opening to displace said part of said first lever from said opening and cause said first lever to move said pawl out of engagement with the teeth of said driving cam, means for moving said portion of said second lever into said opening comprising a third lever moveable with said second lever and engaging said programming cam. said programming cam having a profile portion effective to move said third lever causing said portion of said second lever to move into said opening and means for displacing said portion of said second lever from said opening to cause said pawl to re-engage the teeth of said driving cam comprising a fourth lever moveable with said second and third levers and a cam surface on said timing wheel for engaging and moving said fourth lever to displace said portion of said second lever from said opening.

4,186,551

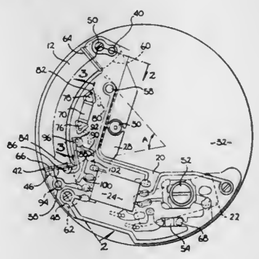
ELECTRONIC TIMEPIECE STRUCTURE

Yasuaki Nakayama, Hanno, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 675,637, Apr. 9, 1978, abandoned. This application Apr. 3, 1978, Ser. No. 892,403

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **8 Claims**



1. A structure for a quartz wrist watch of the type comprising a pillar plate, a motor and a circuit board having an electrical lead pattern formed thereon provided superjacent said pillar plate and a stator of said motor provided on said plate comprising a yoke, a core provided adjacent said yoke and a bobbin provided about said core having wire wound around, said structure being characterized by:

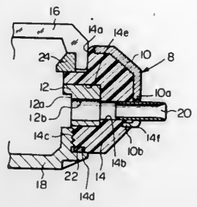
said yoke being fixed to said plate;

said bobbin being subjacent said circuit board and superjacent said pillar plate, said bobbin further being fixed directly to a lower surface of said circuit board;

said wire wound on said bobbin being extended directly to and electrically coupled to said electrical lead pattern; and

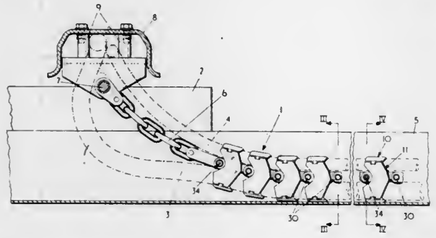
a fastening means for magnetically and mechanically coupling said yoke to said core and for positioning said circuit board on said plate, said means being a removable screw.

4,186,552
WRISTWATCH CASE
Hisao Ishigaki, Tokyo; Ryuzo Tanaka, Tanashi, and Koichi Nakajima, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Japan
Filed Nov. 29, 1977, Ser. No. 855,802
Claims priority, application Japan, Nov. 30, 1976, 51-143026
Int. Cl.² G04B *37/06, 39/00*
U.S. Cl. 58—88 W **9 Claims**



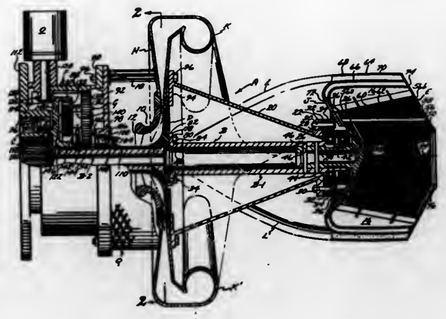
1. A wristwatch case comprising:
a watchglass;
a case body for retaining said watchglass and including an outer shell made of a metallic sheet plate, an inner shell having an outer peripheral wall a major portion of which is held in intimate contact with an inner wall of said outer shell and having an inwardly facing annular recess, and an annular metallic reinforcing member disposed in the inwardly facing annular recess of said inner shell, said inner shell being formed by injection molding a synthetic resin to form a one piece structure with said outer shell and said annular reinforcing member, and said inner shell having a recessed portion to which said watchglass is fitted; and
a back cover secured to the inner shell of said case body.

4,186,553
CABLE PROTECTION EQUIPMENT
Kevin Fitchett, Aston-on-Trent, England, assignor to Coal Industry (Patents) Limited, England
Filed May 8, 1978, Ser. No. 903,874
Claims priority, application United Kingdom, May 10, 1977, 19553/77
Int. Cl.² F16L *3/14*
U.S. Cl. 59—78.1 **10 Claims**



1. A link adapted to be pivotally attached to similar adjacent links to provide a chain for protecting a plurality of flexible supply components leading to equipment which in use repeatedly traverses to and fro, the link comprising two elements in engagement with each other, one of said elements defining an open sided passageway for containing said plurality of flexible supply components which elements when connected define a closed passageway around any such flexible supply components, the open side forming a part of the closed passageway when said elements are connected, and which other of said elements can be at least partially disconnected to permit access to the passageway, both the elements having means capable of being pivotally attached to elements of adjacent links.

4,186,554
POWER PRODUCING CONSTANT SPEED TURBINE
Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110
Continuation-in-part of Ser. No. 630,430, Nov. 10, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,441
Int. Cl.² F02C *3/04*
U.S. Cl. 60—39.37 **28 Claims**

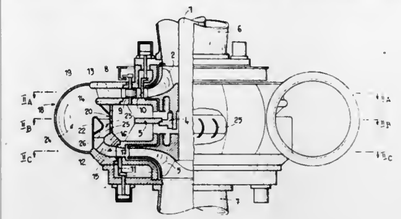


1. A turbine system comprising:
(a) power take-off means being rotationally displaceable about a longitudinally extending axis of rotation, said power take-off means being rotatably mounted within a first housing;
(b) compressor rotor means mounted within a housing assembly having at least one diffuser tube extending in a radial outward direction from said axis of rotation direction for discharge of air from said compressor rotor means;
(c) at least one volute casing member in fluid communication with said diffuser tube for directing said air in a predetermined path;
(d) fuel combustion means coupled to said volute casing for issuing products of combustion of said air and a fuel combusted in said combustion means; and,
(e) turbine rotor means mounted within a second housing, said turbine rotor means being coupled to said power take-off means by a rotational shaft member extending in said longitudinal direction through said compressor means, said turbine rotor means including (1) a plurality of disc members displaced each from the other in said longitudinal direction to form a plurality of circular passages extending from an outer portion to an inner passage formed through each of said disc members, said plurality of discs defining a peripheral outer wall and, (2) at least one nozzle member in fluid communication on opposing ends thereof with said fuel combustion means and said circular passages, said nozzle member being positionally located for directing said products of combustion substantially tangential to the contour of a peripheral outer wall of said disc members.

4,186,555
HYDRAULIC MACHINE
Michel Fauconnet, Marchissy, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland
Filed Jun. 28, 1978, Ser. No. 919,959
Claims priority, application Switzerland, Jul. 18, 1977, 8854/77
Int. Cl.² F16D *33/00*
U.S. Cl. 60—330 **7 Claims**

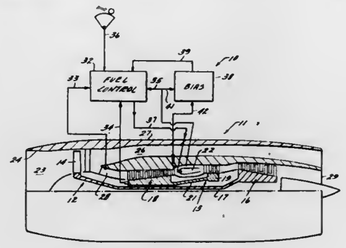
1. A hydraulic machine having a turbine and a pump orientated for the same direction of rotation and comprising a casing connected to an upper inlet pipe, blades interposed between the casing and the turbine and pump wheels, the turbine and the pump being mounted, spaced one from the other, on a

common shaft and their respective inlets being orientated in opposite directions, and including a pump inverter housed at least partially inside the casing which is provided with an



internal separating wall dividing it into two chambers, one of which constitutes the volute of the turbine into which the pump inverter discharges.

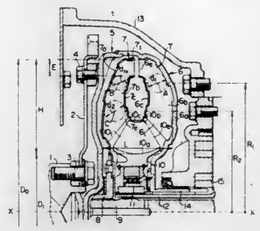
4,186,556
COMPRESSOR BLEED BIASED ACCELERATION SCHEDULE
William C. Lowry, West Chester, and William L. Phipps, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed May 29, 1975, Ser. No. 581,752
Int. Cl.² F02C *9/02*
U.S. Cl. 60—39.03 **6 Claims**



1. An improved fuel control system for a turbine engine of the type having a compressor from which a portion of the air can be bled off and a fuel control system responsive to engine operating parameters wherein the improvement comprises:
a. means for sensing the amount of air that is bled off from the compressor; and
b. means for biasing the fuel control system as a function thereof to increase the acceleration fuel schedule.

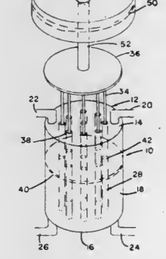
4,186,557
TORQUE CONVERTER WITH NARROWED FLOW PASSAGES
Hajime Arai, Aichi, and Kiyoshi Oonuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jan. 16, 1979, Ser. No. 3,869
Claims priority, application Japan, May 22, 1978, 53/61266
Int. Cl.² F16D *33/00, 33/20*
U.S. Cl. 60—361 **7 Claims**

1. A hydraulic torque converter which comprises an impeller, a stator, and a turbine, each of which is provided with vanes, wherein the space through which fluid circulates is of the form of the space between an inner and an outer torus which are coaxial, wherein a section through the toruses by a plane containing their axis consists of an annulus which is defined by an inner closed curve provided by the intersection of the plane and the inner torus and an outer closed curve provided by the intersection of the plane and the outer torus, wherein the dimension parallel to the axis of the toruses of the outer closed curve is smaller than its dimension in the direction perpendicular to this axis, and wherein, considering a circle inscribed between the inner and outer closed curves and touching both of them and passing round the annulus, the value



which is the product of the radius of such a circle and the distance of its center from the axis of the toruses alters, as the center of the circle passes around at least the portion of the annulus which corresponds to the turbine, from a maximum value at the inlet of the turbine to a minimum value which is substantially smaller than this maximum value.

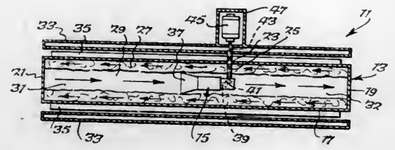
4,186,558
THERMAL CONVERSION ENGINE
Sheafen F. Kuo, 40 Croft Pl., Staten Island, N.Y. 10314
Filed Apr. 10, 1978, Ser. No. 894,910
Int. Cl.² F03G *7/06*
U.S. Cl. 60—527 **1 Claim**



1. An engine for converting thermal energy into mechanical energy, comprising:
an outer container having a system of ports for providing a hot fluid input port, cold fluid input port, and output ports for the hot and the cold fluid;
at least one cylinder positioned in said container, a liquid in said cylinder, a piston on the surface of said liquid and a piston rod extending from said piston; and
an output means coupled to said piston rod, whereby the liquid in said cylinder is periodically frozen and melted by a repetitive succession of cold fluid and hot fluid in said container, thereby causing said piston rod to reciprocate said output means as the volume of liquid changes between its frozen and melted states, wherein said system of ports comprises four separate ports, two of which accommodate cold fluid input and output, and two of which accommodate hot fluid input and output, and wherein said container is hollow and is of elongated shape, and comprises a top and bottom cover at respective opposite ends of said container, said top cover having openings therein through which extend said piston rod, and wherein said hot fluid input and output ports are located adjacent to

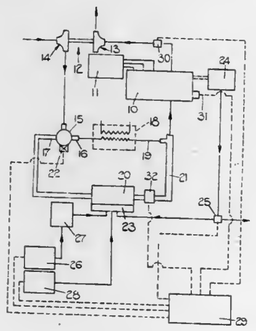
one end of said container, said cold fluid input and output ports are located adjacent to the other end of said container, and further comprising a thermal separator transversely positioned within said container and freely movable in a longitudinal direction.

4,186,559
HEAT PIPE-TURBINE
Bert J. Decker, deceased, late of Buffalo, N.Y., and by Jean S. Decker, executrix, 136 Copen Blvd., Buffalo, N.Y. 14226
Filed Jun. 7, 1976, Ser. No. 693,195
Int. Cl.[2] F01K *27/00*
U.S. Cl. 60—531 **15 Claims**



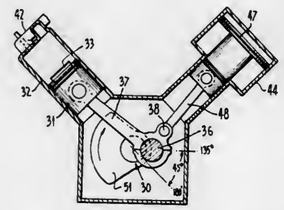
1. A heat pipe-turbine assembly which comprises: a heat pipe-turbine, which includes a heat pipe having evaporating and condensing sections, means for heating the evaporating section, means for cooling the condensing section, a vaporizable liquid in the pipe, return means for returning condensate from the condensing section to the evaporating section and a turbine inside the heat pipe so located that fluid evaporated in the evaporating section of the heat pipe passes through the turbine as a gas and drives it, after which said gas is condensed to a liquid in the condensing section and is returned to the evaporating section as a liquid through the return means; and an auxiliary heat pipe so positioned as to extract heat from the means for heating the evaporating section of the heat pipe-turbine after said heating of the evaporating section is effected and to transfer said heat to means for heating the evaporating section to increase the heat content thereof before said evaporating section is heated.

4,186,560
INTERNAL COMBUSTION ENGINES
George Frankl, Kenton, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Mar. 8, 1978, Ser. No. 884,486
Claims priority, application United Kingdom, Mar. 12, 1977, 10575/77
Int. Cl.[2] F02B *37/00*; F02M *31/04*
U.S. Cl. 60—599 **1 Claim**



1. An internal combustion engine system including a compression ignition engine, a turbosupercharger for supplying air under pressure to the engine, means for supplying fuel to the combustion spaces of the engine, an intercooler operable to cool the air flowing to the air inlet manifold of the engine through the compressor of the turbo charger, an air heater for heating the air flowing to the air inlet manifold through the compressor, a fuel burner assembly located within the air heater and operable in use to cause fuel to be burnt in the air flowing to the engine to effect heating of the air, a selector valve operable to direct the air flow through the intercooler and/or the air heater, valve control means for controlling the operation of said valve, means for providing a control signal when the air supplied to the engine requires to be heated, and a control network to which the control signal is supplied and which provides a signal to said valve control means to cause a small flow of air through said heater to enable combustion to start therein, the flow of air through the heater being increased when combustion has started whilst the flow of air through the intercooler is decreased.

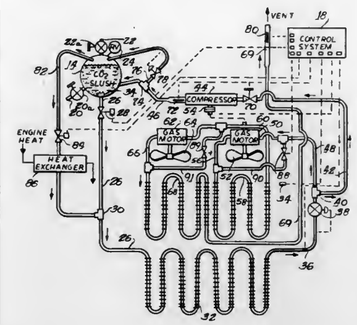
4,186,561
SPLIT CYCLE INTERNAL COMBUSTION ENGINES
John D. Wishart, 8 Chapel St., Blackburn, Victoria, 3130, Australia
Filed Sep. 21, 1978, Ser. No. 944,653
Claims priority, application Australia, Sep. 22, 1977, PD1772; Jun. 29, 1978, PD4909
Int. Cl.[2] F02B *73/00*
U.S. Cl. 60—620 **13 Claims**



1. A split cycle internal combustion engine comprising a crankshaft, at least one firing cylinder, for each firing cylinder an expansion cylinder adjacent thereto, each firing cylinder having a transfer port in the lower region of the combustion chamber communicating with the top of the adjacent expansion cylinder, a multistage compressor comprising at least two cylinders operating in series, a piston in each cylinder, means directing air supplied by the high pressure stage of the compressor to the combustion zone of each firing cylinder during the first part of the power stroke, means supplying fuel to the combustion zone of each firing cylinder to mix intimately in the correct proportion with the entering compressed air, means external of each firing cylinder heating the air before entry to the top of the combustion zone, and means controlling the timing of the admission of fuel and of compressed air to each firing cylinder in relation to the position of the piston in said firing cylinder.

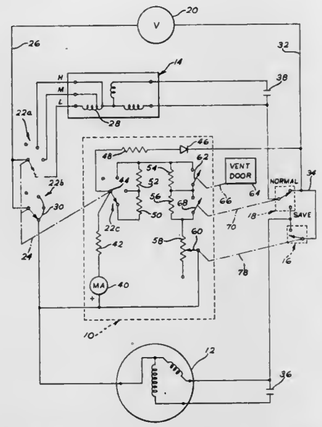
4,186,562
CRYOGENIC REFRIGERATION FOR VEHICLES
Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521
Continuation-in-part of Ser. No. 737,440, Nov. 1, 1976, Pat. No. 4,127,008. This application Jul. 24, 1978, Ser. No. 927,455
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—62 **17 Claims**

1. A method for cooling the cargo compartment of a refrigerated vehicle using carbon dioxide, which method comprises
providing reservoir of liquid CO_2 and solid CO_2 in the form of CO_2 slush in a storage tank carried by the vehicle,
separating liquid CO_2 from the slush and transferring the separated liquid from the tank to first heat-exchange means,
vaporizing said transferred liquid CO_2 in said first heat-exchange means by heat transfer from the cargo compartment atmosphere while maintaining a vapor pressure of at least about 75 psia therein,
returning at least a portion of said CO_2 vapor stream from



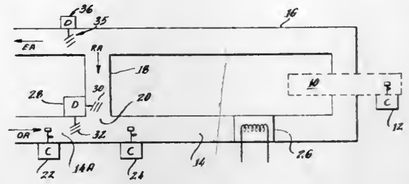
said first heat-exchanger to said vehicle storage tank where additional liquid CO_2 is created by melting solid CO_2 in said slush, and
eventually venting at least a portion of said CO_2 vapor stream.

4,186,563
COOLING EFFICIENCY METER CIRCUIT FOR AN AIR CONDITIONER
James L. Schulze, Sr., Middletown, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 24, 1978, Ser. No. 898,739
Int. Cl.[2] F25B *49/00*; G05D *23/00*
U.S. Cl. 62—126 **4 Claims**



1. A cooling efficiency circuit for an air conditioner of the type having a plurality of manually adjustable parameters, changes in which parameters result in changes in the long term energy consumption of said air conditioner, said circuit comprising
means for detecting the status of each of said parameters,
integrating means responsive to said detecting means for generating an analog signal representative of the combined effects of each parameter upon said energy consumption, and
means for displaying said signal for providing an indication of a change in said energy consumption caused by a change in the status of said parameters.

4,186,564
AIR VENTILATION SYSTEM
Melvin Myers, 1621 Gulf Blvd., Clearwater, Fla. 33515
Filed Sep. 23, 1977, Ser. No. 836,002
Int. Cl.[2] F24F *3/00*
U.S. Cl. 62—180 **12 Claims**



1. An air conditioning system comprising a space thermostat controller for maintaining a range of desired temperature of air in said space, and outside air controller determining the mode of cooling said space when said space thermostat determines said space is to be cooled, said modes including mechanical cooling and natural cooling, a mixing chamber for mixing return air from said space with outside air for natural cooling, damper means for controlling the relative mixture of said return and outside air to said mixing chamber, a mixed air controller positioned with respect to said mixing chamber for sensing the temperature of said mixed air, said mixed air controller settable at a set point temperature within a range of ambient temperatures and having a preset switch differential at any particular temperature, control means coupled to said mixed air controller and responsive to said mixed air controller for adjusting the position of said damper means, said control means including drive means for continuously moving said damper means across its entire operating range in accordance with the state of said mixed air controller, said bidirectional damper means modulating between said set point temperature and said set point temperature minus said switch differential of said mixed air controller, thereby maintaining said desired air temperature in said space, wherein said drive means drives at a slow and substantially constant rate in either of two directions, at a lesser rate than the response rate of the mixed air control, thereby causing said modulating of said damper, the mixed air control reaching the actual mixed air temperature before the dampers can overcompensate.

7. An air conditioning economizer system utilizing natural and mechanical cooling modes, comprising a closed space, an air inlet duct, air outlet duct, air return duct and outside air inlet, said outside air inlet and return duct meeting in a mixing chamber, a space thermostat controller for determining whether said space is to be cooled or not to be cooled, an outside air controller sensing enthalpy of said outside air for determining the mode of cooling said space when said space controller demands cooling, said air return duct and said outside air duct each including a damper, the position of each said damper determining the relative mixture of outside air and recirculated air for said natural cooling mode, a mixed air controller having a preset set point temperature and a preset switch differential temperature setting for sensing the temperature of said mixed air, a damper drive means acting to bidirectionally drive each said damper at a constant rate in opposing directions to control the proportions of said mixture, said drive means responsive to said mixed air controller to drive said dampers until said mixed air controller indicates that its set point has been surpassed, whereupon said drive means reverses the movement of damper drive until said mixed air controller senses an air flow temperature of said set point minus said switch differential, said continuous reversing action of said damper causing a modulating damper condition, thereby providing a desired temperature range within said closed space, wherein said drive means drives at a slow and substantially constant rate in either of two directions, at a lesser rate than the response rate of the mixed air control, thereby causing said modulating of said damper, the mixed air control reaching the

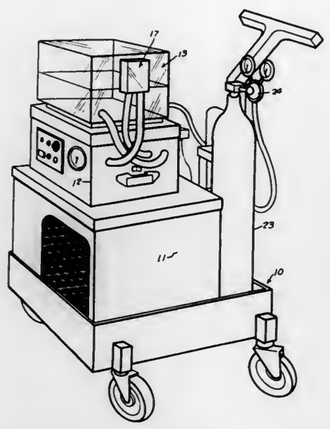
actual mixed air temperature before the dampers can overcompensate.

4,186,565

PERFUSION SYSTEM FOR ORGAN PRESERVATION

Luis H. Toledo-Pereyra, Grosse Pointe Farms, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed May 19, 1978, Ser. No. 907,878
Int. Cl.[2] B01F 3/04; A61B 19/00
U.S. Cl. 62—306 **10 Claims**



1. A perfusion system for organ preservation comprising
a wheeled cart,
a refrigeration unit on said cart having coolant inlet and outlet lines,
a pump unit removably mounted on said cart and having pump inlet and outlet lines,
and a cassette removably mounted on said cart and including an organ receptacle for receiving the organ, a heat exchanger, a bubble trap having an inlet line and an outlet line, a membrane oxygenator having an inlet and an outlet line, and an ice deposit area,
said heat exchanger being connected to the inlet and outlet lines of the refrigeration unit and having perfusate inlet and outlet lines connected to the outlet line of the said oxygenator and the inlet line of the pump unit,
said bubble trap having an inlet line connected to the outlet line of said pump unit,
said outlet line of said bubble trap being adapted to be connected to the organ,
said oxygenator having a gas inlet line,
and a gas tank on said cart connected to said gas inlet line.

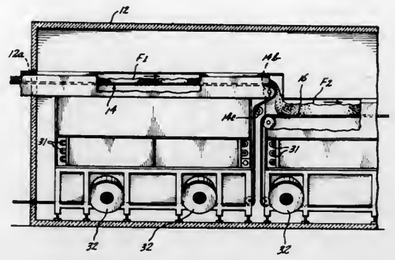
4,186,566

MODIFIED WIRE MESH CONVEYOR BELT FOR AIR FLUIDIZATION TYPE FOOD FREEZERS

David K. Y. AuYoung, Vancouver, Canada, assignor to Lewis Refrigeration Co., Redmond, Wash.

Filed Apr. 24, 1978, Ser. No. 899,555
Int. Cl.[2] F25D 25/04
U.S. Cl. 62—380 **5 Claims**

1. In apparatus for IQF freezing of food particles and the like massed in air-fluidized state on a moving conveyor belt, the combination comprising elongated flexible endless wire mesh conveyor belt means having a substantially horizontal belt stretch upon which the particles are deposited to a depth subject to variation of thickness or permeability to airflow over the area of said belt stretch for conveyance of the particles through the apparatus, enclosure means associated with said belt stretch and forming compartment spaces respectively above and below said belt stretch and associated air pressurization and freezer apparatus operable to create a pressure difference of air in said compartments that causes forceable upward flow of freezing air through the open mesh of said belt stretch and the mass of particles thereon over the area of said stretch at sufficiently depressed temperature and with sufficient flow velocity substantially to fluidize and freeze the mass of particles while in transit through the apparatus; the combination of a wire mesh conveyor belt means comprising a series of elon-



gated substantially helical wire links individually disposed transversely to the length of the belt stretch in the plane thereof and successively interconnected, and a plurality of elongated rod elements inserted lengthwise through the successive helical links across the width of the belt, said rod elements having a flow obstructing cross section that materially reduces the open flow area through the belt mesh and confines the upward flow through the belt to the mesh openings between rods totalling a minor fraction of the total belt area.

4,186,567

ORNAMENT UTILIZING RARE EARTH-COBALT MAGNET

Souhei Monden, Inuyama, and Sadaharu Takimoto, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,239
Claims priority, application Japan, Apr. 18, 1977, 52/47736[U]; Apr. 18, 1977, 52/47737[U]; Apr. 18, 1977, 52/47738[U]; Jun. 22, 1977, 52/81007[U]
Int. Cl.[2] A44C 7/00
U.S. Cl. 63—14 R **22 Claims**



1. An ornament comprising an ornament piece, an attracting piece and means for mutually attracting said pieces, the means for mutually attracting including a rare earth-cobalt permanent magnet secured to one of said pieces and being of a size and construction adapting said pieces to cooperate to produce, when said pieces are confronted by each other across an interposed non-magnetic body of a thickness of 2.5 mm or larger, a magnetic attracting force between said pieces ranging between 30 and 100 grams per square centimeter of area of contact of said pieces with said body and greater than 30 grams per gram weight of said ornament.

4,186,568

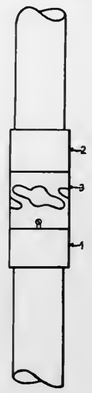
TUNABLE LINK

Amnon Katz, 401 Forrest Hill La., Grand Prairie, Tex. 75051

Filed Aug. 1, 1977, Ser. No. 820,469
Int. Cl.[2] F16C 1/00, 3/00
U.S. Cl. 64—1 V **3 Claims**

1. In a control rod for the transmission of axial signals that is subject to forced transverse vibrations, apparatus comprising:

a universal joint disposed in series in said rod,
a resilient bendable member rigidly coupled to said rod on either side of the universal joint,
said resilient bendable member comprising a member gener-



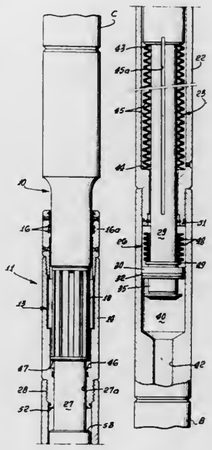
ally in the form of a sleeve with cutout portions surrounding the said universal joint,
said cutout portions being selected in size and shape to effect the detuning of the natural frequency of the control rod from the frequency of the forced vibrations.

4,186,569

DUAL SPRING DRILL STRING SHOCK ABSORBER

James T. Aumann, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Feb. 21, 1978, Ser. No. 879,237
Int. Cl.[2] F16D 3/06; E21B 7/42
U.S. Cl. 64—23 **29 Claims**



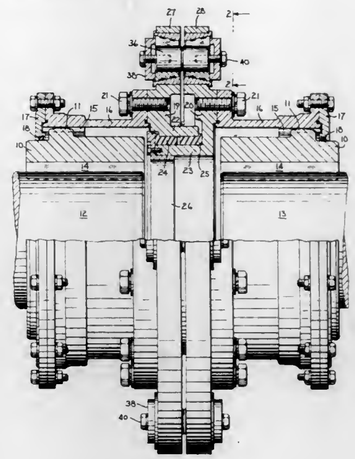
1. A shock absorber for well drilling strings comprising: an enlongated telescopic structure including an inner tubular body and an outer housing having means for connecting said structure in a well drilling string for conducting well drilling fluid through said structure; rotary drive means between said body and said housing; and first and second compression spring means in said housing engageable between said body and said housing for alternately cushioning telescopic contraction and extension of said structure.

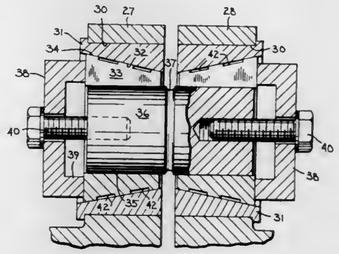
4,186,570

SHEAR PIN COUPLING

Glenn C. Pokrandt, Menomonee Falls, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed May 11, 1978, Ser. No. 904,732
Int. Cl.[2] F16D 3/56, 7/00
U.S. Cl. 64—28 R **3 Claims**





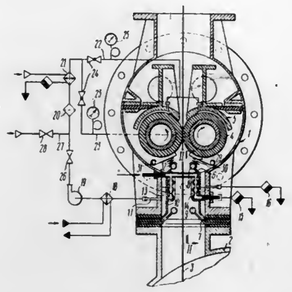
1. A shear pin flexible coupling for connecting two shafts, comprising:
two coupling halves each connectable to one of said shafts and each including a radially extending annular flange spaced from and confronting the flange of the other half, said flanges having spaced bores which can be aligned with the like bores of the opposite flange;
an outer bushing fitted into each bore, each outer bushing having a central opening the surfaces of which tapers inwardly toward the gap between the flanges;
an inner bushing having a single split and being received in each outer bushing, said inner bushing having a central opening and an outer surface which is tapered to complement the taper of the outer bushing;
elongated shear pins extending across the gap and having two circular cylindrical ends of like diameter disposed within the tapered inner bushings, and a central annular groove disposed in said gap; and
means for forcing the inner bushings in the direction of the gap to rigidly grasp the shear pins with an interference fit,
said forcing means each comprising a circular loading plate having a rim which bears against the outer end of the split bushing and having a central bore, and
a headed bolt having its shank extending through the central bore and threaded received into one end of the shear pin.

4,186,571

DEVICE FOR LUBRICATION OF ROLLER SEAL

Leonid G. Gorodissky; Raisa V. Vasilieva; Vyacheslav I. Zhmurov; Mikhail D. Kozlov; Vera I. Kuzmina, all of Moscow, U.S.S.R., and Nikolai T. Romanov, deceased, late of Moscow, U.S.S.R. (by Anastasia I. Romanova, administratrix), assignors to Vsesojuzny Nauchno-Issledovatelsky I Experimentalny Institut Po Pererabotke Khimicheskikh Volokon, U.S.S.R.

Filed Dec. 27, 1977, Ser. No. 864,437
Int. Cl.[2] D06B *3/18*
U.S. Cl. 68—5 E **4 Claims**



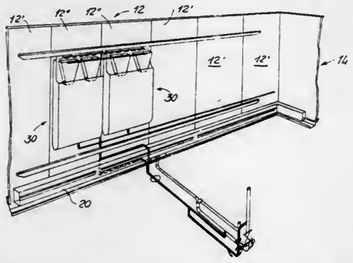
1. A device for lubrication of a roller seal including parallel rollers rotating in contact with one another and adapted to pass between them the treated fabric in a vertical plane; said device comprising a roller lubricating pipe line having a discharge end associated with said rollers for supplying a lubricant thereover, a group of baffle plates arranged in two tiers under the rollers in the fabric conveyance zone; a circular container defined outwardly of at least said upper tier of baffle plates for collecting a surplus of the lubricant supplied to said rollers; a tubular air heater which is in thermal contact with said circular container, and a recirculating pipe line fluidly interconnecting said circular container with the roller lubricating pipe line.

4,186,572

STEAMING APPARATUS FOR PRINTED FABRICS

Amedea Arioli, and Lorenza Arioli, both of via Colombo 20, 21040 Gerenzano (Varese), Italy

Filed Oct. 2, 1978, Ser. No. 947,577
Claims priority, application Italy, Oct. 6, 1977, 28335 A/77
Int. Cl.[2] D06B *3/10, 3/30, 23/00*
U.S. Cl. 68—5 C **10 Claims**



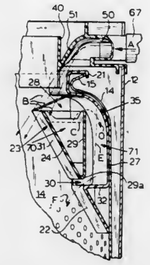
1. An improved apparatus for steaming printed fabrics, in particular for selectively treating or processing printed fabrics in a chamber essentially saturated with steam wherein the chamber is open at the bottom and comprises means for admitting a fabric to be steamed into said chamber and for removing said fabric from said chamber, said chamber comprising a pair of side walls, an upper wall connecting said side walls, said upper wall and said side walls having double walls which define an interior passage therebetween, means for generating steam in said interior passage, a steam inlet at the uppermost point of the chamber for introducing the generated steam into the chamber, humidifying channels in said chamber, wherein the steam present in said chamber is caused to circulate through said humidifying channels, means for detecting the temperature in the chamber, humidifying means in said chamber responsive to a temperature increase above a predetermined value in the chamber for supplying additonal humidity to said chamber, said humidifying means including means for introducing water in the form of a mist into the steam circulating through said humidifying channels, said humidifying channels being essentially U-shaped and comprising a downwardly directed inlet portion, an intermediate portion connected to said downwardly directed inlet portion for reversing the direction of flow and an upwardly directed outlet portion connected to said intermediate portion, nozzles associated with said humidifying channels for supplying pressurized steam to said channels, said nozzles being arranged and oriented in said downwardly directed portion for establishing therein a dynamic steam entraining effect from the chamber to assure the circulation of the steam through said channels, and means for collecting the supplied water, which is not vaporized, in said channels whereby the water is prevented from entering in liquid state said chamber.

4,186,573

RINSE OUT CENTRIFUGALLY OPERATED DISPENSER FOR AUTOMATIC WASHER

Robert A. Brenner, St. Joseph Township, Berrien County, and Victor W. Cuthbert, Sodus Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 21, 1979, Ser. No. 13,009
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—12 R **8 Claims**



1. For use in an automatic laundry appliance having a circular rotatable spin basket containing items to be washed, an inlet means disposed above an upper rim of said basket for supplying wash liquid, and means for controlling a cycle of operation including an agitation portion, a spin portion, and a spray rinse portion, the improvement of a rinsable liquid additive dispenser for said laundry appliance comprising:

a first selectively fillable receptacle for containing said additive during said agitation portion of said cycle,

said first receptacle having an inlet for receiving said additive and for receiving a supply of liquid from said appliance inlet means during said spray rinse portion to clean said dispenser; and

a second receptacle communicating with said first receptacle for receiving said additive from said first receptacle during said spin portion, said second receptacle containing said additive received during said spin portion,

said second receptacle having an outlet for discharging said received additive at the end of said spin portion of the cycle; and

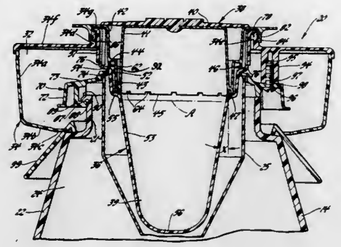
a mounting means for mounting said additive dispenser on said upper rim of said basket.

4,186,574

FABRIC SOFTENER DISPENSER FOR VERTICAL AGITATOR

John A. Sundstrom, Springboro, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 4, 1978, Ser. No. 965,898
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—17 A **2 Claims**



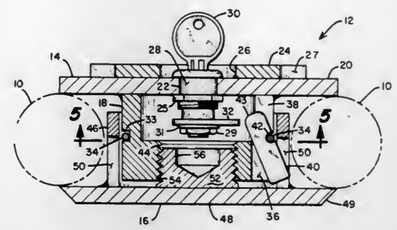
1. In a rinse agent dispenser adapted for mounting on an agitator for rotation and vertical reciprocation therewith and including an open top storage chamber for receiving and containing a rinse agent and having outflow ports above upwardly diverging wall means therein for releasing said rinse agent from said storage chamber by centrifugal force during rotation of said dispenser, means forming a dispensing compartment radially outwardly from said storage chamber and in continuous communication therewith through said outflow ports for receiving and retaining the rinse agent released from said storage chamber and for releasing said rinse agent at the close of said dispenser rotation, and a cap for covering the open top of said storage chamber and removable therefrom for filling said storage chamber with rinse agent, the improvement comprising a separable, three-part assembly including said cap, said storage chamber and said dispensing compartment, said dispensing compartment being in the form of an outer container and said storage chamber being in the form of a removable cup with a lip defining its open top, said outer container defining a radially inwardly opening annulus with a rim circumscribing the annulus internally thereof to define therewith an inlet to and an outlet from said dispensing compartment, said rim having an opening for telescopically receiving said cup sufficiently into said outer container to position the lip of said cup on said outer container with said outflow ports adjacent the inlet to said outer container, and means on said cap for retaining said rinse agent in said storage chamber during reciprocation of said dispenser, said retaining means cooperating with the wall means of said storage chamber to form a labyrinth seal by extending telescopically into said cup in sufficiently close proximity to said wall means below said outflow ports to interrupt communication between said storage chamber and said outer container during reciprocation of said dispenser without interrupting communication between the storage chamber and said outer container during rotation of said dispenser, said cap being fastenable to said outer container in a manner to sandwich said lip between the cap and outer container while forcing said retaining means into cooperating proximity to said wall means for holding the three parts in assembled relationship and being user removable therefrom to permit separation of said three-part assembly for easy cleaning of each part thereof and for convenient removal of said cup to permit filling of said storage chamber remote from said dispenser assembly.

4,186,575

TRAILER HITCH RING LOCK

Marshall R. Bulle, 918-3rd St., Farmington, Mich. 55024

Filed Oct. 2, 1978, Ser. No. 947,484
Int. Cl.[2] B60R *25/00;* **E05B** *27/36*
U.S. Cl. 70—14 **6 Claims**



1. For use with a trailer type vehicle having a generally toroidal shaped coupling hook, locking apparatus for inhibiting the unauthorized use of said trailer comprising:

(a) a first plate having an aperture therethrough and a tubular cylinder projecting from a first side surface thereof, said tubular cylinder being threaded over a predetermined portion thereof and having a longitudinally extending slot formed in the side wall thereof;

(b) a bar member pivotally mounted in said slot;

(c) a key operated lock assembly secured in said aperture and having a cam member affixed thereto for rotation when a key is inserted in said lock and turned, said cam member cooperating with said bar member for pivoting at least a portion of said bar member into and out of said slot; and

(d) a second plate having first and second generally concentric cylinders extending outwardly from a first side thereof, said first cylinder on said second plate being tubular and having an inner diameter which is greater than the outer diameter of said cylinder projecting from said first plate and having at least one longitudinal slot formed in the side wall thereof, said second cylinder on said second plate being threaded along a portion thereof, the arrangement being such that when the key operated lock is in a first condition, said threaded portions of said cylinder projecting from said first plate may be engaged with the threaded portion of said second cylinder projecting from said second plate by rotating said first plate relative to said second plate, but when said key operated lock is in a second condition, said bar will extend outward from said longitudinal slot in said tubular cylinder projecting from said first plate and into said longitudinal slot formed in the side wall of said first concentric cylinder projecting from said second plate to prevent relative rotation of said first and second plates.

4,186,576

VEHICLE LOCKING DEVICE

Howard W. Means, 5777 NE. Cascade, West Linn, Oreg. 97068, and Edward Allick, 812 6th St., Oregon City, Oreg. 97045

Filed Mar. 16, 1978, Ser. No. 887,181
Int. Cl.[2] E05B *71/00*
U.S. Cl. 70—233 **6 Claims**

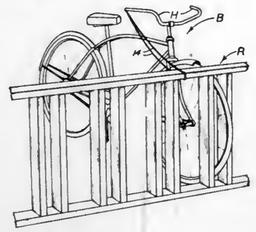
1. A locking device for securing a vehicle to an object comprising:

an elongate cable with enlarged end portions;

insert means adapted to be detachably mounted within a chamber opening defined on the vehicle;

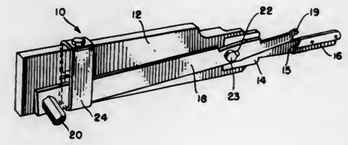
said insert means including locking means for selectively locking said insert means in said opening;

said insert means having receiving means provided thereon for receiving and holding said enlarged end portions of



said cable, with at least one of said end portions being separable from said insert means.

4,186,577
LOCK OPENING DEVICE
Robert L. Jarm, Wauconda, Ill., assignor to Credit Industry Associates, Inc., Arlington Heights, Ill.
Filed Jul. 17, 1978, Ser. No. 924,978
Int. Cl.[2] E05B *19/20*
U.S. Cl. 70—394 **10 Claims**



1. A device for opening a lock of the type wherein a lock core having a key slot formed therein rotates within a fixed housing, a series of spring-loaded tumblers being located between said core and housing which must be brought into alignment along the shear line therebetween in order to permit the rotation of said core, said device comprising:

a holder having a key blank corresponding to the key slot formed in said core mounted at one end thereof;

a resilient member secured to said key blank in a position such that it engages said tumblers when said key blank is inserted into said key slot;

a means secured to said holder for engaging said housing on the side thereof opposite said tumblers and for urging said key blank and core against said engaged side in a manner such that the width of the shear line between said core and housing will be increased at the location of said tumblers, whereby adjusting the alignment of said key blank within said core will cause said spring-loaded tumblers to deform said resilient member at various depths until they are brought into proper alignment along said shear line thereby permitting the rotation of said core within said housing.

4,186,578
TAMPER PREVENTING LOCK
Frederick A. Sommer, 4238 Sibley Ave., Cincinnati, Ohio 45236
Filed Jan. 9, 1978, Ser. No. 867,815
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—419 **11 Claims**

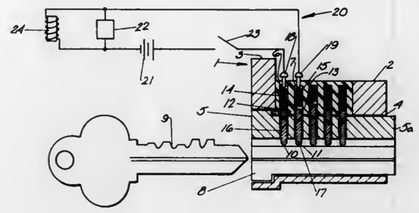
1. A tamper preventing lock comprising:

(a) a shell housing having a cylinder core accepting axial bore therein, said housing including a plurality of driver accepting apertures therein in parallel spaced relationships communicating at one end with said bore;

(b) a cylinder core rotatably mounted within said axial bore, said core containing a keyway adapted to receive a key and a plurality of driver receiving apertures therein in parallel spaced relationship communicating at one end with said keyway,

(c) a pin-like driver slidably received in each of said housing apertures and extending into said core apertures when said lock is in a locked position, at least two of said drivers being electrically conductive and electrically insulated from each other;

(d) means in association with said core and said drivers for moving said drivers out of said core apertures upon insertion into said keyway of a properly coded key so that said core may be rotated to place said lock in an unlocked position, the portions of said driver moving means associated with said conductive drivers being electrically conductive to form an electrical path through said conductive drivers and said conductive part of said driver moving

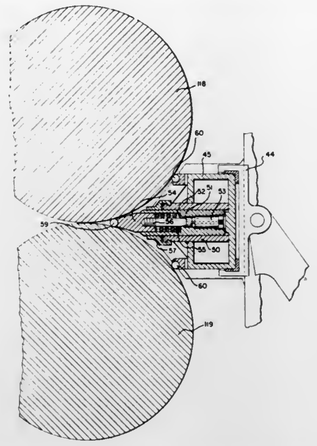


means when said conductive portions of said moving means are bridged by an electrical conductor, and

(e) means in association with said core for preventing rotation thereof when said conductive portions of said moving means are bridged by an electrical conductor, ssaid rotation preventing means comprising a cam non-rotatably secured to the end of said core opposite the end of said core into which the key is inserted, a slotted arm in association with said cam having a normal position wherein said arm permits movement of said cam relative thereto and an actuated position wherein said arm engages said cam to prevent movement relative thereto, and solenoid means operable to move said arm from said normal position to said actuated position when said conductive portions of said moving means are bridged by an electrical conductor.

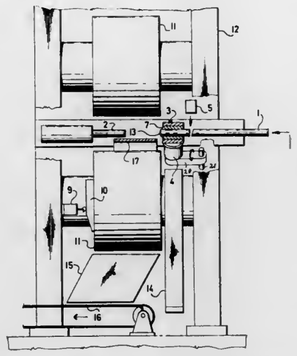
4,186,579
ROLLING MILL GAUGE AND FLATNESS CALIBRATION SYSTEM
Werner W. Eibe, McClandless Township, Allegheny County, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 833,262, Sep. 14, 1977, Pat. No. 4,131,004. This application Jun. 7, 1978, Ser. No. 913,308
Int. Cl.[2] B21B *37/08*
U.S. Cl. 72—8 **4 Claims**

1. Apparatus for calibrating the gap between working rolls of a rolling mill stand comprising transducer menas to convert the width of gap into a signal, frame means for mounting said transducer means, said frame means being dimensioned for insertion into the gap between working rolls so as to bring said transducer means against the working rolls and for removal therefrom, said transducer means including a spring-urged feeler tip projecting beyond the frame and transducer means positioned to contact the working rolls near their line of contact but short thereof and movable against said spring away from said line of contact only, and a pair of support tips, one above and one below the feeler tip positioned to contact the



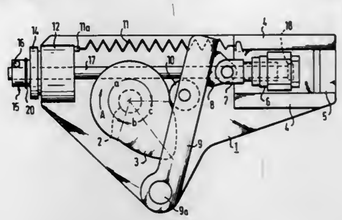
working rolls at a greater distance from their line of contact than the feeler tip.

4,186,580
APPARATUS FOR THE DISCHARGE OF WASTE ENDS OF BARS IN THE CROSS WEDGE ROLLING PROCESS
Ján Zalešák, Modrice, and Jan Kovář, Ricmanice, both of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia
Filed Sep. 7, 1978, Ser. No. 940,504
Claims priority, application Czechoslovakia, Sep. 8, 1977, 5854-77
Int. Cl.[2] B21H *9/00*
U.S. Cl. 72—14 **5 Claims**



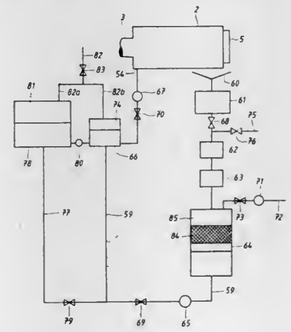
1. In an apparatus for the step-wise feeding axially of an elongated work piece to a mechanism which works upon it while the work piece is axially at rest between feeding steps, the improvement which comprises a guide for the work piece disposed upstream of the mechanism adjacent thereto, means mounting the guide for swinging between the first position in which the guide is aligned with the path of step wise travel of the work piece and a second, tipped position in which the guide is disposed at a substantial angle respect to such path, and means responsive to a discontinuity in the work piece immediately upstream of the guide for swinging the guide into its second position, whereby the portion of the work piece supported by the guide travels down the guide and is removed from the path of feeding of the work piece.

4,186,581
DRIVE ARRANGEMENT FOR A TOOL CARRIAGE OF A MACHINE TOOL
Otto Bihler, Schleiferweg 2, D-8959 Halblech, Füssen, Fed. Rep. of Germany
Filed Aug. 10, 1978, Ser. No. 932,648
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741150
Int. Cl.[2] B21J *7/46;* **B21D** *55/00;* **B21J** *9/18*
U.S. Cl. 72—26 **21 Claims**



1. In a tool carriage arrangement for a machine tool including a support, a tool carriage mounted on said support for movement between a working position and a rest position, drive means for moving said carriage in a path from said rest position into said working position and for thereafter permitting return of said carriage to said rest position, and a spring interposed between said carriage and said support in a manner to stress said spring during said moving, whereby the stressed spring biases the carriage to return from said working position to said rest position, the improvement which comprises auxiliary return means for supplementing the biasing force of said spring and for thereby augmenting the force available for returning the carriage toward said rest position at least in a position of said carriage adjacent said working position.

4,186,582
PRESS FOR HYDROSTATIC EXTRUSION OF TUBES AND PROFILES
Tom Johannisson; Kai Nilsson; Rolf Sjöblom, and Marja Widell, all of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden
Filed Jan. 19, 1978, Ser. No. 870,735
Int. Cl.[2] B21B *22/10*
U.S. Cl. 72—60 **10 Claims**



1. An apparatus for the hydrostatic extrusion of tubes and profiles of metallic material which comprises

means forming an elongated high-pressure hollow cylinder

forming a pressure chamber therein, said high-pressure cylinder having opposed open ends;

means forming a die having an extrusion hole therein positioned in one of the open ends of said cylinder to sealingly close said open end;

punch means positioned in the other of the open ends of said cylinder and able to move in the elongation direction of said cylinder and thereby generate a pressure within a pressure medium contained in said pressure chamber, which pressurized pressure medium is then able to extrude a billet of metallic material contained in said pressure chamber through said extrusion hole; said pressure medium being prevented from exposure to the atmosphere;

conduit means for supplying pressure medium directly to said pressure chamber, and

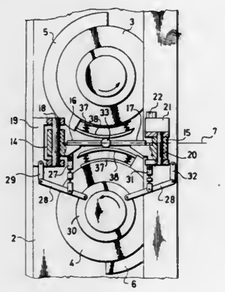
degassing means connected to said conduit means, said degassing means capable of degassing a pressure medium supplied to said degassing tank and thus to said conduit means and said pressure chamber.

4,186,583

APPARATUS FOR CROSS WEDGE ROLLING

Jan Kovář, Ricmanice; Jan Drkal, Brno; Jan Zálešák, Modrice, and Vaclav Hladký, Brno, all of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia

Filed May 8, 1978, Ser. No. 903,522
Int. Cl.² B21H *1/00*
U.S. Cl. 72—108 **2 Claims**



1. Apparatus for the cross wedge rolling of a workpiece comprising a roll stand with a frame having opposed side members, a pair of opposed working rolls supported between the side members for rotation in the same direction, said working rolls being spaced apart to present a working space between them, working tools mounted on the working rolls, guide bars disposed in the plane of the axis of the workpiece to maintain the workpiece centered in the working space, and segments on the rolls arranged ahead of the working tools to start rotation of the workpiece prior to its engagement by the working tools.

4,186,584

TUBE EXPANDER

Donald E. Schott, Chester, Vt., assignor to Thomas C. Wilson, Inc., Long Island City, N.Y.

Filed May 24, 1978, Ser. No. 909,168
Int. Cl.² B21D *39/06*
U.S. Cl. 72—122 **14 Claims**

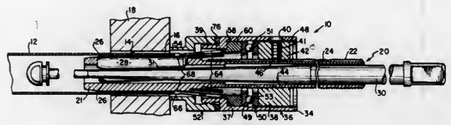
1. An apparatus for expanding an end portion of a tubular member positioned within an opening defined by an outer member, which comprises:

(a) a cage having one end portion adapted for insertion into one end portion of the tubular member;

(b) means mounted on said cage for expanding at least a part of the end portion of the tubular member outwardly into engaged relation with peripheral portions of the opening;

(c) means rotatably movable within said cage for operatively engaging said expanding means to expand at least a part of the end portion of the tubular member and for developing traction forces which tend to displace said cage axially into the tubular member;

(d) means disposed about said cage and adapted to engage the outer member to limit the axial displacement of said cage into said tubular member; and



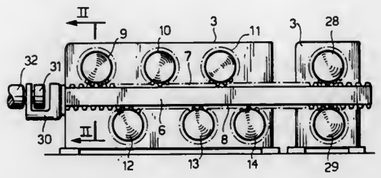
(e) a stop collar disposed about said cage and having a plurality of individual members generally circumferentially positioned about said cage, each member having an end portion which faces and engages the tubular member to limit axial displacement of the tubular member to a predetermined position relative to the outer member and configured and dimensioned to distribute the limiting forces over the end of the tubular member without damaging the tubular member.

4,186,585

DEVICE FOR CONTROLLING THE SPEED OF A MANDREL IN CONTINUOUS RETAINED-MANDREL ROLLING MILLS

Teresio Passoni, Magenta, Italy; Jean P. Calmes, Lausanne, Switzerland; Filippo Cattaneo, Milan, Italy, and Aurindo Nessi, Albate, Italy, assignors to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Apr. 20, 1978, Ser. No. 898,118
Claims priority, application Italy, May 5, 1977, 23217 A/77
Int. Cl.² B21B *25/02*
U.S. Cl. 72—208 **9 Claims**



1. A device for controlling the speed of a mandrel in a continuous retained-mandrel rolling mill, comprising:

a rod having a double rack provided at one end with a means for removably securing an end of a mandrel;

a plurality of sets of pinions engaging said double rack on the rod; and

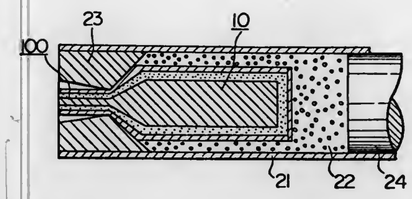
each pinion in each of said plurality of sets of pinions being driven in rotation by a corresponding motor-driven shaft operatively connected to a respective clutch, motor and speed-reducing group provided with a brake for each motor-driven shaft.

4,186,586

BILLET AND PROCESS FOR PRODUCING A TUBULAR BODY BY FORCED PLASTIC DEFORMATION

Masayuki Takamura; Norio Shinoda; Kazuo Kurahashi, and Masataka Hatae, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 801,052, May 27, 1977, abandoned, which is a continuation of Ser. No. 645,367, Dec. 30, 1975, abandoned. This application Aug. 31, 1978, Ser. No. 938,424
Claims priority, application Japan, Jul. 18, 1975, 50/87221
Int. Cl.² B21C *23/08*
U.S. Cl. 72—264 **13 Claims**



1. An improved method for producing a tubular body by forced plastic deformation comprising the steps of:

preparing a billet including a metallic tubular sheath, a metallic center core in position within said tubular sheath and an intermediate salt core filling the cylindrical space between said tubular sheath and said center core, the radial thickness t of said sheath being equal to or less than 0.11 times the outer diameter of said sheath;

subjecting said billet to a forced plastic deformation for reducing the diameter of said billet; and

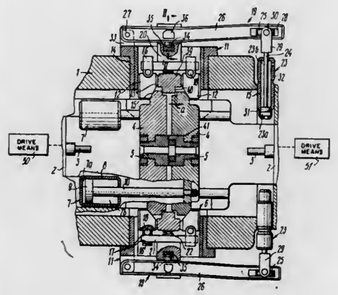
thereafter removing said intermediate core through solution and removing said center core by drawing said center core out of said sheath in order to obtain said tubular body.

4,186,587

FORGING PRESS

Anatoly S. Grigorenko, ulitsa Tovstukho, 1, kv. 21; Jury A. Moroz, ulitsa Fugenfirova, 11, kv. 91; Leonid I. Kortusov, prospekt Mira, 57a, kv. 10; German N. Kuznetsov, ulitsa Romanenko, 8, kv. 46, and Nina A. Franchenko, ulitsa 4 Severnaya, 126, all of Omsk, U.S.S.R.

Filed Aug. 9, 1978, Ser. No. 932,115
Int. Cl.² B21J *13/02*
U.S. Cl. 72—354 **3 Claims**



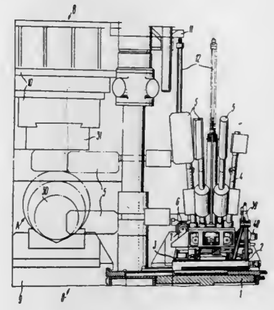
1. A press exerting double action upon a workpiece, comprising: a framework; male dies and female die halves; rams carrying said male dies; rams carrying said female die halves and having sloping planes on the sides adjacent to the respective ones of said male dies; said rams carrying said male dies and said rams carrying said female die halves being mounted on said framework for opposing reciprocation; independent drive means for each of said ram; a mechanism adapted to clamp said female die halves together for a stamping operation, comprising wedges mounted for reciprocation on said framework and adapted to cooperate with said rams carrying said female die halves along said sloping planes of said rams carrying said female die halves; rocker arm means interconnecting said wedges adapted to cooperate with different ones of said rams and connecting them with their drive means; spring means urging said rocker arm means with respect of said framework.

4,186,588

DEVICE FOR FEEDING AUXILIARY TOOLS INTO WORKING ZONE OF PRESS

Sergei N. Gorlitsyn, prospekt Ordzhonikidze, 10, kv. 80; Mikhail R. Kavitsky, ulitsa Bakinskikh komissarov, 58, kv. 164; Vladimir I. Koires, ulitsa Bakinskikh komissarov, 58, kv. 83, all of Sverdlovsk, U.S.S.R.; Leonid A. Efimov, deceased, late of Sverdlovsk, U.S.S.R., and by Iraida I. Gebler, administratrix, ulitsa Khmeleva, 18, kv. 77, Sverdlovsk, U.S.S.R.

Filed Jan. 12, 1978, Ser. No. 868,919
Int. Cl.² B23Q *3/00*
U.S. Cl. 72—394 **5 Claims**



1. A device for feeding an auxiliary tool into a working zone of a press, comprising: a fixed base; a horizontally movable platform mounted on said base; means for horizontally moving said platform; a fixed supporting element located near said platform and oriented relative to the working zone of the press in the direction of tool feed; a plurality of tools; a plurality of tool rods supporting said tools installed on said platform with a provision for moving relative to it; a discrete feed mechanism for moving said tool rods with respect to said platform so that a required tool is brought into the zone of said supporting element; means for moving said platform in a vertical direction, said tool rods being installed on said platform with a provision for turning in a vertical plane around said supporting element so that in the course of vertical movement of said platform the brought-out tool is positioned at the level of the working zone of the press.

4,186,589

APPARATUS FOR FEEDING WORKPIECES IN A MULTI-STATION CROSS-FED PRESS

Roger Criblez, Bottmingen, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed Apr. 6, 1978, Ser. No. 894,160
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715966
Int. Cl.² B21D *43/05*
U.S. Cl. 72—405 **10 Claims**

1. Apparatus for feeding workpieces being acted on in a

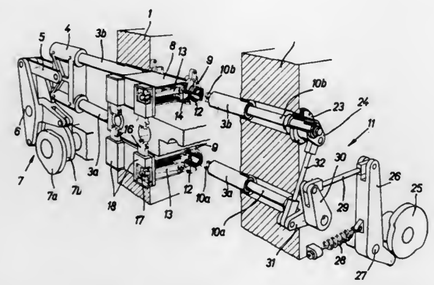
multi-station cross-fed press, said apparatus comprising in combination:

(a) two parallel interconnected hollow carrier elements,

(b) a first driving mechanism connected to the carrier elements and adapted to reciprocally drive the elements in synchronism with the press,

(c) pairs of gripper jaws,

(d) straight guides which are movable with the carrier elements and in which said gripper jaws are arranged to move linearly,



(e) rotatable camshafts which pass through the carrier elements,

(f) a second driving mechanism connected to the camshafts and adapted to oscillate the camshafts about their axes, and

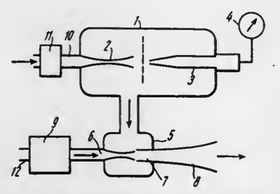
(g) transmission members engaging the camshafts and the gripper jaws and adapted to transmit motion from the camshafts to the jaws.

4,186,590

METHOD OF DETERMINING THE QUANTITATIVE CONTENT OF GASEOUS OR VAPOROUS IMPURITY IN A GAS MIXTURE AND A DEVICE FOR ACCOMPLISHING SAME

Alexandr F. Egorov, Shmidtovsky Proezd, 15, kv. 25; Vadim J. Ryzhnev, Ryazansky prospekt, 95, Korpus 4, kv. 20; Dmitry K. Simonovsky, ulitsa Vvedenskogo, 17, korpus 1, kv. 97, and Valery A. Sokolov, ulitsa Malysheva, 4, kv. 30, all of Moscow, U.S.S.R.

Filed May 2, 1978, Ser. No. 902,106
Int. Cl.² G01N *7/00*
U.S. Cl. 73—23 **3 Claims**



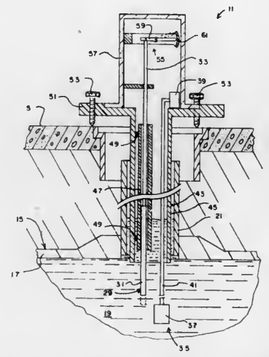
1. A device for determining the quantitative content of gaseous or vaporous impurity in a gas mixture, comprising: a hollow body of a sensing element; a feed nozzle made in the form of a Laval nozzle and mounted in a wall of said sensing element body; an inlet nozzle arranged coaxially with said feed nozzle and mounted in the opposite wall of said hollow body of a sensing element; a hollow body of an ejector, communicated with the space of said sensing element body; a working nozzle fixed in a wall of said hollow ejector body; a pressure regulator connected to said working nozzle; a body of a mixing chamber, arranged coaxially with said working nozzle and fixed in the opposite wall of said hollow ejector body; a diffuser located on the outside of said hollow ejector body and communicated with said mixing chamber; and a vacuum measuring instrument communicated with said inlet nozzle.

4,186,591

DEVICE FOR AND METHOD OF DETECTING LEAKS IN A LIQUID STORAGE RESERVOIR

Joseph R. Mooney, 33 Hawk St., New Orleans, La. 70124

Filed Nov. 27, 1978, Ser. No. 964,088
Int. Cl.² G01M *3/32*
U.S. Cl. 73—49.2 **9 Claims**



1. A method of detecting leaks in an underground liquid storage reservoir of the type including a hollow tank having a top portion located beneath the ground surface, and including one or more hollow tube members extending upwardly above said top portion of said tank and communicating the interior of said tank with said ground surface, the combined cross-sectional area of said tube members being greatly less than the cross-sectional area of the tank, said method comprising:

(a) filling said reservoir with liquid until the level of the liquid rises into said tube members and is above said top portion of said tank and below said ground surface;

(b) measuring any change in the level of the liquid in one of said tube members over a period of time; and

(c) measuring any change in the temperature of the liquid in said reservoir over the same period of time that any change in the level of the liquid in said one of said tube members is measured.

4,186,592

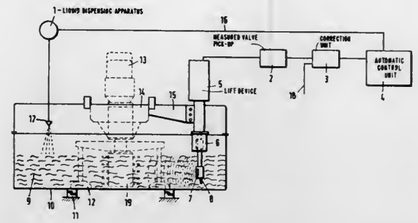
METHOD OF MEASURING THE MOISTURE CONTENT IN FLOWABLE MATERIALS AND APPARATUS FOR CARRYING OUT THE METHOD

Hubert Eirich, Erster Sandweg 16, 6969 Hardheim; Walter Eirich, Spessartweg 18, 6969 Hardheim; Paul Eirich, Bahnhofstrasse 11 6969 Hardheim; Josef Hasenhüindl, 6965 Ahorn-Berolzheim, Eubigheimdr-str.840, and Adolf Spengler, Haagstrasse 6, 6987 Kulsheim, all of Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,673
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712210
Int. Cl.² G01N *33/38*
U.S. Cl. 73—73 **11 Claims**

5. In a mixing apparatus for agitating flowable materials such as casting sand, wet concrete, or chemical mixtures, having a mixing tray in which said flowable material is disposed, a mixing tool disposed in said mixing tray and rotatable relative to said mixing tray for mixing said flowable material to a state of substantially uniform mixture, a moisture measuring probe disposable in said mixture for measuring the moisture content thereof, an automatic liquid dispensing means having a liquid injection nozzle disposed for injecting liquid into said flowable material in said mixing tray, and means associated with said moisture sensing probe for receiving signal input from said probe and operating said liquid dispensing means to inject liquid into said flowable material to adjust the liquid content of said material to a predetermined value, wherein the improvement comprises:

a cooling and cleaning casing disposed above the surface of said flowable material in said mixing tray, and



means for moving said moisture sensing probe between a retracted position wherein said probe is disposed in said casing and an operative position wherein said probe is disposed in said flowable material in said mixing tray for measuring the moisture content of said material, and

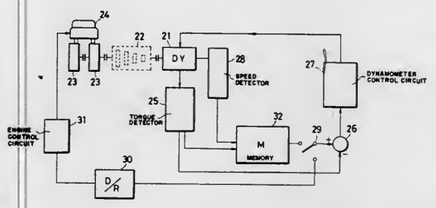
means associated with said casing for cleaning and/or cooling said probe when in said retracted position.

4,186,593

DRIVE SIMULATOR OPERATING METHOD

Youichi Watanabe, Kamakura, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,613
Claims priority, application Japan, Aug. 16, 1977, 52-98091
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117 **5 Claims**



1. A drive simulator operating method for permitting a test vehicle to run on the dynamometer system under conditions equivalent to actual vehicle running conditions, the method comprising the steps of

storing in a data recorder on the relationship between vehicle speed and any one of engine throttle opening, intake manifold pressure, and drive dynamometer shaft torque while actually driving the test vehicle on a test course,

storing in a memory data on the relationship between vehicle speed and road load corresponding to the torque absorbed in the dynamometer while driving the test vehicle on the dynamometer system under road load control in accordance with the data stored in the data recorder, and

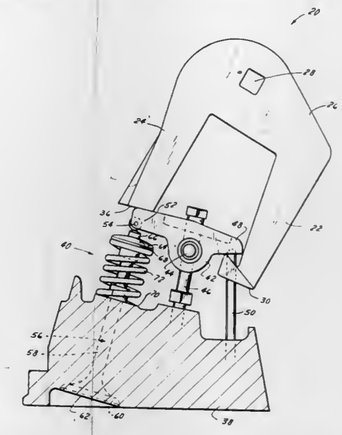
operating the dynamometer under road load control in accordance with the data stored in the memory.

4,186,594

PORTABLE SPRING TESTER

William E. Mitchell, 800 Tanglewood Rd., West Islip, N.Y. 11795

Filed Sep. 28, 1978, Ser. No. 946,505
Int. Cl.² G01M *13/00*; G01L *1/04*
U.S. Cl. 73—118 **4 Claims**



1. A portable spring tester adapted for use in testing spring strength for spring assemblies mounted on automobiles and the like comprising; a mounting arm with means thereon for removably locating the tester in fixed position on supporting structures on the spring assembly, an actuating arm extending from the mounting arm in position to engage with the spring assembly and be shiftable to bias the spring, engagement means on the tester for removably mounting a strength indicator thereon so that when the actuating arm is shifted to bias the spring, the strength indicator will provide a reading to indicate the spring strength, the mounting arm and the actuating arm are integrally formed with a central base portion into a U-shaped configuration with each arm forming an opposing leg of the U-shaped tester, the means for removably locating the tester in fixed position on supporting structures being on an edge of the mounting arm distal from an inner section of the central base portion, and the end of the actuating arm distal from the central base portion being substantially axially aligned with the spring to form an engagement surface with the spring assembly which acts in substantially a direct axial direction to bias the spring and thereby facilitate operation of the tester and to facilitate the provision of an accurate reading to indicate spring strength, the means for removably locating the tester in fixed position on supporting structures on the spring assembly including a laterally extending flange on an end of the mounting arm formed by two parallel tangs, and the tangs being positioned to capture a reciprocal rod means on said spring assembly therebetween with the upper surface of the tangs bearing on an adjacent portion of the rod means to thereby removably mount the tester in position on the spring assembly.

4,186,595

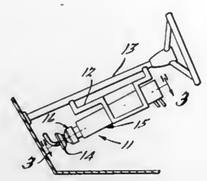
BRAKE TESTING APPARATUS

Erich Domitter, Warren, Mich., assignor to Dominion Tool & Die Company, Inc., Roseville, Mich.

Filed Sep. 8, 1978, Ser. No. 940,822
Int. Cl.² G01L *5/28*
U.S. Cl. 73—132 **6 Claims**

1. A testing device for a pedal operated system comprising a supporting housing adapted to be fixed against movement relative to the pedal, a force applying portion supported for movement by said supporting housing into engagement with the pedal, power means within said housing for moving said

force applying portion relative to said supporting portion for applying a force to the pedal, distance sensing means within said housing for sensing the distance of travel of said force



applying portion relative to the supporting housing and force sensing means carried by said force applying portion for sensing the force applied to said pedal.

4,186,596

TORQUE MEASURING ARRANGEMENT

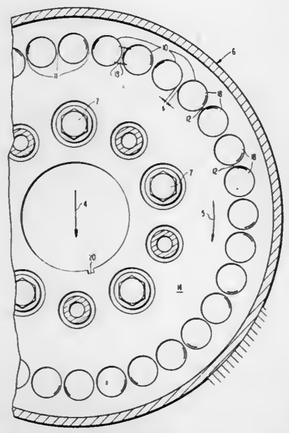
Karl Böhringer, Stuttgart; Peter Reichle, Donaueschingen, and Paul Schwerdt, Freudenstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,107

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708484

Int. Cl.[2] G01L *3/10*

U.S. Cl. 73—136 C **23 Claims**



1. A torque-measuring arrangement with a rotating torque-measuring means adapted to be installed into a force flow of a force transmission, said torque-measuring means having a deformation section which is adapted to be loaded by the torque to be measured and provided with strain gauge strip means adhesively secured thereto, characterized in that the torque-measuring means is essentially disk-shaped and extends substantially perpendicularly to an axis of rotation, a plurality of aperture means of a circular contour are arranged in the torque-measuring means at predetermined radial positions substantially uniformly distributed over a circumference thereof, said aperture means leaving therebetween essentially radially extending spoke-life webs of predetermined position, shape and surface quality, a wall thickness of the torque-measuring means, as measured in an axial direction, is considerably larger at least within an area of the webs than a width of the webs measured in a circumferential direction along a narrowest place thereof, and in that the strain gauge strip means are secured to selected webs so as to form measuring webs.

4,186,597

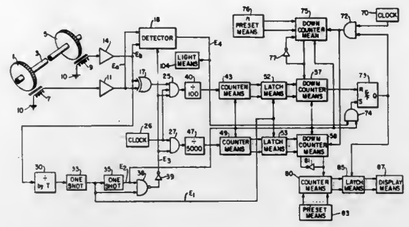
TORQUE METER MEANS WITH REVERSE ROTATION DETECTION

Winthrop K. Brown, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,964

Int. Cl.[2] G01L *3/10*

U.S. Cl. 73—136 A **18 Claims**



1. A torque meter for measuring the torque of a rotating shaft comprising at least two sensing means, portions of which are affixed to the shaft, for providing shaft pulse signals at the same frequency but having a phase difference corresponding to the torque experienced by the shaft, first clock means for providing clock pulses, detection means connected to the two sensing means for providing a detection signal corresponding to the direction of rotation of the shaft, circuit means connected to the two sensing means and to said first clock means for providing first groups of pulses in accordance with the shaft pulse signals so that the number of pulses in each group of the first groups of pulses corresponds to the torque experienced by the shaft, first counting means for counting the pulses from the circuit means, pulse means connected to said first clock means for providing second groups of pulses and responsive to the shaft rotation so that a ratio of a group of pulses from said first groups of pulses to a corresponding group of pulses from the second groups of pulses averages out errors due to the shaft rotation; second counting means connected to the pulse means for counting the pulses from the pulse means, control pulse means connected to both counting means for resetting the counting means each revolution of the shaft, and ratio means connected to both counting means and to the detection means for providing an output corresponding to the torque experienced by the shaft in accordance with the ratio of the counts in the counter means and the detection signal.

4,186,598

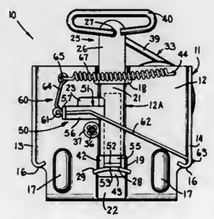
BELT TENSION GAUGE

James A. Okamuro, Oshtemo Township, Kalamazoo County, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed Aug. 23, 1978, Ser. No. 936,075

Int. Cl.[2] G01L *5/06*

U.S. Cl. 73—144 **12 Claims**



1. In a gauge for determining the tension on an element, comprising a frame having a pair of spaced coplanar first

element engaging surfaces facing in substantially the same first direction, a first element engaging member supported on said frame for movement substantially parallel with said first direction, said first element engaging member having a second element engaging surface movable into and out of a first terminal position disposed between said first element engaging surfaces and substantially within the plane defined by said first element engaging surfaces, first resilient means urging said first element engaging member in a second direction opposite said first direction, and means supported on said frame for indicating the tension in said element, the improvement comprising:

a second element engaging member slidably supported on said frame for movement independent of said first element engaging member and substantially parallel with said first direction, said second element engaging member having a third element engaging surface facing in said first direction and movable between said first terminal position disposed between said first element engaging surfaces and substantially within said plane defined by said first element engaging surfaces and a second terminal position;

second resilient means urging said second element engaging member in said first direction toward said first terminal position;

wherein said second element engaging surface of said first element engaging member faces in said second direction, and said first resilient means urges said first element engaging member toward said first terminal position;

wherein said indicating means includes means responsive to the movement of said second element engaging member and said third element engaging surface thereon away from said first terminal position in said second direction to said second terminal position, the spacing between said first and second terminal positions being proportional to the tension on said element; and

wherein said frame is defined by a generally U-shaped member having a base wall and a pair of parallel sidewalls disposed along the lateral edges thereof, said base wall having guide means thereon for guiding said first and second element engaging members.

4,186,599

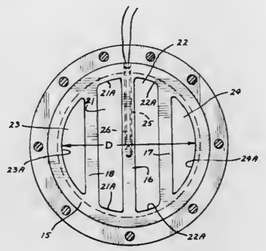
VORTEX SHEDDING FLOWMETER ASSEMBLY

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 755,357, Dec. 29, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,828

Int. Cl.[2] G01F *1/32*

U.S. Cl. 73—194 VS **19 Claims**



1. A flowmeter of the vortex shedding type for a fluid flow conduit comprising a plurality of flow obstruction bodies being contoured to cause fluid flow separation and formation of vortices, means to mount said flow obstruction bodies in said conduit in position spaced from each other in a first direction transverse to the flow direction, said flow conduit having a cross section dimension in the first direction of "D", each of said flow obstruction bodies having at least one surface portion generally facing a surface portion of another obstruction body in direction transverse to the flow direction, the spacing of said obstruction bodies being such that vortices formed along one of said facing surface portions affects formation of vortices formed along other of said facing surface portions and reinforces the vortices so formed, and the total width of all flow obstruction bodies in the first direction being not substantially less than 0.2D, and sensor means to sense formation of vortices from at least one flow obstruction body.

4,186,600

MAGNET SYSTEM FOR ELECTROMAGNETIC FLOWMETER

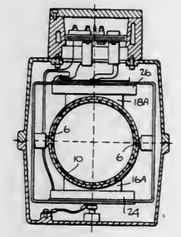
Eggert Appel, Dransfeld; Herbert Gehrke, Rosdorf, and Wilfried Kiene, Hedemunden, all of Fed. Rep. of Germany, assignors to Fischer & Porter Co., Warminster, Pa.

Filed Oct. 3, 1978, Ser. No. 948,222

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744865

Int. Cl.[2] G01F *1/58*

U.S. Cl. 73—194 EM **4 Claims**



1. An electromagnetic flowmeter comprising:

A. a flow tube constituted by an outer pipe component formed of a non-magnetizable, weldable metal and an inner liner component protectively lining the pipe formed of electrically insulating material;

B. a pair of electrodes mounted at diametrically-opposed positions on said flow tube; and

C. a magnet system excitable by a low-frequency current source to establish a magnetic field in said flow tube which is intercepted by a fluid to be metered to induce a signal in said electrodes indicative of its flow rate, the system including at least one solid core of ferromagnetic material about which is wound an excitation coil through which said current flows, the frequency of said current being well below the frequency of a standard a-c power line whereby the production of eddy currents in said core is minimized, said core having the shape of a pole shoe whose inner face is welded to the outer surface of said pipe to provide a stable magnetic system, said system being formed by two cores disposed at opposite positions on said pipe and welded thereto at their inner faces, the outer faces of said cores being interconnected by a flux return strap.

4,186,601

MASS FLOW MEASURING APPARATUS

Hiroyuki Maruoka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Division of Ser. No. 852,331, Nov. 17, 1977, abandoned. This application Nov. 1, 1978, Ser. No. 956,631

Int. Cl.[2] G01F *1/70*

U.S. Cl. 73—194 F **5 Claims**

1. Apparatus for measuring the mass flow of fluids passing through a conduit comprising:

means for charging a stream of said fluid at a first potential;

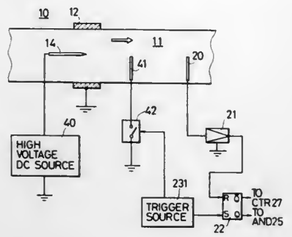
a first electrode disposed downstream of said charging means;

a source of generating trigger pulses at periodic intervals;

a gate-controlled switch for applying a second potential to

said first electrode to discharge a portion of the stream of said charged fluid in response to each of said trigger pulses;

a second electrode disposed downstream of said first electrode to detect each of said discharged portions to generate an output signal;



a bistable device for assuming a first binary state in response to said trigger pulses and a second binary stage in response to the output signals from said second electrode; and

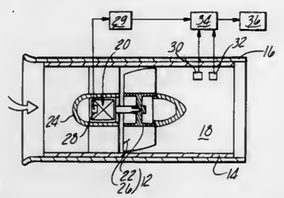
means connected to said bistable device for measuring the lengths of time between said first and second binary states.

4,186,602

HIGH RESPONSE AUTOMOTIVE MASS AIR FLOW SENSOR

Albert Blatter, Southfield, and John Miller, Auburn Heights, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 21, 1978, Ser. No. 935,428
Int. Cl.[2] G01F *1/28*
U.S. Cl. 73—228 **32 Claims**



32. A fluid flow sensor for generating a signal corresponding to the rate of fluid flow in a passage, said sensor comprising:

a sensor housing comprising a section of circular tubing adapted to be positioned in said passage to receive the fluid flow therethrough;

a turbine rotor comprised of a hub portion and a plurality of radially extending turbine vanes affixed to said hub portion configured to create an angular momentum change on fluid flowing therethrough;

turbine support means comprised of a plurality of radially extending stator vanes fixed to said sensor housing at a location upstream of said turbine rotor, said support means also including means supporting said turbine rotor on said stator vanes and controlling the angular momentum of said fluid flowing through said turbine rotor;

means sensing the reactive force imposed on said turbine rotor by said change in angular momentum imposed on said flowing fluid by said turbine vanes and generating a signal corresponding thereto;

whereby a signal corresponding to fluid flow rate through said sensor housing is provided;

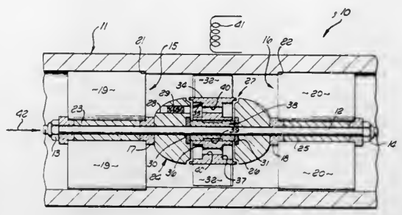
said plurality of stator vanes being located radially intermediate the angular position of said turbine vanes, whereby the effect of turbulence induced by the wake of said stator vanes is minimized.

4,186,603

TURBINE FLOWMETER

Hyung Du Bae, Brea, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,854
Int. Cl.[2] G01F *1/12*
U.S. Cl. 73—231 R **2 Claims**



1. A turbine flowmeter comprising: a hollow housing having an approximately cylindrical internal bore, said bore having an axis; a rotor including a hub and a plurality of fan-like rotor blades fixed thereto in a position extending radially outwardly therefrom; support means fixed relative to said housing inside thereof, said rotor being mounted on said support means and being rotatable relative thereto about said axis and axially slidable thereon; flow control means fixed relative to said support means, said flow control means including a diffuser fixed relative to said support means spaced axially from said rotor on each side thereof, each said diffuser having an external surface which is approximately a surface of revolution concentric with said axis, the diameter of each said diffuser external surface increasing in an axial direction toward said rotor, said flow control means being constructed and positioned to prevent fluid flowing axially inside said bore from reaching said rotor except by flowing over the external surface of one of said diffusers toward said rotor, said hub having an approximately cylindrical external surface, said rotor being hollow and having an impeller fixed therein to increase the pressure on the downstream diffuser inside said hub to keep said rotor spaced from said downstream diffuser when said rotor is turned by flow in said bore against said rotor blades, downstream movement of said rotor away from the upstream diffuser decreasing the space between said rotor and said downstream diffuser for restricting escape of fluid therebetween to limit the ability of said impeller to move downstream, movement of said rotor toward the upstream diffuser reducing the space therebetween, reducing flow to said impeller and reducing its ability to move said rotor upstream, said upstream diffuser having a passageway therethrough from the exterior thereof to the interior of said hub upstream of said impeller, said passageway being L-shaped and having one radial leg and one axial leg in communication therewith.

4,186,604

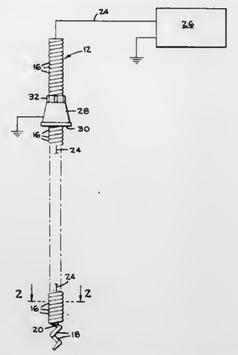
ELECTRONIC DIPSTICK

Alvin J. Mattila, 2 Beaver St., San Francisco, Calif. 94114

Filed Sep. 13, 1978, Ser. No. 941,950
Int. Cl.[2] G01F *23/24, 23/04*
U.S. Cl. 73—295 **7 Claims**

1. An improved dipstick for supporting a thermally sensitive electrical element at a prescribed level in a sump defining container comprising an elongate tubular member formed by a plurality of convolutions of helically wound strand, said member having a first end at which the convolutions axially abut one another and a second end remote from said first end at which the convolutions are spaced apart to afford liquid flow therebetween, an axially limited thermally sensitive electrical

element supported interior of said convolutions adjacent said second end, said element being spaced apart from and thermally isolated from said convolutions with said element having direct exposure to liquid flow between said spaced apart convolutions electric circuit forming means including a conductor



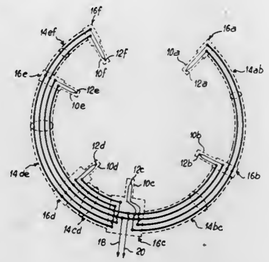
connected to said element and extending interiorly of said convolutions toward said first end, and stop means secured exteriorly of said tubular member adjacent said first end for limiting movement of said second end and said element inward of said sump defining container.

4,186,605

SET OF THERMOCOUPLES FOR MEASURING THE AVERAGE OF SEVERAL TEMPERATURES IN A GIVEN SPACE

Raymond Bourigault, Le Pecq, France, assignor to Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation, Auxitrol, France

Filed Feb. 21, 1978, Ser. No. 879,278
Claims priority, application France, Feb. 25, 1977, 77 05557
Int. Cl.[2] G01K *7/02*
U.S. Cl. 73—341 **5 Claims**



1. A thermocouple arrangement for measuring the average temperature in a region, comprising

a plurality of thermocouples at spaced apart locations within the region, each thermocouple comprising two conductors of different materials,

a plurality of pairs of conductors, one pair allocated to each thermocouple, connecting said thermocouples in parallel to a common junction, the pairs of conductors being of different lengths depending on the distance of their respective thermocouples from the common junction, the material of each conductor of each pair being the same as the material of the thermocouple conductor to which it is connected, and the cross-sectional dimensions of the conductors of each pair being different from the cross-sectional dimensions of the corresponding conductors of other pairs, the cross-sectional dimensions of the conductors of each pair being related to the length of those conductors such that the electrical resistance of each pair of conductors is equal to the electrical resistance of every other pair of conductors and hence the electrical resistance between each thermocouple and the common junction is the same, and

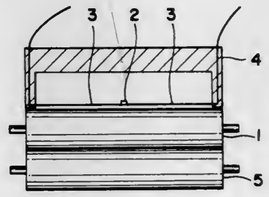
a protective tube between each two successive thermocouples accommodating said pairs of conductors, said tubes being arranged in succession and terminating at a junction box containing said common junction.

4,186,606

APPARATUS FOR MEASURING TEMPERATURE

Noriyoshi Tarumi, Tama; Kenji Ueno, Hachioji, and Hirofumi Sakaguchi, Akigawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,215
Claims priority, application Japan, Apr. 21, 1977, 52-45159
Int. Cl.[2] G01K *1/14*
U.S. Cl. 73—351 **13 Claims**



1. Apparatus for measuring the temperature of a surface of an article comprising:

a thermally responsive temperature measuring element for providing an output signal related to the temperature of said element, an electrical property of said temperature measuring element varying in accordance with the temperature thereof,

and means, comprising a supporting member and conductive elements connected between said supporting member and said temperature measuring element for supporting said temperature sensing element close to said surface so that said temperature measuring element is responsive to the temperature of said surface and for transmitting said output signal from said temperature measuring element, said conductive elements being located close to said surface and exposed to the same temperature as said temperature measuring element whereby no temperature gradient exists between said temperature measuring element and said conductive elements and heat escape from said temperature measuring element to said conductive elements is eliminated.

4,186,607

LIQUID SAMPLE DILUTION SYSTEM

Grady T. Porter; Edward N. Fuller, and Lewis B. Roof, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 6, 1978, Ser. No. 949,288
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 GC **17 Claims**

1. An apparatus for providing diluted samples from a fluid sample source and a fluid diluent source, said apparatus comprising:

first conduit means having first and second ends with the first end thereof in flow communication with said fluid sample source for providing a path for flow of sample fluid therethrough from said fluid sample source;

second conduit means having first and second ends with the first end thereof in flow communication with said fluid

diluent source for providing a path for flow of a diluent fluid stream therethrough from said fluid diluent source;

a first sample valve body, having first, second and third inlet ports and first, second and third outlet ports, with the first inlet port thereof in flow communication with the second end of said first conduit means and with the second inlet port thereof in flow communication with the second end of said second conduit means;

third conduit means having first and second ends with the first end thereof in flow communication with the first outlet port of said first sample valve body for providing a path for flow of fluid therethrough;

fourth conduit means having first and second ends with the first end thereof in flow communication with the second outlet port of said first sample valve body for providing a path for flow of fluid therethrough;

fifth conduit means having first and second ends with the first end thereof in flow communication with the third outlet port of said first sample valve body and with the second end thereof in flow communication with the third inlet port of said first sample valve body for providing a path for flow of fluid therethrough;

first sample valve member means operatively related to said first sample valve body for placing in flow communication said first inlet port with said third outlet port, said second inlet port with said second outlet port and said third inlet port with said first outlet port, and, alternately, for placing in flow communication said first inlet port with said first outlet port, said second inlet port with said third outlet port, and said third inlet port with said second outlet port, so as to inject a predetermined quantity of said sample fluid into said diluent fluid stream emanating from the second outlet port of said first sample valve body;

dilution chamber means having an inlet port and an outlet port with the inlet port thereof in flow communication with the second end of said fourth conduit means for mixing said predetermined quantity of said sample fluid with said diluent fluid stream;

sixth conduit means having first and second ends with the first end thereof in flow communication with the outlet port of said dilution chamber means for providing a path for flow of fluid from said dilution chamber means;

a second sample valve body, having first, second and third inlet ports and first, second and third outlet ports, with the first inlet port thereof in flow communication with the second end of said sixth conduit means;

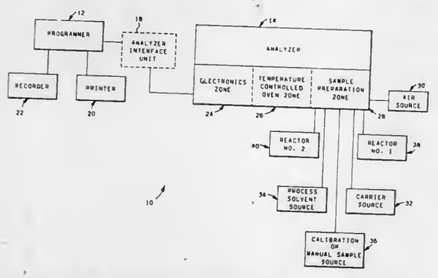
seventh conduit means having first and second ends with the first end thereof in flow communication with a carrier fluid source and with the second end thereof in flow communication with the second inlet port of said second sample valve body for providing a flow path for flow of carrier fluid from said carrier fluid source;

eighth conduit means having first and second ends with the first end thereof in flow communication with the first outlet port of said second sample valve body for providing a flow path for fluid from said second sample valve body;

ninth conduit means having first and second ends with the first end thereof in flow communication with the second outlet port of said second sample valve body for providing a flow path for fluid from said second sample valve body;

tenth conduit means having first and second ends with the first end thereof in flow communication with the third outlet port of said second sample valve body and with the second end thereof in flow communication with the third inlet port of said second sample valve body for providing a path for flow of fluid therethrough; and

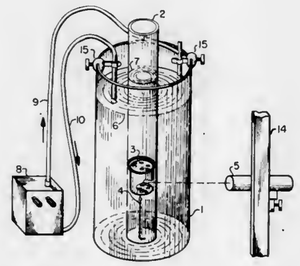
second sample valve member means operatively related to said second sample valve body for placing in fluid communication said first inlet port of said second sample valve body with said third outlet port of said second sample valve body, said second inlet port of said second sample valve body with said second outlet port of said second sample valve body, and said third inlet port of said second sample valve body with said first outlet port of said second sample valve body, and, alternately, for placing in fluid communication said first inlet port of said second sample valve body with said first outlet port of said second sample valve body, said second inlet port of said second sample valve body with said third outlet port of said second sample valve body, and said third inlet port of said second sample valve body with said second outlet port of said second sample valve body, so as to inject a predetermined quantity of said mixed sample fluid and diluent fluid stream emanating from said dilution chamber means into the carrier fluid emanating from said carrier fluid source.



4,186,608
METHOD AND APPARATUS FOR VERIFYING DECLARED CONTENTS OF CONTENTS OF CERTAIN SOLIDS

David J. Stanonis; Walter D. King, both of New Orleans, and Emory E. Coll, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 17, 1978, Ser. No. 925,136
Int. Cl.² G01N *9/10*
U.S. Cl. 73—437 **4 Claims**



1. In a density-measuring apparatus of the type which includes a vessel substantially filled with a liquid; a float in said vessel; a variable weight attached to the bottom of said float to hold it submerged in said liquid; and means to measure the vertical repositioning of said float and variable weight, the improvement, a modification comprising:

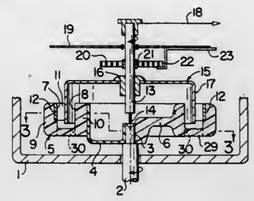
(a) said liquid in said vessel being of a predetermined and constant density; and

(b) means to secure a solid material of unknown density to said float in addition to said variable weight, and to immerse it in said liquid together with said float, said measuring means thus determining the weight of said solid material in said liquid; wherein said float comprises a hollow chamber whose walls are less dense than said liquid, wherein said walls are perforated to allow said liquid to fill said float when submerged in said liquid; and wherein said walls include access opening means to enable said material to be placed within said hollow chamber in an untethered state.

4,186,609
EDDY-CURRENT DEVICE FOR MEASURING ROTATIONAL SPEED

Max Baermann, Bensberg-Wulfshof, Postfach 26, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,779
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709412
Int. Cl.² G01P *3/49*
U.S. Cl. 73—497 **11 Claims**



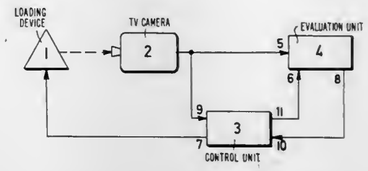
1. An eddy-current device for measuring the rotational speed of a rotating drive shaft comprising, annular permanent magnet element means concentric with and mounted on said shaft for rotation therewith, said element means including concentric radially spaced outer and inner ring portions of molded powdered permanent magnetic material bonded by a plastic binder, means mounting said ring portions on said shaft in radially spaced relationship with respect thereto and with respect to one another, said ring portions providing radially spaced circumferentially continuous and uninterrupted outer and inner cylindrical surfaces concentric with said shaft, said outer and inner surfaces providing a circumferentially continuous and uninterrupted axially open air gap concentric with said shaft, said outer cylindrical surface including a first plurality of magnetic poles of alternating polarity equally spaced completely about the circumference of said outer surface, said inner cylindrical surface including a second plurality of magnetic poles of alternating polarity equally spaced completely about the circumference of said inner surface, said first and second pluralities being of like number and providing at least eight sets of radially opposed poles of opposite polarity completely about said circumferentially continuous air gap to provide alternating magnetic fields emanating from said pole sets with their magnetic flux lines traversing said air gap in directions radially of said drive shaft, a thin temperature compensating element on one of said outer and inner cylindrical surfaces of said magnet element means, and an eddy current rotary element of electrically conductive non-magnetic material mounted for rotation relative to said drive shaft, said eddy current element including a circumferentially continuous cylindrical wall coaxial with said drive shaft and projecting axially into said air gap between said outer and inner cylindrical surfaces of said magnet element means to circumferentially continuously intersect said alternating magnetic fields traversing said air gap.

4,186,610
APPARATUS FOR EVALUATING DEFORMATION CHARACTERISTICS OF MECHANICALLY TESTED MATERIALS

Ladislav Dolezal; Frantisek Weiss; Petr Stanek, and Miroslav Lorenc, all of Brno, Czechoslovakia, assignors to Vyzkumny ustav 070, Brno, Czechoslovakia

Filed Nov. 2, 1978, Ser. No. 956,917
Int. Cl.² G01N *3/08*
U.S. Cl. 73—805 **9 Claims**

1. An apparatus for measuring and evaluating deformation characteristics of mechanically deformed test pieces comprising, a loading device for supporting and continuously placing a mechanical load on a test piece to deform said test piece, a TV camera mounted for visually scanning said test piece as it is being deformed, said TV camera having an output producing electrical signals representative of a scanned picture of said test piece, a control unit connected to the output of said TV camera for transforming picture signals into control pulses, a first output of said control unit being connected to said loading device for controlling mechanical load applied to said test

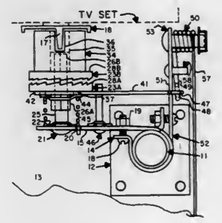


piece, an evaluating unit having a first input thereof connected to the output of said TV camera and a second input thereof connected to a second output of said control unit, said evaluating unit having means for measuring deformation characteristics of said work piece and for producing an output signal at a first output thereof, and a feedback path connecting said first output of said evaluating unit with a second input of said control unit, whereby said control unit produces control pulses for controlling load applied to said test piece.

4,186,611
REMOTE CONTROL TV CHANNEL SELECTOR

Robert J. McKnight, 10-5 Jamestowne Village, Toms River, N.J. 08753

Filed Apr. 24, 1978, Ser. No. 899,522
Int. Cl.² F16D *41/00*; H03J *1/00*; H01H *17/08*
U.S. Cl. 74—10 A **8 Claims**



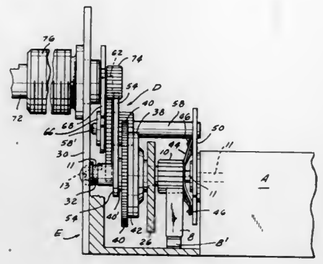
1. An indexing clutch for rotating, in pre-determined arctual increments, a TV channel selector tuner, said clutch consisting of two sleeves rotatably contained on a common shaft fixedly positioned normal to the channel selector dial, coaxially aligned with the center thereof, each sleeve having, on adjacent ends thereof, a plurality of opposed generally wedge-shaped radial teeth which interlock when the driving sleeve is rotated counter-clockwise, the number of teeth on each sleeve being equal to the number of channel positions on the tuner whereby rotating the clutch one ratchet space rotates the tuner one channel space, the driven sleeve being in driving engagement with the tuner.

4,186,612

TUNER DRIVING MECHANISM PERMITTING PLAY IN LOCATION OF INPUT MEMBER

Robert F. Welch, Albuquerque, N. Mex., and Russell D. Stamm, El Paso, Tex., assignors to General Instrument Corporation, Clifton, N.J.

Filed Dec. 19, 1977, Ser. No. 861,857
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.8 **30 Claims**



1. In a tuner comprising an electrical tuning system having a movable control member, a support, means for mounting said tuning system on said support in a given position, a rotatable input member, and an operative driving connection between said control member and said input member; the improvement which comprises first gear means drivingly connected to said control member and mounted on said support to be rotatable about a first and fixed axis, second gear means mounted on said support to be adjustably positionable about the periphery of said first gear means, third gear means mounted to be adjustably positionable about the periphery of said second gear means, means defining a rotatable driving connection from said first gear means through said second gear means to said third gear means, and means operatively connecting said input member and said third gear means for driving connection and fixed relative positioning therebetween, whereby said input member may be located relative to said control member in one of a plurality of positions, said second gear means comprising first and second coaxially mounted and simultaneously rotatable gears, said first gear meshing with said first gear means and said second gear meshing with said third gear means, and means for resiliently urging one of said gear means against the periphery of another of said gear means.

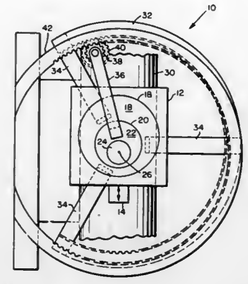
4,186,613

MECHANICAL MOVEMENT

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 9, 1977, Ser. No. 849,749
Int. Cl. F16h *37/12*
U.S. Cl. 74—52 **12 Claims**

1. A mechanical movement for converting between linear and rotation movement, for operating a device, including:
(a) a frame being adapted to move only along a linear path of travel;
(b) a first rotatable member adapted to bear against said frame in such a manner that said first rotatable member is free to rotate with respect to said frame;
(c) a second rotatable member adapted to bear against said first rotatable member in such a manner that said second rotatable member is free to rotate with respect to said first rotatable member in an eccentric fashion; and
(d) a third rotatable member, affixed to said second rotatable member and adapted to rotate therewith, said third rotatable member being adapted to rotate only about a fixed axis; the improvement comprising:
(e) means including a ring gear secured to said first rotary member and a fixed ring gear for positively coupling the rotary members for minimizing sideward thrust on said first and second rotatable members, whereby linear movement of said frame will be converted to rotational movement of said third rotatable member and whereby rotational movement of said third rotatable member will be converted to linear movement of said frame.

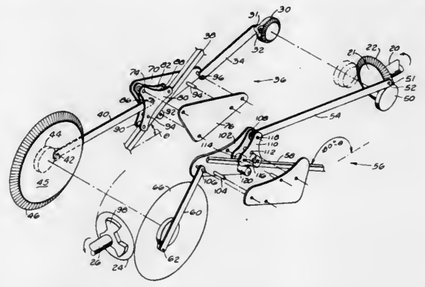


4,186,614

FORCE AND DISTANCE MULTIPLYING OBLIQUE LEVERAGE TRANSMISSION

Fred A. Hamlin, 2957 Henrietta St., La Crescenta, Calif. 91208

Filed Aug. 7, 1978, Ser. No. 931,792
Int. Cl.[2] F16H *21/12*
U.S. Cl. 74—63 **16 Claims**



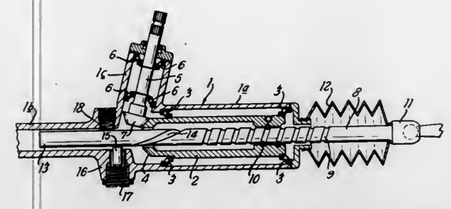
1. An oblique leverage transmission coupled between a first shaft and a second shaft, comprising:
first gearing means coupled for being rotated by the first shaft, the first gearing means comprising at least a first force transfer gear and a second force transfer gear;
second gearing means comprising at least a third force transfer gear and a fourth force transfer gear, the second shaft coupled for being rotated in response to the rotation of the third force transfer gear and the fourth force transfer gear;
inclined plane means comprising:
a first inclined plane positioned between the first and third force transfer gears, and
a second inclined plane positioned between the second and fourth force transfer gears; and linkage means comprising:
first load transfer means coupled for being moved linearly up and down the first inclined plane in response to the rotation of the first force transfer gear and further coupled to rotate the third force transfer gear as the first load transfer means moves linearly up and down the inclined plane, and
second load transfer means coupled for being moved linearly up and down the second inclined plane in response to the rotation of the second force transfer gear and further coupled for rotating the fourth force transfer gear as the second load transfer means moves linearly up and down the inclined plane.

4,186,615

STEERING GEARS

Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hitchin, England

Filed Aug. 3, 1977, Ser. No. 821,473
Claims priority, application United Kingdom, Aug. 6, 1976, 32901/76
Int. Cl.[2] B62D *3/08*
U.S. Cl. 74—89.15 **14 Claims**



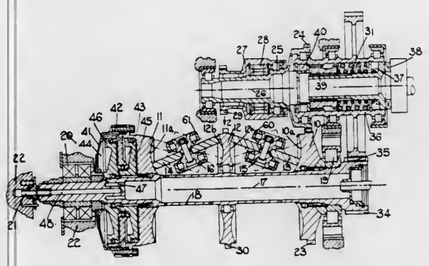
1. A variable ratio steering apparatus for use in turning a steerable vehicle wheel, said apparatus comprising a first drive member having a longitudinally extending central axis, said first drive member having an end portion adapted to be connected with the steerable vehicle wheel, a second drive member, first force transmitting means for transmitting force from said second drive member to said first drive member to effect movement of said first drive member along its longitudinally extending central axis in response to rotation of said second drive member relative to said first drive member to thereby effect turning movement of the steerable vehicle wheel, said first force transmitting means including an external thread convolution formed on said first drive member and an internal thread convolution formed on said second drive member, input means for rotating said second drive member relative to said first drive member in response to rotation of a manually actuatable member, and second force transmitting means for varying the speed of movement of said first drive member along its longitudinally extending central axis during rotation of said second drive member to vary the rate of turning movement of the steerable vehicle wheel, said second force transmitting means including means for varying the speed of relative rotation between said first and second drive members during rotation of said second drive member.

4,186,616

VARIABLE SPEED TRANSMISSION SYSTEMS

Raymond Sharpe, Mirfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 12, 1977, Ser. No. 824,249
Claims priority, application United Kingdom, Aug. 14, 1976, 33905/76
Int. Cl.[2] F16H *15/08*
U.S. Cl. 74—200 **7 Claims**



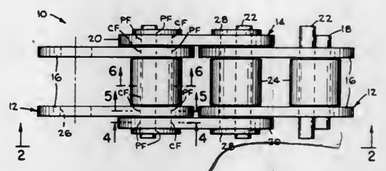
1. A transmission system comprising two axially spaced rotatable torous discs rotatable about a common gear axis, part toroidal surfaces on the respective axially presented faces of the discs respectively, an input connected to one of the discs, an output connected to the other of the discs, a set of circumferentially spaced drive rollers in frictional rolling contact with the part toroidal surfaces on said discs respectively, bearing structures in which said rollers are mounted respectively, each of the bearing structures being tiltable through a ratio angle about an axis at right angles to an axis of rotation of each roller to vary the distances from the common gear axis of the discs at which the rollers engage the two toroidal surfaces of the discs respectively, means for moving the roller bearing structures generally tangentially with respect to the common gear axis of the discs, said means adapted for applying a force to said structures in a direction to vary a caster angle which is the angle of inclination of each roller with respect to a plane perpendicular to said common gear axis, and means for accommodating movement of the roller bearing axes relatively to said common gear axis of the discs, in a direction parallel with said common gear axis.

4,186,617

ROCKER JOINT ROLLER CHAIN

Stellios A. Avramidis, Mooresville, and Frederic L. Jones, Indianapolis, both of Ind., assignors to FMC Corporation, San Jose, Calif.

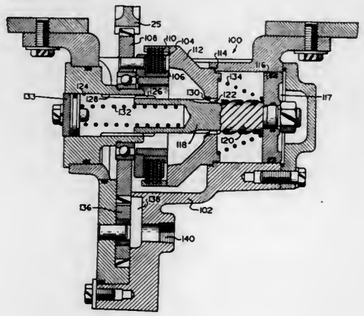
Filed Apr. 6, 1978, Ser. No. 893,919
Int. Cl.[2] F16G *13/06, 15/12*
U.S. Cl. 74—245 S **1 Claim**



1. In an articulated chain comprising a plurality of first links and a plurality of second links, each of said first links and each of said second links having a pair of spaced apart longitudinal sidebars, a pair of transverse pin segments comprising a first pin segment and a second pin segment extending between the opposite ends, respectively, of said sidebars, said first links wider than said second links for an overlapping relationship between said links when said pins are in coupled pivotal engagement, the improvement wherein said sidebars of said second links are spaced apart in the lateral direction to receive the teeth of a sprocket therebetween and said pairs of pin segments are spaced apart longitudinally to receive said teeth therebetween, and wherein each end of each sidebar of said first links has an opening of generally circular configuration with a slightly pinched waist to divide the opening into two portions of unequal size, each end of each first pin segment tightly received in said smaller portion of said opening in each end of each sidebar of said first links to render said first links rigid, each end of each sidebar of said second links having an opening of generally circular configuration with a slightly pinched waist to divide the opening into two portions of unequal size, each end of each second pin segment tightly received in said smaller portion of said opening in each end of each sidebar of said second links to render said second links rigid, said first pin segments received in the larger portion of said openings in the sidebars of said second links with clearance and said second pin segments received in the larger portion of said openings in the sidebars of said first links with clearance, said first pin segments received in said sidebars of said second links in coupled relationship with the second pin segments and said second pin segments received in said sidebars of said first links in coupled relationship with the first pin segments to couple said links together, a convex surface on the inner and outer faces of each of said first pin segments and a convex surface on the inner and outer faces of each of said

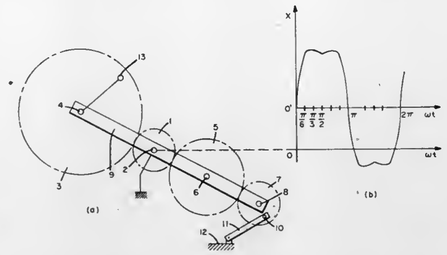
second pin segments for rocking engagement at the joint between each link and adjacent links.

4,186,618
TRANSMISSION INPUT DECELERATING AND REVERSING MECHANISM
Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Aug. 5, 1977, Ser. No. 822,174
Int. Cl.² F16H *3/38*
U.S. Cl. 74—339 **15 Claims**



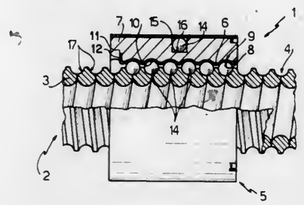
1. A selectively actuatable mechanism adapted to be coupled with a driven shaft, said driven shaft driven by a one-way prime mover through a normally engaged selectively disengageable master clutch and adapted to be selectively engaged to a driven device, said mechanism effective when actuated and when said master clutch is disengaged to decelerate said driven shaft and when said master clutch is disengaged and said driven shaft is disengaged from said driven device or said given device is at rest to decelerate said driven shaft and to then momentarily positively rotate said driven shaft in the direction opposite the direction said driven shaft is rotated by said prime mover said mechanism comprising a housing, a friction coupling rotatable in said housing, one member of said coupling rotationally fixed to a gear adapted to be driven by said driven shaft and the other member of said coupling rotationally fixed to a reaction member, said reaction member axially and rotationally movable in said housing, axial movement of said reaction member toward said one coupling member effective to tend to rotate said reaction member in the rotational direction opposite the direction said one coupling member is normally rotated by said shaft, said reaction member coupled to an actuation shaft by a substantially helical spline, said splined connection permitting relative axial and rotational movement of said reaction member and said actuation shaft, said actuation shaft axially movable but rotationally fixed to said housing, an axial force motor comprising a pneumatic piston for urging said actuation shaft toward said first coupling member, control means for supplying pressurized fluid to said piston, said control means including a timer circuit for limiting the maximum period of time pressurized fluid can be supplied to said piston, a return biasing means for urging said coupling members apart.

4,186,619
WINDING DEVICE
Alex Nissen, Paris, and Distel Charles, Chatillon, both of France, assignors to Videon, S.A., Boulogne-Billancourt, France
Filed Jun. 1, 1978, Ser. No. 905,627
Claims priority, application France, May 13, 1977, 77 14656
Int. Cl.² H02K *15/04*
U.S. Cl. 74—414 **10 Claims**



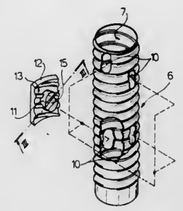
1. Mechanical device for obtaining complex movements, characterized in that it consists of:
a first means of causing the movement from one point whose projection on a given axis is a sinusoidal movement in respect to time at a determined frequency.
a second means causing the movement of the first means in a way such that the projection of the point of movement considered along a given axis is the algebraic sum of a sinusoidal movement in respect to time at a determined frequency and of a sinusoidal movement in respect to time at a frequency three times that of the previous determined frequency,
and the receptor means of the movement obtained.

4,186,620
SCREW-NUT SCREW TRANSMISSION COUPLING
Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Milan, Italy
Filed Feb. 24, 1978, Ser. No. 880,917
Claims priority, application Italy, Mar. 9, 1977, 67516 A/77
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 R **7 Claims**



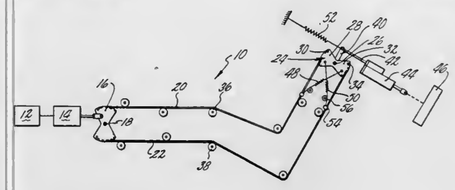
1. A screw-nut screw transmission coupling, comprising an elongate preloaded spring formed from a filiform element wound as a cylindrical helix and machined so as to have a cross-sectional shape defining, between each pair of adjacent turns disposed in mutual contact, an external helical groove of uniform pitch equal to the pitch of the spring and of substantially semicylindrical cross-section, and the coupling further comprising a plurality of ball bearings, and a tubular member through which said elongated member extends with radial slack, said tubular member comprising first and second tubular sleeves which are rigidly connected in coaxial arrangement with the first sleeve disposed within the second sleeve, said first sleeve being formed with an internal helical groove of pitch substantially equal to the pitch of said external helical groove, said internal helical groove cooperating with said external helical groove to define a first duct, and said second sleeve being formed with a return duct which communicates with said first duct.

4,186,621
SCREW-NUT SCREW TRANSMISSION COUPLING
Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Turin, Italy
Filed Jun. 22, 1978, Ser. No. 918,111
Claims priority, application Italy, Jul. 7, 1977, 68574 A/77
Int. Cl.² F16N *55/04*
U.S. Cl. 74—459 **5 Claims**



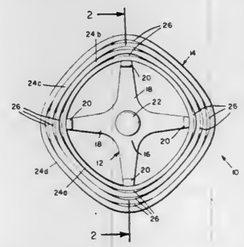
1. A screw-nut screw transmission coupling comprising a tubular outer member and an elongate inner member having complementary helical grooves cooperating to define a helical ball bearing duct; a plurality of return ducts extending between corresponding points of respective pairs of adjacent turns of said helical ball bearing duct to define therewith a plurality of endless ball bearing ducts; and a plurality of ball bearings arranged in mutual engagement within each said endless duct;
said tubular outer member comprising a tubular sleeve provided internally with one of said helical grooves and with a plurality of radial through bores, each said bore straddling a respective pair of adjacent turns of said internal helical groove and having a diameter substantially equal to the width of said pair of turns, and a plurality of plates coupled to the outer surface of said sleeve and each arranged to close a respective one of said through bores; each said return duct being in the form of a cavity provided in each said plate.

4,186,622
REDUNDANT FLIGHT CONTROL SYSTEM
Dean E. Cooper, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Oct. 27, 1977, Ser. No. 846,093
Int. Cl.² B64C *13/04*; F16C *1/10*
U.S. Cl. 74—501 R **8 Claims**



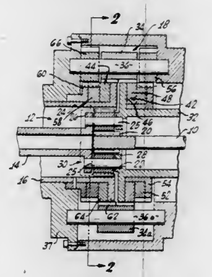
1. A flight control system including:
(A) a quadrant member mounted for clockwise and counterclockwise motion about an axis of rotation and including a left arm member and a right arm member extending on opposite sides of the axis of rotation
(B) output means responsive to quadrant rotation,
(C) a first flexible cable member connected to the quadrant right arm to cause clockwise rotation thereof,
(D) a second flexible cable member connected to the quadrant left arm to cause counterclockwise rotation thereof,
(E) means to actuate said cable members, and
(F) a first preloaded spring member connecting said first cable member to said quadrant member and a second preloaded spring member connecting said second cable member to said quadrant member so that if either of said cable members is severed, said spring members will cause said quadrant member to rotate in the same direction that the severed cable caused the quadrant member to rotate when operative.

4,186,623
MULTI-RIM FLYWHEEL ATTACHMENT
Johan A. Friedericy, Palos Verdes Estates; Dale O. Moeller, Rolling Hills, and Dennis A. Towgood, Huntington Beach, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.
Filed Apr. 3, 1978, Ser. No. 892,587
Int. Cl.² F16F *15/30*; F16C *15/00*; H02K *7/02*
U.S. Cl. 74—572 **14 Claims**



5. A flywheel comprising hub means, and a plurality of nested rims positioned on said hub means, said rims having a non-circular configuration with a plurality of enlarged points when said flywheel is at rest and having a substantially circular configuration when said flywheel is spinning at a preselected speed, a plurality of spacer means being positioned between adjacent pairs of rims in radial alignment at each of said enlarged points for increasing non-circularity of the rim outside each of said spacer means.

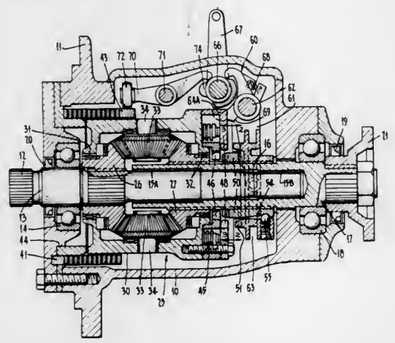
4,186,624
SEQUENTIAL DRIVE MECHANISM
Donald J. Fessett, Industry, Calif., assignor to Western Gear Corporation, Lynwood, Calif.
Filed Apr. 11, 1977, Ser. No. 786,085
Int. Cl.² F16H *37/00, 37/06, 3/74*
U.S. Cl. 74—679 **36 Claims**



1. A drive mechanism comprising:
an input shaft;
first and second output shafts;

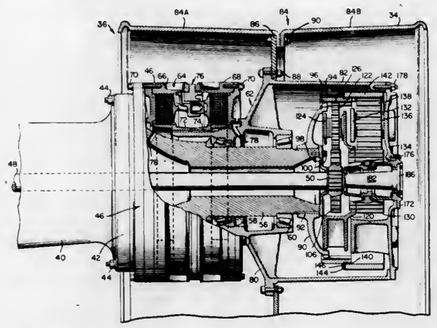
transmission means for alternatively transmitting power from said input shaft to either of said output shafts;
a plurality of rotatable cams;
cam-drive means for driving said cams at different rotational speeds in response to the rotation of at least one of said shafts; and
stop means for arresting rotation of said first output shaft when said cams have a first predetermined relationship and for arresting rotation of said second output shaft when said cams have a second predetermined relationship.

4,186,625
REVERSIBLE TRANSMISSION
Alan H. Chamberlain, 95 Dow St., Port Melbourne, Victoria, Australia (3207)
Filed Jun. 20, 1977, Ser. No. 808,306
Claims priority, application Australia, Jun. 21, 1976, 6344
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—780 **1 Claim**



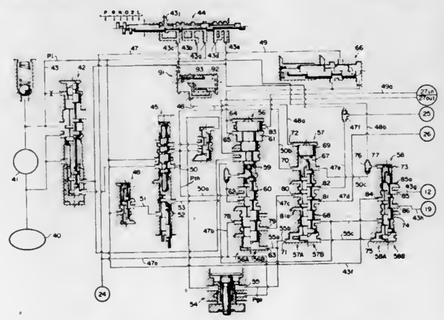
1. A reversible transmission comprising:
a housing;
an input shaft and an output shaft journalled co-axially in the housing;
a planetary gear system including an input gear coupled to the input shaft, an output gear coupled to the output shaft, planetary gears coupling said input and output gears, and a planetary gear carrier rotatably supported co-axially with the shafts and carrying the planetary gears;
brake means operable for selectively locking the carrier against rotation which provides reverse drive and releasable coupling means for selectively drive-coupling the carrier to the output shaft which provides forward drive;
said releasable coupling means including;
first clutch means for coupling the carrier to the output shaft and including a friction drive, and
second clutch means for mechanically coupling the carrier to the output shaft;
actuating means operable for initially engaging the first clutch means and thereafter engaging the second clutch means while maintaining the first clutch means engaged;
said first clutch means comprising:
a dog clutch having a driven toothed member mounted co-axially on the output shaft to rotate therewith and
a drive toothed member coupled to the carrier by a constantly engaged multi-plate friction clutch;
said second clutch means comprising:
two toothed dog clutch elements, one secured directly to the carrier and the other mounted co-axially on the output shaft to rotate therewith;
said driven toothed member and said other toothed dog clutch element being axially slidable together on the output shaft to engage the first clutch means; and
said other toothed dog clutch element being axially slidable on said driven toothed member to engage the second clutch means.

4,186,626
WHEEL FINAL DRIVE ASSEMBLY
Richard W. Chamberlain, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 21, 1978, Ser. No. 879,304
Int. Cl.[2] F16H *1/28, 35/00, 57/00;* **B60K** *23/00*
U.S. Cl. 74—801 **24 Claims**



1. A wheel final drive assembly for vehicles, wherein the assembly includes a double reduction planetary gearing mechanism positioned within and drivingly connected to a wheel hub of a vehicle drive wheel, a drive axle shaft interconnecting a vehicle power train differential and the gearing mechanism, a separable part hollow hub having positioning faces contacting and axially positioning gears of the gearing mechanism, a hollow spacer plug removably insertable through the hollow hub and having a face contactable with the outer end of the axle shaft to operatively position the axle shaft in driving connection between said differential and gearing mechanism, removal of the spacer plug permitting selective movement of the axle shaft through the hollow hub to an inoperative position in the assembly for partial stowing therewithin, and for complete removal therefrom.

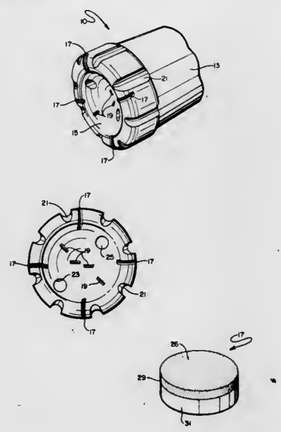
4,186,627
OIL PRESSURE CONTROL MEANS FOR AN AUTOMATIC TRANSMISSION
Koujiro Kuramochi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Mar. 15, 1978, Ser. No. 886,960
Claims priority, application Japan, Apr. 22, 1977, 52-47240
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—869 **6 Claims**



1. An oil pressure control means for an automatic transmission which comprises a fluid torque converter and a speed shift

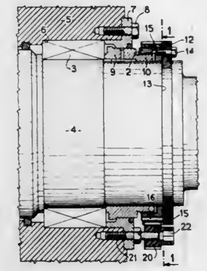
gear means having a plurality of friction engaging means and adapted to establish various speed stages, said oil pressure control means comprising a source of oil pressure, a line pressure regulating valve which generates a line pressure from the oil pressure of said source, a throttle pressure regulating valve which generates throttle pressure corresponding to engine throttle opening, a governor valve which generates governor pressure corresponding to vehicle speed, a manual shift valve having a plurality of output ports which selectively deliver output oil pressure for shifting speed ranges, a plurality of speed shift valves which change over supply of oil pressure to said friction engaging means depending upon a balance of said throttle pressure and said governor pressure, first and second passage means for supplying oil pressure delivered from one of said output ports of said manual shift valve to first and second valves of said speed shift valves, respectively, as a control oil pressure for shifting down these valves, said first and second valves causing changing over between the highest speed stage and the next lower speed stage and between said next lower speed stage and the next but one lower speed stage, respectively, and a downshift control valve provided at a middle portion of said second passage means for selectively intercepting the passage therethrough in a manner such that the supply of oil pressure through said second passage is definitely delayed relative to the supply of oil pressure through said first passage so that abrupt two-stage downshifting from the highest speed stage to the next but one lower speed stage is prohibited.

4,186,628
ROTARY DRILL BIT AND METHOD FOR MAKING SAME
Phillip E. Bonnice, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio
Division of Ser. No. 746,044, Nov. 30, 1976, Pat. No. 4,098,362.
This application Mar. 20, 1978, Ser. No. 888,259
Int. Cl.[2] B21K *5/02*
U.S. Cl. 76—108 A **6 Claims**



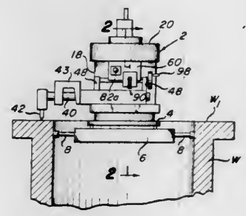
1. A method for making a diamond compact drill bit comprising the steps:
(a) mounting a plurality of cutting elements, each comprised of a diamond compact, in a mold;
(b) filling a drill crown portion of the mold surrounding said elements with a metal powder;
(c) inserting a drill shaft into said mold;
(d) filling said portion of said mold surrounding said elements with a molten solder having a flow point of less than 700° C.;
(e) allowing said solder to solidify; and
(f) removing the drill bit so formed from the mold.

4,186,629
DEVICE FOR UNTIGHTENING AND TIGHTENING NUTS
Claude Costes, Dunkerque, France, assignor to Union Siderurgique de Nord et du l'est de la France, France
Filed Nov. 23, 1977, Ser. No. 854,196
Claims priority, application France, Nov. 25, 1976, 76 35564
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—53 R **4 Claims**



1. A device for untightening and tightening a nut for regulating the chock rolling bearings of rolling mill rolls, comprising:
a shaft of a rolling mill roll;
an annular member mounted on said shaft having an outer surface, a portion of which outer surface is threaded;
a nut having an outer surface and a threaded inner surface, which nut is screwed onto the threaded portion of said annular member;
a collar axially adjacent to said nut which collar is mounted on said shaft and releasably connected to said nut;
a ring gear including a gear member which is separate from said nut but mounted on the outer surface of the nut;
means fixing said gear member on the nut; and
a gear pinion in mesh with the ring gear and rotatably mounted on a fixed pin, the gear pinion having first means for receiving second means for driving the pinion in rotation.

4,186,630
FACING AND JOURNAL TURNING MACHINE
Carl L. Lindhag, International Falls, Minn., assignor to Boise Cascade Corporation, Boise, Id.
Filed Apr. 4, 1978, Ser. No. 893,429
Int. Cl.[2] B23B *3/26*
U.S. Cl. 82—4 C **3 Claims**

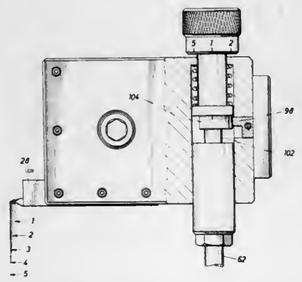


1. Portable turning apparatus for machining an end surface of a generally cylindrical workpiece, comprising
(a) a stationary base plate (6) adapted for connection within an end portion of the workpiece, said base plate extending generally normal to the longitudinal axis of said workpiece;
(b) a stationary shaft (14) connected at one end with said base plate, said shaft being adapted to extend at its other

end from said workpiece in coaxial relation to the longitudinal axis thereof;
(c) a hollow cylindrical drum (2) journalled for rotation concentrically about said shaft, said drum being so supported on said shaft that it is closed at one end by said base plate;
(d) a stationary cover member (20) connected with said other end of said shaft for completely enclosing the other end of said drum;
(e) tool holder means (40) carrying a cutting tool (42);
(f) guide means (36) supporting said tool holder means for axial reciprocation in a plane normal to the axis of said drum;
(g) drive means for rotating said drum shaft about said shaft, said drive means including
(1) a ring (30) connected with said drum concentrically about said shaft;
(2) a drive pinion (26) rotatably connected with said cover member, said drive pinion being in meshing engagement with said ring gear; and
(3) drive motor means (24) mounted on said cover member for driving said drive pinion; and
(h) means responsive to the rotation of said drum about said shaft for linearly displacing said tool holder relative to said guide means, said displacing means including
(1) a stationary conical drive gear (54) concentrically mounted on and secured to said shaft;
(2) a conical driven pinion gear (56) rotatably connected with said drum and extending normal to the axis thereof, said driven pinion being in meshing engagement with said conical drive gear;
(3) a worm gear (52) rotatably connected with said drum;
(4) means (70) connecting said worm gear with said conical driven pinion gear; and
(5) means (50) driven by said worm gear for linearly displacing said tool holder relative to said drive means, whereby during rotation of said hollow drum about said shaft, the cutting tool is progressively radially displaced to machine the entire end face of said workpiece.

4,186,631
THREADING APPARATUS FOR A STANDARD ENGINE LATHE

James D. Grider, 3902 Galway, Houston, Tex. 77080
Filed Feb. 24, 1978, Ser. No. 881,021
Int. Cl.² B23B *1/00*
U.S. Cl. 82—5 **10 Claims**



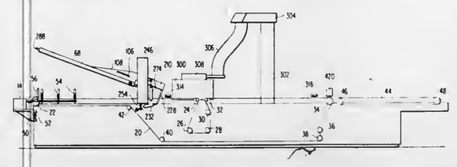
1. An attachment for a standard engine lathe which lathe has
(a) a head stock for rotating a workpiece
(b) above a set of parallel ways
(c) which support a traveling carriage for movement along the ways,
(d) a lead screw parallel to the ways
(e) for driving a traveling nut connected to the traveling carriage to move the traveling carriage along the ways,
(f) a cross feed on the traveling carriage, the attachment comprising:
(1) an attachment housing demountably positioned above the traveling carriage for movement along the cross feed toward and away from the locus of a workpiece supported by the head stock;
(2) said attachment housing comprising:
(i) a lower plate;
(ii) an upper plate;
(iii) abutting faces on said plates contacting one another to enable sliding movement;
(iv) means for relatively fixing said lower plate to the traveling carriage;
(v) a slidable dovetail between said plates enabling movement in a direction and further constraining movement in a direction perpendicular to the direction in which movement is permitted;
(3) tool point securing means carried by said upper plate for securing a tool point to cut a workpiece;
(4) a resilient means coacting between said upper plate and lower plate for urging said upper plate in movement along said slidable dovetail;
(5) wherein said dovetail is oriented on the traveling carriage to retract a tool point carried by said tool point securing means away from a workpiece;
(6) said resilient means imparting movement to said upper plate of at least a specified distance sufficient to retract the tool point from the workpiece;
(7) a shaft supported in a chamber formed in said upper plate, said shaft movable along its length between first and second positions;
(8) a cam operatively supported by said shaft which cam has first and second relative locations which differ from one another;
(9) cam follower means cooperatively engaged with said cam which cam follower means moves from said first to said second locations;
(10) means for rotating said shaft to rotate said cam supported thereby between altered relative positions to said cam follower means;
(11) said shaft and cam incorporating a shaped portion enabling movement of said cam follower means in setting and resetting said cam follower means relative to said shaft to enable movement of said cam follower means for movement between the first and second locations;
(12) each of said cam follower means and cam being fixed in position to one of said upper and lower plates, said resilient means urging said upper plate along said slidable dovetail such that said tool point securing means moves a tool point secured thereby into a cutting and a retracted position relative to a workpiece;
(13) movable means for sensing the position of said housing relative to a designated location on the workpiece which location determines termination of a multipass cut thread on the workpiece; and
(14) connective means connecting movement of said movable means to said shaft for moving said shaft to move said cam relative to said cam follower means which enables said upper and lower plates to move relatively along said slidable dovetail at urging of said resilient means and wherein said resilient means is released for operation only after operation of said sensing means.

4,186,632
CUTTING SYSTEM FOR SLAB-TYPE MATERIALS

Elmer N. Leslie; Bobby Higgins, both of Dallas, and Joe T. Huff, Garland, all of Tex., assignors to Camsco, Inc., Richardson, Tex.
Filed Jul. 7, 1978, Ser. No. 922,703
Int. Cl.² B26D *5/00*
U.S. Cl. 83—13 **18 Claims**

1. A method of cutting component parts from a slab comprising the steps of:

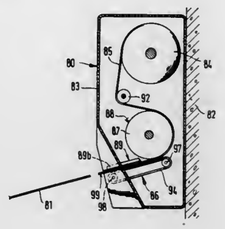
placing at least a first slab in a first measurement device and measuring the dimensions of said first slab;
transmitting the dimensions to a marker-making device for generating a marker;



transporting at least said first slab from said first measurement device to a first cutting device while generating the marker in the time interval of transportation; and
cutting at least said first slab in said first cutting device using the generated marker to define the patterns to be cut in said slab.

4,186,633
APPARATUS FOR DISPENSING SHEETS OF WEB MATERIAL OF PREDETERMINED LENGTH

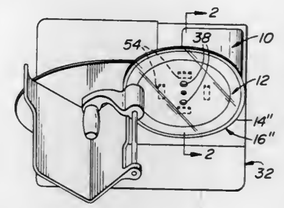
Manfred Baumann, and Walter Besserer, both of Diepoldsau, Switzerland, assignors to Apura GmbH, Mainz-Kostheim, Fed. Rep. of Germany
Filed Apr. 18, 1978, Ser. No. 897,453
Claims priority, application Switzerland, Apr. 19, 1977, 004859/77
Int. Cl.² B65H *35/08*
U.S. Cl. 83—155 **16 Claims**



1. An apparatus for dispensing sheets of web material of predetermined length from a supply of the web material comprising:
a housing;
means for storing the supply of web material in the housing,
separating means comprising a bladed roller having thereon a blade having a width at least equal to the width of the web material arranged in the housing and operable in response to a user of the apparatus pulling from the housing the free end of web material in the storing means, to separate a sheet of the web material from the remainder and to leave at least a portion of the leading edge of the remainder of the web available to be gripped by a subsequent user,
conveying means arranged to engage the web over a part of its width,
non-positive drive means operable between the bladed roller and the conveying means, and
a pressure device arranged to urge the web into engagement with the conveyor means.

4,186,634
SLICING MACHINE CLEANING GUARD

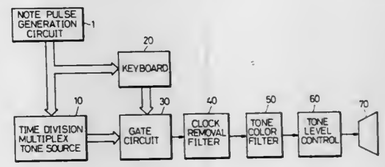
Joseph Akczinski, Sr., 317 Shipley Ave., Glen Burnie, Md. 21061
Filed Sep. 27, 1978, Ser. No. 946,315
Int. Cl.² B26D *7/22*
U.S. Cl. 83—478 **10 Claims**



1. A slicing machine cleaning guard to aid a user in cleaning the rear surfaces of a rotary slicing blade having a substantially planar frontal cutting surface, said rotary slicing blade adapted for rotary displacement with respect to a housing of said slicing machine, wherein the improvement comprises:
(a) a rotary blade cover element mounted to said slicing blade frontal cutting surface in contiguous interface throughout said frontal surface, said cover element extending beyond a cutting edge of said slicing blade throughout an entire circumference of said cutting blade; and,
(b) means for securing said rotary blade cover element to said housing of said slicing machine.

4,186,635
ELECTRONIC MUSICAL INSTRUMENT

Eiichiro Aoki, and Akira Nakada, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jul. 1, 1977, Ser. No. 812,377
Claims priority, application Japan, Jul. 9, 1976, 51/81516
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **3 Claims**



1. A polyphonic keyboard electronic musical instrument comprising:
a timing generator providing a repetitive set of time division multiplex timing signals, each signal in said set occurring at a unique time slot allotted to a particular corresponding musical note;
a numerical value generation circuit for generating numerical values corresponding to frequencies of respective notes on a time shared basis in synchronism with the multiplex timing signals for each corresponding note;
an adder circuit for implementing the cumulative addition of said numerical values for each of the notes at each time slot allotted to said note in synchronism with the multiplex timing signals for each such note and producing carry signals as results of the respective cumulative additions, the carry signals for each note also occurring in the time slot allotted to that note; the envelopes of the carry signals for each note constituting rectangular wave tone signals having frequencies established by the respective added

numerical values and being multiples of the corresponding musical note frequencies;

frequency dividing means for producing rectangular tone wave signals in a plurality of octaves for each of said notes on a time shared basis by frequency dividing the carry signals, and

a tone selection circuit for selecting by gating to an output the rectangular wave tone signal in the octave to which the note of a depressed key belongs from among said plural rectangular wave tone signals produced by said frequency divider means at the time slot corresponding to said note for the depressed key.

4,186,636

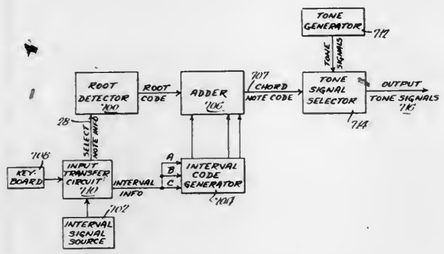
DIGITAL CHORD GENERATION FOR ELECTRONIC MUSICAL INSTRUMENTS

Patrick S. Roberts, Rolling Meadows, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Continuation of Ser. No. 624,416, Oct. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 603,859, Aug. 11, 1975, Pat. No. 4,046,047. This application Sep. 19, 1977, Ser. No. 834,686

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **21 Claims**



1. In an electrical musical instrument having means for generating tone signals corresponding to note codes applied thereto, the improvement comprising:

note means for developing a note code representative of a number value corresponding to a selected note;

interval means for developing an interval code representative of a number value corresponding to the distance between notes with the number value increasing as an arithmetic progression over a range of notes as the distance between notes increases; and

an adder for arithmetically adding the number values of the note code and the interval code to generate a new number value corresponding to a new note code for a new note which is spaced from the selected note by the distance between the notes.

4,186,637

TONE GENERATING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Richard S. Swain, Des Plaines, and Douglas R. Moore, Vernon Hills, both of Ill., assignors to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Sep. 22, 1977, Ser. No. 835,832

Int. Cl.[2] G10H *1/00, 1/02, 5/06*

U.S. Cl. 84—1.01 **21 Claims**

1. A tone generator system for a polyphonic electronic musical instrument, comprising note selection means, a plurality of primary programmable tone generators each assignable to play any of the notes within a selected musical range, said plurality being equal to a selected maximum number of notes within said range which may need to be played, said generators including priority assignment logic responsive to said note selection means and arranged to assign the selected notes to respective ones of said generators, said logic being further arranged to preclude the assignment of any note in any octave to more than one of said primary tone generators, and at least one special function programmable tone generator in addition to said primary generators, said special function generator having priority note assignment logic arranged to assign to it the same note in the same octave as is assigned to one of said primary generators whereby said note is singled out for special treatment.

4. A tone generator system for a polyphonic electronic musical instrument, the instrument having player-operated means for indicating the note or notes to be sounded, comprising:

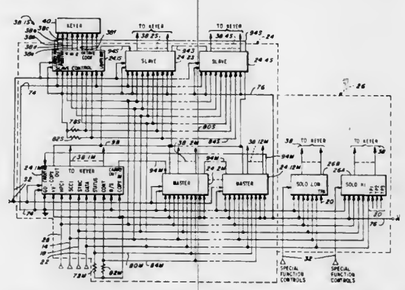
a plurality of storage means, each adapted to store a coded representation of a single note to be sounded;

means responsive to an indication that a note is to be sounded for storing a coded representation of the note in a selected one of said storage means;

a source of high frequency clock signal;

a separate programmable frequency divider for each of said storage means, each of said dividers being adapted to receive the clock signal and to divide the frequency of said signal by a factor which is a function of the code stored in the corresponding storage means to produce an output signal at the frequency of the note having its code stored in said storage means;

means for detecting the storage of a note having a predetermined musical scale relationship to the other notes to be sounded;



and means responsive to said detecting means for storing a coded representation of the detected note in a particular one of said storage means.

17. A tone generator system for a polyphonic electronic musical instrument having player-operated means for indicating the note or notes to be sounded, comprising:

a plurality of storage means, each adapted to store a coded representation of a single note to be sounded;

means responsive to an indication that a note is to be sounded for storing a coded representation of the note, including both note and octave or fractional octave information in a selected one of said storage means;

a source of a high frequency clock signal;

a separate programmable frequency divider for each of said storage means, each of said dividers being adapted to receive the same undivided clock signal and to divide the frequency of said signal by a factor which is a function of the code stored in the corresponding storage means to produce an output signal at the frequency of the note having its code stored in said storage means;

and means for selectively causing pulses to be added to or dropped from the pulses coming from said high frequency clock signal source and applied to at least selected ones of said programmable dividers, including means responsive to the octave or fractional octave information in the corresponding storage means for modifying the rate at which clock pulses will be added or dropped as a function of the octave or fraction of an octave in which said note occurs.

4,186,638

KEYBOARD DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

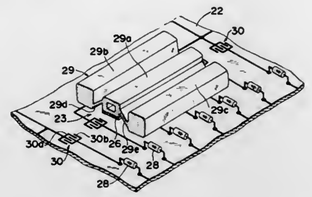
Masakatu Iijima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 8, 1978, Ser. No. 913,840

Claims priority, application Japan, Jun. 16, 1977, 52-78790[U]

Int. Cl.[2] G01H *1/00*

U.S. Cl. 84—1.01 **6 Claims**



1. A keyboard device for an electronic musical instrument, comprising:

a set of keys,

a corresponding set of switches each associated with a respective key, each switch having a stationary contact,

a movable contact that is common to a plurality of keys corresponding to the notes of one octave, depression of any one or more keys in said one octave causing a corresponding portion or portions of said common movable contact to complete an electrical circuit with the corresponding one or more stationary switch contacts, and

note scanning circuitry for providing signals in time sequential order to said stationary switch contacts, so that upon depression of one or more of said plurality of keys, signals in time slots corresponding to the respective note names of the depressed keys are outputted through said common movable contact.

4,186,639

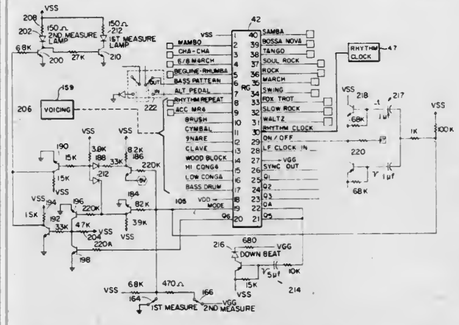
RHYTHM GENERATOR FOR ELECTRONIC ORGAN

John W. Robinson, and Ralph N. Dietrich, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jan. 5, 1978, Ser. No. 867,112

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **15 Claims**



1. A method for generating rhythm pulses in an electronic musical comprising:

storing a first plurality of rhythm patterns and a second plurality of rhythm patterns in a memory,

producing a series of cyclically repeating binary word counts which are rhythmically spaced and which each includes a most significant bit and a plurality of least significant bits,

selecting a pattern from each of the first and second plurality of patterns, and

addressing the memory by means of the least significant bits of the series of counts to call forth one of the selected patterns to produce a series of rhythm pulses when the most significant bit of count is at a logic 1 and to call forth the other of the selected patterns to produce an alternative series of rhythm pulses when the most significant bit of the count is at a logic 0.

4,186,640

ELECTRONIC MUSICAL INSTRUMENT

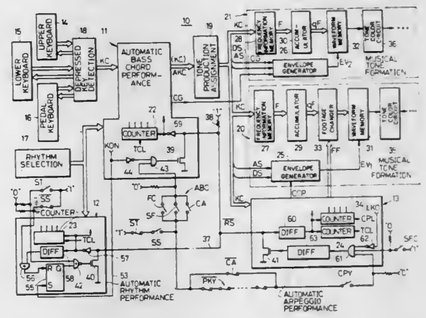
Teruo Hiyoshi; Akira Nakada; Yasuji Uchiyama; Eiichi Yamaga, and Eiichiro Aoki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Feb. 13, 1978, Ser. No. 876,913

Claims priority, application Japan, Feb. 16, 1977, 52-15920

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **5 Claims**



1. An electronic musical instrument including a plurality of automatic performance devices of different functions, said instrument comprising:

a common control line connecting said automatic performance devices to one another,

each one of said automatic performance devices comprising:

a control signal delivery circuit which, in response to a performance stop instruction provided to that one automatic performance control device, delivers out a control signal on said common control line, and

a control signal receiving circuit which detects presence or absence of the control signal on said common control line and thereby controls the performance operation of that one automatic performance device.

4,186,641

WIRELESS TOY MUSICAL INSTRUMENT

Steven R. Dorfman, Fairfield, Conn., assignor to Carnival Toys, Inc., Bridgeport, Conn.

Filed Jun. 22, 1978, Ser. No. 918,087

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.16 **14 Claims**

1. A wireless toy musical instrument for transmitting the output thereof to a separate receiver means comprising:

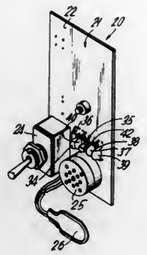
a hollow body member;

non-metallic string means for generating an audio signal disposed on said hollow body member;

sound transducer microphone means for converting said audio signal to a varying electrical signal, said sound transducer means being disposed within and bonded to said body member such that it fixedly abuts against the inner surface of said hollow body member, said sound transducer microphone means generating a voltage output which varies in accordance with the different sounds

received from said string means and the vibrational forces mechanically transmitted from said hollow body member to said sound transducer microphone means;

circuit means for generating a carrier signal having a predetermined radio frequency, said circuit means including an LC circuit;



circuit means for combining said varying electrical signal with said carrier signal to effect a frequency modulation and amplitude modulation of said carrier signal; and

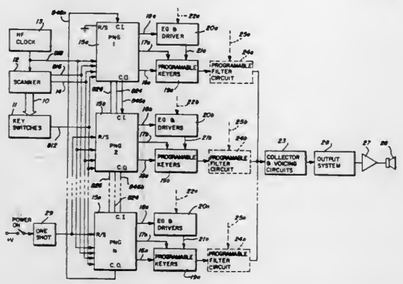
switch means for connecting a power source to said carrier signal generating means, said inductor of said carrier signal generating means radiating the modulating carrier signal to said separate receiver means for detection and demodulation.

4,186,642

PROGRAMMABLE CIRCUITS FOR ELECTRONIC MUSICAL INSTRUMENTS

Glenn Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Sep. 22, 1977, Ser. No. 835,695
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **72 Claims**



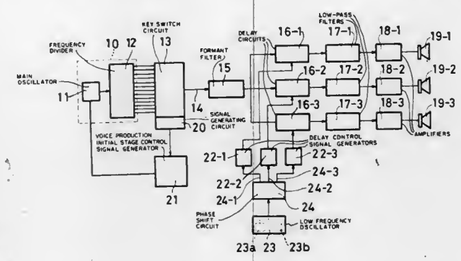
1. In an electronic musical instrument having musical note selection means producing a first control signal for note selection purposes, and circuit means for producing electrical tone signals, said circuit means including at least one circuit which is frequency-dependent by virtue of the fact that it has means defining a critical charging or discharging rate, which critical rate is suitable for operation only over a limited musical frequency range, and note assignment means responsive to said note selection signal to assign said frequency-dependent circuit to participate in the production of a tone signal within a range of musical frequencies exceeding its limited operating range; the improvement wherein: said note assignment means produces a second control signal for programming purposes, and said circuit means includes programming means responsive to said program control signal for adjusting said critical charging or discharging rate to suit the frequency of a selected musical note which is assigned to said frequency-dependent circuit by said note assignment means.

4,186,643

APPARATUS FOR CHORUS EFFECT IN ELECTRONIC MUSICAL INSTRUMENTS

Kouji Nishibe, Okegawa, and Nobuaki Kondo, Saitama, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Apr. 26, 1978, Ser. No. 900,645
Claims priority, application Japan, Feb. 7, 1978, 53-11988
Int. Cl.[2] G10H *1/06, 5/00*
U.S. Cl. 84—1.24 **8 Claims**



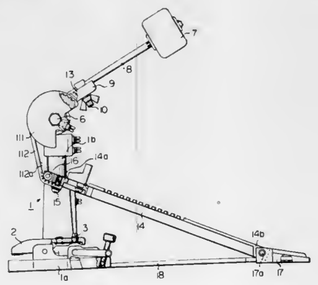
1. Apparatus for chorus effect in an electronic musical instrument comprising: a musical tone signal generator; a passing circuit for a musical tone signal obtained from said musical tone signal generator; a plurality of variable delay circuits connected to said passing circuit; a plurality of delay control signal generators for generating a plurality of delay control signals, said variable delay circuits being individually controlled by said plurality of delay control signals generated by said delay control signal generators; said passing circuit for the musical tone signal having a formant filter interposed therein and a keying signal generating circuit; a voice production initial stage change control signal generator having an output terminal; an output terminal on said keying signal generating circuit and being connected to said voice production initial stage change control signal generator; said output terminal of said voice production intial stage control signal generator being connected to said musical tone signal generator.

4,186,644

FOOT PEDAL ASSEMBLY FOR DRUMS

Makoto Kurosaki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 14, 1977, Ser. No. 815,655
Claims priority, application Japan, Jul. 16, 1976, 51/94548[U]
Int. Cl.[2] G10D *13/02, 13/00*
U.S. Cl. 84—422 R **1 Claim**



1. A foot pedal assembly for percussion musical instruments, comprising:

a pedal frame; an axially rotatable main shaft substantially horizontally carried by said pedal frame;

a rocker cam which is fixedly mounted on and is rotatable with said main shaft and connected to a percussion head; said cam having spaced apart peripheral indentations running in the axial direction of said rocker cam and said cam indentations defining teeth between the indentations around the periphery of said cam;

a foot pedal spaced from and movable with respect to said cam;

a strap of resilient sound-deadening material longitudinally reinforced with substantially non-stretchable elements and fixedly connected at one end to the periphery of said rocker cam; said strap being connected at the other end to said foot pedal to be moved by movement of said foot pedal; said strap having transverse indentations defined on one surface thereof and running in the width direction across said belt; said strap indentations being so shaped and spaced and said foot pedal and said strap being so oriented and positioned and being movable so that said strap indentations are meshingly engageable with said teeth of said cam and the length portion of said strap which is wrapped over said cam periphery being thus meshingly engaged; said strap indentations being on at least that portion of said strap that can pass in contact with said cam as said foot pedal is operated;

further comprising a guide roller rotatably mounted to said foot pedal and about which said strap is entrained as said strap extends to the location at which it is attached to said foot pedal;

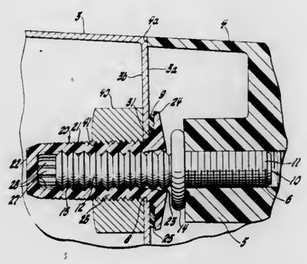
in which said guide roller is provided with peripheral indentations that define teeth on said guide roller and the teeth run in the axial direction of said guide roller and said strap is provided with said indentations which are meshingly engageable with said teeth of said guide roller; said indentations being formed on at that portion of the surface of said strap which is to be entrained about and in contact with said guide roller teeth.

4,186,645

PLASTIC PLUG, NUT AND STUD FASTENER ASSEMBLY

Wieslaw S. Zaydel, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,644
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—83 **2 Claims**



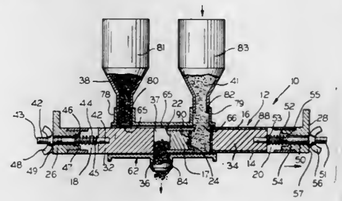
1. A fastener assembly for securing a first member to a second member having at least one aperture therethrough, said fastener assembly including a plastic push-on stud retainer having a flange head portion adapted to be in close proximity to one side of the second member and an integral axially elongated tubular wall portion, defining a hollow crown portion closed by an end wall, extending from said flange head portion and frictionally engaged in the aperture of the second member with said end wall being positioned outward from the opposite side of the second member, said crown portion providing a throat portion adjacent said flange head portion that opens into a socket cavity within said hollow crown portion and a plurality of circumferentially spaced apart longitudinal ribs extending radially inward from said tubular wall portion to define a stud receiving opening having an original, as fabricated, predetermined minor internal diameter, a stud fixed at one end to said first member, said stud having a shank with a series of annular retention grooves thereon extending outward from said first member to project into said stud receiving opening in said hollow crown portion of said push-on stud retainer, the major outside diameter of said shank being complementary to said minor internal diameter of said stud receiving opening whereby said first member is frictionally supported by said second member, and nut means having a bore therein provided with internal threads threaded onto said hollow crown portion of said push-on stud retainer whereby said internal threads cause the material of said longitudinal ribs of said hollow crown portion to flow radially inward into said annular retention grooves to lock said push-on stud retainer to said shank of said stud.

4,186,646

ADJUSTABLE CHARGING BAR

Carl D. Martin, 18824 Grade School Rd., Caledonia, Ill. 61011

Continuation of Ser. No. 389,121, Aug. 17, 1973, abandoned.
This application Feb. 13, 1978, Ser. No. 877,256
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—29 **4 Claims**



1. A charging bar for loading or reloading shells and cartridges comprising:

a body having at least one elongated compartment therein;

a resilient sealing liner disposed entirely within and lining said compartment and closing one end thereof;

a piston movable in said compartment within said liner, and resilient seal means carried by the inner end of said piston for cooperation with said liner to define a measuring chamber for receiving a substance used in said shells, said liner sealing the space between said piston and said body and cooperating with said seal means to inhibit the passage of the substance therebetween from the measuring chamber.

4,186,647

MULTIPLE AREA REAR LAUNCH TUBE COVER

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Aug. 9, 1978, Ser. No. 932,245
Int. Cl.[2] F14F *3/04*
U.S. Cl. 89—1.8 **8 Claims**

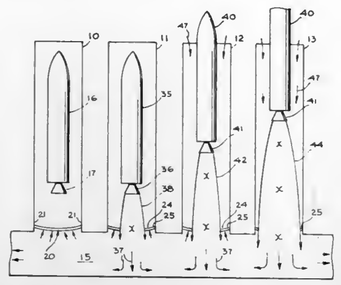
1. Apparatus for normally closing one end of a launch tube for exhaust-propelled vehicles and for opening the end of the launch tube in response to the exhaust plume of the vehicle, said apparatus comprising:

a launch tube;

a duct disposed adjacent said launch tube for conducting away the exhaust of the vehicle; and

a cover for normally blocking connection between said launch tube and said duct, said cover having at least one

frangible central section capable of breaking in response to the pressure of the exhaust plume of the vehicle, thereby



to establish connection between said launch tube and said duct.

4,186,648

ARMOR COMPRISING BALLISTIC FABRIC AND PARTICULATE MATERIAL IN A RESIN MATRIX

Carol W. Clausen, and Eugene J. Davis, both of 1715 E. Florence, Los Angeles, Calif. 90001

Continuation-in-part of Ser. No. 804,230, Jun. 7, 1977, abandoned. This application May 1, 1978, Ser. No. 901,327
Int. Cl.[2] B32B *5/28;* **F41H** *1/02, 5/00*
U.S. Cl. 89—36 A **19 Claims**

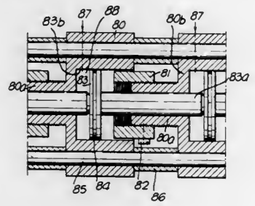
1. An armor laminate structure comprising a resin matrix with oppositely disposed front and rear surfaces and containing a filler of metal abrading particulate material and flexible woven ballistic fabric in supported engagement within the matrix and particulate material.

4,186,649

REGULATORS

Nils E. Sundstrom, Sodertalje, Sweden, assignor to AB Westin & Backlund, Stockholm, Sweden

Filed Mar. 1, 1977, Ser. No. 773,298
Claims priority, application Sweden, Mar. 3, 1976, 7602985
Int. Cl.[2] F01B *7/00;* **F15B** *15/24*
U.S. Cl. 91—170 R **4 Claims**



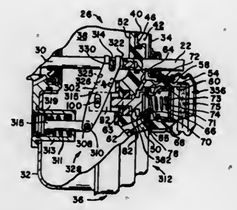
1. In a regulator comprising a number of units connected in series, each of which units comprise a fixed body, and, for axial movement, a pressure transmitting element displaceable relative to that body, said pressure transmitting element via a shaft cooperating with the pressure transmitting element of the next adjacent said unit and said shaft in combination with the shafts of the other said units providing an output shaft that effectively extends through the regulator, said units when assembled defining a corresponding number of pressure chambers to which a working medium can be fed and from which said working medium can be discharged in dependence upon control means, the improvement which comprises: (a) said fixed body in each unit has a pressure wall and an open end, (b) between the pressure wall and the pressure transmitting element there is defined a said pressure chamber, (c) there is provided for the output shaft of each pressure chamber of each said unit a stop means is (i) adjustable over a range of movement for limiting axial movement of its associated pressure transmitting element (ii) located outside of each said pressure chambers of the regulator, and (iii) comprises setting and locking means and (d) said pressure wall of each fixed body has an external hub along which a sleeve can be adjusted in continuous manner to adopt different axial positions relative to the fixed body, thereby affording said adjustable stop means.

4,186,650

INTERNAL FORCE MULTIPLIER FOR A SERVOMOTOR

Oswald O. Kytta, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 736,665, Oct. 28, 1976, Pat. No. 4,086,842. This application Feb. 17, 1978, Ser. No. 878,841
Int. Cl.[2] F15B *9/10, 13/10, 15/02*
U.S. Cl. 91—369 A **3 Claims**



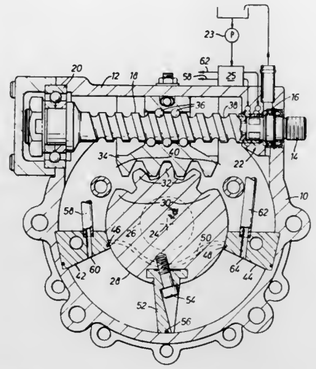
1. A servomotor comprising:
a housing having a cavity therein;
wall means for dividing said cavity into a first chamber and a second chamber, said first and second chambers being connected to a source of vacuum;
valve means in said wall means for interrupting the communication of vacuum to said second chamber and allowing an operational fluid to be communicated to said second chamber to produce a pressure differential across said wall means;
an input push rod member;
an output push rod member extending from said housing and attached to said input push rod member for supplying a mechanism with an operational force;
a first pivot pin attached to said output push rod member;
a cylindrical member connected to said wall means and engaging said valve means;
a second pivot pin attached to said cylindrical member; and
lever means having first and second arm members, each of said first and second arm members having a first end and a second end, each of said first ends forming a pivotal connection with said housing, said first arm member and said second arm member each having a first and second slots therein, said first pivot pin extending through said first slot in each of the first and second arms, said second pivot pin extending through said second slot in each of the first and second arms, said input push rod member moving said output push rod member in response to an operator input, said first pivot pin engaging said second ends of the first and second arms causing said lever means to pivot about said first ends and move said second pivot pin in said second slots, said movement of said second pivot pin operating said valve means to develop said pressure differential, said pressure differential causing said wall means to move and develop an output force, said output force being thereafter transmitted through said second pivot pin into said first and second arms for transmission into said output push rod member through said first pin and thereby proportionally amplify the operational force transmitted from the input push rod member.

4,186,651

HYDRAULIC POWER-ASSISTED ACTUATING ARRANGEMENTS

Alistair G. Taig, South Bend, Ind., assignor to Bendix Westinghouse Limited, Chippenham, England

Filed Jan. 9, 1978, Ser. No. 867,864
Claims priority, application United Kingdom, Feb. 24, 1977, 07939/77
Int. Cl.[2] F15B *9/10;* **F01C** *9/00;* **F01B** *9/00*
U.S. Cl. 91—375 R **3 Claims**



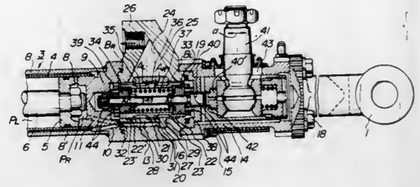
1. A hydraulic power-assisted actuating arrangement comprising:
(a) a hydraulic control means having a first rotary member and a second rotary member, said first and second rotary members being mutually rotationally coupled to vary the relative magnitudes of two hydraulic values to derive first and second hydraulic pressures in accordance with the relative rotational displacement between said first and second rotary members;
(b) a motion-translating means having an input member coupled to the second rotary member of said control means to be movable thereby, and said motion-translating means including an output portion movable by rotation of the second rotary member;
(c) a rotatable actuating member coupled to the movable output portion of said motion-translating means to be rotatable thereby; and
(d) a rotary vane hydraulic actuator means comprising a part-annular volume defined between static volume-enclosing means and the surface of a movable vane-mounting part of the rotatable actuating member, said part-annular volume being divided into first and second mutually inversely variable volumes by an angularly movable vane mounted on said movable vane-mounting part and directly connected to said rotatable actuating member, and means to convey and admit said first and second hydraulic pressures to said first and second variable volumes respectively to act on opposite major surfaces of said movable vane in such a sense as to produce a net force on said movable vane resulting in application of a torque to said rotatable actuating member in proportion to rotation of the first rotary member of said control means producing relative displacement between said first and second rotary members and tending to turn said rotatable actuating member in the same rotational direction as the rotation of said first rotary member acting through said motion-translating means;
said vane-mounting part having a cylindrical peripheral surface and said static volume-enclosing means sealingly engaging said cylindrical peripheral surface to substantially enclose said part-annular volume.

4,186,652

SERVO VALVE FOR POWER STEERING BOOSTER

Masanori Kouda, Atsugi, Japan, assignor to Atsugi Motor Parts Co., Ltd., Atsugi, Japan

Filed Dec. 27, 1977, Ser. No. 864,806
Claims priority, application Japan, Dec. 28, 1976, 51/159156
Int. Cl.[2] F15B *13/14*
U.S. Cl. 91—434 **2 Claims**



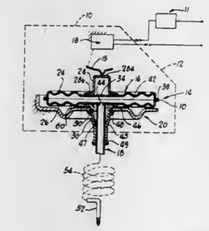
1. A servo valve in combination with a power steering booster comprising a power piston and cylinder assembly and a spool assembly, said power piston and cylinder assembly comprising a hydraulic cylinder, a reciprocatively movable piston rod and a power piston integrally clamped thereto and slidably movable within said hydraulic cylinder, said spool assembly comprising a hollow spool for controlling selective supply and discharge of pumped hydraulic pressures onto and from both sides of said power piston, a pair of reaction pistons having different pressure receiving areas corresponding to those on both sides of said power piston and slidably fitted within ends of said hollow spool to form a reaction hydraulic chamber therebetween, a reaction spring interposed between said reaction pistons against which said reaction pistons slidably move within said spool and having a steering input transmission shaft passing through said reaction pistons, and cover plates being retained by the ends of said steering input transmission shaft for closing the ends of said hollow spool, said spool assembly further comprising reaction support pins respectively held in guide holes formed in said cover plates between said respective reaction pistons and partitions located at ends of a housing forming the servo valve body, said housing slidably accommodating said spool assembly and including ports for said selective supply and discharge of hydraulic pressures.

4,186,653

BELLOWS ASSEMBLY AND METHOD OF MAKING THE SAME

Walter V. Hobbs, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

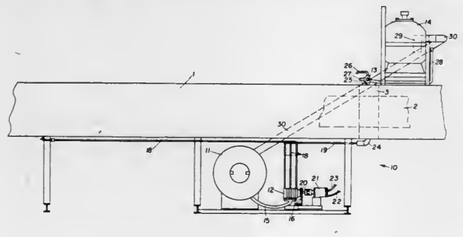
Filed Nov. 1, 1977, Ser. No. 847,427
Int. Cl.[2] F16J *3/04*
U.S. Cl. 92—34 **5 Claims**



1. A bellows assembly comprising:
(a) a bellows head including a thin walled flexible member defining at least part of an expansible chamber and having an aperture therein;
(b) a tube communicating with the chamber via said aperture;

(c) a rigid base member supporting said bellows head and extending along said flexible member, said base member defining an opening aligned with said aperture;
(d) a fitting interconnecting said flexible member, tube and base member comprising:
(i) a thin walled tubular body surrounding said tube and extending through said base member opening;
(ii) a flange disposed between said base member and said flexible member, said flange bonded to said flexible member about said aperture so that said aperture is aligned with said tubular body;
(iii) an outwardly upset fitting body portion engaged with said base member outwardly from said base member opening and exerting a force acting on said base member in the direction of said bellows head to firmly clamp said base member and said bellows head together; and,
(iv) means interposed between said fitting and said base member opening for locking against relative rotation; and
(e) bonding means for securing said tube in said body member.

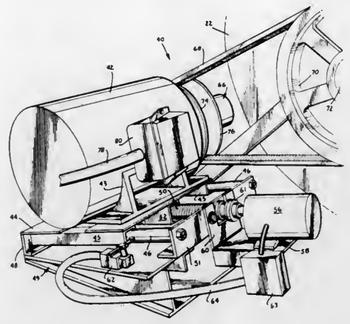
4,186,654
RECIRCULATING LUBRICATION SYSTEM
David G. Scott, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed May 18, 1978, Ser. No. 906,899
Int. Cl.[2] F01B *31/00*
U.S. Cl. 92—78 **2 Claims**



1. An improved lubrication system for the seal means retained within the packing gland of the fluid end of a multiplex pump having reciprocating piston means therein sealingly engaged by said seal means, said improved lubrication system having lubricant reservoir means containing lubricant therein, wherein the improvement in said lubrication system comprises:
positive displacement pump means connected to said lubricant reservoir means supplying said lubricant to said seal means;
filtration means filtering contaminants from said lubricant after exiting from said seal means but before the return thereof to said lubricant reservoir means; and
three-way two-position valve means to direct the flow of said lubricant from said seal means, said three-way two-position valve means operable between a first position directing the flow of said lubricant fluid flow from said seal means through said three-way two-position valve means to said filtration means and a second position directing the flow of said lubricant from said seal means through said three-way two-position valve means onto said piston means.

4,186,655
METHOD AND APPARATUS FOR CONTROLLING FORCED AIR HEATING AND/OR COOLING
Lewis B. Mallory, 5370 Silver Hill Trail, Stone Mountain, Ga. 30083, and Bob W. Dean, 760 Old Ivy Rd., Atlanta, Ga. 30342
Filed May 22, 1978, Ser. No. 908,015
Int. Cl.[2] F24F *11/04, 3/00*
U.S. Cl. 98—1 **3 Claims**

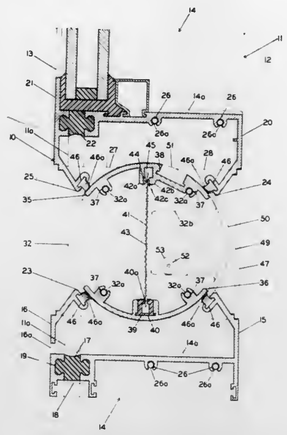
1. In a control system for heating and/or air conditioning system in a building having areas and wherein there is an air passage means such as a duct or conduit leading from a furnace of air cooling means in which there is located an air moving means such as a blower or fan for moving air, one or more individual means such as variable volume boxes located in communication with said air passage means to increase or decrease the supply of air therein, and a plurality of temperature sensing devices in different locations in a building to sense the increase or decrease of temperature therein for controlling the air moving means, the improvement comprising:
(a) a plurality of pressure sensing means located in different locations within said duuct system to sense a change of pressure therein and to generate a signal to actuate,



(b) an air moving control means which accepts the signals from the various duct pressure sensing means and compares said signals to determine the signal to send to the air moving means, and
(c) means for varying the speed of the air moving means in response to the signal received from said comparing instrument,
(d) said means for varying the speed of the air moving means comprising a pulley drive such as a belt member, a variable pulley responsive to changes in tension on said pulley drive member, and electrical drive means for changing pulley tension.

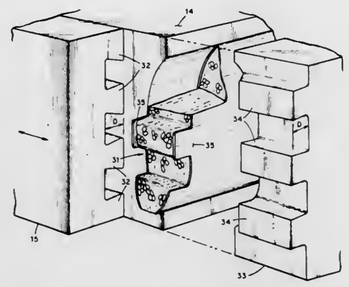
4,186,656
THERMAL BREAK VENTILATOR UNIT
Ronald J. Weber, Wausau, Wis., assignor to Wausau Metals Corporation, Wausau, Wis.
Filed Jan. 23, 1978, Ser. No. 871,218
Int. Cl.[2] E06B *7/03*
U.S. Cl. 98—99 R **13 Claims**

13. In a thermal break frame having opposed end jambs each having spaced internal and external panels connected by a structural heat transfer barrier of substantially lower heat conductivity than the connected panels, a thermal break ventilator unit comprising, in combination:
(a) spaced thermal break sections extending between and connected to the opposed end jambs to define a ventilating passage therebetween, the thermal break sections each having spaced internal and external panels connected by a structural heat transfer barrier of substantially lower heat conductivity than the connected panels, the internal and external panels of the thermal break sections respectively defining therebetween interior and exterior ventilating openings of the ventilating passage,
(b) opposed inner and outer closure panels connected in spaced relation by plates of low heat conductivity to form a closure unit positioned for movement within the ventilating passage, the inner closure panel closing the interior ventilating opening and the outer closure panel closing the exterior ventilating opening, the plates and a closed air space extending between the closure panels cooperating to provide a thermal break for interrupting the flow of heat between the panels when the closure unit is positioned in its closed position and both closure panels permitting substantially unrestricted air flow through the ventilating passage when the closure unit is positioned in its open position, the plates each having an extended arcuate support surface, and



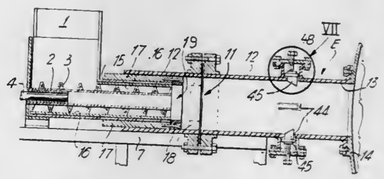
(c) at least one guide member fixedly positioned between the thermal break sections in engagement with the arcuate support surface of each plate to support the plate arcuate surface in rotatable relation with respect to the thermal break sections and permit rotational movement of the closure unit between its open and closed positions.

4,186,657
APPARATUS FOR SHEARING SPENT NUCLEAR FUEL ASSEMBLIES
Bradley S. Weil, and Curtis F. Metz, III, both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Dec. 7, 1978, Ser. No. 967,469
Int. Cl.[2] B30B *13/00*
U.S. Cl. 100—39 **5 Claims**



1. A method for shearing spent nuclear fuel assemblies of the type including an array of fuel pins disposed within an outer metal shroud into small uniform segments for subsequent dissolution of contained fuel values comprising:
(a) reducing the cross section of the fuel assembly by progressively pressing it between gags until it has a compressed end with a substantially reduced cross sectional area relative to the cross section of the uncompressed fuel assembly; and
(b) shearing segments from the compressed end of said fuel assembly by driving a movable shearing blade against one side of said compressed end while maintaining a fixed shearing blade against the opposite side of said compressed end, said fixed and movable shearing blades each having a plurality of spaced-apart, laterally projecting, generally rectangular teeth which are displaced to intermesh in a sliding contiguous relationship during a shearing operation, said fuel assembly being advanced a distance equal to or less than the lateral projection of said teeth after each shearing operation.

4,186,658
APPARATUS FOR CONVEYING PARTICULATE MATERIAL
Douglas B. Brown, Ottawa, Canada, assignor to Stake Technology Ltd., Ottawa, Canada
Division of Ser. No. 762,093, Jan. 24, 1977, Pat. No. 4,119,025.
This application Aug. 3, 1978, Ser. No. 930,677
Int. Cl.[2] B30B *9/38, 11/24*
U.S. Cl. 100—148 **3 Claims**



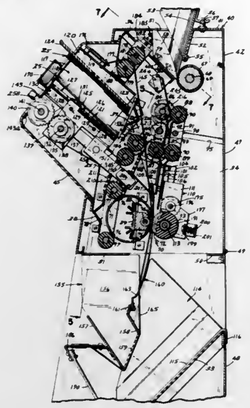
1. Apparatus for feeding a mass of material comprised of solid particles, from an outlet of hopper means to a processing means for processing of said material, said apparatus comprising, in combination:
(a) screw conveyor means for advancing said mass in a generally axial direction away from the outlet of said hopper means, towards an inlet of a tubular conduit, the outlet of said conduit being in a permanent communication with said processing means, said conduit extending generally coaxially with said conveyor means;
(b) an intermediate chamber at the discharge end of said conveyor means, said intermediate chamber being generally coaxial with said conveyor means, being located between said conveyor means and said conduit means, and normally being in a communication therewith;
(c) reciprocating piston means having a forward face end disposed at said intermediate chamber for a reciprocating movement generally coaxially with said screw conveyor means, said forward face of said piston means being turned towards said processing means, said piston means being of the type of an annular piston whose outside diameter generally corresponds to the inside diameter of said conduit, the inside diameter of said piston generally corresponding to the outside diameter of said screw conveyor means, the discharge end of said screw conveyor means being telescopically received inside said annular piston, whereby the portion of the interior of said annular piston between the discharge end of the conveyor means and the face of said piston means forms said intermediate chamber;
(d) first drive means for rotating said screw conveyor means and second drive means for reciprocating said piston means;
whereby said conveyor means is arranged to advance said mass to said intermediate chamber means, while further advance of said mass through said conduit is effected solely by compressive action of said face of the piston means.

4,186,659

MACHINE FOR ADDRESSING CARDS AND ENVELOPES

Ronald A. Rogers, Apple Valley; Ansel J. Wright, Minneapolis, and William H. Wright, Hopkins, all of Minn., assignors to Master Addresser Company, Minneapolis, Minn.

Filed Nov. 25, 1977, Ser. No. 854,611
Int. Cl.[2] B41L *45/00*
U.S. Cl. 101—47 **30 Claims**



1. A machine for reproducing material imprinted on a master element, comprising:

(a) a heating element disposed in a printing zone;

(b) a master element having indicia of heat conducting material thereon;

(c) means for feeding said master element through the printing zone;

(d) means for feeding a print receiving member through the printing zone outwardly of the master element relative to the heating element and in the same direction as said master element;

(e) a length of heat transferrable printing medium equipped flexible sheet material;

(f) means for supporting the length of flexible sheet material under predetermined tension between said master element and said print receiving member;

(g) means for intermittently advancing a predetermined length of the flexible sheet material through the printing zone against the tension of the supporting means in the same direction as said master element;

(h) and pressure means for pressing the master element, flexible sheet material and print receiving member together during movement thereof through said printing zone.

4,186,660

SCREEN-PRINTING FRAME WITH PLASTIC SIDE BARS BONDABLE TO FABRIC BY SURFACE-SOFTENING

John W. Key, 1385 Camino Teresa, Solana Beach, Calif. 92075

Filed Oct. 3, 1977, Ser. No. 838,680
Int. Cl.[2] B41F *15/36*
U.S. Cl. 101—128.1 **13 Claims**

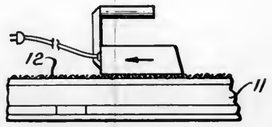
1. The method of making a printing screen consisting of a screen fabric and a frame, including the steps of:

providing a frame having at least the structural surface thereof for receiving fabric thereon formed of a plastic material capable of having its exposed surface rehardenably softened;

tensioning the fabric across said frame and in direct contact with said structural surface;

superficially softening said surface;

impressing the fabric into the softened material of said surface; and



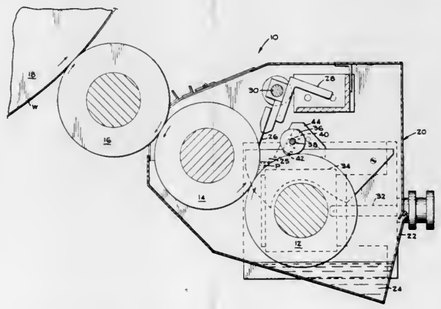
while maintaining the tension of the fabric independently of action thereon by the frame, allowing said surface to harden to secure the fabric against yielding to the tension of the fabric.

4,186,661

FLEXOGRAPHIC INKING SYSTEM INCLUDING A REVERSE ANGLE DOCTOR BLADE

William J. Vieau, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 27, 1978, Ser. No. 881,205
Int. Cl.[2] B41F *31/06, 5/18*
U.S. Cl. 101—178 **4 Claims**



1. A flexographic printing station for imparting a graphic pattern to a web supported by a platen roll, said station comprising a pan containing a supply of ink, a fountain roll, an anilox roll containing a graphic cell pattern forming a nip with said fountain roll, and a plate cylinder for transferring a pattern from the plate cylinder to the web; said pan being located below the centers of both said fountain roll and said anilox roll, said fountain roll being partially immersed in the ink supply, mean for mounting said fountain roll and said anilox roll for rotation in opposite directions so that the outer surfaces of said rolls at said nip move in the same upward direction, said surfaces being spaced apart to define a gap through which ink from the ink supply is fed by said fountain roll to a wedge-shaped cavity defined by the outer surfaces of said rolls above a line containing the centers of said rolls at said nip so that a pool of ink coating said anilox roll is produced, a doctor blade disposed at a reverse angle in contact with said anilox roll, and means adjacent said wedge-shaped cavity and in contact with said fountain roll for restricting the return of ink to said pan to thereby maintain a supply of ink in said wedge-shaped cavity.

4,186,662

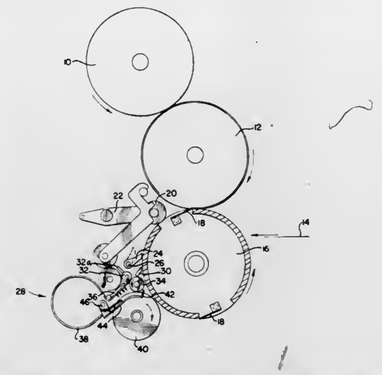
DUPLEXING COPYING SYSTEM

Lawrence Borneman, Lombard, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Aug. 22, 1977, Ser. No. 826,847
Int. Cl.[2] B41F *5/02, 13/28, 21/04, 21/08*
U.S. Cl. 101—218 **14 Claims**

1. In a duplicating system for duplicating images on both sides of copy sheets including a surface for carrying first and second images transferable to the copy sheets, a carrier, drive

means for moving said surface and carrier in unison, means for feeding the copy sheets between the surface and the carrier, gripper means associated with the carrier for gripping edges of said sheets and for holding the sheets on the carrier, said gripper means comprising first and second grippers for separately holding sheets on the carrier, said feeding means feeding each sheet to the first gripper whereby the leading edge of each sheet is engaged by the first gripper and each sheet is moved between the image carrying surface and carrier, said feeding being synchronized with the movement of the first image on the image carrying surface for transfer of said first image to one side of each sheet, and means for releasing said sheet from said first gripper, the improvement in means for handling said sheets after release and for re-feeding said sheets to said second



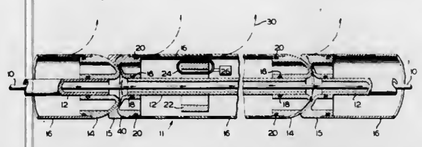
gripper, said handling and re-feeding means comprising fixed stripper means positioned adjacent said carrier, sheet drive means positioned beyond said stripper means, a sheet reversing station, said sheet drive means directing each sheet to said reversing station, said reversing station including second sheet drive means movable in a direction opposite said first mentioned sheet drive means for re-feeding the sheets to said carrier, said second gripper engaging the formerly trailing edge of said sheets opposite the edge held by said first gripper, said sheets being re-fed to said second gripper in synchronism with the second image on said image bearing surface for duplication of said second image on the opposite side of each sheet, and means for releasing said sheets from said second gripper for delivery of the sheets to a receiving area.

4,186,663

TRANSFORMER MOVABLE ALONG POWER CABLE

Westley F. Curtis, 9499 MacArthur Blvd., Washington, D.C. 20854

Filed Feb. 3, 1958, Ser. No. 713,070
Int. Cl.[2] B63G *9/00;* **F42B** *22/26*
U.S. Cl. 102—18 MS **9 Claims**



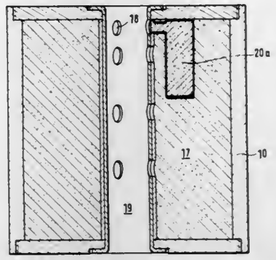
6. A torpedo detecting and explosive charge carrying mechanism comprising an electrically conductive cable, a shielding means adapted to slide on said cable for minimizing the effect of electrically induced eddy currents, and means for transferring power from said cable mounted within said shielding means.

4,186,664

SMOKE PROJECTILE CHARGE AND PROCESS FOR ITS MANUFACTURE

Paul Huber, Haus Nr. 9, 8234 Unterjettenberg; Alois Schiessl, Hochfeldstrasse 26, 8231 Weissbach-Marzoll, and Hartmut Krone, Bertholdstrasse 4, 7844 Neuenburg, all of Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 752,637
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1975, 2555323
Int. Cl.[2] F42B *13/14;* **C06B** *33/02*
U.S. Cl. 102—66 **7 Claims**



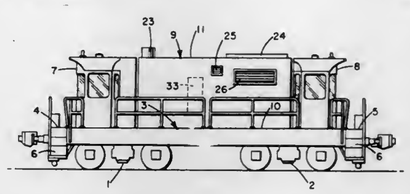
1. A shell filling of smoke pots which are stacked one above the other in the firing direction in the shell casing and which comprise a closed metal housing comprising a smoke charge completely filling the housing, the smoke charge being formed by high compression under a pressure of at least 1300 kp/cm^2, whereby the compressed smoke charge contributes substantially to the support of the above-stacked charges and provides a self-supporting smoke charge structure, wherein the smoke charge incorporates an ignition charge, the smoke charge and the ignition charge being compressed together to form a common block of uniform compression, and wherein the smoke charge comprises a chlorinated organic compound, zinc oxide and metal powder, the zinc oxide being calcined at at least 900° C. before being mixed with other components of the smoke charge, whereby the smoke charge possesses enhanced storage stability.

4,186,665

LOCOMOTIVE ENGINE HOUSING ARRANGEMENT

Hendrikus de Jong, Castricum, and Joseph A. Welboren, Heemskerk, both of Netherlands, assignors to Hoogovens Ijmuiden, B. V., Ijmuiden, Netherlands

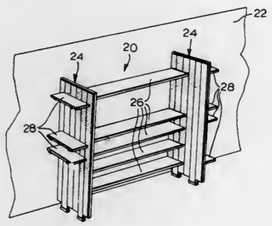
Filed Oct. 31, 1977, Ser. No. 847,104
Claims priority, application Netherlands, Nov. 9, 1976, 7612405
Int. Cl.[2] B61C *5/00, 17/04;* **B61D** *39/00, 49/00*
U.S. Cl. 105—456 **7 Claims**



1. A railway locomotive having at least one cab at one end thereof for an operator, an engine and associated apparatus intermediate the ends of said locomotive a unitary movable enclosure, rectangular in plan, having a roof, two side walls and two end walls enclosing and covering the said engine and associated apparatus, and power-operated lifting means comprising four vertical screw jacks positioned within the enclosure when enclosing said engine, and associated apparatus, two

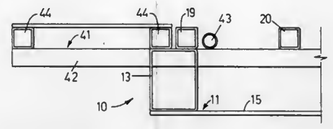
synchronized alternating-current motors and a common drive for each two of said jacks for lifting the said enclosure upwardly as a unit to provide access to the said engine and associated apparatus, two of said screw jacks being at each longitudinal end of the enclosure coupled by said common drive shaft extending along the short side of the enclosure, each said drive shaft being driven by said synchronized alternating-current motor, whereby when driven from a common suitable current supply, the two drive motors drive all four screw jacks at the same speed, the said side and end walls of the enclosure having sound-insulating material on their inner faces and the cab having a wall adjacent to and spaced from one of the said end walls of the enclosure in the closed position thereof.

4,186,666
WALL UNIT
Reuben Honickman, Ste. 4B, 66 Collier, Toronto, Canada (M4W 1L9)
Filed May 5, 1978, Ser. No. 903,322
Int. Cl.[2] A47B *41/04*
U.S. Cl. 108—29 **8 Claims**



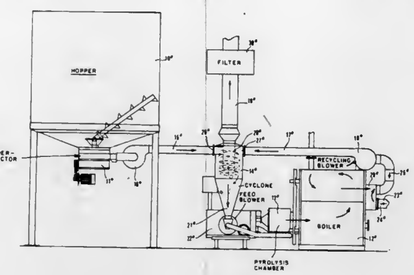
1. A wall unit comprising a relatively rigid, self-supporting panel having a generally flat outer surface and which is adapted to be supported in use with said outer surface generally vertical, said panel being of a rectangular shape and of a substantial width selected to allow a shelf to be positioned across the width of and supported solely by the panel with the ends of the shelf disposed adjacent opposite sides of the panel, said panel being formed with an array of openings which cover substantially the whole of its outer surface and which are arranged in a multiplicity of vertical rows spaced equally from one another with the openings in each row in horizontal alignment with corresponding openings in adjacent rows, said openings extending through the panel to an inner surface thereof and being adapted to co-operate with article supporting elements engageable in selected ones of said openings for supporting articles from the unit, whereby said array of openings allows the article supporting elements to be selectively distributed over said outer surface of the panel in a variety of vertically and horizontally spaced positions and allows a correspondingly wide range of positions for articles supported by said elements, said panel being made up of a plurality of tubular members secured together side by side, each member itself comprising two identical channel elements having generally flat bases and secured together with their channels facing inwardly, each said element having two side flanges disposed generally normal to the base of the element, the edges of said flanges being secured together to form said tubular members, whereby the bases of said channel elements co-operate with the bases of the channel elements of adjacent members in the panel to form front and rear walls of the panel.

4,186,667
MULTI-PURPOSE PALLET
Terence D. Seabrook, 944-956 South Rd., Edwardstown, Australia
Filed Jun. 2, 1978, Ser. No. 911,965
Int. Cl.[2] B65D *19/30*
U.S. Cl. 108—53.5 **7 Claims**



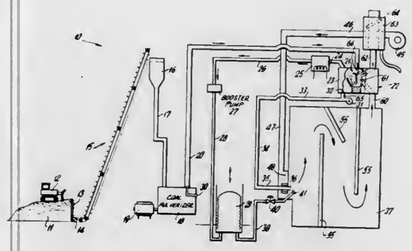
1. A pallet having a base frame, a load frame, a pair of side frames, and a pair of end rails,
a plurality of spacers joining the base frame to the load frame, said spacers comprising tubular section corner members extending vertically and constituting sockets,
each said side frame having posts with depending ends releasably insertable in respective said sockets to be supported thereby to be upstanding therefrom,
each said end rail having retaining means releasably interengageable with the side frames and operable to retain the upper ends of the side frames in spaced relationship with each other,
support shelves provided on said corner spacers,
a pair of outrigger frames releasably engageable with the load frame and arranged to project outwardly from the ends thereof, each outrigger frame having projecting beams which lie beneath the load frame, a bearer interconnecting the beams of each outrigger frame, said bearer having end portions which are restable upon a pair of said shelves.

4,186,668
SYSTEM FOR THE PYROLYTIC COMBUSTION OF LIGNEOUS AND OTHER WASTES
Rene Tabel, Laroquebrou, Cantal, France
Filed Jan. 26, 1978, Ser. No. 872,503
Claims priority, application France, Jan. 26, 1977, 77 03550; May 17, 1977, 77 15823; Oct. 13, 1977, 77 31393
Int. Cl.[2] F23G *5/12*
U.S. Cl. 110—213 **18 Claims**



1. A system provided with a pyrolytic burner cooperating with a boiler for effecting the combustion of a mixture of divided waste such as ligneous waste entrained in a stream of air to produce heat, said burner comprising:
A. an enclosure defining a pyrolysis chamber having inlet and outlet openings, the mixture being blown into the inlet opening and being advanced in said chamber in a flow path from the inlet to the outlet opening;
B. a metal thermally-conductive core having an elongated form disposed in said enclosure and extending substantially from the inlet to the outlet opening thereof to transfer some of the heat of combustion from the outlet opening to the inlet opening; and
C. means to retard the advance of said mixture in said chamber, said means being constituted by a metallic element having pores therein to define a grid or screen-like structure which divides the chamber into an upstream section and a downstream section with respect to said flow path, the transfer of heat by the core being in a direction opposed to the flow path direction whereby pyrolysis of the mixture takes place in the vicinity of the inlet opening and combustion is substantially complete at the outlet opening.

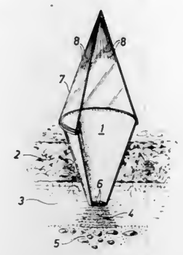
4,186,669
COAL BURNING PROCESS
Frederick C. Cowan, 82 Cove Rd., Oyster Bay, N.Y. 11771, and Thomas L. Cowan, 68 Green St., Huntington, N.Y. 11743
Filed Sep. 22, 1977, Ser. No. 835,520
Int. Cl.[2] F23K *1/04*
U.S. Cl. 110—347 **12 Claims**



1. A process combining, within a plant boundary, obtaining a volatile hydrocarbon gas from coal in the absence of a combustion supporting atmosphere by devolatilizing coal in a noncombustible atmosphere, leaving residue unburned coal, forming the volatile hydrocarbon gas obtained by devolatilization of coal as a stream physically separate from the unburned devolatilized coal, and thereafter burning at last some of said hydrocarbon gas in a main burner flame together and in physical contact with coal in a common furnace in a combustion supporting atmosphere, the physically separate stream of volatile hydrocarbon gas generated within the plant boundary constituting an auxiliary stream for assisting the main burner flame.

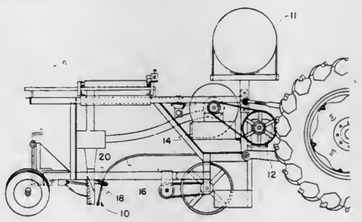
4,186,670
METHOD AND APPARATUS FOR SOWING FOREST SEEDS IN THE HUMUS LAYER
Mats Hagner, Blåbärsvägen 19, S-902 35 Umeå, Sweden
Filed Dec. 12, 1977, Ser. No. 859,519
Claims priority, application Sweden, Dec. 10, 1976, 7613098
Int. Cl.[2] A01C *5/00*
U.S. Cl. 111—1 **7 Claims**

1. A method of sowing forest seeds in a humus layer underlying a surface layer of moss or the like, comprising the steps of:
(a) pressing an inverted funnel-shaped moisture shield having an open lower end through the surface layer and into the underlying humus layer to locally compact the humus layer in the area beneath the lower end of the shield,
(b) depositing forest seeds on the compacted humus layer through the shield, and



(c) leaving the shield in situ to moisturize the seeds by condensation.

4,186,671
FLUID INJECTION SOIL OPENER FOR PLANTERS
Barney K. Huang, 5108 Kaplan Dr., Raleigh, N.C. 27606
Filed Jun. 17, 1974, Ser. No. 479,619
The portion of the term of this patent subsequent to Sep. 5, 1993, has been disclaimed.
Int. Cl.[2] A01C *11/00*
U.S. Cl. 111—2 **6 Claims**

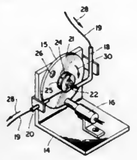


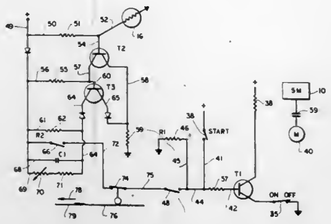
1. A transplanter with a fluid injection soil opener for forming plant receiving cavities in soil for the transplanter, said transplanter with a fluid injection soil opener comprising: a fluid source containing a volume of a selected fluid; fluid conduit means leading from said fluid source for channeling fluid therefrom; means for pressurizing a certain volume of said fluid from said source; nozzle means operatively connected to said conduit means for selectively directing a certain volume of fluid under pressure downwardly into the soil for forming a plant receiving cavity therein; and planting means associated with said transplanter for depositing plants in the plant receiving cavity after the cavity has been formed by said fluid injection soil opener, said planting means including timing control means for synchronizing the actuation of said nozzle means with said planting means.

4,186,672
SEWING MACHINE MONITOR
Perry E. Burton, Fountain Inn, S.C., assignor to Opelika Manufacturing Corp., Chicago, Ill.
Filed May 23, 1977, Ser. No. 799,285
Int. Cl.[2] D05B *69/36*
U.S. Cl. 112—273 **7 Claims**

1. Apparatus for controlling the operation of a sewing machine and the like comprising signal input means for transmitting a pulsing signal at a frequency corresponding to the lineal velocity of a thread moving along its length to the machine with an increase of the lineal velocity of the thread causing a higher frequency of pulsing signals and a decrease of the lineal

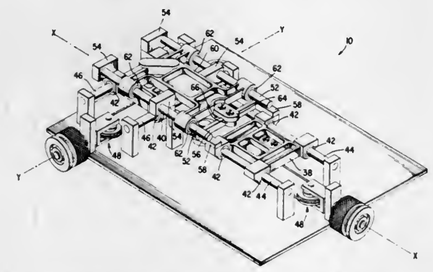
velocity of the thread causing a lower frequency of pulsing signals, start circuit means for actuating the operation of the machine, and holding circuit means for continuing the operation of the machine after the machine operation has been actuated, said holding circuit means including means responsive to





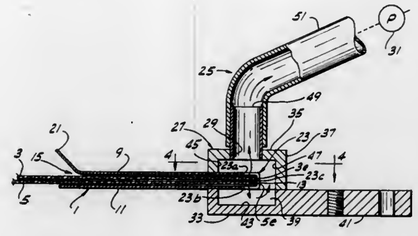
each pulse of the pulsing signal from said signal input means to maintain said holding circuit closed during each pulse, and means for continuing the holding circuit closed for a predetermined period of time after each pulse, whereby the holding circuit is held closed as long as the time lapse between pulses is not more than the predetermined period of time.

4,186,673
MATERIAL FEED MECHANISM FOR SEWING MACHINES
Artin G. Vartoukian, Roselle Park, N.J., assignor to Singer Company, The, New York, N.Y.
Filed Oct. 19, 1978, Ser. No. 952,901
Int. Cl.[2] D05B *21/00;* D05C *9/04;* G05B *19/32*
U.S. Cl. 112—121.15 **9 Claims**



1. A low inertia drive mechanism for imparting variable translational movement to a fabric clamp used for supporting and guiding fabric to be sewn in cooperative disposition with respect to the needle of a sewing machine, said mechanism comprising:
- a first, rigid table mounted for translation in a first straight path on a first pair of fixed rods;
- a second, rigid table mounted for translation independent of said first table in a second straight path perpendicular to said first straight path on a second pair of fixed rods, said second table having a pair of transverse rods each of which is rigidly mounted on a side of said second table perpendicular to said second pair of fixed rods;
- a third, rigid table slidably mounted on said transverse rods;
- means for imparting the translational movement of the first table to the third table whereby said third table may move in any direction in a plane parallel to the planes of said first and second tables;
- a first stationary servomotor not carried by any of said tables for imparting reciprocatory motion to said first rigid table;
- a second stationary sermomotor not carried by any of said tables for imparting reciprocatory motion to said second, rigid table; and
- means for connecting said fabric clamp to said third rigid table.

4,186,674
APPARATUS FOR GUIDING WORK THROUGH A SEWING MACHINE OR THE LIKE
William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.
Filed Nov. 2, 1977, Ser. No. 847,743
Int. Cl.[2] D05B *35/10*
U.S. Cl. 112—153 **15 Claims**

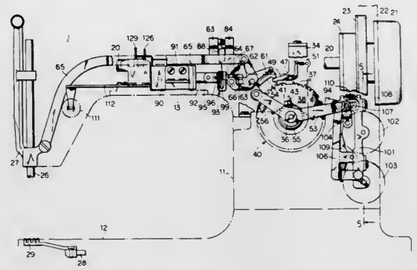


1. Apparatus for guiding work through a sewing machine or the like comprising guide means through which the work is fed to the machine, said guide means having a first and second side, said guide means comprising an upper member and a lower member spaced apart for passage therebetween of the work and an edge guide at said first side of said upper and lower members for engagement by the edge of the work toward said first side as the work travels through said guide means, said guide means being open at said second side and at both ends for passage of the work therethrough and for entry of air to the space between said members, said guide means having at least one air passage at said first side thereof, and vacuum means connected to said air passage for drawing air into said guide means and causing it to flow toward said first side of the guide means and thence out through said air passage, the air flow biasing the work laterally in the direction toward said edge guide for engagement with the edge guide of the edge of the work toward the edge guide, said upper and lower members being spaced apart a distance greater than the total thickness of the work so that the air can flow in the guide means above and below the work in the direction from said second side of the guide means towards the edge guide.

4,186,675
DEVICE FOR DRIVING INFORMATION CARRYING MEMBERS FOR USE IN A SEWING MACHINE
Chikao Yamashita; Takao Sugaya, and Noriyuki Yoshida, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Jan. 23, 1979, Ser. No. 5,829
Claims priority, application Japan, Feb. 8, 1978, 53-13112
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 D **7 Claims**

1. A sewing machine comprising:
- a machine frame,
- a main shaft journaled on said frame,
- a needle driven by said main shaft for endwise reciprocation and for lateral oscillation,
- a feed dog movably mounted in said frame to cooperate with said needle,

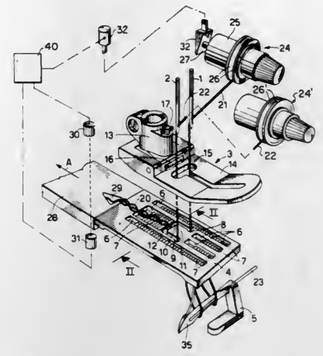
- a feed regulator for regulating the length and direction of feed movement of said feed dog,
- a first information-carrying member with a plurality of bight information recorded thereon for controlling the lateral oscillation and for determining the lateral position of said needle,
- a first scanning member for selectively sensing the bight information from said first information-carrying member;
- a second information-carrying member with a plurality of feed information recorded thereon, correspondingly to said bight information, for controlling the length and direction of feed movement of said feed dog,
- a second scanning member for selectively sensing the feed information from said second information-carrying member and for determining the set position of said feed regulator,
- a single step motor including an output shaft to which one of said information-carrying members is secured and the other is loosely fitted,



holding means functioning to normally set said loosely fitted information-carrying member at a given relative angular position to said secured information-carrying member, and permitting said loosely fitted information-carrying member to rotate relatively to said secured information-carrying member in either of forward and reverse directions from said given angular position within each predetermined angular range,
- blocking means for temporarily prohibiting the rotation of said loosely fitted information-carrying member in timed relation to the rotation of said main shaft, and
- drive control means responsive to control signals applied thereto for sequentially driving said step motor so as to rotate said secured information-carrying member in timed relation with the rotation of said main shaft within the predetermined angular range with said loosely fitted information-carrying member being prohibited of rotation, whereby said first and second information-carrying members are rotated with a substantially fixed phase difference by said single step motor in timed relation with the rotation of said main shaft.

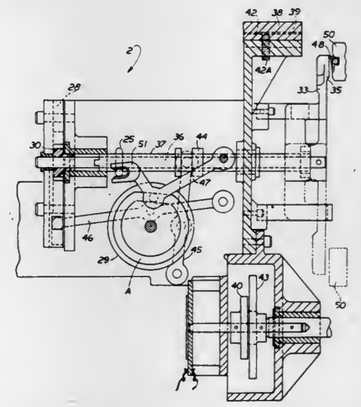
4,186,676
APPARATUS FOR FORMING A CHAIN OF STITCHES ON DOUBLE NEEDLE SEWING MACHINES
Enrico Villa, and Angelo Radice, both of Milan, Italy, assignors to Rockwell-Rimoldi, S.p.A., Milan, Italy
Filed Apr. 3, 1978, Ser. No. 892,572
Claims priority, application Italy, Apr. 28, 1977, 22905 A/77
Int. Cl.[2] D05B *1/10, 27/04, 47/04*
U.S. Cl. 112—165 **1 Claim**

1. A device for forming a continuous chain of stitches between pieces of material on a sewing machine of the type having a feed dog and pressor foot with two needles drawing their thread from independent sources through separate tensioning devices and a needle plate forming a portion of the machine's sewing area with a single looper having an independent thread source disposed beneath the needle plate, said device comprising:
- (a) means mounted on the sewing machine for releasing the tension on the thread of one of the needles;
- (b) means operatively connected to said releasing means for sensing the presence of material in the sewing area and for actuating said releasing means upon detection of the absence of material in the sewing area, including:
- (i) a source of light defining a lamp (**30**); and



- (ii) a photo-electric cell (**31**) spaced from and in alignment with said lamp (**30**) adjacent the sewing area of the machine;
- (c) a cross member forming an integral part of the needle plate for receiving the chain of stitches formed by the tensioned threads of the other needle and looper; and
- (d) an auxiliary feed member mounted in the presser foot in operative association with the feed dog and said cross member for advancing the chain of stitches formed by the tensioned needle and looper threads.

4,186,677
AUTOMATIC COLOR BOBBIN CHANGER
Alfred D. Sacchetti, 1903 Sharon Rd., Meadowbrook, Pa. 19046
Filed May 8, 1978, Ser. No. 903,439
Int. Cl.[2] D05B *57/26*
U.S. Cl. 112—186 **8 Claims**



1. An automatic bobbin changer for attachment to a sewing machine, said bobbin changer serving to detach from the sewing machine a first bobbin case having a latch, said bobbin changer involving grasping means constituting first and second grasping fingers, means to open and close said grasping fingers,

means to move said grasping fingers between said sewing machine and a storage area, said storage area being comprised of a plurality of cartridges for storing full and empty bobbin cases, said grasping means grasping said bobbin latch, and means to move said grasping means away from said sewing machine whereby said grasping means hold said bobbin cases and carry away said bobbin cases from said sewing machine.

4,186,678

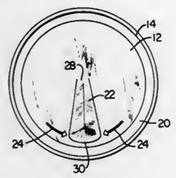
METHOD OF MAKING EASY-OPEN, PUSH-TAB END FOR METAL CONTAINERS

Neal J. McConnellogue, Lakewood, Colo., assignor to Entech Corporation, Englewood, Colo.

Division of Ser. No. 747,100, Dec. 3, 1976, Pat. No. 4,127,213, which is a continuation-in-part of Ser. No. 623,758, Oct. 20, 1975, abandoned. This application Sep. 29, 1978, Ser. No. 947,034

Int. Cl.[2] B21D *51/44*

U.S. Cl. 113—121 C **5 Claims**



1. A method of forming a convenience opening in a container lid comprising the steps of:

(1) providing a sheet of metal to form an end closure having a central panel and outer surrounding rim,

(2) deforming a portion of the central panel in an axial direction away from the plane of the central panel to form an inner offset gate panel and axially directed wall section interconnecting the inner gate panel and central panel,

(3) applying an axially directed force in the opposite direction to said inner gate panel whereby to form an elongated medial rib therein,

(4) folding by axially compressing the wall section while flattening the rib of the inner panel to cause said wall section to be compressed into a tightly folded bead which undergoes a first radially outward reversal from the central panel into a radially inward reversal into the inner gate panel, and

(5) shearing through the radially inward fold of the wall section just outwardly of the outward fold until a line of separation is formed between the inner gate panel and wall section.

4,186,679

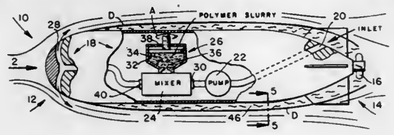
TORPEDO DRAG REDUCTION EMPLOYING POLYMER EJECTION

Andrew G. Fabula, State College, Pa.; James H. Green, Sierra Madre, and William F. Madison, Arcadia, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1965, Ser. No. 441,002

Int. Cl.[2] F42B *19/00*

U.S. Cl. 114—20 R **6 Claims**



6. A method for reducing skin friction drag associated with high Reynolds-number turbulent flows adjacent the surface of a torpedo, said torpedo being of a type having an elongated body and adapted to be self propelled through the water, said method comprising the steps:

(a) ingesting a continuous flow of ambient seawater,

(b) adding to the flow of ingested seawater a quick solvation, polymer-amorphous suspension mixture, said mixture containing a powdered form of hydrodynamic drag reducing water soluble polymer material having a high molecular weight and a linear, long-chain, molecular structure, and containing a quick solvation suspending medium, said mixture added to the seawater at a predetermined rate to produce a concentration of polymer material in the flow between the limits 0.05% and 1.0%, by weight,

(c) mixing the seawater and additive mixture to produce a seawater-polymer solution flow in which the polymer material is present in substantially solvated and hydrated form, and in a manner in which the solvated and hydrated form of polymer molecules retain their linear, long-chain, molecular structure,

(d) ejecting the seawater-polymer solution from the nose of the torpedo with a component of ejection motion in the direction of flow of the adjacent ambient stream to cause the solution to be swept rearwardly along the torpedo in intimate contact with its exterior surface under torpedo forward motion.

4,186,680

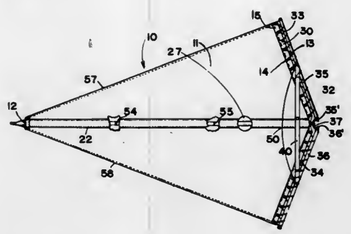
SAIL ASSEMBLY

George B. Harpole, 3905 Rolling Hill Dr., Middleton, Wis. 53593

Filed Jan. 24, 1978, Ser. No. 871,805

Int. Cl.[2] B63H *9/06*

U.S. Cl. 114—103 **5 Claims**



1. A sail assembly comprising,

a. a sail,

b. a mast disposed substantially coincident with one diagonal of said sail,

c. a brace cruciform with said mast, said brace being non-pliant, shorter, and disposed non-coincident with one cross diagonal of said sail, and wherein the end extremities of said brace are configured with groove-like recesses,

d. latch means for adjustably securing said mast to said brace,

e. relatively non-pliant spars, disposed individually along two edges of said sail which form a common juncture with said one diagonal, said spars being moveably retained upon either end extremity of said brace in said groove-like recesses, said brace urging said spars outward for deploying said sail, said sail being fixed to said spars and anchored to the foot of said mast.

4,186,681

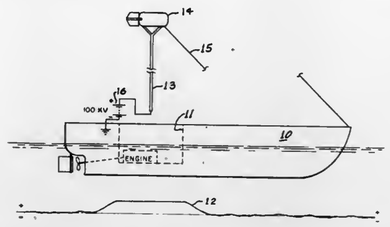
PROTECTION AGAINST INFLUENCE MINES

Oliver H. Gish, Fort Pierce, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1963, Ser. No. 330,198

Int. Cl.[2] B63G *9/00*

U.S. Cl. 114—240 R **5 Claims**



1. Apparatus for decreasing the intensity of cosmic rays at a selected distance beneath a relatively empty displacement volume in an otherwise uniformly loaded ship floating on a body of water comprising in combination,

a ship having a relatively empty displacement volume, and

means for establishing in vertical alinement with said volume a charged particle deflecting field having a strength and configuration effective to divert from a region at said selected distance directly beneath said volume a major fraction of the charged particles which would be prevented from reaching said region by absorption in water displaced by said volume.

4,186,682

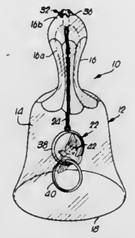
BELL AND CLAPPER ASSEMBLY

Ronald W. Longsdorf, Kansas City, Mo., and Clifford P. Cutler, Overland Park, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Nov. 17, 1978, Ser. No. 961,655

Int. Cl.[2] G10K *1/06*

U.S. Cl. 116—171 **8 Claims**



1. A bell and clapper assembly comprising:

a bell housing provided with a barrel and sound bow of transparent material of a thickness and physical characteristics to vibrate and give a ringing sound when struck;

a hollow handle extending from the barrel in a direction substantially opposite said sound bow of the housing and communicating with the interior of the barrel,

said handle being provided with an opening in the outer extremity thereof remote from the barrel;

an ornamental clapper having an aesthetic, distinctive appearance representative of a particular motif;

an elongated flexible support element for the clapper;

means for suspending the clapper from one end of the support element;

a connector secured to the opposite end of the support element and aligned with said opening in the handle; and

a decorative fastener resting on the handle, extending through said opening and releasably joined to the connector for removable support of the clapper and flexible element from the handle.

4,186,683

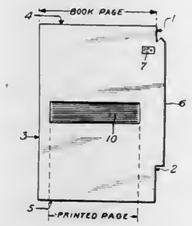
BOOK MARK-PAGE LINE-READER

Edward W. LeRoy, 45-25 Kennedy Blvd., North Bergen, N.J. 07047

Filed Nov. 1, 1978, Ser. No. 956,883

Int. Cl.[2] B42D *9/00*

U.S. Cl. 116—235 **2 Claims**



1. A book mark-page line-tired eyes reader, comprising

a sheet of opaque plastic having the shape and dimensions of a book page; and

comprising an arrow cutout shaped in a middle portion of the right edge of said sheet as viewed when a book is opened thereof, pointing to the top or bottom edge to indicate on which half of either page the user interrupted his reading, and a self-adhesive removable arrow label placed on one of the right or left edges on the sheet pointing to the exact line on either page to indicate where the reader interrupted his reading; and means formed on the sheet so as visibly encompass at least one printed line.

4,186,684

APPARATUS FOR VAPOR DEPOSITION OF MATERIALS

Joseph Intrater, 125 Demarest Ave., Englewood Cliffs, N.J. 07632, and Ralph Gorman, 700 Columbus Ave., New York, N.Y. 10025

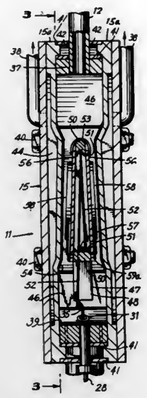
Filed Jun. 1, 1977, Ser. No. 802,469

Int. Cl.[2] C23C *13/08*

U.S. Cl. 118—725 **6 Claims**

1. Apparatus for performing vapor deposition processes on a substrate, comprising a central housing having a centrally located reaction chamber formed therein, said housing having a pair of opposed openings in opposed sides thereof, cover plate means removably secured to said housing for closing said opening, said cover plate means defining coolant chambers therein; means for supplying and exhausting reaction gases from the reaction chamber; said housing including means for defining at least one additional coolant chamber therein about a portion of the periphery of the reaction chamber between said cover plate means; means for supplying and exhausting coolant to and from said coolant chambers; support means in

said reaction chamber for supporting a substrate thereon upon which vapor deposition is to occur; and means for supplying



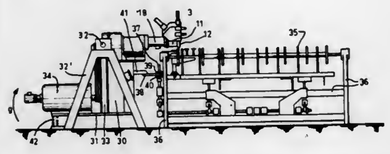
heat in said reaction chamber on the side of said support means opposite said substrate to heat the substrate.

4,186,685

APPARATUS FOR APPLYING A THICK SEAL TO A GLASS SHEET

Pierre Chenel, Enghien les Bains, and Michel Moncheaux, Chalon sur Saone, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 639,787, Dec. 11, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,810
Claims priority, application France, Dec. 11, 1974, 74 40824
Int. Cl.[2] C03C *27/10*; B05C *3/18, 3/20*
U.S. Cl. 118—410 **5 Claims**



1. An apparatus for applying a plastic filament along a line onto the periphery of a face of a glass sheet which is adapted for use in the production of a multiple window pane unit, said apparatus comprising in combination:

(a) an extrusion device having an extrusion nozzle for extruding a plastic material on the glass sheet;

(b) support means defining a surface for supporting the glass sheet;

(c) said extrusion nozzle being situated in spaced relation above the supported glass sheet and disposed in a plane extending through the line along which the plastic material is to be applied;

(d) said extrusion device including a body portion and head member disposed along a predetermined axis extending transversely to the plane in which the nozzle is disposed;

(e) said head member being rotatably mounted on the body portion for rotation about said predetermined axis for selectively positioning the nozzle at a variable angle with respect to the plane of the sheet; and

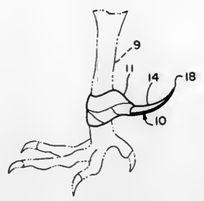
(f) means operatively connected to said body portion for vertically adjusting the body portion, head member and nozzle relative to the plane of the sheet onto which the plastic material is applied to position the nozzle at a vertical height related to the angle of the nozzle and the thickness of the plastic material being applied to the glass sheet.

4,186,686

PROSTHETIC SPUR FOR FIGHTING COCKS

Silverio Hernandez, Philadelphia, Pa., assignor to Conquest Manufacturing Co., Inc., Philadelphia, Pa.

Filed Oct. 25, 1977, Ser. No. 844,970
Int. Cl.[2] A01K *45/00*
U.S. Cl. 119—1 **5 Claims**



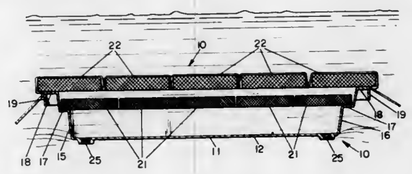
3. A spur for fighting cocks comprising a socket portion providing a cavity adapted to fit on the existing stump of a fighting cock where its natural spur would grow, and a pointed portion extending from said socket portion in a tapered arcuate configuration, said pointed portion terminating in a point at the end thereof opposite said socket portion, said spur being made of a light weight aluminum, said cavity extending approximately the entire depth of said socket portion for fitting a relatively long stump, said pointed portion having a radius of curvature of approximately one and one-half to one and five-eighths inches.

4,186,687

METHOD FOR GROWING OYSTERS AND OTHER MOLLUSCS

Donald S. Gilpatric, 4304 Gifford Pinchot Dr., Annandale, Va. 22003

Filed Jul. 18, 1978, Ser. No. 925,765
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 **5 Claims**



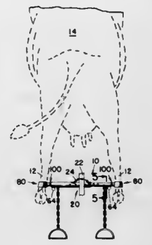
1. A method for rearing and maturing oysters from seed stocks in natural bodies of tidal and intertidal water, comprising placing young oysters of a selected size taken from seed stock in a first set of foraminous cribs, supporting the first set of foraminous cribs with the young oysters therein on a shelf within an open-top receptacle where said oysters are protectively housed above the bottom of the receptacle, placing oysters of a selected larger size than said young oysters taken from seed stock in a second set of foraminous cribs, supporting said second set of foraminous cribs with said larger oysters therein across the open top of said receptacle above said first set of cribs and securing said second set of cribs to said receptacle, lowering said receptacle with said first and second sets of cribs onto the bottom of a natural body of tidal and intertidal water where the waters will flow over said receptacle and through said cribs to supply food and nutrients to the oysters contained therein, keeping said receptacle with its cribs of oysters supported thereon on the bottom of the body of water for a predetermined growth period until the oysters have grown a desired amount, and periodically raising said receptacle with its cribs of oysters to the surface of the water, where the oysters in said second set of cribs are culled, and mature oysters of above a predetermined size are removed therefrom for use or sale, and the oysters in said first set of cribs are culled, and oysters above a selected size which are not yet mature are removed and placed in said second set of cribs, and young oysters of a selected size taken from seed stock are placed in said first set of cribs to replace the oysters of a larger size removed therefrom, and lowering the receptacle with its cribs of oysters again to the bottom of the body of water for another growth period.

4,186,688

RESTRAINING DEVICE FOR CATTLE

Edward W. Gaitan, 9129 Houston, Hanford, Calif. 93230

Filed Mar. 27, 1978, Ser. No. 890,694
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—96 **2 Claims**



2. An improved restraining device particularly suited for use in treating a cow lying on the ground in a prone position comprising:

A. an elongated bar including a pair of telescopically related segments, and locking means for releasably securing said segments in a mutually fixed relationship;

B. a pair of cuffs adapted to receive in confining relation hocks of a cow, and swivel means interconnecting the cuffs of the pair with the opposite ends of the bar;

C. means for securing said bar against displacement relative to the cow including a pair of eyes welded to said bar and a pair of spikes extended therethrough into a penetrating relationship with the ground, and a pair of stirrups suspended from the bar adapted to receive a pair of human feet; and

D. means for mounting on said bar a tongue of a calf-pulling mechanism.

4,186,689

ANIMAL SLING

John T. Alexander, 616 Mount Lebanon Rd., Wilmington, Del. 19803, and John D. Heppner, 83 Doe Run Dr., Holland, Pa. 18966

Filed Oct. 17, 1977, Ser. No. 842,792
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—102 **10 Claims**

1. An animal sling for use with a hoist on large four legged animals which comprises

sternum abdominal panel means having connecting end panels disposed above the body of the animal for connection to a hoist,

a T-shaped member which comprises two panels connected together in a "T" configuration,

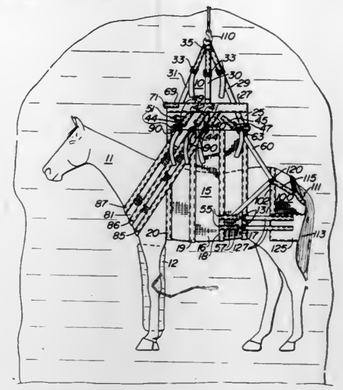
one of said panels conforming to the shoulders or neck of the animal and the other of said panels being connected to a side margin of said sternum abdominal panel means,

separately adjustable strap means carried by said one of said panels of said T-shaped member for securing said one of said panels to said end panels,

converging adjustable supporting straps extending upwardly from said end panels for connection to a hoist,

a tail piece for engagement with the rump of the animal in restraining relation thereto,

strap means including horizontally extending strap members connecting said tail piece to said sternum abdominal panel means, and



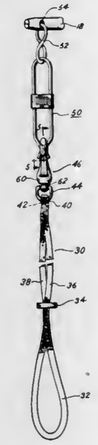
adjustable strap means connected to said abdominal panel means and slidable through means on said tail piece and connected with said end panels.

4,186,690

ANIMAL GROOMING TETHERING DEVICE

John J. Seiler, 10414 E. Jefferson Rd., Osceola, Ind. 46561

Filed Dec. 5, 1977, Ser. No. 857,402
Int. Cl.[2] A01K *1/06*
U.S. Cl. 119—110 **9 Claims**



1. An animal grooming tethering device comprising a one-piece clip having two resilient wire-like, generally parallel arms and a means connecting said arms at one end thereof, at least one of said arms having an end member on the free end thereof extending inwardly toward the other arm to form a yieldable restriction, a ring-like means extending partially around said restriction and between said arms for engagement with said end member at said restriction, said ring-like means being releasably retained by said end member, a band-like adjustable element of a generally oval shape slidable longitudinally on said arms for varying the force required to displace said end member and to thereby release said ring-like means through said restriction, a member connected to one of said

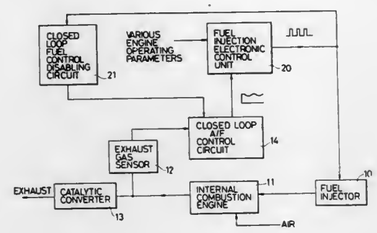
means for supporting said clip, and a leash connected to the other of said means for restraining an animal for grooming.

4,186,691

DELAYED RESPONSE DISABLING CIRCUIT FOR CLOSED LOOP CONTROLLED INTERNAL COMBUSTION ENGINES

Sadao Takase, Yokohama, and Masaharu Asano, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 6, 1977, Ser. No. 831,061
Claims priority, application Japan, Sep. 6, 1976, 51/105847
Int. Cl.² F02B *3/08;* **F02M** *7/12;* **F01N** *3/08*
U.S. Cl. 123—32 EL **13 Claims**



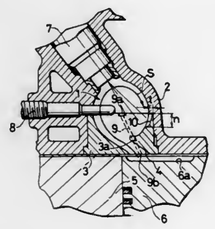
8. A fuel control system for controlling the ratio of an air fuel mixture supplied to an internal combustion engine, comprising exhaust gas sensor means for deriving a control signal for the air fuel mixture, a fuel controller responsive to the air fuel mixture control signal for controlling the amount of fuel supplied to the engine, said fuel controller being activated to reduce the supply of fuel to the engine in response to an engine parameter indicative of deceleration, said control signal having a first amplitude condition during deceleration to indicate that the mixture has been leaned and having a tendency to activate the controller to enrich the mixture, whereby an excessively rich mixture has a tendency to be supplied by the controller to the engine at the instant fuel is resupplied to the engine, and means for decoupling the control signal from the fuel controller in response to the fuel controller being commanded by the deceleration parameter to reduce the flow of fuel for at least a predetermined interval.

4,186,692

COMPRESSION IGNITION INTERNAL COMBUSTION ENGINE WITH AUXILIARY SWIRL COMBUSTION CHAMBER

Hideo Kawamura, Yamato; Kimi Kubota, Chigasaki, and Hideo Ohta, Kanagawa, all of Japan, assignors to Isuzu Motors Limited, Kawasaki, Japan

Filed Apr. 28, 1978, Ser. No. 901,156
Claims priority, application Japan, Jan. 13, 1978, 53-3137
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 L **3 Claims**



1. A compression ignition internal combustion engine having a piston, associated cylinder, a cylinder head and a fuel injection nozzle, comprising:

(a) a primary combustion chamber defined by the piston, associated cylinder and cylinder head,

(b) an auxiliary swirl combustion chamber having a wall on which fuel from said injection nozzle impinges, an upper half of said auxiliary swirl combustion chamber being formed in the cylinder head and a lower half of said auxiliary swirl combustion chamber being formed by a swirl chamber forming member, said swirl chamber being substantially in the form of a sphere,

(c) a primary communicating passage connecting the primary combustion chamber and the auxiliary swirl chamber for indroducing compressed air from the primary combustion chamber to the auxiliary swirl chamber during the compression stroke of the piston and thereby forming a main swirl along the inner periphery of the swirl chamber,

(d) a pair of second communicating passages connecting the primary combustion chamber and the auxiliary swirl chamber for supplementally introducing compressed air from the primary combustion chamber to the auxiliary swirl chamber during the piston compression stroke, said passages being directed to the central portion of the swirl chamber and being formed in the side walls of the swirl chamber so as to introduce air in a direction substantially normal to the main swirl flow from opposite sides of the swirl chamber for introducing air under a small influence of the swirl flow into the central portion of the swirl chamber, and

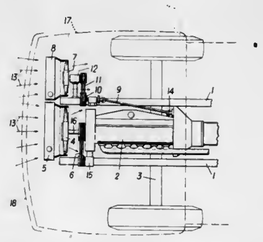
(e) a recess portion being provided in the wall onto which the fuel is injected to thereby produce a plurality of small swirls.

4,186,693

WATER-COOLED INTERNAL COMBUSTION ENGINE FOR MOTOR VEHICLES, PARTICULARLY A DIESEL ENGINE

Gerhard Thien, and Heinz Fachbach, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jul. 21, 1977, Ser. No. 817,857
Claims priority, application Austria, Jul. 21, 1976, 5373/76
Int. Cl.² F01P *3/18, 3/20, 7/12*
U.S. Cl. 123—41.12 **7 Claims**



1. An internal combustion engine with reduced noise level cooling system for a motor vehicle which comprises

a water cooled internal combustion engine mounted on the frame of the motor vehicle, said engine having a drive shaft extending therethrough;

a first cooling unit mounted directly in front of said engine, said first cooling unit including a first radiator through which cooling water from said engine passes and a first fan mounted for rotation between said first radiator and said engine;

drive means mechanically connecting said first fan with said drive shaft so as to rotate same, said drive means including a first temperature-sensitive transmission device which allows said drive shaft to rotate said first fan when the cooling water flowing through said engine and said first cooling unit exceeds a first predetermined temperature;

a second cooling unit mounted adjacent said first cooling unit, said second cooling unit including a second radiator through which cooling water from said engine passes and a second fan, said second radiator and second fan having smaller dimensions than said first radiator and first fan, respectively; and

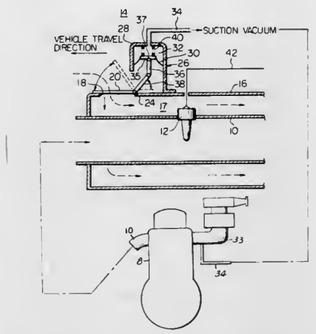
auxiliary means mechanically connecting said second fan with said engine so as to rotate said second fan, said auxiliary means including a second temperature-sensitive transmission means which allows said engine to rotate said second fan only when a second predetermined temperature of said cooling water passing through said engine and said second cooling unit is exceeded, i.e., when said first cooling unit is inadequate to dissipate heat generated by said engine, said first cooling unit being capable of dissipating at least 60% of the maximum heat output of said engine.

4,186,694

TEMPERATURE CONTROL SYSTEM OF AN ENGINE EXHAUST GAS COMPONENT SENSOR

Shyushi Koseki, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 25, 1977, Ser. No. 800,328
Claims priority, application Japan, May 27, 1976, 51-67006
Int. Cl.² F01P *1/06, 3/12*
U.S. Cl. 123—41.31 **10 Claims**



1. A temperature control system in combination with an internal combustion engine including:

means defining an intake passageway for conducting atmospheric air to the engine,

means defining an exhaust gas passageway for conducting exhaust gases of the engine to the atmosphere, and

an exhaust gas component sensor fixedly secured to the exhaust gas passageway defining means for sensing the concentration of a component contained in the engine exhaust gases which concentration is closely related to an air-fuel ratio,

said temperature control system comprising a jacket which surrounds the exhaust gas passageway defining means at a portion equipped with the exhaust gas component sensor and which is spaced from the exhaust gas passageway defining means to define an air chamber therebetween, said jacket having an air inlet which opens from the atmosphere into said air chamber for admitting thereinto atmospheric air for cooling the exhaust gas component sensor,

a flow control valve for controlling said air inlet,

means defining a vacuum chamber which communicates with the intake passageway for receiving a suction vacuum of the engine therefrom,

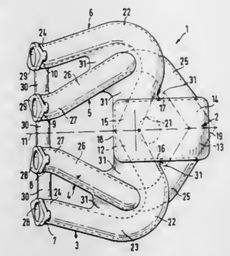
a pressure responsive partition having at a side thereof said vacuum chamber and arranged movably in response to the vacuum in said vacuum chamber, said pressure responsive partition being so operatively connected to said flow control valve that said partition causes said flow control valve to close said air inlet in response to said vacuum chamber above a predetermined value and that said partition causes said flow control valve to open said air inlet in response to a vacuum in said vacuum chamber below said predetermined value and increases and reduces the degree of opening of said flow control valve in accordance with decrease and increase in the vacuum in said vacuum chamber.

4,186,695

INTAKE-TUBE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Jurij Gartner, Germering, and Jiri Seidl, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,988
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736466
Int. Cl.² F02B *75/20*
U.S. Cl. 123—52 M **3 Claims**



1. Intake-pipe arrangement for internal combustion engines, comprising:

an intake manifold,

and intake pipes of approximately equal length and located pairwise from opposite sides of said intake manifold wherein said intake pipes are in communication with one another via said intake manifold,

wherein the ends of the respective opposite intake pipes are connected diagonally with respect to one another to the intake manifold, wherein imaginary extensions of the ends of said intake pipes extending into the intake manifold intersect, the distance between the intersections of said extensions being greater than the distance between the connections of said ends of said intake pipes to their respective side of said manifold.

4,186,696

PUSH RODS AND THE LIKE

Don R. Linsenmann, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

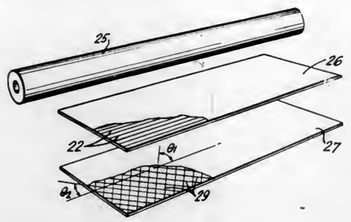
Filed Jan. 31, 1978, Ser. No. 873,938
Int. Cl.² F01L *1/14*
U.S. Cl. 123—90.61 **7 Claims**

1. A push rod comprising:

a tubular body portion having a central core and an exterior sheath, said core being a fiber reinforced tubular resin member, said fibers being continuous unidirectional reinforcing fibers selected from carbon and graphite, said fibers being oriented at substantially 0° with respect to the longitudinal axis of said body portion, and

said exterior sheath being a sheath of resin impregnated continuous unidirectional fibers integral with and disposed on said core, said fibers being oriented at between about ±40° and ±60° with respect to the longitudinal axis

of said body portion, said fibers in said exterior sheath being selected from fibers having a tensile strength of



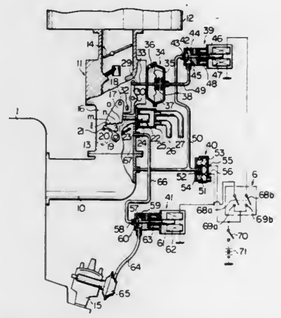
greater than about 250,000 psi and a modulus greater than about 9,000,000 psi.

4,186,697

EXHAUST GAS PURIFICATION PROMOTING DEVICE

Yushiro Yasuda, and Hironori Bessho, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1977, Ser. No. 837,098
Claims priority, application Japan, Jun. 20, 1977, 52-72196
Int. Cl.[2] B60K *41/18*; F02N *17/00*
U.S. Cl. 123—117 A **20 Claims**



1. An exhaust gas purification promoting device of an internal combustion engine having a starting means, a carburetor with a throttle valve in its intake passage, a distributor having a vacuum advance mechanism, an exhaust gas purifier in its exhaust system and a transmission with a shift gear, said device comprising:

means for temporarily maintaining the throttle valve at a predetermined first opening degree when the temperature of the engine is lower than a predetermined first level;

means for detecting the gear position of the gear shift to provide a signal indicating that the gear shift is shifted from neutral into a gear;

means for actuating said maintaining means to release the holding operation of the throttle valve and return the throttle valve to a second opening degree, which is smaller than said first opening degree, in response to said signal when the gear shift is shifted from neutral;

a vacuum operated switch for producing a first operating signal indicating that the engine is being rotated by the starting means and a second operating signal indicating that the engine is operating by its own power;

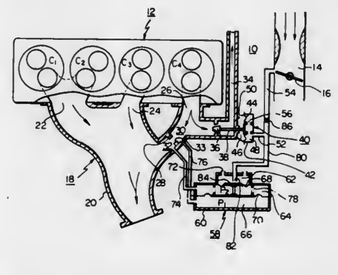
a vacuum control valve for controlling the vacuum level in the vacuum advance mechanism for advancing the ignition timing in response to the first operating signal from said switch during the time the engine is being rotated by the starting means, for retarding the ignition timing in response to the second operating signal from said switch during the time the engine is warming up and the gear shift is in neutral, and for advancing the ignition timing in response to the signal from the detecting means when the gear shift is shifted into gear and the engine is warming up.

4,186,698

ENGINE EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 16, 1977, Ser. No. 851,954
Claims priority, application Japan, Nov. 19, 1976, 51-139871
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **15 Claims**



1. An exhaust gas recirculation control system in combination with an internal combustion engine, comprising:

a plurality of combustion chambers, including a first set comprising at least one combustion chamber and a second set comprising the remaining combustion chambers;

intake passage means providing communication between the atmosphere and said plurality of combustion chambers for conducting air thereinto;

branched exhaust gas passage means for conducting exhaust gases emitted from the engine to the atmosphere, including a first branch communicating with said first set of combustion chambers and a second branch communicating with said second set of combustion chambers;

a restriction dividing said first branch into upstream and downstream sections, said upstream section being closer to said first set of combustion chambers than said downstream section; and means for controlling exhaust gas recirculation to said combustion chambers, comprising:

an exhaust gas recirculation (EGR) passageway providing communication between said upstream section and said intake passage means;

an EGR control valve disposed in said EGR passageway;

a source of fluid pressure;

means, responsive to vacuum produced in said intake passage means, for opening and closing said EGR control valve to control the rate of exhaust gases recirculated; and

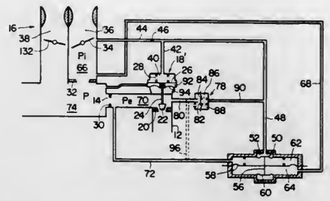
means, responsive to at least the pressure of exhaust gases in said upstream portion of said first branch of the exhaust gas passage means, for controlling the vacuum supplied to said valve opening and closing means by selectively supplying to said valve opening and closing means fluid pressure from said fluid pressure source.

4,186,699

EXHAUST GAS RECIRCULATION SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 7, 1978, Ser. No. 875,819
Claims priority, application Australia, Mar. 27, 1973, 53800/73; Fed. Rep. of Germany, Oct. 17, 1974, 2449431; May 15, 1975, 2521681; Japan, Feb. 8, 1977, 52-12048; Aug. 12, 1977, 52-96121
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **11 Claims**



1. An exhaust gas recirculation system in an internal combustion engine comprising

an induction passage with a throttle valve therein for controlling air flow therethrough to the engine;

an exhaust passage;

an exhaust gas recirculation passage having a first portion leading from said exhaust passage and a second portion extending to said induction passage downstream of said throttle valve;

an exhaust gas recirculation flow control valve including a valve seat arranged in said exhaust gas recirculation passage to permit the flow of exhaust gases from the first portion of said exhaust gas recirculation passage toward the second portion of said recirculation passage, a valve member cooperable with said valve seat to control the flow of exhaust gases therethrough;

a first flow restrictor located in the second portion of said exhaust gas recirculation passage to define a first zone between said first flow restrictor and said valve seat;

a second flow restrictor located in said induction passage downstream of said throttle valve and upstream of a discharge port opening to said air induction passage to which said exhaust gas recirculation passage leads so as to define a second zone between said second flow restrictor and said throttle valve; and

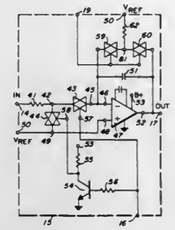
control mechanism operable to maintain a difference between a first pressure in said second zone and a second pressure in said first zone at a predetermined magnitude, including a first spring biasing said valve member into engagement with said valve seat, a pressure responsive member connected to said valve member, a chamber in communication by way of a first and a second opening with induction vacuum downstream of said throttle valve and with atmosphere respectively, so as to develop in said chamber a control pressure which is applied to said pressure responsive member, a bleed valve associated with one of said openings so as to control flow therethrough and regulate said control pressure, a pressure responsive device connected to said bleed valve and operable in response to increased difference between said first and second pressure to displace said bleed valve and decrease said control pressure and enable said pressure responsive member to overcome the bias of said first spring and displace said valve member to increase recirculation of exhaust gases, and a second spring arranged so as to bias said bleed valve to increase said control pressure upon a decrease in difference between said first and second pressure and enable said first spring to displace said valve member towards said valve seat and decrease the recirculation of exhaust gases.

4,186,700

LOW LEAKAGE INTEGRATOR FOR CARBURETOR CONTROL

Liviu Stoian, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1978, Ser. No. 939,295
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EE **14 Claims**



9. A carburetor control system comprising:

adjustable carburetor means for controlling the air to fuel mixture for an engine;

sensor means for providing an input signal at a terminal wherein the magnitude of said input signal is related to the percentage of oxygen mixed with fuel by said carburetor;

a low leakage integrator circuit comprising:

amplifier means having input, output and reference terminals, said amplifier means including structure for receiving signals at said input and reference terminals and producing at said output terminal an output signal related to the amplified input signal;

capacitive feedback means connected between said input and output terminals;

first controllable gate means having first and second through terminals and a control terminal, said second terminal coupled to said input terminal, said first gate means selectively providing open and short circuits between said first and second terminals in accordance with the magnitude of the signal at said control terminal;

second controllable gate means having first and second through terminals and a control terminal, said first terminal of said second gate means coupled to said first terminal of said first gate means and said second terminal of said second gate means coupled to a terminal having substantially the same potential as said reference terminal, said second gate means selectively providing open and short circuits between said first and second terminals of said second gate means in accordance with the magnitude of the signal at said second gate means control terminal; and

control circuit means for producing first and second control signals coupled to said first gate means and second gate means control terminals, respectively, for complimentary operation of said first and second gate means, whereby with said first gate means as a short circuit an input signal can be applied through said first gate means to produce an integrated output signal at said output terminal, and with said first gate means as an open circuit the signal at said output terminal remains constant and said second gate means minimizes any leakage across said first gate means by providing a very low voltage difference across said first gate means;

means coupling said sensor input signal to said amplifier means input terminal; and

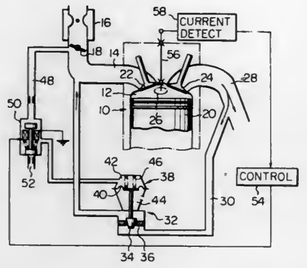
means coupled to said amplifier means output terminal and said carburetor means for controlling the mechanical setting of said carburetor to adjust the carburetor controlled fuel mixture in accordance with the magnitude of the signal at said output terminal.

4,186,701

FEEDBACK CONTROL OF EXHAUST GAS RECIRCULATION BASED ON COMBUSTION CONDITION

Suzuo Suzuki, Yokosuka; Yoshitaka Hata, Fujisawa, and Akihiro Ohnishi, Koshigaya, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 16, 1977, Ser. No. 825,130
Claims priority, application Japan, Aug. 23, 1976, 51-100434
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



1. A feedback control system for controlling the volume of exhaust gas recirculated from an exhaust passage of an internal combustion engine to the induction passage of the engine through an exhaust recirculation passage, the system comprising:

a flow control valve to vary the volume flow rate of the exhaust gas in the exhaust recirculation passage;

a sensor means for sensing the condition of combustion in a combustion chamber of the engine and producing a first electrical signal representing the sensed combustion condition, said sensor means comprising a probe inserted into said combustion chamber to produce an ionic current in said combustion chamber when combustion occurs therein and to direct the intensity of said ionic current;

a control means for producing a second electrical signal based on said first electrical signal, said second electrical signal indicating a decrease in the volume flow rate of the exhaust gas in the recirculation passage when said first electrical signal implies a decrease in the intensity of said ionic current corresponding to an unstable combustion condition in said combustion chamber; and

an actuator means for operating said control valve in response to said second electrical signal.

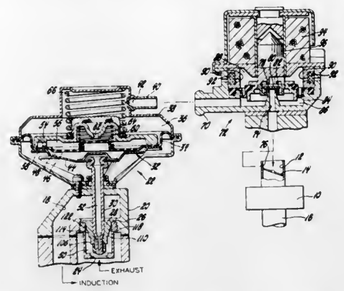
4,186,702

EXHAUST GAS RECIRCULATION CONTROL

Edward G. Day, Rochester, and Thomas J. Hollis, Jr., Fairport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 2, 1978, Ser. No. 911,810
Int. Cl.[2] F02B *25/06*
U.S. Cl. 123—119 A **3 Claims**

1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow and a recirculation passage for exhaust gas recirculation to said induction passage, said assembly comprising a diaphragm defining a portion of an operating pressure chamber, said chamber having an aperture for sensing a subatmospheric pressure signal and also having an air bleed and combining the pressures sensed through said aperture and said air bleed to form an operating pressure, a control valve in said recirculation passage and positioned by said diaphragm to produce an exhaust gas recirculation area in inverse relation to said operating pressure, and a valve varying flow through said bleed to create an operating pressure for positioning said control valve to provide exhaust gas recirculation in accordance with engine operating conditions, and wherein the improvement comprises means defining a signal chamber having ports for sensing subatmospheric pressure in said induction passage and atmospheric pressure and combining the pressures sensed through said ports to create said subatmospheric pressure signal, regulating valve means modulating said ports for preventing said signal from dropping below a lower limit to thereby establish



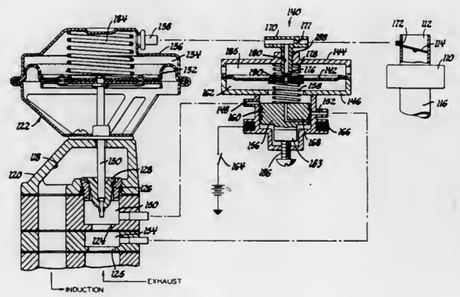
a maximum exhaust gas recirculation area, and means for varying said lower limit and thus said maximum area to thereby decrease the proportion of exhaust gas recirculation to induction air flow when induction air flow exceeds a selected rate.

4,186,703

EXHAUST GAS RECIRCULATION CONTROL

Raymond J. Haka, Rochester, Mich., and Donald D. Stoltman, Henrietta, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1978, Ser. No. 940,079
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**



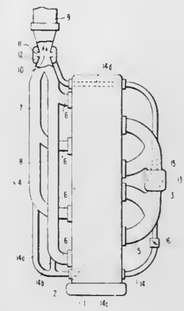
1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow and a recirculation passage for exhaust gas recirculation to said induction passage, said assembly comprising a control diaphragm subjected to a reference pressure, a spring exerting a force on said diaphragm contributing to said reference pressure, said diaphragm defining a portion of a control pressure chamber sensing the pressure in a zone in said recirculation passage, a valve for regulating an operating pressure in response to a deviation of the pressure sensed by said chamber from said reference pressure, and a control valve in said recirculation passage for permitting exhaust gas recirculation in accordance with said operating pressure to provide exhaust gas recirculation at rates which maintain the pressure sensed by said chamber equal to said reference pressure, and wherein the improvement comprises a switchimg member which at one time causes said chamber to sense the pressure in one zone in said recirculation passage and causes said spring to exert one force on said diaphragm and at other times causes said chamber to sense the pressure in another zone in said recirculation passage and causes said spring to exert another force on said diaphragm, whereby exhaust gas recirculation is provided as a proportion of induction air flow with said proportion being higher at said one time than at said other times.

4,186,704

INSTALLATION FOR THE PREHEATING OF THE SUCTION MIXTURE OF A CARBURETOR INTERNAL COMBUSTION ENGINE BY MEANS OF THE EXHAUST GASES THEREOF

Reiner Bachschmid, Kernen; Gerlinde Gross, Stuttgart, and Wolfgang Strobel, Remshalden, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,701
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656448
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AA **16 Claims**



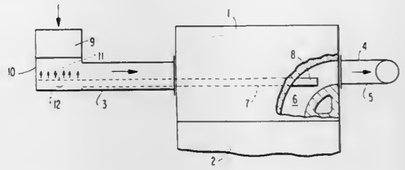
1. An installation for preheating an intake mixture of a carburetor internal combustion engine, the installation comprising exhaust gas branch line means branching off from an exhaust gas manifold means of an exhaust gas pipe system, the exhaust gas branch line means extends along portions of an intake pipe system in heat-exchange relationship therewith, and a closure valve means for controlling a partial stream of exhaust gas flowing through the exhaust gas branch line means, characterized in that a portion of the exhaust gas pipe system is constructed as a Venturi pipe means of a gas jet pump means, the gas jet pump means having an annular space surrounding the Venturi pipe means, the exhaust gas branch line means is connected with the annular space at a position downstream of the heat exchange portions so as to provide for a suction action of the partial stream of exhaust gas flowing through the exhaust gas branch line means into the remaining exhaust gas stream, the closure valve means is arranged in the exhaust gas branch line means at a position upstream of the heat exchange portions, as viewed in a flow direction of exhaust gas through the exhaust gas branch line means and in that means are provided for cooling at least a portion of the exhaust gas branch line means so as to reduce a thermal loading of the closure valve means.

4,186,705

INSTALLATION FOR THE PREHEATING OF THE SUCTION MIXTURE OF A CARBURETOR INTERNAL COMBUSTION ENGINE

Jorg Abthoff, Pluderhausen; Ludwig Fricker, Stuttgart, and Jurgen Lammer, Korb, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,559
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703720
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AC **6 Claims**



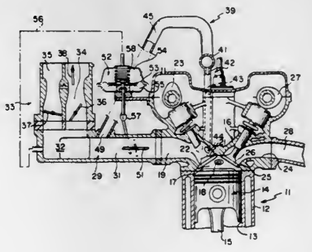
1. An installation for preheating a suction mixture of a carburetor internal combustion engine which includes a cross-flow cylinder head, an exhaust gas line system and a suction pipe system, the installation comprising heat pipe means having a heat-absorption zone and a heat transmission zone, the heat pipe means extends from a portion of the exhaust gas line system to a portion of the suction pipe system, characterized in that the heat pipe means extends through the cross-flow cylinder head to a lower part of a suction pipe of the suction pipe system directly adjoining an outlet of the carburetor, the heat transmission zone includes a flat condenser jacket which partly surrounds a flow channel of the suction pipe from below along a wall surface area thereof while leaving substantially free the main part of the cross-section of the suction pipe.

4,186,706

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsukoki Kabushiki Kaisha, Iweta, Japan

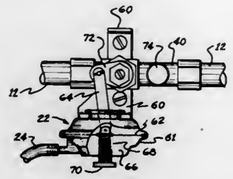
Filed Aug. 29, 1978, Ser. No. 937,711
Claims priority, application Japan, Sep. 9, 1977, 52/108490
Int. Cl.[2] F02M *13/06*
U.S. Cl. 123—127 **12 Claims**



1. In an internal combustion engine having a variable volume chamber in which combustion occurs, a main intake passage communicating with said chamber through a main intake port for delivering a charge thereto, a sub-intake passage communicating with said chamber through a sub-intake port, said sub-intake passage having an effective cross-sectional area at said sub-intake port substantially less than the effective cross-sectional area of said main intake port for causing a given mass flow of charge through the said sub-intake port to enter the

chamber at a substantially greater velocity, a charge forming device for delivering a charge to at least one of said passages, and throttle valve means for controlling the ratio of communication of said ports with said chamber during a given cycle of operation of said engine, said throttle valve means being effective to cause substantially all of the idle load charge requirements of said chamber to be supplied through said sub-intake passage and substantially all of the full load charge requirements of said chamber through said main intake passage, the improvement comprising means for providing at least a portion of the idle charge requirements of said chamber through said main intake passage for reducing the effects of fuel condensation in said passages upon mixture strength.

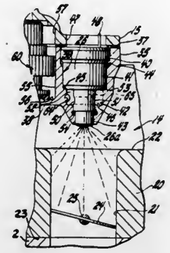
4,186,707
FUEL ECONOMIZER SYSTEM FOR INTERNAL COMBUSTION ENGINES
Vernon J. Driggers, P.O. Box 64, Scranton, S.C. 29591
Filed Apr. 24, 1978, Ser. No. 899,405
Int. Cl.[2] F02B *1/02*
U.S. Cl. 123—139 AV **8 Claims**



1. In a fuel supply system for an internal combustion engine including a fuel supply tank, a fuel supply line connecting the tank to the fuel inlet of the carburetor of the engine, and a constant pressure fuel pump in the supply line between the tank and the carburetor for delivering fuel to the inlet of the carburetor; the improvement therein comprising a fuel metering valve positioned in the fuel line between the fuel supply pump and the inlet to the carburetor, means for automatically adjusting the metering valve between fully open and only partially closed positions in response to changes in load on the internal combustion engine to reduce the fuel pressure and flow to the inlet to the carburetor during idle and no-load operating conditions on the engine to a minimum preselected amount while progressively increasing the fuel pressure and flow to the carburetor to a maximum flow and pressure in response to increasing load conditions on the engine, and wherein said means for automatically adjusting the metering valve includes means for selectively setting the maximum amount of closure of said valve to establish said minimum preselected amount of fuel pressure and flow during idle and no-load operating conditions.

4,186,708
FUEL INJECTION APPARATUS WITH WETTING ACTION
Lauren L. Bowler, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 922,339, Jul. 6, 1978, and a continuation-in-part of Ser. No. 853,331, Nov. 21, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,843
Int. Cl.[2] F02M *39/00*; F02B *33/00*
U.S. Cl. 123—139 AW **3 Claims**

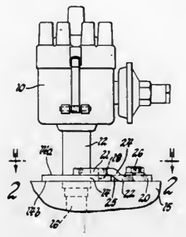
1. An improved low fuel pressure throttle body fuel injection system for a gasoline internal combustion engine comprising in combination:
- a throttle body defining a cylindrical bore communicating at its outlet end with the intake manifold of the engine and at its inlet end being open to atmospheric air;
- a throttle disposed in said bore and composed of a butterfly valve rotatable about an axis normal to the axis of the bore and effective as the valve is progressively closed to define curved diametrically opposed crescent moon shaped air flow spaces having progressively less cross section whereby as the throttle is closed air flow between the same and the bore increases in velocity up to sonic velocity when the throttle approaches the closed condition;
- a fuel injector disposed upstream of the throttle and coaxial with the bore, the fuel injector receiving fuel at low pressure and injection at such pressure in pulses having a spray pattern with a radial velocity component so as to be directed towards the wall of the bore upstream of the throttle and having fuel flow orifices such as to provide droplet



formation incapable of traveling to the walls under open throttle conditions but capable of reaching the walls under closed and nearly closed throttle conditions, whereby with the throttle closed or nearly closed the fuel travels to the bore, collects on the same, and gravitates towards the space between the throttle and the bore, where it is subjected to sonic air flow rates and vaporized, and
- means to actuate the fuel injector in pulses in timed relation to engine speed such that with the throttle in idle position the fuel penetrates the air stream and collects in the throttle bore to gravitate down the same and under off-idle conditions the fuel is entrained by the air stream before reaching the throttle bore.

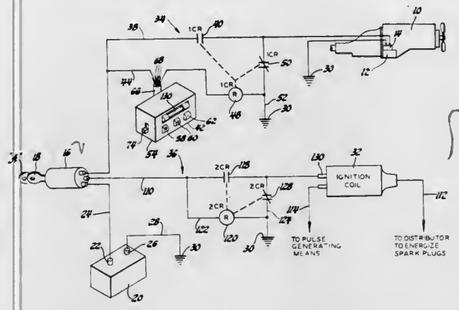
4,186,709
IGNITION DISTRIBUTOR HOUSING ANTI-ROTATIONAL LOCKING ARRANGEMENT
Charles P. Bolles, Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 31, 1978, Ser. No. 929,652
Int. Cl.[2] F02P *7/02*
U.S. Cl. 123—146.5 A **1 Claim**

1. An ignition distributor housing anti-rotational locking arrangement comprising:
- a unitary distributor housing and mounting flange arrangement rotatably mountable upon an internal combustion engine, said mounting flange having top and bottom surfaces extending outwardly from said distributor housing and an inwardly extending notch; and
- a hold-down clamp adapted to be mounted on said engine by a mounting bolt, said engine including a threaded bore for accommodating said bolt, and having a first portion for engaging said top surface of said mouting flange, a second apertured portion outboard of said mounting flange and offset from said first portion by a distance substantially equal to the thickness of said mounting flange to a plane substantially parallel to that of said first portion for engaging said engine and an intermediate portion extending between said first and second portions outboard of said mounting flange having a tang portion extending inwardly toward said mounting flange and so located that when said mounting bolt is extended through said aperture of said second portion and threaded into an accommodating threaded bore of said engine and is tightened to securely clamp said distributor housing in place at an initial angular setting, said tang portion of said intermediate portion is accommodated by said inwardly extending notch of said



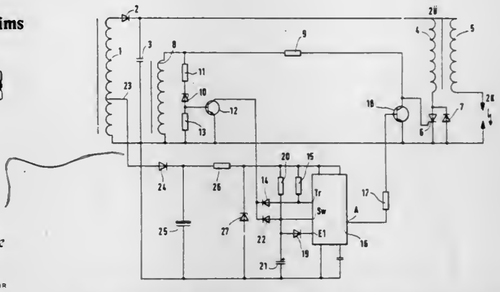
mounting flange in close tolerance fit whereby said distributor housing is securely maintained in the initial angular setting.

4,186,710
VEHICLE DIGITAL ANTI-THEFT SYSTEM
Woodson B. Kilgore, 31827 Maine, Livonia, Mich. 48150
Filed Aug. 7, 1978, Ser. No. 931,377
Int. Cl.[2] B60R *25/00*
U.S. Cl. 123—146.5 B **6 Claims**



1. In combination with a motor vehicle having an engine, a source of electrical energy, and electrical starter means operable to turn said engine,
- a plurality of digital members, each digital member being movable to a plurality of positions, including a first selected position and a second selected position, said digital members being disposed in a first coded arrangement when each digital member is disposed in its respective first selected position, and being disposed in a second coded arrangement when each digital member is disposed in its respective second selected position;
- an ignition key;
- electrical circuit means including an ignition key switch for connecting said source of electrical energy to said starter means to energize same at such times as the ignition key is in a predetermined position in said ignition switch;
- a control switch movable between a first position and a second position, said control switch being connected in said circuit means such that the starter means is connected to the source of electrical energy to turn said engine in response to manipulation of the key in said ignition key switch either when the control switch is disposed in said first position and the digital members are disposed in said first coded arrangement, or the control switch is disposed in said second position and the digital members are disposed in said second coded arrangement, but manipulation of the key in said ignition switch is inoperable to energize the starter means when the digital members are not in a coded arrangement corresponding to the position of the control switch.

4,186,711
IGNITION DEVICE WITH SPEED LIMITATION FOR INTERNAL COMBUSTION ENGINES
Manfred Jöerg, Fuerth, Fed. Rep. of Germany, assignor to Helga Mueller, Fed. Rep. of Germany
Filed Jun. 13, 1977, Ser. No. 806,216
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630261
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **9 Claims**



1. An ignition arrangement with speed limitation for internal combustion engines comprising: a voltage source; switching means actuatable by a trigger pulse for generating a high ignition voltage and including capacitor ignition means with thyristor control; timing means triggered by a trigger pulse for preventing renewed actuation of said switching means by a trigger pulse within a predetermined reference time interval of said timing means, a magnet moving past an ignition armature for inducing said high ignition voltage; said switching means generating a substantially precisely predetermined and temperature-compensated pulse with each trigger pulse, said temperature-compensated pulse being independent of the potential of said voltage source and having said predetermined reference time interval at limiting rotational speed when below the limiting rotational speed; discharge switch means being actuatable by said trigger pulse; said timing means having a time-determining capacitor connected in parallel with said discharge switch means, said capacitor resetting said timing means upon attaining a predetermined charge voltage.

4,186,712

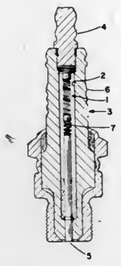
RFI-SUPPRESSING IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Arthur O. Fitzner, and James R. Hager, both of Fond du Lac, WI, assignors to Brunswick Corporation, Fond du Lac, Wis.

Continuation of Ser. No. 698,066, Jun. 21, 1976, which is a continuation of Ser. No. 516,990, Oct. 22, 1974, which is a division of Ser. No. 323,089, Jan. 12, 1973, Pat. No. 3,871,349. This application Jun. 12, 1978, Ser. No. 914,727

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—148 CB **6 Claims**



1. An ignition system for an internal combustion engine capable of operating with substantially reduced radiation of radio frequency interference, comprising in combination; a breakerless and mechanically distributorless capacitor discharge ignition system, and an inductor spark plug, said spark plug having a center electrode and an inductor element in electrical series therewith, said center electrode and inductor element being enclosed within an insulator body of the spark plug, and said inductor element having a resistance of between 10 and 100 ohms and an inductance of between 10 and 100 microhenries, whereby the inductance of said element will necessarily coact with the inherent capacitance of the ignition system to substantially reduce radiation of radio frequency interference.

4,186,713

IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINE

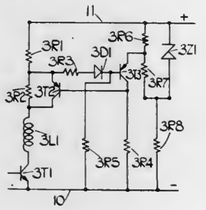
Lancelot Phoenix, and Stephen A. Eckhoff, both of Birmingham, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 25, 1977, Ser. No. 844,947

Claims priority, application United Kingdom, Oct. 28, 1976, 44793/76

Int. Cl.[2] H05B *37/02*

U.S. Cl. 123—148 E **8 Claims**



1. An ignition system for an internal combustion engine comprising an output transistor having its emitter connected to one of a pair of supply conductors, an ignition transformer having a primary winding which has one end connected to the collector of said switching transistor, a ballast resistor and a current sensing resistor connected in series between the other end of the primary winding and the other of said supply conductors, a ballast by-pass transistor, of opposite conductivity type from the output transistor, having its emitter connected to the junction of the ballast resistor and the current sensing resistor, and its collector connected to said other end of the primary winding, a sensing transistor of the same conductivity type as said by-pass transistor and having its emitter connected to said other supply conductor, its base connectd to the junction of the ballast resistor and the current sensing resistor and its collector connected to the base of the by-pass transistor and a bias resistor connecting the base of said by-pass transistor to said one supply conductor, whereby when the current in the current sensing resistor is below a predetermined value, which is below the steady state current which can flow from the power supply through the series combination of the current sensing resistor, the ballast resistor and the primary winding, the by-pass transistor short-circuits the ballast resistor, whereas when the current reaches the predetermined value the by-pass transistor is switched off but the current in the current sensing resistor continues to increase, current flow in the primary winding being initiated by switching on of the output transistor and switching off of the output transistor causing interruption of such current flow to create a high voltage spark producing pulse in the transformer secondary winding.

4. A system as claimed in claim 1, further comprising a first resistor and a diode in the connection between the junction of the ballast resistor with the current sensing resistor and the base of the sensing transistor, a second resistor connecting the base of said sensing transistor to said one supply conductor, and means for applying a bias voltage to the emitter of the sensing transistor.

4,186,714

SOUND INSULATED INTERNAL COMBUSTION ENGINE

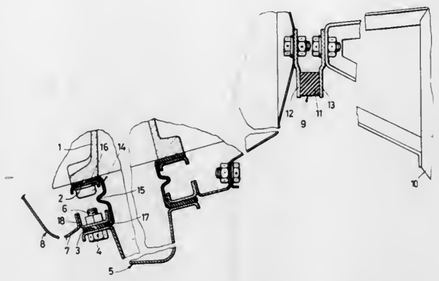
Hermann Danckert; Michael Willmann, and Egon Wundrak, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,446

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825927

Int. Cl.[2] F02F *7/00;* **B60K** *9/00*

U.S. Cl. 123—195 C **5 Claims**



1. In an internal combustion engine having an engine block, an oil pan and a sound insulating capsule shrouding the engine block; the engine block and the oil pan having circumferential mounting faces oriented towards one another; mounting means including a sound dampening intermediate layer situated between said mounting faces for a noise-dampened connection of said oil pan with said engine block and with a lower terminal zone of the capsule; the improvement comprising means for attaching said oil pan to said lower terminal zone of said capsule; further wherein said capsule is supported by a component other than the internal combustion engine and wherein said intermediate layer is constituted by a gasket having at least one fold to take up relative motions between said engine block and said oil pan during operation of the internal combution engine.

4,186,715

SPLIT ENGINE OPERATION OF CLOSED LOOP CONTROLLED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

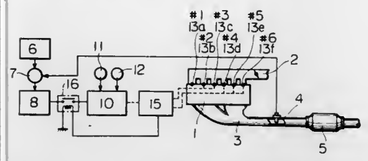
Haruhiko Iizuka, Yokosuka, and Nagayuki Marumo, Yokohama, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Sep. 28, 1978, Ser. No. 947,164

Claims priority, application Japan, Nov. 22, 1977, 52-157028[U]

Int. Cl.[2] F02D *17/00*

U.S. Cl. 123—198 F **2 Claims**



1. An engine control system for a multi-cylinder internal combustion engine having a plurality of cylinders consisting of a first group of cylinders and a second group of cylinders, said system comprising:

an oxygen sensor provided in an exhaust system of the engine;

means for supplying fuel to the engine;

means responsive to load on the engine for preventing fuel to be supplied to the first group of cylinders to effect split operation of the engine;

means responsive to an output from said oxygen sensor for controlling said fuel supplying means to effect feed back control; and

means whereby the feed back control is suspended during the split operation of the engine and for a predetermined time duration after the termination of the split operation of the engine.

4,186,716

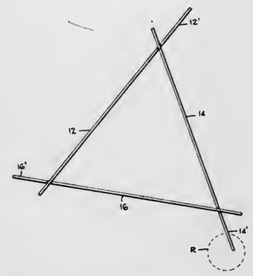
PORTABLE CAMPFIRE GRILL

David E. Baker, and Kenneth D. Baker, both of 18880 Walnut Dr., Castro Valley, Calif. 94546

Filed May 5, 1976, Ser. No. 683,406

Int. Cl.[2] A47J *37/07*

U.S. Cl. 126—29 **1 Claim**



1. A portable campfire grill for supporting cooking pots on an open fire comprising a trinity of substantially identical straight linear elongate members constructed of substantially rigid heat resistant resilient material having an elastic limit, each said elongate member having a substantially uniform cross sectional shape throughout its length and a thickness dimension, two spaced apart portions of each said elongate member defining first and second oppositely opening slots extending substantially perpendicularly of the longitudinal axis of said member, each said slot having a dimension longitudinally of the respective elongate member greater than the thickness dimension and less than $\sqrt{3}$ times the thickness dimension so as to stress within the elastic limit the elongate members when assembled into a triangular configuration by interengaging the slots of respective said members, said slots having a depth approximately equal to $\frac{1}{2}$ said width dimension so that when said members are interengaged with one another the exterior surfaces thereof are substantially coplanar, said first slot in each said member being spaced farther from the adjacent end than said second slot so that each said member has a relatively long leg portion outward of said first slot, so that with said first slot in an upward position said grill can be supported at three triangularly spaced locations which are outwardly remote from the apices of said triangular configuration.

4,186,717

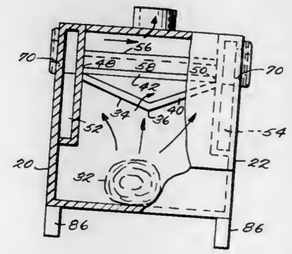
STOVE STRUCTURE

John M. King, Yorktown, Va., assignor to KBS Enterprises, Newport News, Va.

Filed Jan. 16, 1978, Ser. No. 869,764

Int. Cl.[2] F24B *3/00*

U.S. Cl. 126—66 **6 Claims**

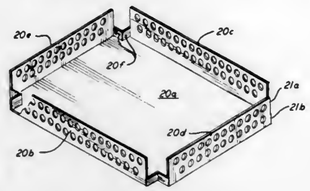


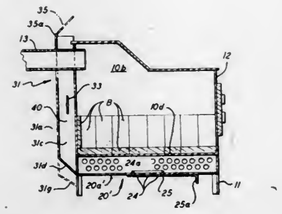
1. A stove comprising an enclosure having a front wall, a rear, a bottom, a top and side walls, closure means on said front wall for allowing access to the interior of said enclosure, a flue opening in said top wall adjacent said rear wall, a V-shaped baffle plate having a front edge secured to the interior of said front wall so as to prevent passage of air therebetween, a rear edge spaced a distance from said rear wall of said enclosure, side edges secured in an airtight manner to each respective side wall of said enclosure and an edge vertically lower than said side edges defining the base of the "V" located at substantially the midpoint between said side walls and extending generally perpendicular to said front wall, said V-shaped baffle plate being disposed closer to said top wall than to said bottom wall of said enclosure so that the heat and gas flow that reaches said V-shaped baffle plate from a combustion source supported on said bottom wall will be directed toward each said side wall, baffle wall means located at least partly above said V-shaped baffle plate for defining a vent path extending from between said V-shaped baffle plate and said rear wall, between said V-shaped baffle plate and said baffle wall means toward said front wall and, then, from said front wall between said top wall and said baffle wall means toward said flue opening,

said stove further comprising air channel means on each side wall extending from said rear wall toward said front wall, said air channel means being open to room air at said rear wall and having vent means adjacent said front wall, each air channel means having a vertical dimension that decreases progressively from said rear wall to said front wall, and

said rear wall of said stove having a chamber mounted thereon, the interior of which is open to each said air channel means, said chamber having an opening to room air located vertically below the point where said air channel means are open to room air.

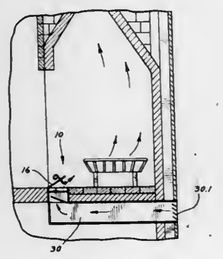
4,186,718
STOVES
Paul O. Goodwin, Box 52, R.D. 2, Mehoopany, Pa. 18629
Filed Jan. 3, 1978, Ser. No. 866,654
Int. Cl.[2] F24B *3/00*; F24C *15/08*
U.S. Cl. 126—67 **11 Claims**





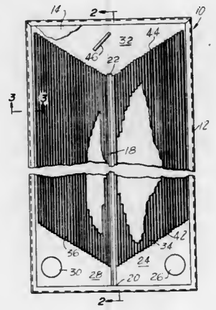
1. For use with a stove generally of box shape having a bottom lined with a layer of fire resistant material, a plurality of vertical sides, a top, and a plurality of legs supporting the stove with its bottom spaced above a floor surface, heat shielding and air circulating attachment means comprising first panel means adapted for ready attachment beneath the bottom of said stove and having a substantially horizontal plate portion and a plurality of substantially vertical side portions extending upwardly from said plate portion, said plate portion and side portions having means adapted to accommodate the legs of the stove whereby said first panel means is readily attachable beneath the bottom of the stove with the upper edges of said vertical side portions adjacent the bottom so as to form a substantially horizontal air passageway between the bottom and said horizontal plate portion, said vertical side portions including a plurality of apertures through which air enters said passageway to cool the bottom of the stove and shield the floor surface underneath.

4,186,719
AIR SUPPLY DEVICE FOR FIREPLACES
Bernard L. Dalsin, Edina, Minn., assignor to Bernard Dalsin Manufacturing Company, Bloomington, Minn.
Filed Sep. 19, 1977, Ser. No. 834,164
Int. Cl.[2] F24B *13/02*
U.S. Cl. 126—143 **9 Claims**



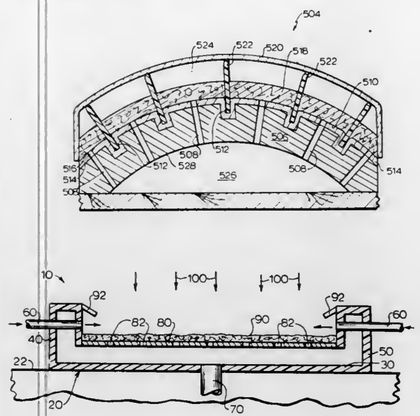
1. An air supply device for a fireplace comprising a housing installable forwardly of the fireplace and having an air inlet and outlet, adjustable volume damper means carried by the housing for controlling the volume of air passing through the housing, an independently adjustable direction damper means carried by the housing for receiving air controlled by the volume damper means and for controlling the direction of air flow from the device toward the fireplace, the volume damper means being closely adjacent the direction damper means and adjustable to deflect air toward the direction damper means, and means for maintaining the position of the direction damper means, the position-maintaining means including limit means positively limiting the adjustability of the direction damper means thereby to insure that air flowing through the device is directed within a fireplace.

4,186,720
SOLAR HEATING PANEL
Robert W. Schmauder, Sr., and Robert W. Schmauder, Jr., both of Fleetwood, Pa., assignors to Solar Shelter Engineering Inc., Kutztown, Pa.
Filed Feb. 27, 1978, Ser. No. 881,448
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—445 **5 Claims**



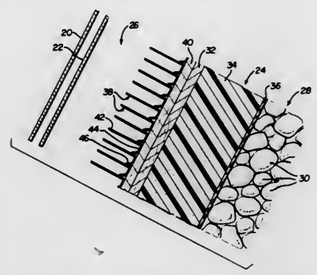
1. A solar heating panel comprising an elongated rectangular housing having one major face transparent to solar energy and a base sheet on the opposite major face, a partition between said faces in said housing, said partition being shorter than the length of said housing and extending from one end of the housing, said partition dividing the enterior of the housing into an inlet chamber and an outlet chamber, an inlet to said inlet chamber and outlet to said outlet chamber, the inlet and outlet being adjacent said one end of the housing, a connecting passage between said chambers adjacent the other end of said housing, heat collectors dividing each of said chambers into discrete parallel paths which are about 4 to 8 times higher than the width of the paths, said flow paths being open at each end thereof whereby a fluid may flow from the inlet through the flow paths of the outlet chamber to the outlet, each of the collectors being L-shaped in cross section with its short leg being secured to the base sheet and abuting the lower end of the long leg of the next adjacent collector, each long leg of each collector extending from the base sheet to said first major face, the collectors in the inlet chamber and in the outlet chamber being of the same length, the ends of the collectors being arranged on a bias to evenly distribute air flow from the inlet to said flow paths in the inlet chamber, the ends of said collectors being arranged at a bias from one end of said partition to a corner of said housing to thereby define an edge of said connecting passage, said connecting passage being free from said collectors.

4,186,721
SOLAR ENERGY HEAT COLLECTOR
William C. Whitman, 3 Fourth St., New Brunswick, N.J. 08901
Filed Jul. 5, 1977, Ser. No. 812,812
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—430 **5 Claims**



1. A solar energy heat collector comprising
a curved rigid insulating form having a top surface and a bottom surface and having a plurality of through holes,
a plurality of slots extending along the top surface of said form,
a first layer of heat-absorptive material on the top surface of said form and having holes aligned with said through holes,
a second layer of fibrous, heat-absorptive material on said first layer,
a sheet of material, which transmits solar energy, spaced from said second layer to provide an air space, and
means disposed in said slots and supporting said sheet spaced from said fibrous layer.

4,186,722
SOLAR ENERGY COLLECTOR
Charles E. Muessig, Imlay City, Mich., assignor to International Solar Technologies, Inc., Bainbridge, Ind.
Filed Apr. 27, 1977, Ser. No. 791,274
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—428 **4 Claims**



1. In a solar energy collecting and storing unit utilizing a heat collecting chamber defined by a front transparent sheet through which solar energy may enter, a thermally insulated back wall substantially parallel to the front sheet, and thermally insulated side walls completing the enclosure of the chamber, an inlet port through which air to be heated may be admitted to the chamber, an outlet port through which heated air may leave the chamber, and a system of baffles substantially bridging the space between the front sheet and the back wall and defining a predetermined path for air traversing the chamber between the inlet and outlet ports, the improved solar energy absorbing means which comprises:
a plurality of elongated sheet metal fins, each fin having a generally L-shaped cross section defined by a first leg lying in a plane substantially parallel to the back wall and a second leg extending substantially perpendicularly away from its intersection with said first leg and toward the front sheet but with the free end of said second leg terminating at a point spaced from the front sheet to define an air flow channel between said free ends and the front sheet, both legs of said fins being darkened to provide maximum absorption of solar energy;
said fins and the baffles being mounted within said chamber so that said free ends of said fins extend perpendicularly to the direction of air flow along the predetermined path and through said channel.

4,186,723
CONTOURED INSULATION WINDOW FOR EVACUATED SOLAR COLLECTOR
Frank T. Coppola, Horseheads; William P. Lentz, Addison, and Robert V. VanDewoestine, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 10, 1978, Ser. No. 894,899
Int. Cl.[2] F24J *3/02*; E04B *7/18*
U.S. Cl. 126—443 **5 Claims**

1. An evacuated flat plate solar collector comprising, means forming a housing for said evacuated flat plate solar collector, said housing means including an upper portion and a lower portion defining a partially evacuated chamber therebetween, solar energy collector plate means positioned within said chamber between said upper and lower housing portions, fluid channel means associated with said collector plate means for removing heat therefrom, said upper housing portion including a solar glass window contoured to provide sufficient strength to withstand the force of atmospheric pressure exerted on one side thereof, said contoured solar window having both a longitudinal and a lateral expanse bounded by peripheral support means lying within a first plane, said peripheral support means being sealably connected to the lower portion of said housing and providing the sole support for said contoured glass window, a plurality of laterally extending support beams spaced-apart longitudinally along said contoured glass window, said beams projecting arcuately outwardly from said planar support means at opposite ends thereof, each said support beam having a maximum bending stress not exceeding that obtained as a constant stress beam, said plurality of beams being joined along adjacent portions thereof to form a plurality of sinusoidal corrugations extending longitudinally along said solar window, the junctures of said adjacent beams lying in a second plane parallel to said first plane and vertically spaced apart therefrom, and said plurality of laterally extending beams, except where communicating with and projecting outwardly from said peripheral support means, being spaced apart from and out of contact with the remainder of said evacuated flat plate solar collector so as to inhibit conductive heat losses from the collector plate means to the solar window.

4,186,724

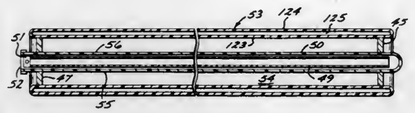
SOLAR ENERGY COLLECTOR

David H. Nelson, Arroyo Grande, Calif., assignor to American Solar, Arroyo Grande, Calif.

Continuation-in-part of Ser. No. 744,290, Nov. 22, 1976, Pat. No. 4,108,154. This application Jan. 27, 1978, Ser. No. 872,890

Int. Cl.² F24J *3/02*

U.S. Cl. 126—443 **20 Claims**



12. A linearly extending solar energy collection apparatus carrying a solar energy collection and heat transfer fluid comprising:

a pair of metal fluid transfer tube segments linearly extending in spaced parallel relationship to receive solar radiation and joined at one end in a serial fluid transfer connection, whereby said fluid flows within said tube segments in opposite directions,

a glass vacuum jacket of elongated toroidal configuration having a cylindrical interior wall laterally encompassing said pair of metal fluid transfer tube segments and transverse end closure means extending across the area enclosed by said interior wall at both ends thereof to define an elongated volume of dead air and

end support means coupled at both ends both to said tube segments and to said vacuum jacket.

4,186,725

SOLAR ENERGY COLLECTOR

David M. Schwartz, 137 Foster St., Boston, Mass. 02135

Filed Mar. 29, 1978, Ser. No. 891,210

Int. Cl.² F24J *3/02;* **F28F** *7/00;* **F16L** *55/00*

U.S. Cl. 126—443 **2 Claims**



1. In a solar energy collector having an elongated metal tube through which solar heated fluid may pass, said metal tube coated with a heat absorption layer and a transparent glass tube enclosing said metal tube, the improvement comprising,

a pair of metal annular bellows each having its outer periphery sealed in a glass to metal seal to said glass tube and its inner periphery sealed to said metal tube, said bellows and said glass and metal tubes defining a vacuum chamber having an internal pressure in the order of 10^{-6} torr, said inner and outer peripheries of said bellows are longitudinally displaced from one another to accommodate differential radial and linear expansion of said metal and glass tubes.

4,186,726

APPARATUS AND METHOD FOR COLLECTING SOLAR ENERGY

Donald L. Spencer, Iowa City, Iowa, assignor to The University of Iowa Research Foundation, Iowa City, Iowa

Division of Ser. No. 670,764, Mar. 26, 1976, abandoned. This application Dec. 30, 1977, Ser. No. 866,202

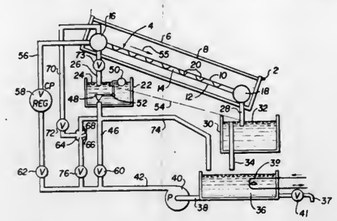
Int. Cl.² F24J *3/02*

U.S. Cl. 126—444 **9 Claims**

1. A solar collector system comprising

a plurality of absorber panels for receiving radiant solar energy, each of said absorber panels having an internal flow passage,

a circulatory system including means entirely filling said passages with heat-receiving liquid and circulating said liquid through said absorber panels, said circulatory system including an inlet manifold line connected by inlet branch lines to a plurality of said absorber panels and an



outlet manifold line connected by outlet branch lines to a plurality of said absorber panels, pressure reducing means in a plurality of said branch lines to provide said absorber panels with absolute pressure which increases progressively in a direction which is downstream with respect to the associated manifold line, said circulatory system including means for maintaining said absolute pressure at subatmospheric pressure.

4,186,727

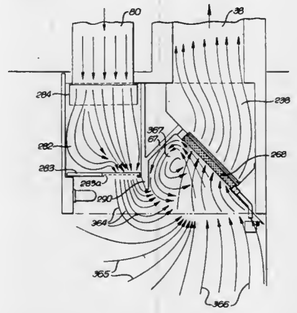
AIR VENTILATION AND WASHING SYSTEM

Arnold S. Kaufman, Studio City, and Robert L. Anderson, Reseda, both of Calif., assignors to National Food Service Equipment Fabricators, Inc., Glendale, Calif.

Continuation-in-part of Ser. No. 652,484, Jan. 26, 1976, Pat. No. 4,085,735. This application Jun. 20, 1977, Ser. No. 807,917

Int. Cl.² F21C *15/08;* **F23J** *11/00*

U.S. Cl. 126—299 D **20 Claims**



1. In a ventilating hood structure for use above a cooking area: a horizontally extended makeup hood; a horizontally extended exhaust hood; a longitudinally extended divider wall between said hoods; means forming an inlet for conducting makeup air into said air hood; means forming an outlet for exhaust air from said exhaust hood; said makeup hood having a lower makeup air distribution means extending longitudinally within said makeup hood and disposed above the bottom of said divider wall; makeup air diffusing means at said inlet disposed in said makeup hood above and spaced from said air distribution means; said makeup hood having walls defining a makeup plenum with said divider wall, air distribution means and air diffusing means; said air distribution means being constructed to restrict the flow of makeup air from said makeup air plenum to maintain a positive pressure in said makeup air plenum causing equal distribution of makeup air throughout the length of side makeup air plenum; said exhaust hood having

filter means extending longitudinally and facing said divider wall and having walls defining with said filter means an exhaust plenum communicating with said outlet; air flowing through said air distribution means discharging downwardly along said divider wall to a region below its lower end and then turning toward said exhaust hood.

4,186,728

APPARATUS FOR ADAPTING A SKULL FOR THE APPLICATION OF A PRESSURE TRANSDUCER

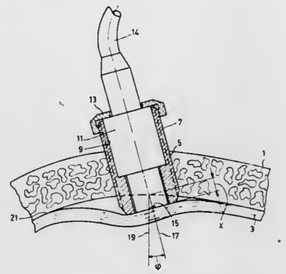
Antonius L. M. van Lotringen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,744

Claims priority, application Netherlands, Feb. 18, 1977, 7701722

Int. Cl.² A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**



1. Apparatus for adapting a human or animal skull for the application of a pressure transducer for the epidural measurement of the intracranial pressure, comprising: a screw with a continuous axial cavity in which the pressure transducer can be accommodated; a tool which is shaped to engage with the screw for introducing said screw into a hole in the skull; and indicator means which function to indicate when the screw has been introduced into the hole to the desired depth, which indicator means include a sensor which, in the operating condition, extends through the cavity in the screw.

4,186,729

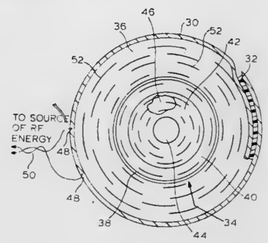
DEEP HEATING ELECTRODE

William H. Harrison, Woodland Hills, Calif., assignor to Donald L. Morton & Associates, Los Angeles, Calif.

Filed Nov. 25, 1977, Ser. No. 854,730

Int. Cl.² A61N *1/42*

U.S. Cl. 128—1.3 **17 Claims**



1. The method of deep heating animal tissue comprising the steps of:

(a) placing the animal tissue in non-contacting relationship within a substantially annular region defined by a single turn loop electrode; and,

(b) exciting said electrode with radio frequency energy to establish a magnetic field comprising a plurality of concentric electrostatic field lines of similar magnitude within said annular region whereby the tissue is heated throughout.

4,186,730

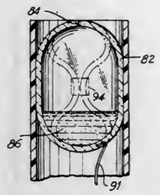
METHODS FOR COLLECTING BODY FLUIDS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Continuation-in-part of Ser. No. 534,893, Dec. 20, 1974, Pat. No. 3,998,211, which is a continuation-in-part of Ser. No. 499,925, Aug. 23, 1974, Pat. No. 3,934,575, and a continuation-in-part of Ser. No. 499,926, Aug. 23, 1974, Pat. No. 3,924,607, each Division of Ser. No. 329,862. This application Dec. 2, 1976, Ser. No. 746,827

Int. Cl.² A61B *10/00*

U.S. Cl. 128—769 **14 Claims**



1. In a method for collecting fluids from the body of a human being or animal, the steps of positionally arranging an enclosure in juxtaposition to a cavity of the body which at least at times contains body fluid in such manner that when the body fluid is present in the cavity the enclosure is in contact with the body fluid, said enclosure having within itself a hollow interior for receiving the body fluid while shielding the body from the interior of the enclosure, creating between the interior of the enclosure and the body fluid conditions for only inward transfer of the body fluid into the interior of said enclosure, the inward transfer of the body fluid into the enclosure commencing solely as a result of the contact with the body fluid, so that the collection commences automatically without external actuation, and maintaining said inward transfer conditions effective at least part of the time while the enclosure remains in contact with the body fluid, so that thereafter when the enclosure is separated from the body cavity, the desired body fluid will be situated in the interior of the enclosure.

4,186,731

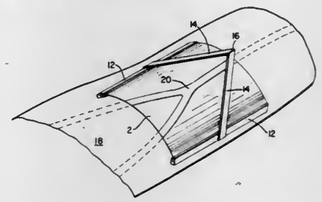
TOPICAL THERMOGRAPH

William T. Clark, III, Number Six Davis Blvd., New Orleans, La. 70121

Filed May 15, 1978, Ser. No. 905,849

Int. Cl.² A61B *5/00*

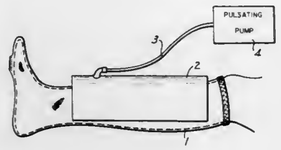
U.S. Cl. 128—736 **8 Claims**

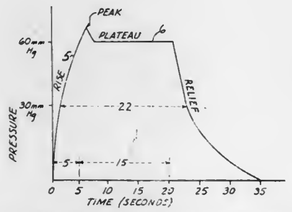


1. Topical thermographic apparatus comprising a flexible sheet of thermographic material having a myriad of closely-adjacent sites which respond chromatically according to variations in temperature and being adapted to be engaged against a body surface (for displaying variations in color characteristic of various temperatures along the body surface,) and sheet-edge engaging means for applying opposing forces across the

sheet in response to force against the surface of the sheet, whereby to maintain substantially uniform pressure of the sheet surface against those portions of a body surface against which the surface of the sheet is pressed.

4,186,732
METHOD AND APPARATUS FOR PULSING A BLOOD FLOW STIMULATOR
William D. Christoffel, Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Dec. 5, 1977, Ser. No. 857,312
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 R **20 Claims**



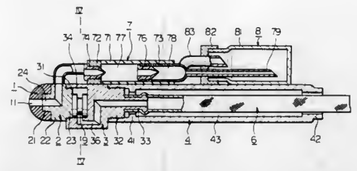


1. A method of controlling the inflation rate and pressure in a body compression device for aiding blood circulation comprising the steps of:
(a) utilizing a gas pressure at an output of a gas supply source that is greater than the desired operating pressure for the device;
(b) venting a portion of the gas from the output to establish a control pressure less than said gas supply pressure;
(c) dispensing gas at the control pressure into the device for a measured period of time which automatically provides a predetermined inflation rate and operating pressure; and
(d) maintaining a generally constant plateau pressure for a measured period of time by opening a balancing vent means downstream.

18. Apparatus for supplying intermittent pressure to a body compression device for aiding in blood circulation comprising: an air compressor capable of generating air pressure substantially greater than the desired peak pressure for such device; said apparatus including timing means coupled to a downstream balancing vent means having a flow capacity and pressure balanced against the air being supplied to the device, whereby a generally constant plateau pressure is maintained by the balanced vent valve while the compressor is simultaneously delivering compressed air to the device.

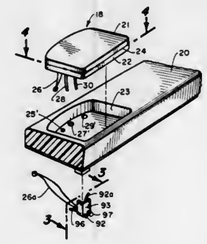
4,186,733
PNEUMATIC MASSAGE MACHINE
Tadahisa Mogaki, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan
Filed Jun. 7, 1978, Ser. No. 913,318
Claims priority, application Japan, Aug. 19, 1977, 52-109990
Int. Cl.[2] A61H *1/00, 9/00*
U.S. Cl. 128—32 **17 Claims**

1. A pneumatic massage machine comprising
a semi-spherical vibratory massage head having a construction allowable of dispersion of liquid therethrough,
means for pneumatically driving said massage head for vibration and connected to a given supply source of compressed air,
a main cylindrical body carrying said massage head via said pneumatic driving means,



a liquid reservoir disposed to said main cylindrical body and connected to said massage head for supply of said liquid, means for forcibly discharging said liquid out of said liquid reservoir upon application of user's finger action thereto and operationally coupled to said liquid reservoir.

4,186,734
INFLATABLE SEAT UNIT
John M. Stratton, 2936 Briar Knoll Dr., Los Angeles, Calif. 90046
Filed Mar. 22, 1978, Ser. No. 888,834
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **9 Claims**

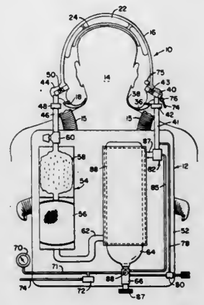


1. In an inflatable seat unit having a plurality of adjacent, individual elongated air cells located on a seat and selectively inflated by a control mechanism to produce a translational pressure wave along the seat;
said unit comprising a piece of foam material containing a cavity;
said air cells being completely located in said cavity;
a portion of said material fully overlying all said air cells and located at a surface of said seat;
said portion of said material overlying said air cells having a thickness permitting said wave to be transmitted therethrough to a seat occupant while providing a soft surface when said cells are not inflated.

4,186,735
BREATHING APPARATUS
John W. Henneman, 4416 39th Ave., Rock Island, Ill. 61201, and Michael G. Flood, 6119 Hickory Crest, Spring, Tex. 77373
Filed Apr. 21, 1977, Ser. No. 789,646
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—201.25 **12 Claims**

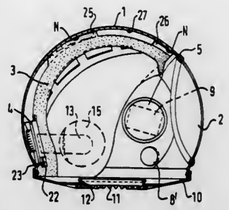
11. A portable breathing apparatus for use by a wearer and comprising: a helmet having a bottom opening adapted to slip over the head of the wearer as it is put on, an annular, flexible neck seal means mounted in the bottom opening and having a neck opening adapted to expand to slip over the head of the wearer as the helmet is mounted and to contract to seat against the neck of the wearer when the helmet is worn, the neck seal sealing the helmet bottom opening to form a substantially

airtight enclosure about the head of the wearer, and a door having a transparent portion opposite the eyes of the wearer and swingably mounted on the helmet for swinging between an open condition, wherein it permits exposure of the helmet interior to ambient atmosphere and provides manual access for adjustment of the neck seal, and a closed condition wherein it seals the helmet interior from the ambient atmosphere; a breathing line means connecting the air supply to the interior of the helmet; an exhaust means operatively connected to the helmet for permitting the exhaust of gas from the helmet interior; a portable pack adapted to be carried by the wearer and



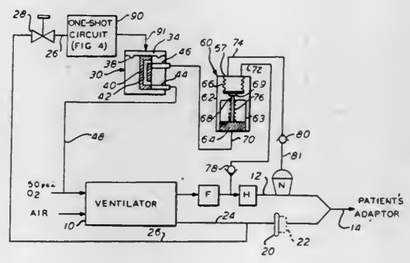
including an oxygen tank, an air scrubber means connected to and adapted to receive exhaust gas from the helmet exhaust means and remove carbon dioxide therefrom, and regulator valve means operatively connected to the air scrubber means, the oxygen tank and the breathing line for mixing oxygen from the oxygen tank with gas from the air scrubbing means and delivering the mixed gas to the breathing line; and heat exchanger conduit means connecting the air scrubber means to the regulator valve means and closely surrounding a substantial portion of the oxygen tank exterior in a heat exchanging relationship therewith to transfer heat from the gas in said conduit to the oxygen tank.

4,186,736
DEVICE FOR SAFEGUARDING THE RESPIRATORY ORGANS
Attilio Angioletti, and Giosue Citelli, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy
Filed Sep. 26, 1977, Ser. No. 836,729
Claims priority, application Italy, Oct. 4, 1976, 27951 A/76
Int. Cl.[2] A62B *18/04*
U.S. Cl. 128—201.19 **4 Claims**



1. A helmet for protecting the head and respiratory organs comprising a rigid outer shell having an open lower portion adapted to fit over the head of a user and provided with a transparent screen across the front portion thereof, a headgear of flexible cellular material placed inside said shell, sealing means connected to the open lower portion of said rigid outer shell and adapted to be secured about the neck of the wearer, containers housing filtering blocks sealingly connected to said rigid outer shell, a ventilating device contained in said helmet, conduits inside said helmet for conveying the filtered air from the filtering blocks to the ventilating device and at least one air passage for conveying the filtered air from the ventilating device to the respiratory organs, whereby air enters the helmet through the filtering blocks, flowing in the conduits recalled by the ventilating device and being sent to the respiratory organs via the air passage, a communications device, a battery operatively connected for supplying electric current to said communication and said ventilating devices and at least one exhaust valve on said helmet for the elimination of air from the helmet, characterized by the fact that:
a slot is present on the external surface of the headgear farthest from the transparent screen and in correspondence of the plane of symmetry of the helmet vertically dividing the transparent screen into two parts, said ventilating device being mounted on the lateral surface of the rigid outer shell and located in said slot of the headgear which is on the side opposite to the transparent screen, with respect to the plane of symmetry substantially parallel to the transparent screen and symmetrically placed with respect to the plane of symmetry of the helmet vertically dividing the transparent screen, are present means for housing and fixing said containers housing filtering blocks,
on a first lateral surface of the rigid outer shell which is on the same side as the transparent screen, with respect to the plane of symmetry substantially parallel to the transparent screen and symmetricallgy placed with respect to the plane of symmetry of the helmet vertically dividing in two the transparent screen are present means for housing said communication device and on a second lateral surface of the rigid outer shell facing said first lateral surface are present means for housing said battery for supplying electric current to said communication device and ventilating device,
sealing means comprising an elastically deformable rubber collar sealingly connected to the lower periphery of said open lower portion of the rigid outer shell and intended to sealingly press around the wearer's neck,
whereby all the space inside the helmet is in communication with the outside atmosphere only through the filtering blocks and the exhaust valve and the center of gravity of the helmet coincides with the oscillating center of the neck of the wearer so that the helmet is perfectly balanced on the head of the wearer with respect to whatever position is assumed by the head of the wearer itself.

4,186,737
DRUG NEBULIZING SYSTEM FOR MEDICAL VENTILATORS OF THE VOLUME-LIMITED TYPE
James D. Valenta, Madison, and Kenneth T. Heruth, Sun Prairie, both of Wis., assignors to Airco, Inc., Montvale, N.J.
Filed Nov. 10, 1977, Ser. No. 850,326
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—203.28 **7 Claims**



1. A drug nebulizer control system for adding medication to a patient's breathing gas from a medical ventilator of the volume limited type having an inhalation phase where gas having

a predetermined oxygen concentration is delivered to the patient and an exhalation phase, said system comprising:

(a) a patient gas breathing line adapted to receive breathing gas from the ventilator and deliver said gas to the patient during the inhalation phase,

(b) drug nebulizing means connected to said breathing line and adapted to be powered by a pressurized gas to cause injection of nebulized medication into said breathing line,

(c) means to withdraw a predetermined volume of gas of predetermined oxygen concentration supplied from said ventilator during its inhalation phase, and

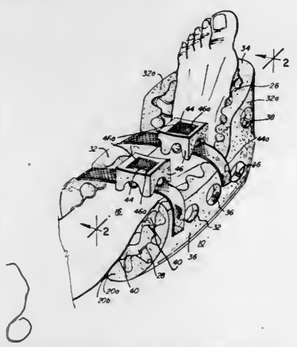
(d) means to pressurize said withdrawn predetermined volume of gas during the same inhalation phase and apply said pressurized gas to said nebulizing means for powering said nebulizing means to inject the nebulized medication into said breathing line.

4,186,738

HEEL SUPPORTING BOOT FOR BED PATIENTS

Thomas R. Schleicher, 1819 Oak St., Northbrook, Ill. 60062; Donald J. Maylahn, 4255 Madison St., Skokie, Ill. 60076, and Denis B. Drennan, 4 Milburn Park, Evanston, Ill. 60201

Filed Feb. 15, 1978, Ser. No. 877,876
Int. Cl.² A61F *5/30*
U.S. Cl. 128—153 **25 Claims**



1. A heel supporting boot for bed patients comprising:

a body formed of flexible, resilient, sheet foam material having an inside support surface provided with a plurality of alternate peaks and valleys with the peaks adapted for contact against the skin of the patient,

said body including a pair of sidewall portions adapted to bear against opposite sides of a patient's lower leg and ankle, a leg support portion between said sidewall portions, and a foot portion for supporting the sole of the patient's foot in an upright condition remotely away from the patient's heel, said foot portion extending above the upper level of said sidewall portions adjacent said patient's leg;

at lease one leg support cushion formed of said foam material securable on said leg support portion between said sidewall portions spaced from the patient's heel for supporting the patient's leg with the heel in an elevated position above an adjacent bed surface out of contact with said leg support portion of said body, and

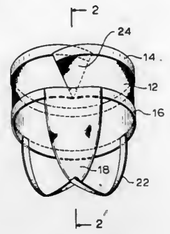
detachable fastening means for interconnecting said sidewall portions above said patient's leg to retain said boot in place on the patient's leg.

4,186,739

ATHLETIC GARMENT

Gwendolyn L. Hall, and Bradley G. Hall, both of 60 Redcar Ave., Islington, Toronto, Canada (M9B 1K1)

Filed Aug. 19, 1977, Ser. No. 826,149
Int. Cl.² A61F *5/40*
U.S. Cl. 128—158 **10 Claims**



1. An athletic supporter including:

a waist band,

a pouch connected to the centre of the front of said waist band and two straps connected to the rear of said waist band,

wherein the waist band comprises a relatively wide elastic portion of a length to extend about the waist of the wearer,

wherein the ends of said waist band are arranged to be connected, at the front of the wearer's body, in overlapping, non-parallel relationship,

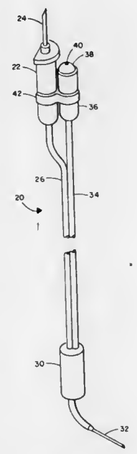
wherein the end edges of the waist band diverge in an upward direction and at the lower end connect to each other near the pouch over a circumferential extent, short relative to and approximately centered with respect to the circumferential extent of the top of the pouch.

4,186,740

METHOD AND APPARATUS FOR REGULATING INTRAVENOUS FLOW OF A LIQUID

Romeo E. Guerra, 6118 Walnut Hill La., Dallas, Tex. 75230

Filed Feb. 6, 1978, Ser. No. 875,455
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 R **2 Claims**



1. A construction having utility in intravenous flow control, comprising:

(a) a rigid housing having a first liquid-tight compartment with entrance and exit apertures, with the entrance aperture being adapted for connection with a reservoir of liquid which is to be fed intravenously to a patient, and the exit aperture being adapted for connection with a needle which is to be inserted into one of a patient's veins, and said housing having a second compartment which is immediately adjacent the first compartment, and there being a flexible diaphragm constituting a wall in common between said first and second compartments, and the diaphragm being sufficiently flexible and so positioned so as to selectively restrict the flow of liquid between the entrance and exit apertures of said first compartment; and

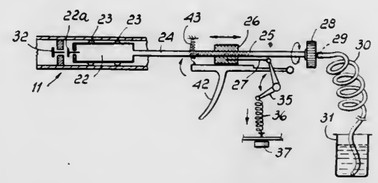
(b) a one-way check valve positioned between the first and second compartments, such that liquid may pass from the first compartment into the second compartment but not vice versa.

4,186,741

AUTOMATIC INJECTING GUN FOR REMOTE CONTROLLED VACCINATION OF CATTLE, PIGS, AND ANIMALS IN GENERAL

Giulio Cesaro, Via Vittorio Veneto, 17, Vigodarzere (Province of Padova), Italy

Filed Dec. 2, 1977, Ser. No. 857,109
Claims priority, application Italy, Dec. 13, 1976, 41700 A/76
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 P **4 Claims**



1. An injecting gun for controlled vaccination of cattle, pigs and animals in general, comprising a supporting box-like gun body having an extension in the form of a handle, an injector assembly supported by said box-like gun body, said injector assembly having a hollow elongated cylinder member with a cylinder cavity having an open ended portion thereof fixed on said box-like body and facing the interior thereof and an opposite end portion thereof projecting outside said box-like body, said opposite end portion having connector means for selectively connecting thereto needle means and auxiliary elongation members, a hollow plunger member with a head portion and a plunger cavity and slidable within said cylinder cavity, a first check valve structure within said cylinder cavity arranged in a position more remote from said open end of the cylinder member than said plunger head portion to define therebetween a cylinder chamber the length whereof being defined by the actual position of said plunger member, a second check valve structure in the head portion of said plunger member, said first check valve structure controlling the flow of vaccination liquid from said chamber towards said opposite end portion of the cylinder cavity and vice versa to prevent such flow when the liquid pressure in said opposite end portion cavity is higher than the liquid pressure in said cylinder chamber and to allow such flow when the pressure conditions are reversed, said second check valve structure controlling the flow of vaccination liquid from said cylinder chamber towards said plunger caivty and vice versa to prevent liquid passage from said cylinder chamber towards said plunger cavity when the liquid pressure within said cylinder chamber is higher than the liquid pressure within said plunger cavity and to allow such passage when the pressure conditions are reversed, duct means for connecting the plunger cavity with a source of vaccination liquid, adjustable limit stop means for said plunger to adjust the maximum volume of said cylinder chamber and trigger means and rechargeable springed release means for said plunger member to actuate the injection action of said plunger member, when said trigger means are triggered.

4,186,742

CONTRACEPTIVE-ANTIVENEREAL DISEASE TAMPON

Jack W. Donald, El Paso, Tex., assignor to Donald Enterprises, Inc., El Paso, Tex.

Filed Jun. 9, 1978, Ser. No. 888,578
Int. Cl.² A61F *13/20*
U.S. Cl. 128—270 **14 Claims**



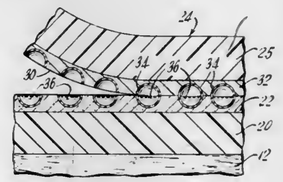
1. A moist medicated vaginal tampon for contraceptive and venereal disease control comprising a soft, porous foam ball of substantially spherical configuration in the uncompressed state and of a size and compressibility to fit snugly within the vagina of a human female to cover the cervix area while permitting intercourse to take place, said spherical configuration permitting easy insertion without the necessity of orientation, said porous foam ball being impregnated with a solution containing an amount of an antibiotic selected from the group consisting of salts of bacitracin, neomycin, polymyxin B and mixtures thereof effective to control venereal disease and a contraceptively effective amount of nonoxynol.

4,186,743

PERFUMING SELF-ADHERING NAPKINS

Fred H. Steiger, East Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Feb. 28, 1978, Ser. No. 882,299
Int. Cl.² A61F *13/16, 13/18, 13/20*
U.S. Cl. 128—284 **5 Claims**



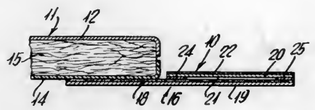
1. In a sanitary napkin comprising an elongated absorbent body having a body contacting surface and a garment contacting surface and provided with a pressure-sensitive adhesive element on said garment contacting surface for adhering said napkin to the crotch portion of an undergarment, means for both protecting said pressure-sensitive adhesive element and for releasing a controlled quantity of a deodorant, said means comprising a protective releasable layer overlying and adhered to said adhesive element and having affixed to the surface thereof in contact with said adhesive element, a controlled quantity of deodorant in pressure-frangible microcapsules whereby, upon removing said protective releasable layer, a controlled portion said microcapsules fracture releasing a controlled quantity of deodorant.

4,186,744

SEPARABILITY MEMBER TO ALLOW DISPOSABLE DIAPER OPENINGS AND RE-FASTENINGS

Irving S. Ness, Princeton, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 709,748, filed Jul. 29, 1976, abandoned. This application Oct. 31, 1977. Ser. No. 847,458
Int. Cl.[2] A61F *13/16*; A43C *11/00*
U.S. Cl. 128—287 **6 Claims**



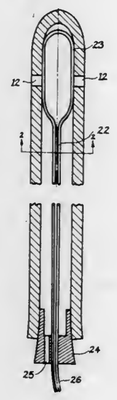
1. In combination with the disposable diaper of the type having a thin, flexible plastic film outer surface and having adhesive closure tabs; a separability member for use with the adhesive portion of a closure tab to allow separation of said closure tab from said diaper and re-fastening thereto without tearing the diaper outer surface, said separability member comprising: a strip of material having a non-adhesive surface for mating with the adhesive portion of said closure tab and an adhesive surface for fastening said strip to the diaper outer surface; and adhesive release areas on the end portions of the non-adhesive surface of said strip, whereby after said diaper has been fastened around a wearer thereof, said adhesive portion of the tab is detachable from said separability member by peeling the two apart without tearing the diaper outer surface due to the reduction or elimination of peel forces transmitted to the diaper surface at the end portions of said strip by the provision of said release areas, the separability member remaining affixed to the diaper after separation for subsequent re-fastening.

4,186,745

POROUS CATHETERS

David W. Lewis, Rte. 2, Box 198, and James J. Kauzlarich, 1603 Inglewood Dr., both of Charlottesville, Va. 22901

Continuation-in-part of Ser. No. 711,067, Jul. 30, 1976, aban doned. This application Feb. 15, 1978, Ser. No. 877,841
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R **5 Claims**



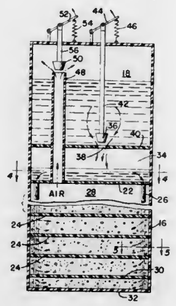
1. A catheter, comprising an annular walled drainage tube with upper and lower ends, having suitable lateral openings at the upper end for receiving body fluids and an outlet at the lower end for discharging such body fluids, said catheter being composed of a flexible material selected from the group of materials consisting of open microporous polyethylene, open microporous polypropylene, open microporous fluorocarbon, open microporous Poly-Oil polyethylene, or other open microporous thermoplastics, of a microporosity in the range of 0.5 to 5 microns, initially containing a liquid medicament and/or lubricant in the interstices of said microporous pores, the size being in the critical range of 0.5 to 5 microns as necessary for the function of flow control of said liquid medicament and/or lubricant so as to retain the liquid medicament and/or lubricant while the catheter is being stored over a long period of time until inserted into a body cavity at which time the liquid will egress or ooze from the catheter due to pressure gradients, and/or gravity gradients, with significant pressure gradients arising from the differential thermal expansion between the microporous catheter material and the liquid medicament and/or lubricant, said differential thermal expansion arising from the change of temperature experienced by the catheter on insertion into a body cavity; said generated liquid medicament and/or lubricant flow from the catheter, being produced by the said differential thermal expansion and persisting for hundreds of hours, thereby providing the functions of self-sterilization, self-lubrication, and self-cleansing.

4,186,746

BODY WARMING DEVICE

William H. Byler, 804 Village La., Winter Park, Fla. 32792, assignor to William H. Byler and Thelma T. Byler. Trustees of William H. Byler Revocable Trust, Winter Park, Fla.

Filed Jan. 16, 1978, Ser. No. 870,012
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—403 **11 Claims**



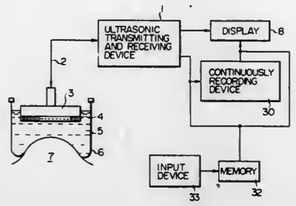
1. A body warming device which comprises in combination:
(A) a housing containing a water compartment and a salt compartment, said salt compartment having segmented chambers in stacked arrangement each containing salt which reacts exothermically with water;
(B) a plurality of water conveying tubes interconnecting the water compartment and the salt compartment, said tubes extending between said water compartment and the lowest of said segmented chambers to deliver water first to the lowest of said chambers then to higher chambers in succession;
(C) an air relief tube interconnecting the salt compartment and the water compartment; and,
(D) means for controllably supplying water from the water compartment to the salt compartment.

4,186,747

ULTRASONIC DIAGNOSING APPARATUS

Kazuhiro Iinuma, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 29, 1977, Ser. No. 820,148
Claims priority, application Japan, Jul. 30, 1976, 51/90183
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—660 **18 Claims**



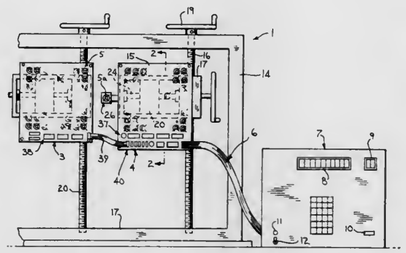
1. An ultrasonic diagnosing apparatus for examining a subject comprising:
an ultrasonic probe having a linear array of closely spaced electroacoustic converters for transmitting a plurality of ultrasonic beams to the subject, sensing the ultrasonic beams reflected from the subject and converting the received ultrasonic beams to electric, tomographic signals,
means for electronically activating the electroacoustic converters to effect repeatedly a plurality of sequential, high-speed electronic, ultrasonic scans along the direction of the linear array,
means for continuously moving the ultrasonic probe in a direction substantially broadside to the linear array during the period that the activating means effects said scans,
means for processing the electric, tomographic signals from the electroacoustic converters to form sequentially from the electric, tomograhic signals representing each scan a respective planar, B-mode tomographic image in a plane parallel to the beams transmitted by the array of electroacoustic converters, and
means for recording the plurality of planar B-mode tomographic images as they are formed by said processing means to obtain a three-dimensional representation of the subject.

4,186,748

THERMOGRAPHIC APPARATUS FOR PHYSICAL EXAMINATION OF PATIENTS

Kenneth J. Schlager, 12825 Elmwood Rd., Elm Grove, Wis. 53122

Filed Feb. 6, 1978, Ser. No. 875,527
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—736 **11 Claims**



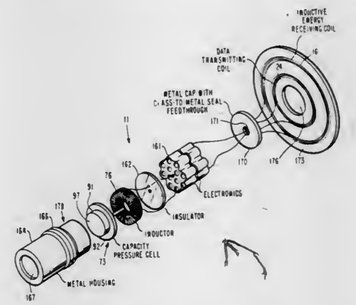
1. A physiological thermographic detection apparatus comprising first and second multiple sensor array means each defining a sensing area, said arrays each including a plurality of individual thermally responsive units located in a selected pattern and developing individual signals related to the thermal state of the body of an aligned patient, a thermally responsive reference unit, support means, mounting means securing said array means to said support means and including adjustment means for independently positioning each of said arrays relative to each other and with respect to said reference unit, a digital memory means, reading means for recording of the individual signals in said memory means, means for processing of said signals in accordance with a spatial pattern recognition program within each array and in one array relative to the other and in the first and second arrays relative to said reference unit to produce an automatic determination of the significance of said signals, and means for displaying of an encoded signal indicative of the diagnostic result of the pattern recognition process.

4,186,749

INDUCTION POWERED BIOLOGICAL RADIOSONDE

Thomas B. Fryer, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

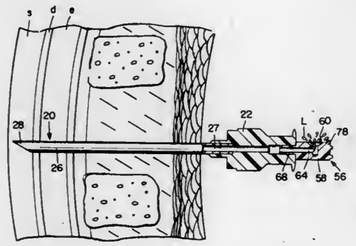
Filed May 12, 1977, Ser. No. 796,256
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—748 **2 Claims**



1. A detector for measuring intracranial pressure at a subject's dura and adapted to function in proximity to a source of electromagnetic energy, said detector comprising:
an oscillator with an L-C resonant circuit, said C of said resonant circuit comprising a capacitance-type pressure transducer, said transducer having a first electrode comprising a pressure-responsive diaphragm and a second fixed electrode opposite said first electrode, said diaphragm being a stiff metal disc hermetically sealed to one end of a metal tubular body, said diaphragm having a stiffness at least as great as 10 torr per micron, the frequency of said oscillator being the direct function of the intracranial pressure sensed by said diaphragm when said diaphragm contacts said subject's dura;
a second resonant circuit having a data transmitting coil and a capacitor;
a buffer having an input with a high impedance and an output with a low impedance, said oscillator being coupled to said buffer input and said data transmitting coil being coupled to said buffer output;
a cylindrically-shaped metal housing having a band of threads on the outer surface thereof said housing having a diameter larger than said transducer, said transducer being sealed to one end of said housing with said diaphragm and part of said tubular body projecting outside of said housing, the housing surrounding said transducer forming a shoulder, said diaphragm being a distance X from said shoulder, means for sealing the other end of said housing, said oscillator, said capacitor of said second resonant circuit, said buffer and said converting means all being hermetically sealed within said metal housing;

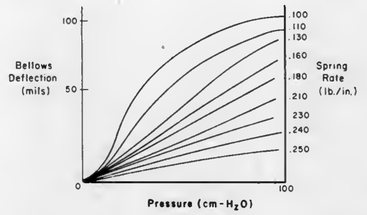
a collar with internal threads;
means for fastening said collar to a patient's cranium;
a sleeve with external and internal threads, said external threads adapted to mate with said collar threads, said internal threads adapted to mate with said housing threads, said sleeve having an end plate with an inner and an outer surface and a centrally located aperture slightly larger than said diaphragm, said aperture permitting a user to see when said sleeve has been advanced in said collar to the position where the end plate outer surface is flush with said subject's dura, said end plate being X thick so that said transducer diaphragm will be flush to said outer surface of said sleeve and plate when said housing is screwed all the way into said sleeve and said shoulder touches said inner surface.

4,186,750
POSITION TESTING DEVICE
Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.
Continuation of Ser. No. 680,959, abandoned. This application Apr. 19, 1978, Ser. No. 897,964
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—748 **4 Claims**



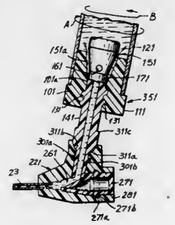
1. A position testing device for a patient's body, comprising:
an elongated tubular member having a lumen, a proximal end, and a distal end for placement in the patient's body; and
a body member having a proximal end, a distal end, an outer surface defining an exterior of the body member, a shallow dish-shaped cavity recessed from said outer surface and exposed to the atmosphere to receive a testing liquid, an elongated tubular section at the distal end of the body member and being releasably received in the proximal end of the tubular member, said body member having a passageway communicating between a first opening at an inner portion of said cavity and a second opening at the distal end of said tubular section such that the passageway communicates with the lumen of the tubular member through said second opening, said passageway intermediate said first and second openings incuding a substantially linear portion and being closed to the exterior of the body member, said passageway being unobstructed intermediate said openings to permit passage of fluid in opposite directions between said first and second openings, said body member being capable of orientation in a testing position while attached to the tubular member and while said passageway linear portion is in a generally horizontal configuration with the cavity being exposed in a generally vertical direction above the body member, said cavity tapering toward said first opening, said cavity having a height between said first opening and said outer surface substantially less than the length of said linear passageway portion, and said cavity having a maximum width adjacent said outer surface substantially greater than the maximum height of the cavity in said testing position, whereby the testing liquid indicates whether the tubular member communicates with a positive or negative pressure inside the patient's body.

4,186,751
NON-INVASIVE, PRESSURE SENSOR APPARATUS FOR COMMUNICATING PRESSURE INSIDE A BODY TO THE EXTERIOR THEREOF
Lewis Fleischmann, Randallstown, Md., assignor to Hittman Corporation, Columbia, Md.
Continuation-in-part of Ser. No. 726,798, Sep. 27, 1976, abandoned. This application Jan. 31, 1978, Ser. No. 873,904
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—748 **18 Claims**



1. A pressure sensor apparatus for indicating pressure in the body comprising a housing, a gold-plated nickel bellows contained within said housing, said bellows having a plurality of convolutions and a length over the convoluted portion of substantially 0.410 inch, a wall thickness substantially within the range of 0.00025 to 0.00033 inch, and an average spring rate of substantially 0.130 to 0.242 pounds per inch, wherein the mean cross-sectional area of said bellows is substantially 0.005 square inches, means for placing said bellows in communication with said pressure in the body so that said pressure will cause said bellows to expand and contract linearly as a function of said body pressure substantially 24.5 to 45.5 mils, and means contained within said housing and associated with said bellows for communicating the linear movement of said bellows to a receiver means located external to said body to provide data indicative of said pressure.

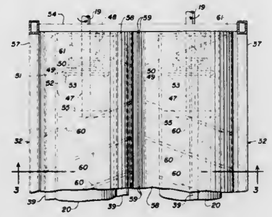
4,186,752
DEVICE FOR TAKING BLOOD AND FOR INJECTING MEDICATION
Luis A. Guerra, 715 Park Ave., New York, N.Y. 10013
Filed Aug. 30, 1978, Ser. No. 938,155
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—766 **9 Claims**



1. A device for taking blood from a blood vessel, comprising a support portion having a passage therethrough, a cannula at the distal end of said support portion, an evacuable container portion, elastic stopper means in the distal end of said evacuable container portion and disposed for rotation therewith, tube means passing through said stopper means, said support portion having a socket at the proximal end of said passage, the distal end of said tube means hereinafter termed "tip", being

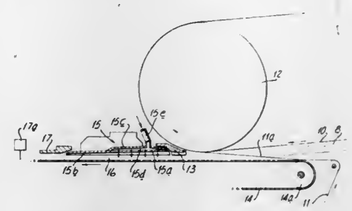
shaped to join with said socket for forming a continuous passage through said tube means and said support portion, said stopper means and the proximal end of said tube means forming a first valve means for gradually connecting the passage in said tube means with the interior of said container portion by rotation of said container portion in a first direction relative to said tube means, said tip being shaped to join with said socket by rotation in said first direction and to present a first resistance in joining said tip with said socket, said proximal end of said tube means being shaped for passing from a fully seated position to a partly seated position and thence gradually to a position in which said valve means is fully open when said container portion is rotated in said first direction, said valve means being fully closed when said tube means is in the fully and partly seated positions, said tube means presenting a second resistance, greater than said first resistance, when moving said tube means from said fully-seated to said partly-seated position by rotation of said container portion, said tube means and said evacuable container portion being essentially coaxial, whereby inserting said tip in said socket when said tube means is fully seated, and continuously rotating said container in said first direction first joins said tip to said socket, and only then moves said tube means from fully-seated to partially seated position, whence the valve means can be opened to any selected extent by further rotation in said first direction, thereby insuring that said container portion is joined to said support before said first valve means is opened.

4,186,753
MATERIAL FLOW RETARDERS
Robert R. Todd, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Jul. 14, 1978, Ser. No. 924,547
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 T **12 Claims**



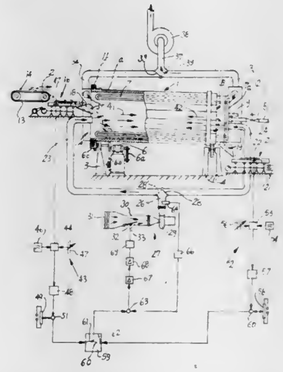
1. In a crop harvesting and threshing machine having a mobile frame with a longitudinal axis, at least one threshing and separating member having a first end and an opposing second end supported on the frame for rotation about an axis substantially parallel to the longitudinal axis by means including a shaft on the second end, the shaft and the second end of the member defining a junction, a casing surrounding a substantial portion of the member, the casing including an upper substantially closed portion and a lower portion having a discharge area adjacent the junction, the casing further having an end wall positioned rearwardly of the junction and in intersecting relationship with the axis of the member, the member and the casing cooperating to direct crop material toward the second end from the first end, and drive means therefor, the improvement comprising:
crop material flow inhibiting means attached to the upper portion of said rotor casing adjacent the junction, the inhibiting means decelerating and redirecting the crop material toward the discharge area prior to the crop material reaching the end wall, whereby the crop material is prevented from reaching the junction.

4,186,754
CIGARETTE MANUFACTURE
Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins Limited, England
Filed Jul. 8, 1977, Ser. No. 814,043
Claims priority, application United Kingdom, Jul. 14, 1976, 29222/76
Int. Cl.[2] A24C *5/14*
U.S. Cl. 131—23 A **9 Claims**



1. A cigarette making machine including a tongue by which the tobacco is compressed to its final cross-section, characterised by liquid feeding means formed in the tongue for feeding liquid to a surface of the tongue in contact with the tobacco to dilute and reduce the viscosity of any gum from the tobacco which comes into contact with the tongue.

4,186,755
TOBACCO DRYING APPARATUS
Herbert Schmidt, Glinde, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany
Filed Jul. 14, 1977, Ser. No. 815,500
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638446
Int. Cl.[2] A24B *3/10, 3/12*
U.S. Cl. 131—135 **15 Claims**



1. Apparatus for drying tobacco, comprising a conditioning unit having an inlet and an outlet; means for feeding tobacco into said inlet; means for effecting the movement of tobacco from said inlet to said outlet; means for receiving conditioned tobacco from said outlet; at least one source of fluid heating medium; means for conveying heating medium from said source to said inlet; means for conveying heating medium from said source to said outlet; and switchover means operative to connect said source with said first mentioned conveying means while sealing said source from said last mentioned conveying means and vice versa whereby the tobacco in said conditioning unit is respectively dried by heating medium which flows only from said inlet toward said outlet and vice versa.

4,186,756

METHOD OF PROCESSING SMOKING COMPOSITION

Nagaaki Takemoto; Teruo Sakurai; Kimio Mashiko, and Harumatsu Tomari, all of Yokohama, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Japan

Filed Jun. 1, 1977, Ser. No. 802,419
Claims priority, application Japan, Jun. 15, 1976, 51-69316
Int. Cl.[2] A24B *3/14*; A24D *1/18*
U.S. Cl. 131—140 C **17 Claims**

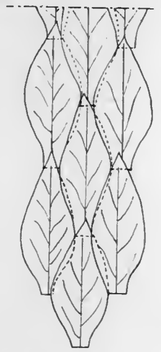
1. Method of processing smoking composition having an equilibrium value to improve the water-resistance of the same which comprises:
(a) admixing CMC-Na with natural tobacco material and/or either organic or inorganic material each of which is combustible,
(b) forming the mixture resulting from step (a) into a sheet-like or rod-like shape so as to prepare a conventional smoking composition,
(c) heating the conventional smoking composition prepared in step (b) at a temperature in the range of about 110°–240° C., whereby the moisture content of said composition is reduced to not more than 1%, and
(d) returning the moisture content of the smoking composition heating-processed at step (c) to the equilibrium value.

4,186,757

PROCESS FOR FORMING A LARGE SHEET OF NATURAL TOBACCO FOR MANUFACTURING PARTICULARLY CIGAR WRAPPERS

Rene Bornsztein, Antony, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Aug. 17, 1977, Ser. No. 825,385
Claims priority, application France, Aug. 20, 1976, 76 25344
Int. Cl.[2] A24B *3/00*
U.S. Cl. 131—149 **11 Claims**



1. A process for forming a sheet of natural tobacco from tobacco leaf portions each having a main rib and secondary ribs, the method comprising forming at least two substantially parallel rows of said leaf portions by positioning leaf portions for each row in end to end engagement with the main ribs of the leaf portions extending lengthwise of the respective rows and positioning the rows such that parts of the leaf portions of one row overlapp complementary parts of the leaf portions of an adjacent row and securing said overlapping complementary parts to each other to form said sheet.

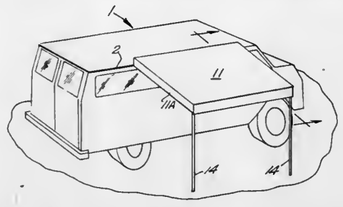
4,186,758

VEHICLE CANOPY

Harold Bridgman, 5317 S. 188th Ct., Aloha, Oreg. 97005

Filed Jun. 16, 1978, Ser. No. 916,792
Int. Cl.[2] E04F *10/06*
U.S. Cl. 135—5 AT **3 Claims**

1. A vehicle canopy attachment for disposition outwardly from one side of the vehicle, said canopy comprising,
tubular canopy supporting members,
leg members in supporting engagement at their upper ends with at least one of said canopy supporting members and in ground contact at their lower ends,
C-shaped members each having a flange adapted for abutment with a segment of the vehicle rain gutter, an upright threaded member in adjustable engagement with each C-shaped member, an elongate plate rotatably mounted at one end of said threaded member and adapted for insertion by advancement of said threaded member into a



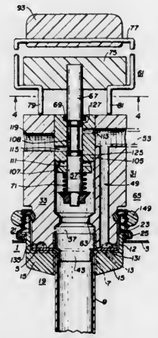
segment of rain gutter and into abutting engagement therewith whereby said flange of each C-shaped member and said plate of each threaded member are securely and oppositely abutted against a length of rain gutter, each threaded member terminating at its remaining end in a circular retainer for disposition above the rain gutter and within which one of said canopy supporting members is insertably engageable, and
a canopy for supported placement over said tubular members.

4,186,759

CLOSED SYSTEM QUICK COUPLING HEAD ASSEMBLY

James S. Stevenson, Oakland, and John J. Rodriques, Orinda, both of Calif., assignors to Terminator Products, Inc., Oakland, Calif.

Filed Aug. 4, 1978, Ser. No. 931,163
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—240 **7 Claims**



1. A coupling head assembly for coupling a container in a closed system, said coupling head assembly including a coupling head having an end portion adapted for insertion into an opening in such container, said coupling head having a main flow passageway therethrough, extending from the insertable end of said coupling head, for flow connecting such container in a closed system to a hose line for withdrawing chemical from such container, a valve seat in said main flow passageway, a main valve in said main flow passageway adapted to engage said valve seat to block said passageway, means normally urging said main valve into engagement with said valve seat, means for removing said valve from its valve seat to open

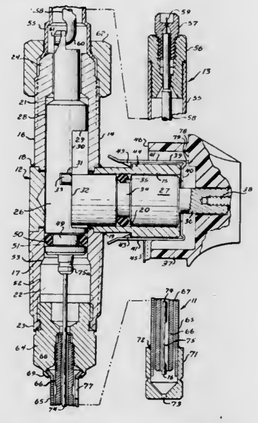
said valve, alternate rinse passageways in said coupling head, one of said rinse passageways terminating at the insertable end of said coupling head for communication with the interior of such container for rinsing the same, the other of said rinse passageways terminating in said main passageway, downstream of said main valve, for supplying rinse liquid to said main flow passageway for rinsing of at least one hose line of such closed system, and means for switching said rinse passageways with respect to a source of rinse liquid, in response to opening and closing of said main valve.

4,186,760

FUEL CONTROL ASSEMBLY FOR BURNERS

Thomas C. Hastings, Willowdale, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jan. 10, 1978, Ser. No. 868,399
Int. Cl.[2] F23D *11/38, 13/28*
U.S. Cl. 137—244 **7 Claims**



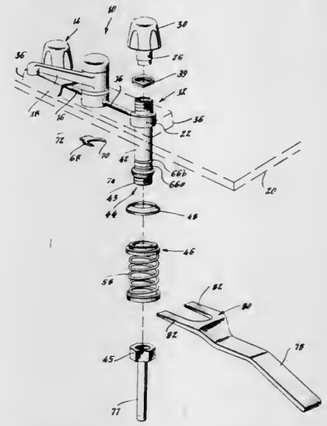
1. An improved fuel control assembly for a fuel burning apparatus comprising:
(a) an elongated valve body having first and second ends and a fuel passage extending axially therethrough from one end to the other end,
(b) a fuel inlet conduit connected to the first end of the valve body and having a fuel passage therethrough communicating with the fuel passage of the valve body and a fuel inlet orifice,
(c) a fuel outlet conduit connected to the second end of the valve body and having a fuel passage therethrough communicating with the fuel passage of the valve body and a fuel outlet orifice,
(d) a movable valve closure member axially slidably mounted within the valve body,
(e) a control member rotatably mounted on the valve body for rotation about an axis extending perpendicularly to the direction of sliding movement of the valve closure member,
(f) crank means connecting the control member and the valve closure member for reciprocating the valve closure member within the valve body as the control member rotates,
(g) valve means on the valve closure member and the valve body for closing the fuel passage through the valve body when the valve closure member moves toward the second end of the valve body beyond a predetermined sealing point in the valve body and for opening the fuel passage through the valve body when the valve closure member moves toward the first end of the valve body beyond said predetermined point,
(h) inlet restricting means extending through the fuel inlet conduit and being connected to the valve closure member for movement therewith as the valve closure member reciprocates for restricting the fuel inlet orifice, and
(i) outlet cleaning means extending through the fuel outlet conduit and being connected to the valve closure member for movement therewith in all positions of the closure member as the valve closure member reciprocates for cleaning the fuel outlet orifice, the valve closure member being movable by the control member in the direction extending from the second end of the valve body to the first end of the valve body from:
(1) a clean position in which the outlet cleaning means is positioned within the fuel outlet orifice of the fuel outlet conduit and the valve means closes the fuel passage through the valve body, to
(2) a light position in which the outlet cleaning means is positioned out of the fuel outlet orifice of the fuel outlet conduit and the valve means opens the fuel passage through the valve body and the inlet restricting means is positioned within the fuel inlet orifice of the fuel inlet conduit for restricting flow of fuel through the fuel inlet orifice, to
(3) a run position in which the outlet cleaning means is positioned out of the fuel outlet orifice of the fuel outlet conduit and the valve means opens the fuel passage through the valve body and the inlet restricting means is positioned out of the fuel inlet orifice of the fuel inlet conduit.

4,186,761

QUICK-RELEASE SYSTEM FOR MOUNTING A FAUCET ASSEMBLY

Carmine Guarnieri, P.O. Box 373, Fairfield, Conn. 06430

Filed May 15, 1978, Ser. No. 906,258
Int. Cl.[2] F16L *5/00*
U.S. Cl. 137—315 **18 Claims**



1. A quick-release system for mounting and demounting a faucet assembly on a wall structure having an opening therein, said assembly including a valve positionable on and operable from one side of said wall structure adjacent said opening and being connected to a source of fluid located on the other side of said wall structure; said system comprising:
an escutcheon mounted in fixed relation with said valve to be located on said one side of said wall structure, said escutcheon being configured to prevent passage of it and, therefore, said valve through said opening;
an elongate, sustantially inextensible, tubular stem, secured at one end in fixed relation to said valve and said escutcheon and providing fluid communication between said valve and said source of fluid, said stem being configured to extend through said opening with its free end, opposite

said one end, spaced from said other side of said wall structure;

washer means engagable against said other side of said wall structure and configured to prevent its passage through said opening;

retainer means, generally radially mountable on and generally radially demountable from said stem in a fixed axial position relative thereto intermediate said free end and said other side of said wall structure;

platform means secured to said stem forming a shoulder that projects generally radially from the axis of said stem and faces toward said one end of said stem;

spring means compressible between said retainer means and said washer means to urge said washer means to engage said other side of said wall structure thereby confining said wall structure between said escutcheon and said washer means to hold the valve in its operable position; and

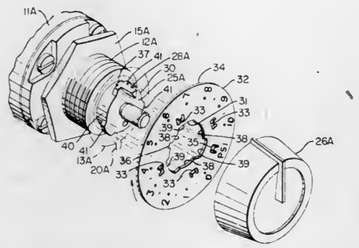
spring lifter means supportable on said shoulder for compressing said spring means against said other side of said wall structure sufficiently to permit mounting of said retainer means on said stem and demounting of said retainer means from said stem.

4,186,762

CONTROL DEVICE MOUNTING MEANS AND PARTS THEREFOR

George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 18, 1978, Ser. No. 943,666
Int. Cl.² F16L *3/00*; G12B *9/00*
U.S. Cl. 137—343 **10 Claims**



1. In the combination of a control device having a threaded cap telescoped through a mounting opening in a control panel and being secured thereto by a nut threaded on said cap and disposed against one side of said panel and means carried by said cap and disposed against the other side of said panel, the improvement wherein said means comprises a substantially flat plate spanning said opening of said panel and having a bayonet opening passing therethrough and aligned with said opening of said panel, said plate having a plurality of spaced apart tabs extending therefrom into said opening of said panel, said tabs being disposed outboard of said bayonet opening said cap having a bayonet portion extending completely through said bayonet opening and cooperating with said bayonet opening to lock said cap and plate together.

4,186,763

IRRIGATION SYSTEM

George R. Ferguson, Rte. 2, Clover, S.C. 29710, and Eric D. Freeman, Rte. 1, Box 134, Lake Lure, N.C. 28746

Filed Mar. 20, 1978, Ser. No. 890,716
Int. Cl.² B05B *3/12*
U.S. Cl. 137—344 **4 Claims**

1. A circular irrigation system comprising:

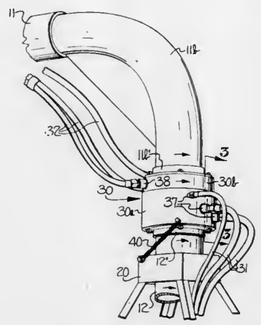
a generally vertical water delivery pipe defining an axis;

a water distribution pipe extending horizontally from and communicating with said delivery pipe;

means supporting said distribution pipe for rotation about said axis and including hydraulic fluid operated drive motor means movable with said distribution pipe for motivating rotation thereof;

hydraulic fluid circulating means mounted stationarily relative to said distribution pipe for circulating a flow of hydraulic fluid to said drive motor means;

conduit means for establishing fluid communication between said circulating means and said drive motor means and including rotary joint means encircling said axis for conducting hydraulic fluid flow between said circulating means and said drive motor means during rotation of said



distribution pipe about said delivery pipe, said rotary joint means comprising a rotor element detachably interposed in said delivery pipe for defining a portion of a water conduit and a stator element encircling said rotor element, said elements being positioned coaxially of each other and coaxially of said water delivery pipe, and means connecting said rotor element to said distribution pipe for rotation therewith about the axis of said delivery pipe, said stator element having a plurality of passageways therein and said rotor element also having a plurality of passageways therein communicating with corresponding passageways in said stator element for conducting hydraulic fluid flow therebetween; and

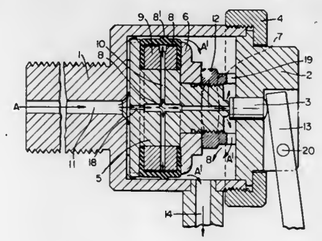
restraining means connected to said stator element for restraining said stator element against rotation.

4,186,764

VALVE FOR CONTROLLING LIQUID FLOW

Odd Ottersen; Egil S. Solvang, both of Oslo, Norway, and Endre Røsjø, London, England, assignors to Ole Gunnar Selvaag, Oslo, Norway

Filed Jul. 22, 1977, Ser. No. 818,198
Claims priority, application Norway, Jul. 22, 1976, 762569
Int. Cl.² F16K *31/18*
U.S. Cl. 137—414 **6 Claims**



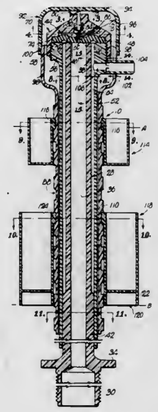
1. A valve for controlling the fluid flow from an inlet of a closed valve housing to an outlet thereof, characterized in that between said inlet and said outlet there is arranged at a distance from the inside of the housing a stationary insert body, through which there extends from said inlet a through channel and from said through channel extend transversely extending cross channels, which open at the inner side of at least one elastic annular ring having a pair of radially inwardly extending legs, said ring surrounding the periphery of the insert body such that said ring, in its inactive position, is spaced from the wall of the valve housing so as to enable flow around said insert between said inlet and outlet of the valve, and a piston which is a sliding close fit through the wall of the valve housing in such a manner that the piston may be brought to lie in sealing engagement against the outlet of the through channel thereby closing said outlet of said through channel, which closing of the through channel outlet will increase the pressure in said channel and thus also in said transverse channels, whereby the pressure against the inner side of the annular ring is increased and said ring is brought to a fluid-tight engagement with the inside of the valve housing, thus preventing any connection between the said inlet and said outlet of the valve, said ring having a U-shaped cross section and said transverse channels opening in between the radially inwardly extending legs of the U, said ring being provided with a surrounding contact bead and said valve housing comprising a unitary cylindrical hollow body closed at one end by a lid which serves to fix said insert body in place and which includes a passage therein for said piston.

4,186,765

LIQUID LEVEL CONTROL VALVE ASSEMBLY

Robert V. Anderson, 3900 Summercrest Dr., Fort Worth, Tex. 76109

Filed Mar. 13, 1978, Ser. No. 885,810
Int. Cl.² F16K *31/28, 33/00*
U.S. Cl. 137—414 **23 Claims**



1. A liquid level control assembly for use in connection with a liquid storage tank having an inlet through which liquid enters the tank under a supply pressure, said assembly comprising:

a valve shiftable between a closed position preventing liquid from entering the tank through said inlet and an open position permitting said entry; and

valve-operating means for operating said valve when the liquid level in said tank drops to a lower predetermined level and for then reclosing the valve when the liquid level rises to an upper predetermined level,

said valve-operating means including a float for closing said valve when the liquid level reaches said upper predetermined level and gravity-operated means so disposed with respect to said float as to open said valve when the liquid level drops to said lower predetermined level,

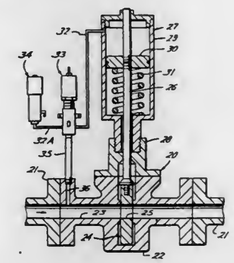
said gravity-operated means being adjustably coupled with said float and said valve in such manner as to permit selective adjustment of said lower predetermined level independently of the location of said upper predetermined level.

4,186,766

FLOW LINE CONTROL SYSTEM

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,513
Int. Cl.² F16K *17/00*
U.S. Cl. 137—458 **9 Claims**



1. In a system wherein flow through a line is controlled by a valve which is moved between flow controlling positions by a fluid-operated actuator, apparatus comprising a first sensor having an inlet to the interior thereof and a vent opening connecting with the interior, a second sensor having an inlet to and a vent opening from the interior thereof, means connecting the first sensor inlet to the line, means connecting the interior of the first sensor with each of the inlet to the actuator and the inlet to the second sensor, said first sensor also having valve means shiftable between a first position opening the inlet thereof to admit line fluid to the actuator and to the inlet to the second sensor while closing the connection of the first sensor interior with the vent opening therefrom, and a second position closing the said inlet while opening the connection of the interior to the vent opening so as to exhaust line fluid from said interior through said vent opening, and means yieldably urging the shiftable valve means toward its second position so that said valve means will be shifted from its first to its second position when line pressure within the interior of the first sensor drops below a predetermined value, and said second sensor also having valve means shiftable between positions opening and closing the inlet to the interior thereof, and means yieldably urging said shiftable valve means to its closed position so that, as long as said shiftable valve means of the first sensor is in its first position, said shiftable valve means of the second sensor will not shift to its open position to exhaust line fluid through the vent opening thereof until the pressure of line fluid within the interior of the second sensor has risen to a predetermined value, the drop of fluid pressure within the interior of the first sensor to said predetermined value, due to opening of the shiftable valve means of the second sensor, causing said shiftable valve means of the first sensor to shift to its second position.

4,186,767

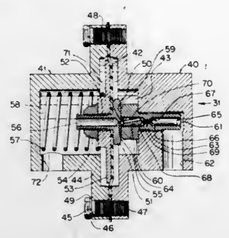
BLEED VALVE PARTICULARLY FOR A MULTI-STAGE COMPRESSOR

Terence Caffrey, Kent, Ohio, assignor to Davey Compressor Company, Cincinnati, Ohio

Continuation of Ser. No. 820,208, is a division of Ser. No. 644,539, Dec. 29, 1975, abandoned. This application Jul. 24, 1978, Ser. No. 927,669

Int. Cl.[2] G05D *7/01*

U.S. Cl. 137—501 **7 Claims**



1. A bleed valve for bleeding fluids between two ambients at different pressures including a housing, said housing having an inlet communicating with the ambient of higher pressure and an outlet communicating with the ambient of lower pressure, said housing having first and second chambers therein, said first chamber communicating with said inlet, said second chamber communicating with said outlet, control means in said housing to allow flow to said second chamber while maintaining a maximum predetermined pressure differential between said first and second chambers irrespective of the pressure differential between said inlet and said outlet, and said control means including flexible means separating said first chamber from said second chamber, passage means extending through said flexible means to provide communication therethrough, and means responsive to the position of said flexible means to control flow from said inlet to said first chamber and from said inlet to said second chamber without flowing through said first chamber.

4,186,768

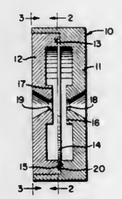
PRESSURE SENSITIVE HYDRAULIC VALVE

Donald W. Kuester, West Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1959, Ser. No. 805,645

Int. Cl.[2] F16K *15/14*

U.S. Cl. 137—516.25 **10 Claims**



1. A sensitive blocking valve device comprising a casing, said casing comprising a pair of half-shell members each including a mating surface at the outer periphery and each having an axial valve seat portion projecting into the interior of said casing and in mutual alignment, an axial orifice through the valve seat portion of each half-shell member, a metallic valve wafer comprising a central valving portion disposed to move to close either of said orifices in said valve seat portions of the casing and having an integral double spiral flat spring formed integrally therewith and extending from said central portion, and an annular portion at the outer periphery of said double spring and formed integrally therewith, said annular portion being disposed in clamped relation between said half-shell members, said wafer including said double flat spring and annular portion all being of the same uniform thickness and planar when the valve device is unoperated.

4,186,769

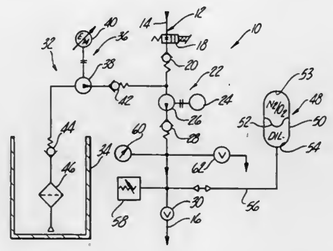
LIQUID MIXING AND DELIVERING APARATUS

Dwight D. Buyce, Hendersonville, N.C., assignor to Chem-Trend, Inc., Howell, Mich.

Filed Jan. 25, 1978, Ser. No. 872,246

Int. Cl.[2] F04B *41/06*

U.S. Cl. 137—566 **10 Claims**



1. Apparatus for mixing a liquid concentrate and a liquid diluent to form a liquid dilution of desired concentration and for delivering the dilution to work stations comprising

a conduit means adapted to be in communication at its upstream end with a source of liquid diluent and at its downstream end with work stations, said conduit means including a first shut-off valve and a primary pump means downstream thereof;

a concentrate supply means including a container for said concentrate, and a metering pump means in communication with said container and with said conduit means at a location between said first shut-off valve and said primary pump means for metering concentrate into the diluent to form said dilution;

accumulator means in communication with said conduit means downstream from said primary pump means for receiving dilution from said primary pump means and returning the same to said conduit means for delivery to said work stations in accordance with preselected pressure conditions; and

control means responsive to one of said preselected pressure conditions for actuating said first shut-off valve to an open position and for actuating simultaneously said metering pump means and said primary pump means so that concentrate and diluent can be caused to flow together toward said primary pump means and discharged therefrom toward said work stations as a dilution of desired concentration.

4,186,770

WASH-HOUSE FITTING INCLUDING A TROUGH

Jan G. H. Zijlstra, Auckland, New Zealand, assignor to AHI Operations Limited, Auckland, New Zealand

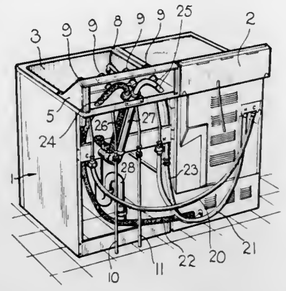
Filed Nov. 9, 1976, Ser. No. 740,345

Claims priority, application Netherlands, Nov. 19, 1975, 179293

Int. Cl.[2] E03C *1/01*

U.S. Cl. 137—572 **6 Claims**

1. A wash-house fitting including a trough able to be combined with a washing appliance, the trough having wall means bounding a space for holding liquid and also having a drainage aperture formed in said wall means and provided with a drainage pipe, first and second conduits extending from said washing appliance and connected to said drainage pipe at first and second positions respectively, said first position being above said second position, and a directional flow control member positionable in said drainage pipe between said first and second positions and having a first condition in which it substantially blocks downward flow of liquid from said first position past said second position while permitting liquid to flow from said first position into the trough, and a second condition in which



it permits downward flow of liquid from said first position past said second position, whereby a first liquid initially in said washing appliance can be passed through said first conduit to said drainage pipe and then to waste if said directional flow control member is in its second condition but to said trough when said member is in its first position for later return to said washing appliance through said first conduit, and a second liquid may be transferred from said washing appliance to waste through said second conduit and said drainage pipe.

4,186,771

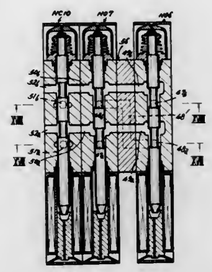
HYDRAULIC CONTROL APPARATUS

Kazumasa Matsumoto, Itami, Japan, assignor to Sanyo Kiki Kabushiki Kaisha, Hyogo, Japan

Filed Nov. 3, 1977, Ser. No. 848,326

Int. Cl.[2] F15B *13/06*

U.S. Cl. 137—596.17 **3 Claims**



1. A hydraulic control apparatus comprising normally opened and normally closed, solenoid operated, spring return type, two-direction, two-position directional control valves, said valves comprising:

(a) a sleeve having a rectangular parallelepipedic cross-section, an upper and lower surface, each being at least partially flat; two opposed lateral surfaces, each being at least partially flat, said sleeve having an axially extending cylindrical void therein and ports including at least one port for communicating said void with one of said surfaces, and at least one common port for communicating each of said lateral surfaces with each other and with said void;

(b) a spool held within said void and being slidably movable therein, said spool having land portions having an external diameter approximately equal to the internal diameter of said cylindrical void, and a reduced portion having an external diameter smaller than the internal diameter of said cylindrical void;

a solenoid mounted on one end of said sleeve;

a U-shaped clamp elastically secured to said sleeve, covering said solenoid;

a conical coil spring mounted on the opposite end of said sleeve from said solenoid; and

a U-shaped clamp elastically secured to said sleeve, covering said spring, wherein said components are arranged such that said spool is slidably moved within said void by said solenoid in order to open or close communication between at least one of said ports and at least one of said common ports, a plurality of valves being interconnected at said flat surfaces in series through at least one of their respective common ports.

4,186,772

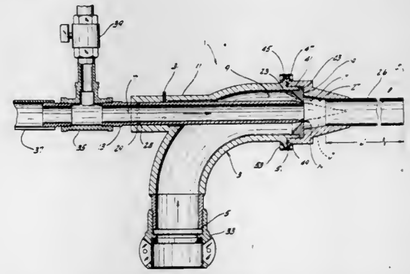
EDUCTOR-MIXER SYSTEM

Avrom R. Handleman, P.O. Box 13151, St. Louis, Mo. 63119

Filed May 31, 1977, Ser. No. 801,620

Int. Cl.[2] F16K *19/00*

U.S. Cl. 137—604 **6 Claims**



1. An eductor-mixer system comprising:

an eductor body having a curved passage extending therethrough for flow of a pressurized working fluid from one end of the passage, constituting an inlet end, to the other end of the passage, constituting a discharge end, said passage being generally of uniform circular cross-section throughout its length;

said body having an opening therein opposite said discharge end of the passage, said opening being coaxial with said discharge end and of substantially smaller diameter than the diameter of said passage;

a nozzle member comprising a ring separate from the body having inside and outside faces and a central opening therethrough from its inside to its outside face, said ring being removably mounted in place at the discharge end of said passage coaxial with said discharge end, said central opening in the ring being of substantially smaller diameter than the diameter of said passage;

a cylindrical tube of substantially smaller diameter than the diameter of said passage extending from outside said body through said opening in the body opposite the discharge end of the passage and extending forward in said passage from the inner end of said opening in the body into the central opening in the ring, said tube being open at its end in said central opening in the ring, said open end of the tube constituting a discharge end;

said tube being axially adjustable in and removable from said opening;

said tube being adapted for connection of its end outside the body to a source of fluent material to be educted and mixed with said working fluid for flow of said material through said tube and out of the discharge end of the tube;

the discharge end of the tube being substantially flush with the outside face of said ring;

the tube being exteriorly tapered at its said discharge end

and thereby having an exterior conical surface convergent in the direction toward its said discharge end with the angle of taper with respect to the axis of the tube less than about 30°;

the inner periphery of the ring bounding the central opening in the ring being formed as a conical nozzle surface extending from the inside face to the outside face of the ring and convergent in downstream direction from the inside to the outside face of the ring;

said conical nozzle surface of the ring surrounding and being spaced from said exterior conical surface of the tube a distance which is small relative to the diameter of the outer end of said conical nozzle surface, thereby providing an annular conical orifice between the exterior

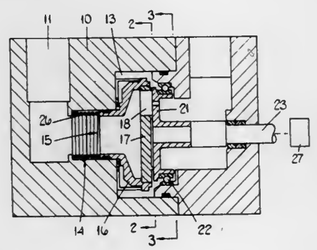
conical surface of the tube and said conical nozzle surface of the ring for delivery of the pressurized working fluid from said passage through said orifice in the form of a hollow conical jet converging in downstream direction from the outside face of the ring;

the gap between the exterior conical surface of the tube and the conical nozzle surface of the ring being relatively small and the length of said orifice being relatively short for rapid acceleration of working fluid flowing through the orifice to a relatively high lineal velocity with low flow losses;

and means separate from the ring providing a passage downstream from said ring at the discharge end of the passage in said body in which the material issuing from the discharge end of the tube and the working fluid conically jetted through said orifice may mix;

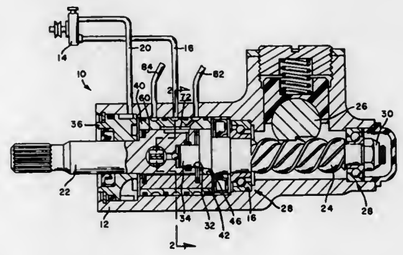
said passage means being removably secured to said body at the discharge end of the passage in the body extending outwardly from said ring and having an internal diameter at its end at the outside face of said ring larger than the diameter of said conical nozzle surface of the ring at the outside face of the ring and the internal surface of said passage means lying outward of and wholly clear of the projection of said conical jet throughout the length of the jet.

4,186,773
CONTROL VALVES FOR FLUIDS
Derek J. Flynn, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Jul. 7, 1977, Ser. No. 813,706
Claims priority, application United Kingdom, Aug. 18, 1976, 34374/76
Int. Cl.² F16K *39/00*
U.S. Cl. 137—625.3 **11 Claims**



1. A control valve for fluids comprising a body having an inlet and an outlet, a bore through which fluid can flow from said inlet, a control element sealingly slidable in said bore, a port plate including first port means located between said control element and said outlet, means for maintaining opposed faces of said port plate and control element in mutual sliding and sealing engagement in a plane substantially perpendicular to the axis of said bore, a passage through said control element from said bore and opening onto said control element face to define a second port means, means for causing relative sliding between said opposed faces, said sliding resulting in variation of the overlapping areas of said first and second port means, a raised land surrounding one of said port means and defining one of said opposed faces, the cross sectional area of said bore being substantially equal to the sum of the cross sectional areas of one of the port means and of half the area of the face defined by said land so that variations in fluid pressure at said inlet do not materially affect axial force applied to said control element.

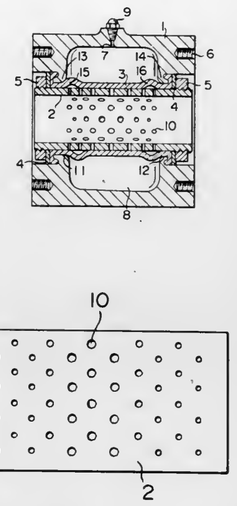
4,186,774
HYDRAULIC CONTROL DEVICE
Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Apr. 3, 1978, Ser. No. 892,575
Int. Cl.² F15B *9/08*
U.S. Cl. 137—625.23 **2 Claims**



1. In a control device having a rotatable input member, a sleeve having a bore receiving the rotatable input member and at least one pin disposed between the rotatable input member and the sleeve to limit the rotation between the rotatable input member and the sleeve, characterized by the sleeve including a groove and the rotatable input member including a slot opposite the groove, said one pin being disposed within the groove and slot, said slot including a bottom surface which is normally spaced from the pin and including surface portions which are contoured to the shape of the pin, said surface portions being normally spaced from matching surface portions on the pin when the latter is in an idle position, and one of said surface portions including notches facing said other surface portions.

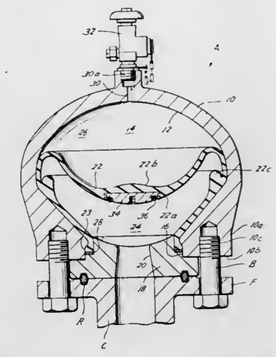
4,186,775
WATER HAMMER SHOCK ABSORBER
Sankichi Muroi, Matsudo, Japan, assignor to Tozen Sangyo Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 728,730, Oct. 1, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 918,726
Claims priority, application Japan, Oct. 7, 1975, 50-121143
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **4 Claims**

1. A water hammer shock absorber comprising: a casing forming a cavity adapted to have a pressurized gas sealed therein and provided with two openings, said casing having smoothly curved surface portions at junctures of the openings and the cavity; a pipe extending within the cavity between said two openings and sealed with respect to the casing, said pipe having perforations along its length that vary in area, the total area of said perforations along equal increments of pipe length being greater in a central portion of the pipe and lesser adjacent the two openings of the casing; and an elastic tube covering the perforations of the pipe and sealed about the pipe in a liquid-tight fashion, said tube having annular convex zones within the cavity adjacent each of said two casings openings and a central zone engaging the pipe in one condition of operation, the central zone being expansible in another condition of operation to a position spaced from the pipe, said annular zones



being at least partially in contact with the inner wall of the cavity in both said conditions of operation.

4,186,776
PULSATION DAMPENER OR SURGE ABSORBER
James A. Burton, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.
Filed Oct. 30, 1978, Ser. No. 955,929
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **1 Claim**



1. A pulsation dampener for dampening undesired pressure changes in a fluid, including:

a pressure vessel forming a cavity means for receiving and containing fluid under pressure in said cavity means, said pressure vessel having a first opening and a second opening formed therethrough;

an inlet nozzle disposed in said first opening and having a flow passage for permitting ingress and egress of fluid subject to the undesired pressure changes from said cavity means through said flow passage;

a flexible diaphragm disposed in said cavity for dividing said cavity means into a first zone for receiving a first fluid and a second zone for receiving a second fluid, said first zone communicating with said flow passage of said first inlet nozzle;

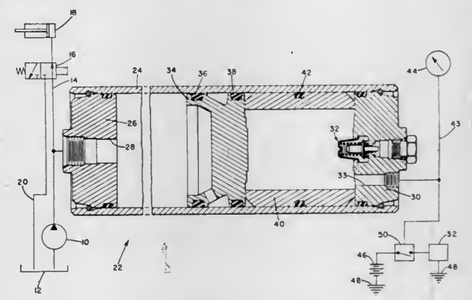
said second opening communicating with said second zone;

means operably mounted with said pressure vessel for controlling the fluid pressure in said second zone;

means formed on said pressure vessel for securing said pressure vessel with a conduit having the fluid subject to pressure changes for communicating the fluid subject to the undesired pressure changes through said flow passage of said inlet nozzle to said first zone; and

said inlet nozzle sealingly secured to the conduit and said pressure vessel by said means for securing said pressure vessel wherein replacement of said inlet nozzle does not require replacement of said means for securing said pressure vessel; and wherein said diaphragm seals with said inlet nozzle to limit contact of the fluid subject to the undesired pressure changes in the first zone to only the inlet nozzle and diaphragm to protect the pressure vessel from corrosion or flow erosion by the fluid subject to the undesired pressure changes; said diaphragm having a diaphragm pressure reinforcement molded thereon for bridging said flow passage to support said bladder when the fluid pressure in said second zone exceeds the fluid pressure in said first zone to reduce the adverse effect of differential pressure on said bladder; said diaphragm having having having an annular rib formed thereon for forming a radius of curvature for said bladder as the first zone decreases in size relative to the second zone; and wherein said diaphragm pressure reinforcement is a metal disk; and said shock absorbing means including an O-ring mounted with said metal disk; and wherein said means for securing said pressure vessel comprises a collar and polytetrafluoroethylene ring, and maintains said inlet nozzle in sealing engagement with the conduit to prevent leakage of fluid between said inlet nozzle and the conduit when communicating the fluid subject to the undesired pressure changes through said flow passage of said inlet nozzle to the first zone.

4,186,777
PRESSURE VESSEL RETAINED ENERGY MEASUREMENT SYSTEM
Lawrence R. Klope, Cedar Falls, and Robert E. Haight, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Oct. 27, 1978, Ser. No. 955,498
Int. Cl.² F16L *55/04*
U.S. Cl. 138—31 **1 Claim**



1. In a hydraulic system having a fluid pump drawing fluid from a fluid reservoir and supplying said fluid to a fluid function through a supply line, a pressure vessel system comprising: a cylindrical housing having first and second open ends; a cylindrical plug member having a port provided therein secured to and closing said first open end of said cylindrical housing, said port fluidly connecting said supply line in said cylindrical housing; a cylindrical cap member having first and second through holes provided therein secured to and closing said second end of said cylindrical housing; a normally closed gas valve disposed in blocking position in said first through hole operable to allow bi-directional flow of gas through said

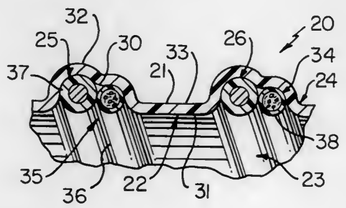
hole; sensing means connected to said second through hole for sensing the pressure of said gas in said cylindrical housing and providing an indication thereof; said sensing means includes a normally-closed pressure switch held open by gas pressure in the cylindrical housing so long as the pressure is above a predetermined value and closable below the predetermined pressure of said gas in said cylindrical housing, and a warning indicator responsive to the closing of said pressure switch to provide an indication thereof; a cylindrical piston slidably disposed in said cylindrical housing between said cylindrical plug member and said cylindrical cap member, said cylindrical piston separating said fluid from said gas; and means disposed between said cylindrical piston and said cylindrical cap member for stopping said cylindrical piston a predetermined distance from said cylindrical cap member and defining a predetermined minimum gas volume.

4,186,778

HOSE CONSTRUCTION HAVING INTEGRAL FIRE EXTINGUISHANT AND METHOD OF MAKING SAME

Richard D. Carey, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed May 30, 1978, Ser. No. 910,922
Int. Cl.² F16L *11/12*
U.S. Cl. 138—103 **25 Claims**





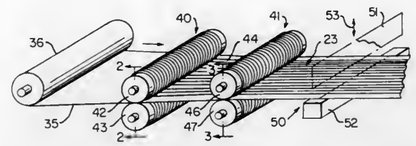
1. In a hose construction made primarily of combustible material and having a tubular inside surface defining a longitudinally extending passage for conveying a fluid therethrough and having an outside surface, the improvement comprising, at least one member which has a fire extinguishing material comprising same, said member being disposed adjacent one of said surfaces, said fire extinguishing material being activated upon subjecting said member to combustion temperatures, said member comprising an independent tube having an enclosing wall made of a combustible material and containing a fire extinguishing material therein, said fire extinguishing material being exposed and free to act upon destruction of said enclosing wall by subjecting same to said combustion temperatures.

4,186,779

CORRUGATED METAL TUBE

William T. Wagner, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed May 12, 1978, Ser. No. 905,487
Int. Cl.² H02G *3/04*
U.S. Cl. 138—121 **1 Claim**



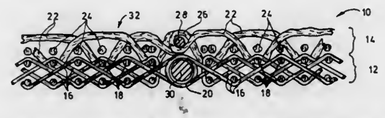
1. A corrugated ferrous metal tube having a central longitudinal axis and comprising, a single piece member having equal thickness throughout and consisting of a central portion and a pair of right circular cylindrical portions extending from the opposite ends of said central portion, said central portion having integral corrugations and opposed edges, said member being in tubular form with said corrugations defining substantially annular alternating radially outwardly facing projections and channels having a substantially semi-circular cross-sectional outline and each having the same average radius, said cylindrical portions having a diameter substantially equal to the diameter of said channels; said opposed edges disposed immediately adjacent each other, each of said edges disposed in abutting relation in an associated plane extending along a mean path substantially parallel to said axis, and a butt weld defined by fusing together the metal defining said opposed edges and fixing said edges together.

4,186,780

SEAM CONSTRUCTION FOR MULTI-LAYER FELTS

Michael J. Josef, Clifton Park, and Eric R. Romanski, Delmar, both of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,989
Int. Cl.² D03D *25/00, 3/04*
U.S. Cl. 139—383 A **10 Claims**



1. A pin seam construction joining together the two ends of a multi-layered, woven papermakers felt or forming fabric characterized in part by a first system of lengthwise yarns in one layer and a second system of lengthwise yarns positioned above the first system, which comprises;

a plurality of first loops protruding from the two ends of the fabric on a plane co-extensive with the plane of the lengthwise yarns in the first system of lengthwise yarns;

a plurality of second loops, protruding from the two ends of the fabric on a plane co-extensive with the plane of the lengthwise yarns in the second system of lengthwise yarns;

said loops being anchored in the body of the felt or fabric;

said loops in one end being alternately displaced in respect to the loops of the other end so that the loops of the one end will interleaf with the loops of the other end when the ends are brought together to form a seam at the interleafed loops;

a first pintle through the plurality of interleafed first loops; and

a second pintle through the plurality of interleafed second loops;

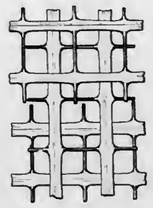
said pintles joining the interleafed loops in a seam construction.

4,186,781

NETWORK STRUCTURES AND METHODS OF MAKING SAME

Charles W. Kim, Wilmington; Chia-Seng Liu, and Richard MacDuff, both of Newark, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 750,982, Dec. 15, 1976, Pat. No. 4,101,358, which is a division of Ser. No. 590,664, Jun. 26, 1975, which is a division of Ser. No. 324,028, Jan. 16, 1973, Pat. No. 3,922,329.
This application Apr. 14, 1978, Ser. No. 896,547
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.
Int. Cl.² D03D *15/00*
U.S. Cl. 139—420 R **2 Claims**



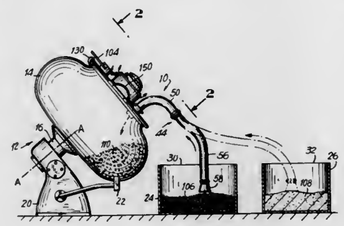
2. A woven fabric comprising a plurality of tapes each tape having two or more parallel continuous uniaxially oriented main filaments interconnected in a predetermined uniform spaced relationship by a plurality of transverse discontinuous parallel tie filaments, no substantial portion of which crosses over the main filaments, each of said tie filaments between each pair of adjacent main filaments having its longitudinal axis in axial alignment with the longitudinal axis of the adjacent tie filament, and each tape having portions of tie filaments protruding from the edges thereof, said tapes being woven together to provide a woven fabric having a predetermined porosity.

4,186,782

PORTABLE ARRANGEMENT FOR AND METHOD OF TRANSFERRING MATERIALS BETWEEN OPEN-MOUTHED CONTAINERS

Lou Scharf, 240 Central Park South, New York, N.Y. 10019

Filed May 22, 1978, Ser. No. 908,051
Int. Cl.² B65B *31/00*
U.S. Cl. 141—7 **10 Claims**



1. A portable arrangement for reversibly transferring materials in either direction between open-mouthed containers, at least one of said containers being a mixing drum for receiving solid materials to be coated and coating materials, comprising:

(a) portable cover means for removably sealingly engaging the respective mouths of at least two containers, said cover means including

(i) a portable frame having an access opening, and

(ii) a sealing member mounted on said frame for movement together with the latter between a loading position in which said sealing member covers and sealingly engages the mouth of one of said containers while leaving another of said containers uncovered, and an unloading position in which said sealing member covers and sealingly engages the mouth of said other container while leaving said one container uncovered;

(b) elongated conduit means for communicating between the respective interiors of said covered and said uncovered containers, said conduit means having

(i) one end region mounted on said frame for movement together with the latter and communicating with the interior of the respectively covered container, and

(ii) another end region in communication with and movable relative to said one end region of said conduit means for entry through the mouth of the respectively uncovered container into the interior of the latter;

(c) means for moving material from the interior of said uncovered container to the interior of said covered container in each position of said cover means, said material-moving means including

(i) suction transfer means mounted on said frame for movement together with the latter and operative in each position of said cover means for generating within the respectively covered container a pressure which is lower than the pressure within the respectively uncovered container, said pressure differential being operative for loading material from said other container through said conduit means to said one container in said loading position, and for unloading material from said one container through said conduit means to said other container in said unloading position,

(ii) said suction transfer means including a vacuum pump having a suction inlet opening in communication with said access opening of the frame, an electrical motor drive for the pump, and adjusting means electrically connected to said motor for adjusting the transfer rate of the materials to be transferred during loading and unloading by electrically controlling said motor drive;

(d) filtering means at said access opening for preventing entrance of undesired contaminants through said openings to said vacuum pump in each position of said portable cover means; and

(e) handle grip means mounted on said frame for reversing the orientation of said suction transfer means and said other end region of said conduit means relative to the covered and uncovered containers in each of said positions, whereby materials are transferred in either direction between the two containers.

4,186,783

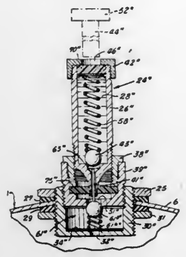
CHEMICAL INJECTOR

Michael W. Brandt, P.O. Box 1092, Stillwater, Okla. 74074

Continuation of Ser. No. 462,364, Apr. 19, 1974, abandoned.
This application Jan. 26, 1976, Ser. No. 652,372
Int. Cl.² B65B *3/32*
U.S. Cl. 141—18 **5 Claims**

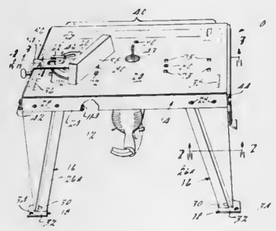
1. Pesticide sprayer apparatus comprising: a sleeve having a bore extending therethrough forming a chamber containing a premeasured quantity of liquid pesticide; a conically-shaped lower end on said sleeve having a passage extending through said conically-shaped lower end; valve means in said passage, said valve means being moveable between a first position preventing flow of liquid from said chamber through said passage and a second position permitting flow of liquid through said passage; a container, said container having an upper end and a lower end; an air pump on said container, said air pump being adapted to deliver pressurized air into said container; a tube; means securing said tube to said container such that a lower end of said tube is positioned inside said container and adjacent the lower end of the container; a hose having one end secured to the upper end of said tube and

another end secured to a spray gun; a valve body on said container, said valve body having a passage through which pesticide is introduced into said container, said passage through said valve body terminating inside said container adjacent the upper end of the container to assure mixing of pesticide introduced into said container with contents of the container before flowing into the lower end of said tube; means detachably securing said sleeve to said valve body, said passage formed in said conically-shaped lower end of said sleeve communicating with said chamber and terminating exteriorally of said sleeve and communicating with the passage in the valve



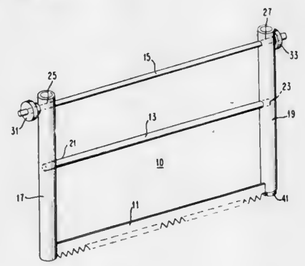
body when said sleeve and said valve body are secured together; seal means on said valve body, said seal means being adapted to prevent leakage of liquid pesticide from said chamber to the outside of the container when said sleeve and said valve body are secured together; a rod in the passage in the valve body positioned to extend into the passage in the conically-shaped lower end of said sleeve to move said valve means from said first position to said second position when said sleeve is secured to said valve body and permitting movement of said valve means from said second position to said first position when said sleeve is not secured to said valve body and means to eject liquid from said chamber into said container.

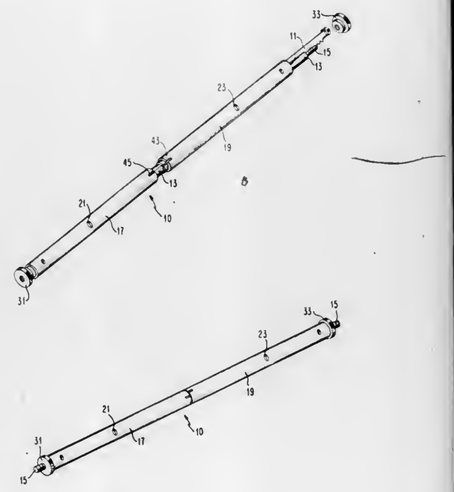
4,186,784
TOOL TABLE CONSTRUCTION
John T. Stone, Saylorsburg, Pa., assignor to Atlantic Container Corporation, Easton, Pa.
Filed Jul. 21, 1977, Ser. No. 817,630
Int. Cl.² B25H *1/02*
U.S. Cl. 144—253 J **20 Claims**



1. A tool table for a plurality of different tool assemblies each having a different type cutting tool, said table comprising a top structure, a plurality of legs secured to said top structure for supporting said top structure, said top structure being a laminated structure comprising a sheet metal base and a hardboard top adhesively secured thereto, said hardboard top having an upper surface defining a working surface for supporting the material to be worked on by the cutting tool, a generally centrally located opening in said top structure, and mounting means for mounting the plurality of different tools to said top structure with the cutting tool being extendable through the opening, said mounting means adapted to be secured to saber saws and routers, said mounting means comprising a generally annular member having an inwardly dished portion with a generally central tool aperture and an outer peripheral flange having a plurality of radially outwardly extending notches therein, first fastening means extending through said notches for removably securing said annular member to the underside of said top structure and below said upper surface with said tool aperture in line with said opening whereby said upper surface alone defines the working surface immediately surrounding the cutting tool of the saber saws and routers, said inwardly dished portion of said annular member having a first plurality of circumferentially distributed slots adapted to receive mounting means for attaching a router to said annular member and a second plurality of circumferentially distributed slots adapted to receive mounting means for attaching a saber saw to said annular member.

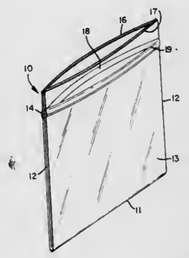
4,186,785
SELF-STORING BUCKSAW
Malvin S. Bilsback, 20 Park Dr., Woodstock, N.Y. 12498
Filed Jul. 24, 1978, Ser. No. 926,871
Int. Cl.² B27B *21/00*
U.S. Cl. 145—32 R **3 Claims**





1. A self-storing buck saw assembly having an assembled and a stored condition comprising in combination
a frame including a handle assembly, a compression member and a tension member,
a saw blade of predetermined length,
said handle assembly comprising a pair of hollow tubular handle members of substantially equal size,
one tubular handle member being formed for interconnection to the other handle member of each said pair to form a carrier assembly for the remainder of said buck saw components,
said tension member comprising a solid rod having screw portions at opposite ends, and
a pair of tension adjustments means associated with opposite ends of said tension rod,
said tension adjusting means comprising a pair of thumb nuts on opposite ends of said tension rod, the outer diameter of each thumb being larger than the inner diameter of each tubular handle member
said blade, tension and compression members being contained within said handle assembly when said buck saw is in said store condition,
said tension adjusting means adjusting the tension of said tension member when said buck saw is in the assembled condition,
and also functioning as end members of said carrier assembly when said buck saw is in said store condition whereby only those components of said buck saw assembly utilized in said assembled state are utilized in said store state said tension member being longer than the interconnected length of said tubular handle members by the length of said screw portions so that in the stored condition the tension member may be inserted into the interconnected tubular handle members with the said screw portions extending at opposite ends and the thumb nuts screwed down the said screw portions to close the interconnected tubular handle members at opposite ends with the blade and compression member therewithin and retain the handle members in the interconnected carrier condition.

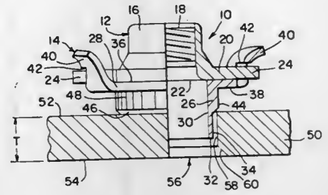
4,186,786
COLORED INTERLOCKING CLOSURE STRIPS FOR A CONTAINER
George F. Kirkpatrick, Downers Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed Sep. 29, 1978, Ser. No. 947,040
Int. Cl.² B65D *17/20*
U.S. Cl. 150—3 **14 Claims**



1. A container comprising two flexible sidewalls and an interlocking closure device including two closure profiles operable for being interlocked continuously over a predetermined length and connected to said sidewalls, wherein the improvement comprises said closure profiles having different colors for establishing visually the completeness of the occlusion of said closure profiles.

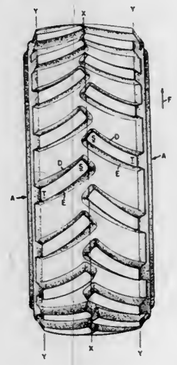
4,186,787
FLOATING ANCHOR NUT ASSEMBLY AND BASKET MEMBER COMPONENT
Ahmed Husain, Union, N.J., assignor to Amerace Corporation, New York, N.Y.
Filed Dec. 28, 1977, Ser. No. 865,028
Int. Cl.² F16B *37/00*
U.S. Cl. 151—41.73 **20 Claims**

1. A basket member for use as a component of a rivetless floating anchor nut assembly, said basket member being of one-piece metal construction and having a sleeve portion and a nut member engaging and retaining portion, said sleeve portion adapted to enter an aperture in a workpiece and having a deformable part adapted to be permanently deformed to affix said basket member to said workpiece and said nut member engaging and retaining portion having a bearing surface adapted for slidable engagement with a bearing surface of said nut member and a pair of wings each having a slot there-



through adjacent said basket member bearing surface, said slots adapted to receive nut member lugs releasably to capture the nut member, said wings being resiliently flexible to permit assembly and disassembly of a nut member with and from said basket member an indefinite number of times, said basket member having a hardness in the range of which the lower limit is 34 on the Rockwell C scale and the upper limit is 38 on the Rockwell C scale.

4,186,788
PNEUMATIC TIRE
Jean Pommier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Mar. 2, 1978, Ser. No. 882,783
Claims priority, application France, Mar. 3, 1977, 77 06682
Int. Cl.² B10C *11/08*
U.S. Cl. 152—209 B **7 Claims**



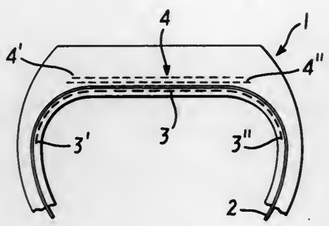
1. A pneumatic tire having a tread with two side edges, a longitudinal plane of symmetry and traction bars with a leading edge and a trailing edge, said traction bars having, with respect to said longitudinal plane of symmetry, an average angle of inclination which is greater at their end adjacent said side edges than at their end adjacent said longitudinal plane of symmetry, said leading edge having a slope more abrupt in the region of said longitudinal plane of symmetry than in the region of said side edges and said trailing edge having a slope more gentle in the region of said longitudinal plane of symmetry than in the region of said side edges.

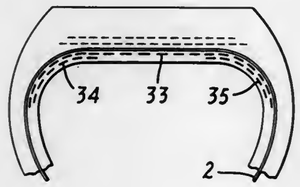
4,186,789

HEAVY-DUTY RADIAL TIRE WITH PLY OF OBLIQUE ELASTIC CORDS RADIALLY INWARD OF THE CARCASS

Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, France

Continuation-in-part of Ser. No. 598,689, Jul. 24, 1975, abandoned. This application May 19, 1977, Ser. No. 798,372
Claims priority, application France, Jul. 25, 1974, 74 25988
Int. Cl.[2] B60C *9/20, 9/10*
U.S. Cl. 152—354 R **8 Claims**





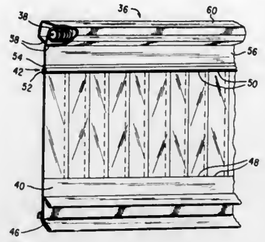
1. A large, heavy-duty pneumatic tire for construction equipment and the like comprising two beads, a continuous carcass extending from one bead to the other and substantially formed of radial cords, and a tread with a tread reinforcement which is formed by at least two plies of parallel cords in each ply in crosswise superimposed arrangement from one ply to the next one and forming with the longitudinal direction of the tire angles of at most 30°, said tread reinforcement being less wide than the tread and located radially outside said carcass to restrain the latter and having a slightly curved meridian profile, said carcass, under the effect of the restraint by said tread reinforcement, assuming a meridian profile which in the region covered by said tread reinforcement is less curved than the normal equilibrium profile and in the region of the shoulders of the tire is more curved than the normal equilibrium profile, said tire comprising also at least one ply of oblique elastic cords which form angles of at most 30° with the radial cords of the carcass, said ply of oblique elastic cords being arranged radially inward of the carcass, extending continuously in the transverse direction of the tire over a width greater than the maximum width of the tread reinforcement, having its two edges located beyond the edges of said tread reinforcement, producing a complementary attenuation of the restraining force of the crown reinforcement, decreasing the curvature of the carcass reinforcement in the equatorial zone of the tire, and increasing this curvature in the region of the shoulders.

4,186,790

ACCESS SHIELD FOR UNCOVERED REFRIGERATED UNITS

M. Allan Schenker, 17046 Burbank Blvd. #16, Encino, Calif. 91316, and Irving J. Kerstein, P.O. Box 404, Calabasas, Calif. 91302

Filed Oct. 3, 1977, Ser. No. 839,731
Int. Cl.[2] E06B *3/80, 9/14*
U.S. Cl. 160—329 **9 Claims**



1. An apparatus for forming a shield across an aperture wherein a temperature gradient is maintained across said aperture while permitting access therethrough, comprising:

a plurality of substantially transparent and resilient panels, each one of said plurality of panels being adjacent to at least one other one of said plurality of panels each one of said plurality of panels assuming an overlapping relationship with at least one other one of said plurality of panels;

means for disposing said plurality of panels across said aperture and tensioning each one of said panels across said aperture said means including at one edge of said aperture a rotatable roller having a torque imparted to said roller by a spring, said roller being coupled to a flexible member, said flexible member being rolled and retractable on one end portion onto said roller and at an opposing end portion said flexible member is coupled to a rigid member which in turn is coupled to one end of each of said plurality of panels for maintaining tension on said plurality of panels;

means for affixing each opposing end of said plurality of panels along one edge of said aperture whereby the parting of an adjacent pair of said panels is operable to draw said rigid member across at least a portion of said aperture toward said means for affixing;

said means for affixing includes rotating means for permitting rotation of at least one edge segment of each of said plurality of panels about the longitudinal centerline of each panel while maintaining tension on each one of said plurality of panels;

said rotating means comprising a freely rotatable holder coupled to an edge segment of one of said panels said holder having a pivot hole and having at least one protrusion extending from said holder, said protrusion having at least a portion offset from said pivot hole;

a receiving fixture having a pivot hole and at least one indentation said indentation for mating and contacting said protrusion on said holder; and

a spring-loaded pivot pin disposed in said pivot hole in said fixture and holder for urging said protrusion into said indentation to return said protrusion and indentation to a configuration of substantially full contact, said contact and mating between said offset portion of said protrusion with said indentation generating a restoring torque whereby said holder and fixture are urged into a realigned configuration;

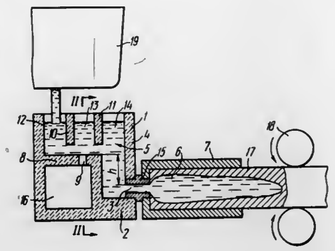
whereby a thermal barrier is formed across said aperture without prohibiting substantially free movement therethrough.

4,186,791

PROCESS AND APPARATUS FOR HORIZONTAL CONTINUOUS CASTING OF METAL

Vladimir T. Sladkoshteev; Oleg A. Shatagin; Samuil F. Khalemsky, and Eleonora B. Besedina, all of Kharkov, U.S.S.R., assignors to Ukrainsky Nauchno, Kharkov and Nauchno Proizvodstvennoe, Tula, both of, U.S.S.R.

Filed Dec. 27, 1976, Ser. No. 754,681
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—66 **6 Claims**



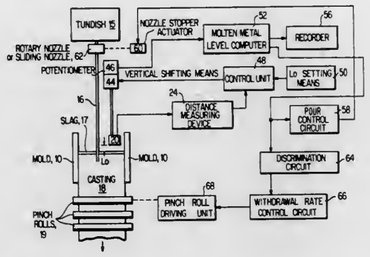
1. A process for horizontal continuous metal casting, comprising the steps of supplying molten metal in a stepped flow through a tundish; blowing through said metal flow a gas which will not react with said metal; and feeding the metal into a horizontally disposed mold; wherein said gas is blown through said metal at a position in said tundish which is above an exit of said tundish where said metal flows into said mold, and said position of the tundish wherein the molten metal flow is being blown through with the gas is substantially isolated from portions of said tundish into which said metal is being fed and from which said metal flows into said mold.

4,186,792

APPARATUS FOR MONITORING AND CONTROLLING THE LEVEL OF THE MOLTEN METAL IN THE MOLD OF A CONTINUOUS CASTING MACHINE

Takeo Yamada; Seigo Ando; Yoshio Miyashita; Katsuhiko Murakami; Masahisa Tate, and Kiyoshi Mizui, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1977, Ser. No. 862,501
Claims priority, application Japan, Dec. 21, 1976, 51-152839
Int. Cl.[2] B22D *11/16*
U.S. Cl. 164—150 **1 Claim**



1. An apparatus for monitoring and controlling the level of a molten metal in a mold of a continuous casting machine, comprising:

supporting means for positioning detecting means of an eddy-current distance measuring device just above the surface of the molten metal in said mold, said detecting means detecting the surface;

monitoring and controlling means adapted to receive a distance signal generated from said distance measuring device in response to a variation in the level of said molten metal relative to said detecting means for controlling the level of the molten metal in said mold at a predetermined height and for simultaneously displaying said distance signal on a recorder, said supporting means comprising:

a shifting mechanism for vertically moving the detecting means of said eddy-current distance measuring device;

control means for actuating said shifting mechanism in such a manner that the distance signal applied from said distance measuring device is maintained at a predetermined value; and

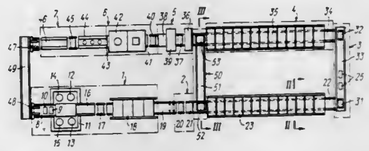
a potentiometer mounted to said shifting mechanism whereby a signal output corresponding to the amount of movement of said shifting mechanism is generated as a distance signal indicative of the level of the molten metal in said mold.

4,186,793

AUTOMATIC LINE FOR COATED METAL MOULD CASTING

Anatoly D. Teplinsky, ulitsa Generala Petrova, 27, korpus 1, kv. 73; Grigory A. Yarovinsky, Treugolny pereulok, 13, kv. 14; Rostislav L. Snezhnoi, ulitsa Bogdana Khmelnitskogo, 36, kv. 12; Savely L. Burakov, Treugolny pereulok, 13, kv. 23; Vladimir S. Serebro, ulitsa Ostrovidova, 88, kv. 1; Yakov M. Ryvkis, ulitsa Garibaldi, 14, kv. 26; Lidia P. Kolienko, ulitsa Tereshkova, 2, korpus 5, kv. 28, all of Odessa; Anatoly I. Bolshakov, ulitsa 25 let Oktyabrya, 92, kv. 52; Vladimir A. Antonov, ulitsa Fitko, 14, kv. 63, both of Tiraspol Moldavskoi SSR; Gerbert G. Tsaizer, prospekt Lenina, 22, kv. 12, Chelyabinsk; Moisei S. Shapiro, pereulok Artilleristov, 2, kv. 8, Chelyabinsk, and Mark M. Pekarsky, ulitsa 40 let Oktyabrya, 28, kv. 123, Chelyabinsk, all of U.S.S.R.

Filed Mar. 17, 1978, Ser. No. 887,532
Int. Cl.[2] B22D *47/00*
U.S. Cl. 164—158 **7 Claims**



1. An automatic line for casting into coated metal moulds assembled from separate parts thereof, comprising:

a unit for applying a coating to the working surface of said metal mould parts so as to be set thereon, said unit incorporating:

a feed conveyer adapted to deliver said metal mould parts for a coating to be applied to said working surface thereof,

a sand-blowing machine intended for applying a coating to the working surfaces of said metal mould parts, said machine being arranged directly after said feed conveyer,

a first turnover manipulator for turning over said metal mould coated parts, with the working face up, arranged after said sand-blowing machine in the direction of the coating process,

a discharge conveyer connecting said sand-blowing machine with said first turnover manipulator for transferring said coated metal mould parts from said sand-blowing machine to said first turnover manipulator,

a device adapted to provide for additional setting of the coating applied to the working faces of said metal mould parts, arranged directly after said first turnover manipulator and formed as a heating means provided with a first conveyer for transferring said coated metal mould parts from said first turnover manipulator to said heating means;

a unit for assembling a complete mould from said separate coated metal mould parts, arranged in the direction of the

assembly operation directly after said coating unit and incorporating:

a second turnover manipulator for turning over the upper part of an assembled mould with its working face down,

an assembly manipulator for assembling said coated metal mould parts into a complete mould, arranged directly after said second turnover manipulator for turning over the upper part of a coated mould,

a second conveyer connecting said first conveyer incorporated in said device for additional setting of the coating with said second turnover manipulator incorporated in said assembly unit for transferring said coated metal mould parts from said additional coating setting device to said second turnover manipulator;

a unit for pouring molten metal into said assembled mould having an inlet and an outlet, arranged in the direction of the production process after said assembly unit and incorporating:

a third conveyer intended for transferring said assembled moulds in said pouring unit where molten metal is poured while said moulds are on said third conveyer,

a transfer device arranged on each end of said third conveyer for placing said assembled moulds on said third conveyer and removing said moulds therefrom,

a device, including a fourth conveyer connecting said assembly manipulator with said transfer device arranged at the inlet of said pouring unit and including further heating means for maintaining a requisite temperature of said assembled moulds awaiting to be filled with molten metal;

a unit for solidifying a casting inside the mould, arranged directly after said pouring unit and incorporating:

a fifth conveyer adapted to receive and transfer poured-in moulds from said transfer device arranged at the outlet of said pouring unit,

additional heating means arranged on said fifth conveyer of the casting solidification unit and energized upon shutting down of the automatic line as a whole;

a unit for disassembling said mould and removing the casting therefrom, arranged directly after said casting solidification unit and incorporating:

a disassembly manipulator for disassembling said mould and cleaning supercharging holes fitted in said metal mould upper part, connected with said solidification unit conveyer,

a third turnover manipulator for turning over said metal mould lower part with the casting contained therein, with the working face down, arranged directly after said disassembly manipulator,

a manipulator for removing said casting from said lower part of the mould and cleaning said supercharging holes fitted in said mould, arranged directly after said third turnover manipulator for turning said metal mould lower part,

a sixth conveyer connecting said manipulator for removing the casting from said metal mould lower part with third turnover manipulator;

a cleaning unit for cleaning said metal mould parts of any used coating, arranged directly after said disassembly unit and incorporating:

a fourth turnover manipulator for turning over said metal mould parts with their working faces up, connected with said disassembly unit conveyer,

a cleaning device for removing the remnants of the used coating from said metal mould parts, arranged directly after said fourth turnover manipulator incorporated in said cleaning unit,

a seventh conveyer connecting said fourth turnover manipulator incorporated in said cleaning unit with said cleaning device;

a unit for stabilizing the temperature of said cleaned mould parts, arranged directly after said cleaning unit and incorporating:

a device for stabilizing the temperature of said cleaned metal mould parts, formed as a chamber for cooling said metal mould parts,

a fifth turnover manipulator for turning over said metal mould parts with the working faces down, arranged directly after said cooling chamber,

an eighth conveyer carrying said cooling chamber and connecting said turnover manipulators incorporated in the cleaning unit and temperature stabilizing unit,

a second discharge conveyer manipulator for removing said metal mould parts from said turnover manipulator incorporated in the temperature stabilizing unit,

an intermediate conveyer connecting said temperature stabilizing unit with said coating unit for transferring said metal mould parts from the temperature stabilizing unit to the coating unit,

a transfer device arranged intermediate said temperature stabilizing unit and said intermediate conveyer for transferring the metal mould parts from said second discharge conveyer incorporated in the temperature stabilizing unit to said intermediate conveyer,

a transfer device arranged between said intermediate conveyer and said coating unit, for transferring said metal mould parts from the intermediate conveyer to said feed conveyer incorporated in the coating unit,

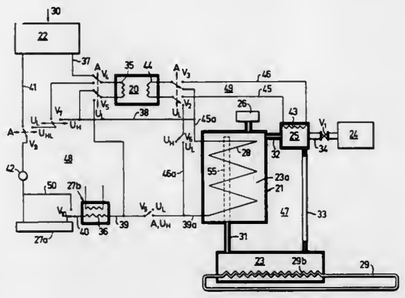
an additional conveyer means connecting a section of said device connecting said assembly manipulator with said transfer device with a section of said fifth conveyer incorporated in the casting solidification unit, for transferring said assembled moulds from one said section to another.

4,186,794

METHOD AND SYSTEM FOR STORING AND EXTRACTING LOW-TEMPERATURE HEAT ENERGY

Ernst-Åke Brunberg, 34, Frejavagen, Djursholm, Sweden (S-182 64), and Ray Olsson, 27, Boforsgatan, Farsta, Sweden (S-123 44)

Filed Dec. 28, 1977, Ser. No. 865,214
Claims priority, application Sweden, Dec. 29, 1976, 7614653
Int. Cl.[2] F25B *15/00, 17/02*
U.S. Cl. 165—2 **21 Claims**



1. Method of storing heat energy in a substance which is comprised in a chargeable and dischargeable energy accumulator and contains less liquid in the charged, high-energy condition of the accumulator than it does in the discharged, low-energy condition of the accumulator, comprising the steps of driving off vapor from the accumulator substance and transferring said vapor to vapor condensing and generating means while maintaining said vapor condensing and generating means at a low temperature as compared with the accumulator, and maintaining the system comprising said energy accumulator and said low temperature means substantially free from other gases than said vapor, so that the pressure in said system is constituted substantially by the pressure of said vapor.

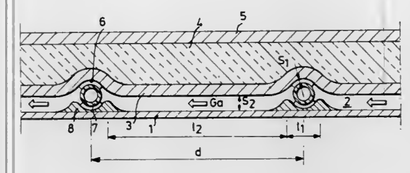
8. System for the storage of heat energy into and the extraction of heat energy from at least one energy accumulator comprising a substance, which contains a bound liquid in the low-energy or discharged condition of the accumulator and which substantially lacks bound liquid in the high-energy or charged condition of the accumulator; means for the charging of the accumulator by vaporation of liquid from the substance of the accumulator due to supply of heat from an energy source to the accumulator substance; a vapor generating and condensing means, which has a low temperature in relation to the energy accumulator and has a liquid container for collecting condensed vapor from the accumulator substance and means for the supply of vapor from the liquid container to the accumulator substance for discharging the accumulator; pressure reducing means for maintaining the partial pressure of other gases than said vapor at a lower level than the partial pressure of said vapor in the system comprising the energy accumulator and said low temperature means; and means for utilizing the energy freed at the discharge of the accumulator.

4,186,795

HEAT-EXCHANGER

Ove B. Platell, Tilskogsvagen 15, S-190 30 Sigtuna, Sweden

Filed Dec. 2, 1977, Ser. No. 856,631
Claims priority, application Sweden, Dec. 6, 1976, 7613694
Int. Cl.[2] F24D *5/10*
U.S. Cl. 165—53 **10 Claims**



1. An arrangement for exchanging heat between a system of pipes adapted to conduct a flow of medium therethrough, and a plate-like heat exchange means, said arrangement being intended particularly for use in connection with air-temperature regulating means operating at a small temperature differential between the temperature of the plate-like heat exchange means and the medium,

said arrangement including mutually facing surfaces of two substantially parallel material layers, one of which surface comprises one side of the plate-like heat exchange means, defining an elongated plenum,

respective pipes of said system being arranged in said plenum to extend parallel with one another and at a distance from each other in a longitudinal direction of said plenum; and a stream of gas or air arranged to flow through the plenum, characterized in that gaps having a constant width are formed on opposite sides of the pipes by spacer means, which gaps extend along a considerable part of the outer surfaces of each pipe with the gaps having dimensions to cause the air or gas to move in a laminar flow through said gaps.

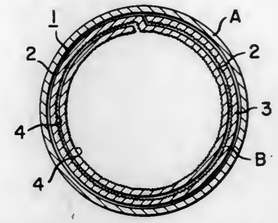
4,186,796

HEAT PIPE ELEMENT

Masayoshi Usui, Numazu, Japan, assignor to USUI International Industry, Ltd., Shizuoka, Japan

Filed May 8, 1978, Ser. No. 903,593
Claims priority, application Japan, May 17, 1977, 52-56030; Sep. 9, 1977, 52-120662[U]
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—105 **10 Claims**

1. In a heat pipe element having an outer pipe member and an inner wick or capillary member incorporated in the inner circumference of said outer pipe member, the improvement which comprises outer elongated pipe means and inner elongated tubular means adapted to be snugly inserted into the inner circumference of said outer pipe means in a closely overlapped manner with a continuous narrow space therewith, said inner tubular means being formed in a spiral shape in such a manner that there is provided a continuous narrow space between the adjacent surfaces of said inner tubular means, said



inner tubular means being provided with a multiplicity of fine recesses or corrugations extending longitudinally of said inner means in either of circumferential surfaces thereof.

4,186,797

DUAL-BELT COOLING SYSTEM

Manfred Guttinger, Stuttgart, and Konrad Schermutzki, Schmiden, both of Fed. Rep. of Germany, assignors to Sandco Limited, Ottawa, Canada

Continuation of Ser. No. 585,823, Jun. 11, 1975, abandoned.
This application Apr. 21, 1977, Ser. No. 789,663
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428292
Int. Cl.[2] F28F *25/06*
U.S. Cl. 165—120 **5 Claims**

1. A dual-belt cooling system which includes two endless metal belts and four end rolls upon which the belts are mounted one above the other with coextensive runs of the belts forming a cooling zone therebetween through which a product passes in heat-exchange relationship with both of said belts, said belt runs extending at an angle with respect to the horizontal; means for supporting the lower of said coextensive belt runs; header means for providing stepped cooling of said product, said header means comprising a plurality of cooling frames arranged in series in the direction of belt travel, each of said cooling frames including an open top structure seated above the upper of said coextensive belt runs and being in fluid sealed relationship therewith, means for discharging a liquid coolant in each of said cooling frames such that said liquid in each frame is in substantially fluid sealed relationship with said upper of said coextensive belt runs to produce cooling and a controlled pressure within each of said cooling frames such that said liquid performs the dual function of cooling said product and exerting a pressure on said upper of said coextensive belt runs so as to urge said upper run against the product, the liquid level in the second cooling frame in the series being higher than the liquid level in the first of said cooling frames in cascade fashion, and a coolant flow connection between the two cooling frames so that liquid coolant discharged from one frame is introduced into the other.

4,186,798

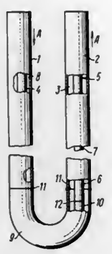
TUBULAR COOLED MEMBERS OF METALLURGICAL FURNACE

Jury I. Tseluiko, prospekt Lenina, 17, kv. 55; Dorina B. Kutsykovich, prospekt Lenina, 39, kv. 54; Ljudmila A. Shabelnikova, Krasnoshkolnaya naberezhnaya, 22, kv. 101; Vladimir P. Kholopov, ulitsa 23 Avgusta, 79, kv. 54, all of Kharkov; Nikolai G. Schekin, ulitsa Cheljuskina, 75, Ljubotin Kharkovskoi oblasti; Lev D. Gritsuk, ulitsa Kombainovskaya, 13, kv. 3, and Leonid B. Katsenelenbogen, ulitsa Karla Marxa, 38, kv. 18, both of Kharkov, all of U.S.S.R.

Filed Jan. 27, 1978, Ser. No. 872,918

Int. Cl.[2] F28F *13/08, 9/26*

U.S. Cl. 165—147 **7 Claims**



1. Tubular cooled members for a metallurgical furnace, comprising: a plurality of straight cooled pipes; a coolant flowing through an interior of each of said straight pipes; a plurality of inserts, a respective insert being coaxially arranged in the interior of a respective straight pipe, the cross-section of each of said inserts decreasing in the direction of flow of said coolant; a bent connecting pipe coupling a pair of said straight pipes together, said connecting pipe having the same diameter as each straight pipe at a junction between said connecting pipe and that straight pipe; and an insert coaxially arranged in an interior of said connecting pipe and arranged concordantly to a longitudinal axis of said connecting pipe, said insert in said connecting pipe having the same diameter as said insert in each straight pipe at a junction between said insert in said connecting pipe and said insert in that straight pipe.

4,186,799

SLAB HEADER

James H. D. Nickerson, and Robert R. Steel, both of St. Catharines, Canada, assignors to Foster Wheeler Limited, St. Catharines, Canada

Division of Ser. No. 603,849, Aug. 11, 1975, Pat. No. 4,117,885, which is a continuation of Ser. No. 510,327, Sep. 30, 1974, abandoned. This application Jun. 20, 1977, Ser. No. 807,845

Int. Cl.[2] F28F *9/22*

U.S. Cl. 165—176 **5 Claims**

1. A heat exchanger comprising:

a vessel;

a first tube sheet axially disposed within said vessel and having a first channel extending into said tube sheet from a periphery thereof;

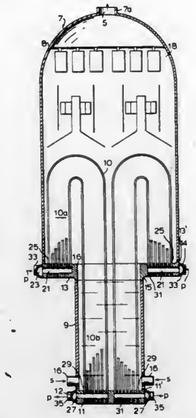
a second tube sheet coaxial with said first tube sheet and having a channel extending into said tube sheet from a periphery thereof;

a plurality of tubes perpendicular to said channels, each of said tubes having a first leg connected to said first tube sheet for communication with said channel extending into said first tube sheet and a second leg connected to said second tube sheet for communication with said channel extending into said second tube sheet, said tube legs being received in said channels along the lengths of said channels;

a first peripheral chamber communicating with said channel extending into said first tube sheet;

a second peripheral chamber communicating with said channel extending into said second tube sheet;

means for introducing a heat exchange fluid into one of said chambers, and



means for removing said heat exchange fluid from the other of said chambers.

4,186,800

PROCESS FOR RECOVERING HYDROCARBONS

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,898

Int. Cl.[2] E21B *43/22, 43/24*

U.S. Cl. 166—256 **6 Claims**

1. A process for recovering hydrocarbons from an underground formation penetrated by an injection well and a production well which comprises:

(a) establishing a burning zone in said formation at the face of said injection well,

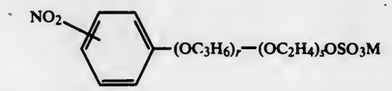
(b) introducing a combustion-supporting gas into said formation via said injection well to propagate said zone toward said production well,

(c) terminating the injection of the combustion-supporting gas into the formation,

(d) displacing the unconsumed combustion-supporting gas in the formation behind the combustion zone by injecting into the formation via the injection well a gas selected from the group consisting of carbon dioxide, nitrogen or steam,

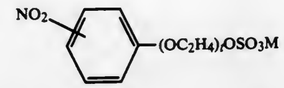
(e) injecting into the said formation via said injection well a mixture of carbon monoxide and hydrogen where reaction of steam generated from the formation water with the injected carbon monoxide forms additional hydrogen and carbon dioxide, and

(f) recovering the displaced hydrocarbons via the said production well, and wherein after step (e) there is injected into the formation via the said injection well a drive fluid comprising water containing dissolved therein from about 0.001 to 1.0 weight percent of an interfacial tension reducer selected from the group consisting of a compound of the formula:



wherein r is an integer of from 2 to about 5, s is an integer of from 8 to about 60 and M is selected from the group

consisting of hydrogen, sodium, potassium and the ammonium ion, and a compound of the formula:



wherein t is an integer of from 8 to about 40 and M has the same meaning as previously described.

4,186,801

IN SITU COMBUSTION PROCESS FOR THE RECOVERY OF LIQUID CARBONACEOUS FUELS FROM SUBTERRANEAN FORMATIONS

Ajay M. Madgavkar, Pittsburgh; Roger F. Vogel, Butler, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Dec. 18, 1978, Ser. No. 970,561

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—256 **17 Claims**

1. The in situ combustion process for recovering liquid hydrocarbons from subterranean formations which comprises injecting a stream of combustion air into at least one injection well leading to a combustion zone in said subterranean formation, producing liquid hydrocarbons and combustion gas from at least one production well, separating the liquid hydrocarbons from the stream of combustion gas whereby a separated stream of flue gas is obtained having a heating value between about 15 Btu/scf. and about 200 Btu/scf. and containing at least one aliphatic hydrocarbon having from one to about seven carbon atoms, passing said gas stream admixed with air for combustion in contact with at least one supported platinum oxidation catalyst having incorporated therewith at least one metal oxide cocatalyst selected from Groups IA, II, III, VIIB and VIII up through atomic No. 45, the lanthanides, chromium, silver, tin and antimony in at least one combustion zone at a temperature high enough to initiate and maintain combustion of said gas stream, the total amount of combustion air being sufficient to provide an air equivalence ratio between about 0.20 and about 0.90, expanding the gas stream in a gas turbine following said catalyzed combustion; and driving an air compressor with said gas turbine to compress and inject said stream of combustion air into the said subterranean combustion zone.

4,186,802

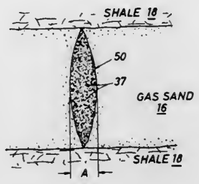
FRACING PROCESS

William Perlman, 2302 Niels Esperson Bldg., Houston, Tex. 77002

Filed Mar. 13, 1978, Ser. No. 885,944

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—280 **23 Claims**



1. A method of forming vertical linear fractures in a subterranean producing formation extending outwardly from a well penetrating the formation without forming any substantial radial vertical fracturing of overlying or underlying strata, comprising the steps of introducing, in a multiplicity of stages a proppant laden fracing fluid carrying a fine-sized proppant material in an average proppant-to-fluid ratio of at least eight pounds per gallon, introducing between said stages of proppant laden fracing fluid a spacer stage of fracing fluid without proppant, said proppant laden fracing fluid and said spacer fracing fluid being injected at an injection rate below 25 barrels per minute and at a pressure selected for producing said vertical linear fracture in the formation, said introduction of said proppant laden fracing fluid continuing until at least 25,000 pounds of said fine proppant material have been deposited in the formation fracture for each one-foot of available net producing formation.

4,186,803

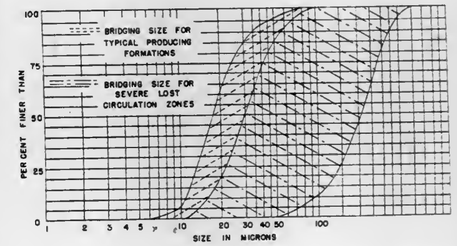
WELL COMPLETION AND WORK OVER METHOD

Thomas C. Mondshine, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.

Division of Ser. No. 850,639, Nov. 11, 1977, which is a continuation-in-part of Ser. No. 735,169, Oct. 26, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,033

Int. Cl.[2] E21B *33/138*

U.S. Cl. 166—292 **2 Claims**



1. In a well completion and workover method wherein a subterranean formation in a well is contacted with a treating fluid, the steps comprising:

a. pumping a treating fluid in the well and contacting the formation with said treating fluid wherein said treating fluid comprises a saturated aqueous saline solution with at least one water soluble salt which is substantially insoluble in the saturated saline solution, said aqueous saline solution and water soluble salt each selected from the group consisting of potassium chloride, sodium chloride, calcium chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate and mixtures thereof;

b. forming a bridge and seal on the formation to bridge and seal off the formation by maintaining said water soluble salt which is substantially insoluble in the saturated saline solution in a particle size range of about 5 microns to about 800 microns with greater than about 5% of the particles being coarser than 44 microns; and

c. dissolving the water soluble salt bridging particles off the formation to remove the bridge and seal from the formation for flow of hydrocarbons therefrom into the well.

4,186,804

BALLAST EXCAVATING CHAIN ARRANGEMENT

Josef Theurer, Vienna, and Karl Fulser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Filed Mar. 2, 1978, Ser. No. 882,665

Claims priority, application Austria, Mar. 22, 1977, 1998/77

Int. Cl.[2] F01B *27/00*

U.S. Cl. 171—16 **8 Claims**

1. In a track working machine comprising a frame mounted for mobility on the track having ties resting on ballast: a ballast excavation chain arrangement including

(a) a polygonal chain guide mounted on the frame and having two longitudinally extending guide sections and a

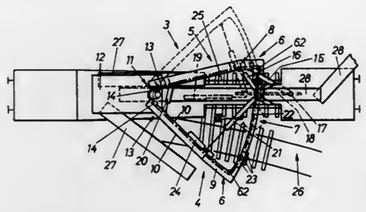
transversely extending guide section, the chain guide sections being trough-shaped and having a bottom,

(1) the longitudinally extending guide sections having respective lower portions connected to respective ends of the transversely extending guide section, and

(2) the longitudinally extending guide sections being so mounted that respective center portions thereof have a minimum distance corresponding to at least a length of a track tie in a direction transverse to the track and being mounted for lateral adjustment of the lower portion thereof independently of each other by a distance corresponding to at least a length of a track tie,

(b) an endless ballast excavation link chain supported in the chain guide,

(1) the transversely extending guide section and a portion



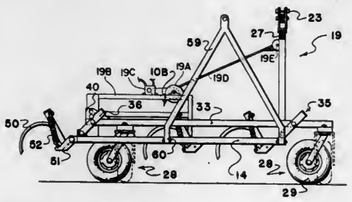
of the link chain therein being mounted for extension transversely of, and below, the track for excavating ballast,

(c) drive means separately connected to each one of the longitudinally extending guide sections in respective end portions thereof for laterally adjusting the end portions in the planes of the bottoms for selectively and independently extending a respective one of the chain guides to the right and to the left of the track for at least the length of a track tie,

(d) guide section members detachably connecting the transversely extending guide section and the lower portions of the longitudinally extending guide sections, and

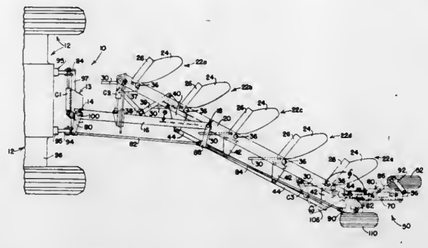
(e) ballast conveyor means adjustable for redistributing cleaned excavated ballast in the ballast bed selectively to the right and to the left of the track.

4,186,805
GROUND WORKING IMPLEMENT
Pete Repski, Box 30, Craik, Saskatchewan, Canada
Filed May 30, 1978, Ser. No. 910,218
Int. Cl.[2] A01B *19/04*
U.S. Cl. 172—248 **14 Claims**



1. A ground working implement comprising in combination a center section and at least two further sections articulately connected one upon each side of said center section for relative movement one with the other in at least a vertical plane, a hitch pole assembly operatively connected to said implement, each section including a generally rectangular frame, a plurality of ground working tools operatively mounted on said frame, means to raise and lower said tools relative to said frame, and at least one pair of castor wheel assemblies mounted on said frame for supporting said frame, means mounting said castor wheel assemblies to said frame, said means including a fore and aft beam pivotally mounted to the front and rear of said frame, said castor wheel assemblies being operatively connected one adjacent the front end of said fore and aft beam and the other being operatively connected adjacent the rear end of said beam, link means pivotally mounting said beam to said frame for generally vertical movement of said frame, means to pivot said link means and further means to limit the pivotal movement of said link means relative to said frame.

4,186,806
PLOW SYSTEM
Gerald G. Ward, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Sep. 6, 1977, Ser. No. 830,713
Int. Cl.[2] A01B *69/00, 59/044*
U.S. Cl. 172—283 **7 Claims**



1. In a tractor-motivated plow system, in combination, a hitch assembly for attachment to the rear end of a tractor and including a hitch block having a generally vertical hitch pivot, said block being mounted for generally transverse to and fro movement of said block and said pivot relative to the line of travel of the tractor, a first hydraulic ram for moving said block and pivot, a pull frame having its forward end connected to said hitch pivot for limited horizontal swinging movement of the pull frame throughout a small angle, a main frame having a medial region pivoted to the rear end of the pull frame and inclined relative to the latter, a second hydraulic ram effective between the forward end of the main frame and the pull frame for regulating the inclination between the main frame and the pull frame, said first and second hydraulic rams being connected in series for unison but proportional movement about said medial connection, a plurality of plow units mounted on said main frame in longitudinally spaced relationship and on opposite sides of said medial region, said plow units being rotatable about respective vertical axes, and means responsive to the inclination between the main frame and the pull frame for effecting commensurate rotation of said plow units in unison so that their cut lines remain parallel, said latter means embodying a crank arm on each plow unit, draw links connecting the crank arms of adjacent plow units together for movement in unison, and a draw link connecting the crank arm of at least one plow unit forwardly of said medial region of the main frame to the pull frame.

4,186,807
OPTIONAL UP-BLOW, DOWN-BLOW JAR TOOL
Wayne N. Sutliff, and Jim L. Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308
Filed Dec. 20, 1977, Ser. No. 862,487
Int. Cl.[2] E21B *1/10*
U.S. Cl. 175—302 **6 Claims**

1. In a mechanical jar tool, the combination of:

inner and outer telescopically related tubular elements;

means for connecting one of said elements to a drill string;

means for connecting the other element to an object to be jarred referred to herein as a "fish", telescopically overlapping portions of said elements providing an annular chamber;

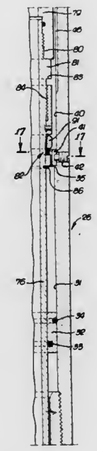
a pair of impact shoulders being provided on said respective elements to form impact faces which are brought into collision to limit telescopic movement between said elements in one of the two directions effecting respectively extension or contraction of said tool;

a male threaded area formed externally on said inner element within said chamber;

a tapered external conical face formed on said inner element starting at one end of said threaded area and decreasing in radius as said conical face extends axially away from said threaded area;

a thin walled adjusting nut screwed onto said threaded area and freely adjustable lengthwise thereon, said nut having locking means for fixing said nut in a selected position on said inner element;

a jar wedge ring internally tapered to conform to and loosely fit said tapered face of said inner element and having at least one radial split formed in said jar wedge ring, the periphery of said jar wedge ring being approximately cylindrical with outer corner edges bevelled;

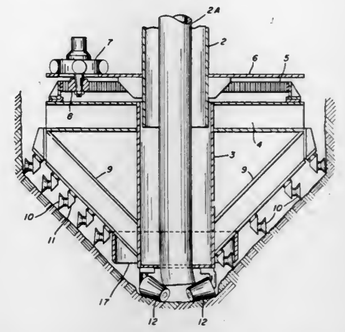


means for spring biasing said jar wedge ring axially towards and into conctact with said adjusting nut and halting axial shifting of said jar wedge ring more than a short distance away from said adjusting nut; and

a jar trip ring mounted fixedly on the inner face of said outer element, the inner face of said jar trip ring being cylindrical with bevelled inner corner edges and slightly less in inside diameter than the outside diameter of said split bevelled jar wedge ring;

said nut being locked in such a position that when said telescopic movement shifts said jar wedge ring axially against said trip ring and constricts the inside face of the wedge ring into conformity with said tapered element face while forcing said wedge ring also against said adjusting nut, the periphery of the wedge ring will be just enough larger than the inside diameter of the jar trip ring to require application of a predetermined desireable heavy pressure through said bevelled wedge ring to said bevelled trip ring to force the bevelled wedge ring through the trip ring and accomplish a jar blow being struck by bringing said impact faces into a violent collision.

4,186,808
EARTH BORING MACHINE WITH CRUSHING ROLLERS
Kenneth C. Cox, Blackburn Rd., R.D. #4, Sewickley, Pa. 15143
Filed Jun. 29, 1977, Ser. No. 811,033
Int. Cl.[2] E21B *9/22*
U.S. Cl. 175—334 **7 Claims**



1. For use on an earth boring machine of the type where there is a rig with a rotating shaft, a boring head at the lower end of the shaft having cutters disposed around the undersurface of the head at various distances upwardly and outwardly between the center of the rotation of the boring head and the periphery thereof, the boring head and cutters being so arranged as to form and provide a collecting area in the bottom of the bore into which rock chips and fragments produced in the operation of the machine collect with the bottom of the bore around the collecting area sloping upwardly and outwardly from the collecting area toward the periphery of the bore at an angle to favor the descent of the fragments by gravity toward a barrier and collecting area and wherein elevator means is provided for removing the rock chips and fragments so produced and received in the collecting area, the invention comprising a boring head having:

(a) means arranged on the undersurface of the head comprising an annular barrier attached to the undersurface of the head effectively interposed between cutters in the collecting area and those cutters on the head outside the barrier for intercepting rock fragments moving down the sloping area around the barrier which are too large for removal thereof from said area by said elevator means while at the same time providing clearance for other cuttings and fragments to enter said area; and

(b) crushing roller means with the peripheral surface thereof spaced above the surface of the bottom of the bore on the undersurface of the boring head arranged to crush said rock fragments which are so intercepted to a size where they can clear said barrier.

4,186,809
STEEP ANGLE RAISE BIT
Howard E. Mitchell, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Nov. 6, 1978, Ser. No. 958,299
Int. Cl.[2] E21B *9/24;* **E21C** *23/00*
U.S. Cl. 175—334 **2 Claims**

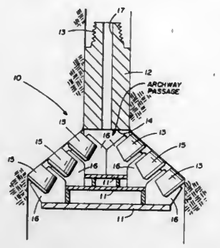
1. An earth boring bit for boring a large diameter hole by disintegrating the earth formations surrounding a pilot hole, comprising:

main plate means;

a pair of inner saddles mounted on said main plate means, said inner saddles positioned adjacent each other;

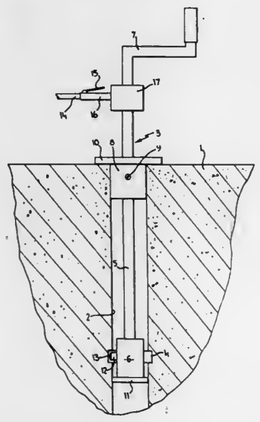
a pair of inner rolling cutters mounted in said pair of inner saddles;

a multiplicity of additional saddles mounted on said main plate means;
a multiplicity of additional rolling cutters mounted in said additional saddles; and
a stem member for projecting into said pilot hole, said stem member having an archway passage and extensions extending from said archway passage that bridge said pair of



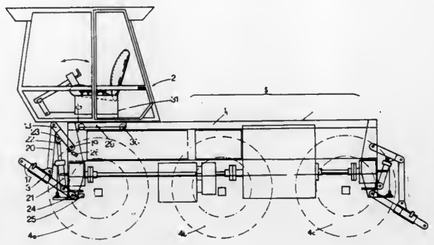
inner rolling cutters with said extensions attached to said main plate means and said pair of inner saddles and said pair of inner rolling cutters located substantially within said archway passage with said pair of inner rolling cutters and said additional rolling cutters positioned to provide a continuous angle earth formation profile having a conical shape with an included angle within the range of 134° to 60°.

4,186,810
FLUID OPERATED UNDERCUTTER
David T. Allan, 9 Broomhill Dr., Rutherglen, Glasgow, Scotland (G73 3 QH), assignor to John MacDonald & Company (Pneumatic Tools) Limited and David Thomson Allan, both of Glascow, Scotland
Filed Jul. 5, 1977, Ser. No. 812,620
Claims priority, application United Kingdom, Jul. 6, 1976, 28015/76
Int. Cl.² E21B *1/06*
U.S. Cl. 175—96 **17 Claims**



1. An undercutter for undercutting the wall of a substantially parallel sided hole and comprising a substantially tubular body having a lesser diameter than the diameter of said hole for positioning into said hole, means mounted on the body for setting the length of said body contained in the hole, and a fluid operated reciprocating cutting head pivotally mounted on the body to be rotated within the hole so as to form an undercut portion therein.

4,186,811
TRACTOR VEHICLE IN PARTICULAR FOR AGRICULTURAL USE
Jacques Bidon, 51230 Velye, Vertus, France
Continuation of Ser. No. 765,779, Feb. 4, 1977, abandoned. This application Mar. 15, 1978, Ser. No. 886,817
Claims priority, application France, Feb. 10, 1976, 76 03589
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.48 **7 Claims**

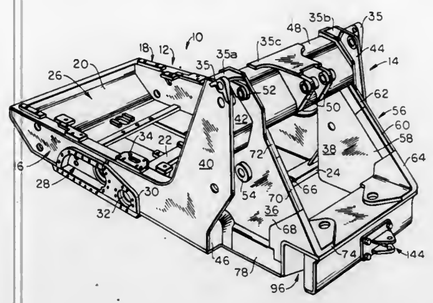


1. A tractor vehicle, in particular for agricultural use, comprising a chassis having a longitudinal axis, at least a front set of driving wheels and a rear set of driving wheels supporting the chassis with at least one wheel of each set being positioned on each lateral side of said longitudinal axis, a cab, means mounting the cab on the chassis and allowing the cab to travel from one end of the vehicle to an opposite end of the vehicle in a direction parallel to said longitudinal axis, an engine and power take-off means carried by the chassis, the power take-off means being for connection to tool means, first means for controlling the driving and steering of the vehicle and second means for controlling the tool means connected to the take-off means, the first and second means being located inside the cab, two independent drive means, one of the drive means being drivingly connected to a pair of said wheels located on one lateral side of said longitudinal axis and the other of the drive means being drivingly connected to a pair of said wheels located on an opposite lateral side of said longitudinal axis, transmission means drivingly connecting the engine to the two drive means, variator-inverter means included in the two drive means, whereby the engine is capable of driving selectively either of the drive means, both of the drive means at the same time in a symmetrical manner and in an unsymmetrical manner, means included in the two drive means for reversing the drive means so that the vehicle can be made to travel in two opposite directions, substantially identical raising devices respectively mounted on the chassis at longitudinally opposed ends of the vehicle for carrying said tool means, a driving station located in the cab and mounted to pivot through at least 180° about a vertical axis relative to the chassis whereby, irrespective of the direction of travel of the vehicle, the operator of the vehicle can face and be close to the stretch of ground to be treated.

4,186,812
EQUALIZER BAR SUPPORT ASSEMBLY
Robert A. Sutton, Davenport, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 7, 1977, Ser. No. 813,725
Int. Cl.² B62D *55/14*
U.S. Cl. 180—9.5 **15 Claims**

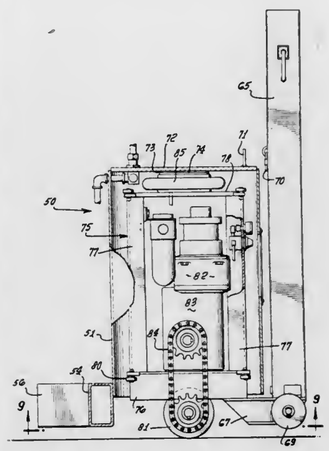
1. A support assembly for an equalizer bar for a loader having a main frame, comprising:
(a) a plurality of plates being connected in a box section, one

of said plates being of a construction to extend from said box section to define a space between said one plate and



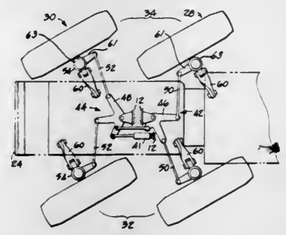
said box section and to connect said box section to the main frame; and
(b) means for holding the equalizer bar in said space.

4,186,813
STEERABLE DRIVE UNIT FOR TRANSPORTER
Robert E. Burdick, Santa Barbara County, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.
Filed Apr. 3, 1978, Ser. No. 893,079
Int. Cl.² B60V *1/00;* **B60K** *7/00*
U.S. Cl. 180—13 **3 Claims**



1. In a drive unit for moving a transporter or other load carrier over a floor or the like, the combination of:
a first frame including a circular sleeve;
coupling means for removably coupling said first frame to the carrier;
a second frame;
said first and second frames having interengaging means for vertical sliding and horizontal pivoting of said second frame with respect to said first frame;
said interengaging means consisting of vertically spaced sets of rollers mounted on said second frame for rotation about vertical axes in engagement with the inner wall of said sleeve;
a drive wheel mounted in said second frame;
drive means for rotating said drive wheel;
lift means for moving said second frame vertically relative to said first frame for engaging said drive wheel with the floor for propelling the carrier;
a steering arm connected to said second frame for pivoting said second frame relative to said first frame for steering the carrier;
with said steering arm connected to said second frame at a pivot axis for pivoting in a vertical plane; and
a pair of auxiliary wheels mounted on said second frame for rotation on said pivot axis and for tipping of said drive unit about the axis of said auxiliary wheels;
with said rollers rotating when said second frame is rotated about a vertical axis relative to said first frame and with said rollers sliding along said sleeve inner wall when said second frame is moved vertically relative to said first frame.

4,186,814
MOTOR GRADER ROADWHEEL ARRANGEMENT
Cullen P. Hart, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 23, 1977, Ser. No. 863,967
Int. Cl.² B60G *19/06;* **B62D** *7/06*
U.S. Cl. 180—24 **15 Claims**



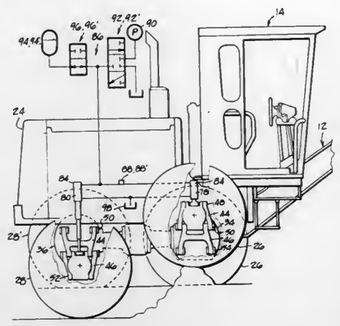
1. A construction vehicle, comprising:
a frame;
a first pair of steerable roadwheels mounted on opposite lateral sides of and adjacent a first end of said frame;
a tandem roadwheel arrangement mounted adjacent a second end of said frame and comprising a second pair of steerable roadwheels, one mounted on a first and the other on a second lateral side of said frame and a third pair of steerable roadwheels, one mounted on the first and the other on the second lateral side of said frame intermediate the mounting of said second pair of roadwheels and said second end of said frame, the two roadwheels of said second and third pairs of roadwheels on said first side of said frame comprising a first tandem roadwheel set and the two roadwheels of said second and third pairs of roadwheels on said second side of said frame comprising a second tandem roadwheel set;
means for linking said second and third pairs of roadwheels for simultaneous coordinated angling thereof relative to said frame to accomplish steering thereof;
means for transmitting power to said tandem roadwheel arrangement;
four hydraulic strut cylinders, one for each of the roadwheels of said second and third pairs of roadwheels, each strut cylinder acting generally vertically between said frame and a respective roadwheel, each of said strut cylinders being rigidly connected at a cylinder end thereof to said frame and being rigidly connected at a rod end thereof to a respective one of said roadwheels; and
means for causing said roadwheel angling means to act simultaneously to rotate the rods of said strut cylinders, thus utilizing said strut cylinders as pivotal kingpins with the rods thereof rotating within the cylinders thereof.

4,186,815

SUSPENSION AND DRIVE FOR TANDEM WHEEL VEHICLE

Cullen P. Hart, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1977, Ser. No. 864,996
Int. Cl.² B60G *17/00*; B62D *61/10*
U.S. Cl. 180—41 **5 Claims**



1. In a tandem roadwheel system for a vehicle having a frame; a pair of longitudinally separated axle members supported adjacent the frame; a first pair of roadwheels adjacent a first of said axle members, one of said first pair of roadwheels on a first and the other on a second lateral side of the frame; a second pair of roadwheels adjacent a second of said axle members, one of said second pair of roadwheels on said first and the other on said second lateral side of said frame; four parallelogram linkages, one independently mounting each respective one of said roadwheels to said vehicle to allow independent vertical movement of each of said roadwheels relative to said frame; four generally vertically acting hydraulic motors, each of said motors being disposed between said frame and a respective one of said roadwheels for adjusting the relative vertical positioning therebetween; the improvement comprising:

four drive shafts, one between each roadwheel and the adjacent axle member;

means for universally mounting a first end of each drive shaft to be driven by the adjacent of said axle members;

means for universally mounting a second end of each drive shaft to drive a respective one of said roadwheels;

a source of pressurized fluid carried by said vehicle;

first conduit means for interconnecting the head ends of the two hydraulic motors acting on the roadwheels on the first lateral side of the frame;

means for selectively coupling said pressurized fluid source with said first conduit means;

second conduit means for interconnecting the head ends of the two hydraulic motors acting on the roadwheels on the second lateral side of the frame; and

means for selectively coupling said pressurized fluid source with said second conduit means.

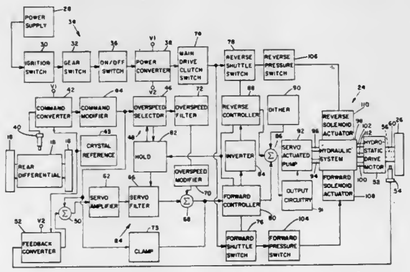
4,186,816

SUPPLEMENTARY HYDROSTATIC DRIVE ELECTRONIC CONTROL

Donald K. Pfundstein, Peosta, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 30, 1978, Ser. No. 910,572
Int. Cl.² B60K *17/34*
U.S. Cl. 180—243 **21 Claims**

15. In a vehicle having an engine, an engine driven transmission shiftable between forward and reverse in response respectively to forward and reverse pressure signals, a shuttle controller having a lever positionable between forward and reverse positions to respectively effect the forward and reverse pressure signals, a differential connected to the transmission and driven thereby, a pair of main drive wheels connected to the differential for propelling the vehicle, an engine-driven, reversible, variable displacement fluid pump operable in response to a positive or negative control signal to respectively provide pressurized fluid in a forward or reverse pressure line connected thereto in proportion to the control signal, a pair of reversible fluid motors connected to the forward and reverse pressure lines to be driven by the pressurized fluid therein, a pair of auxiliary drive wheels; a pair of drive means respectively connecting the pair of motors to the pair of drive wheels; said pair of drive means respectively including a pair of fluidly activated clutches for establishing a drive connection between the pair of fluid motors, and the pair of wheels only when the clutches are activated, conduit means connected between the forward and reverse pressure lines and to a pair of clutches and including valve means responsive to a forward or reverse actuator signal to connect the pressurized fluid in the forward or reverse pressure line to activate the pair of clutches, an electronic control comprising: main drive sensor means operatively associated with the connection between the transmission and the differential for sensing the speed thereat and providing a command signal representative thereof; command modifier means connected to the main drive sensor means for modifying the command signal by a first predetermined percentage thereof and providing a modified command signal representative operatively associated with one of the pair of fluid motors and providing a feedback signal representative of the speed thereat; first summing means connected to the command modifier means and the supplementary drive sensor means for summing the modified command and feedback signals to provide a servo signal representative of the difference therebetween; amplifier means connected to the first summing means for amplifying the servo signal to provide an amplified servo signal; servo filter means connected to the amplifier means for regulating the rate of change of the amplified servo signal to a first predetermined rate; overspeed selector means connected to the command modifier means selectively actuatable to block or allow the modified command signal therethrough; overspeed filter means connected to the overspeed selector means for regulating the rate of change of the modified command signal to a second predetermined rate; overspeed modifier means connected to the overspeed filter means for modifying the modified command signal therefrom by a second predetermined percentage thereof and providing an overspeed signal representative thereof; second summing means connected to the servo filter and the overspeed modifier means for summing the servo and overspeed signals and providing a servo control signal representative of the sum thereof; forward controller means connected to the second summing means and the shuttle controller responsive to the forward and reverse pressure signals and positions of the lever to provide the servo control signal respectively to first and second outputs provided therein, said forward controller means including means connected to the clutch valve responsive to the forward pressure signal and position of the lever to provide the forward actuator signal to the clutch valve; inverter means connected to the first output of the forward controller means for inverting the servo control signal to provide an inverted servo control signal;



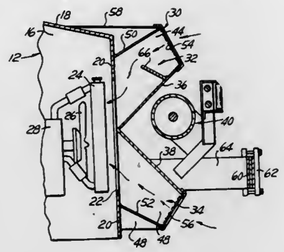
reverse controller means connected to the inverter means and the shuttle controller means responsive to the reverse pressure signal and position of the lever to block or allow the inverted servo control signal therethrough, said reverse controller means including means connected to the clutch valve responsive to the reverse pressure signal and position of the lever to provide the reverse actuator signal to the clutch valve; and third summing means connected to the fluid pump and the output of the forward controller means and the reverse controller means for summing the servo control and inverted servo control signals to provide the positive or negative control signal representative of the sum thereof to the fluid pump.

4,186,817

AIR INLET FOR ARMORED CAR

Russell E. Bauer, 920 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Oct. 14, 1977, Ser. No. 842,224
Int. Cl.² B60K *1/00*; F41H *5/00*; B60H *3/00*; F01P *7/00*
U.S. Cl. 180—54 A **9 Claims**



1. A cooling air induction system for the engine compartment of an armored car and like vehicle, said engine compartment being an enclosure made of armor steel plates and having at least a front panel, a top panel, and a pair of side panels, said air induction system comprising an opening in said front panel for the passage of air therethrough into said engine compartment, a pair of air ducts disposed with their longitudinal axes at an angle and converging toward said opening, a first exterior wall of said air ducts being formed by a pair of panels of armor steel plate arranged at an angle to each other and forming a shield overlapping at least a pair of opposite edges of said opening, a pair of opposite second and third exterior walls for each air duct, said opposite exterior walls being made of armor steel plate and extending each from proximate one of the other edges of said opening, and a fourth exterior wall for each air duct opposite to said first wall and extending from the inlet of said duct to the front armor steel plate panel proximate said opening, each of said fourth exterior walls being made of ordinary non-bullet-proof material.

4,186,818

AUXILIARY POWER STEERING FOR MOTOR VEHICLES

Erich Jablonsky, Boebingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,682
Int. Cl.² B62D *5/08*
U.S. Cl. 180—133 **8 Claims**

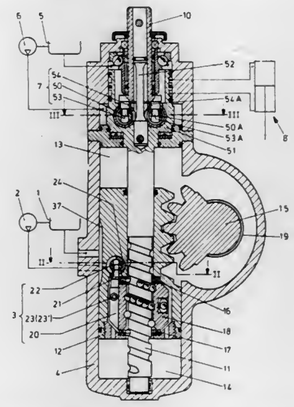
1. In a dual system for power steering of a vehicle wherein said system has a pair of hydraulic circuits, each circuit comprising a pump, a double acting power cylinder and a valve mechanism; the improvement which comprises:

a first hydraulic steering circuit wherein the double acting cylinder (4) has a piston therein with the valve mechanism of said circuit carried thereby and comprising a moveable valve means (22) and resilient means (23, 23') for effecting return to a neutral position of said valve means from a steering position and an actuator means (51, etc.) for actuating said valve means;

a second hydraulic steering circuit having the valve mechanism thereof comprising moveable valve means (50, 50A) and resilient means (52) for return bias thereof to a neutral position from a steering position;

a manually operable actuator means (10) connected to operate the second steering circuit valve means (50, 50A), and connected to the actuator means (51) of said first hydraulic steering circuit by the resilient means (52) of said second hydraulic steering circuit for operation of said latter actuator means (51);

wherein said latter resilient means (52) is of a lesser resiliency than that of the first hydraulic steering circuit so that initially upon operation of said manually operable actuator means (10) the actuator means (51) of the first hydraulic circuit is operated by connection with said latter resilient means (52) whereby to effect operation to a predetermined position of the valve means (22) of the first hydraulic steering circuit and means (21) whereby continued operation of the manually operable actuator means (10) effects yielding of the latter resilient means (52) to effect a subsequent operation of the valve means (50, 50A) of the second hydraulic steering circuit.



7. An arrangement for actuating a pair of valve means (22; 50, 50A) in sequential order wherein each valve means has a respective valve actuator (10, 51) which are relatively rotative;

each valve means having a respective resilient return bias means (23, 23'; 52);

the return bias means (52) of one valve means (50,50A) dominating the return bias means (23, 23') of the other valve means (22) and the actuators being connected to each other by said dominant return bias means (52) so as to effect actuation of the other valve means (22) against its yielding return bias means (23, 23') by rotation of one actuator (10), acting through said dominant return bias means (52), to a predetermined position of said other valve means and means effective at that time whereby said dominant return bias means (52) then yields to permit rotation of the other actuator (51) upon continued rotation of said one actuator (10).

4,186,819

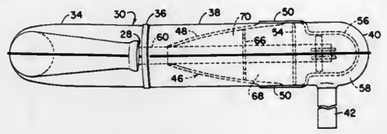
EXHAUST SYSTEM FOR A TWO-STROKE ENGINE

Klaus F. Nowak, Uxbridge, Canada, and Stephen A. Braun, Horicon, Wis., assignors to Deere & Company, Moline, Ill.

Filed Sep. 28, 1978, Ser. No. 946,546
Int. Cl.² F01N *1/08*
U.S. Cl. 181—265 **11 Claims**

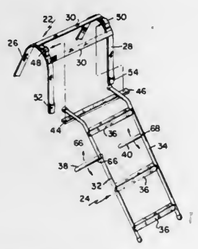
1. A two-cycle engine exhaust muffler, comprising: an elon-

gate tubular shell having inlet and outlet openings spaced from each other along the length of the shell; said shell including a first portion which increases in cross-section from a first to a second end thereof with the first end being located adjacent the inlet opening; said shell further including a second portion of substantially constant cross-section having a first end joined to the second end of the first portion; a generally conical baffle defining a hollow enclosure and being located in the shell



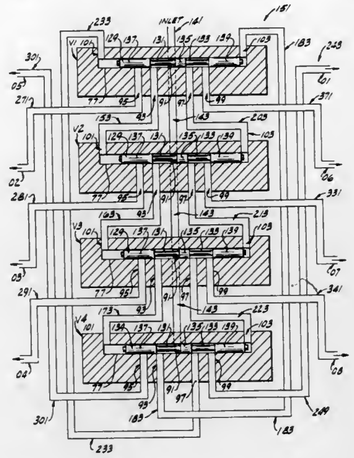
between the inlet and outlet openings; said baffle having a large end fixed in exhaust gas sealing relationship to the second portion and having a small end located adjacent the second end of the first portion; inlet port means provided in the baffle for establishing a path for exhaust gas to flow to the interior of the baffle from the inlet opening; and outlet port means provided in the baffle establishing a path for exhaust gas to flow from the interior of the baffle to the outlet opening.

4,186,820
BOARDING LADDER AND STRAPS
Dieter Cosman, Huntington, N.Y., assignors to Henry W. Ruppel and Kathleen C. Ruppel, both of Huntington, N.Y.
Filed Oct. 26, 1978, Ser. No. 955,012
Int. Cl.[2] E06C *7/48;* B63B *27/14*
U.S. Cl. 182—93 **7 Claims**



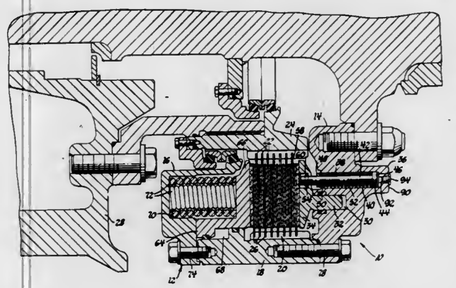
1. A boarding ladder for use in conjunction with an inflatable boat having a rigid floorboard and an inflated side pontoon comprising:
a ladder portion including a pair of substantially vertical side rails and a plurality of substantially horizontal rungs mounted to said rails;
a horizontal projection extending from each side rail;
a pair of struts extending from said ladder portion substantially perpendicular to a plane defined by said side rails;
a harness means fastening said harness to said boat whereby said harness is wrapped outwardly around said pontoon and extends downwardly therefrom;
said harness includes first means for removably engaging said horizontal projections of said side rails with said harness and second means for engaging ends of said pair of struts remote from ends communicating with said side rails in said harness whereby when engaged in said harness said ladder portion will project downward and upward from an inflated side pontoon of an inflatable boat and will be prevented from rotating about said pontoon under said boat.

4,186,821
LUBRICATING APPARATUS
Jerome B. Wegmann, St. Louis County, Mo., assignor to McNeill Corporation, Akron, Ohio
Filed May 15, 1978, Ser. No. 905,633
Int. Cl.[2] F01M *1/06*
U.S. Cl. 184—7D **12 Claims**



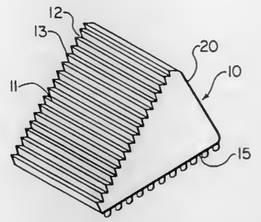
1. Lubricating apparatus comprising:
an assembly of base blocks forming a base, said assembly comprising two base blocks at the ends of the assembly constituting first and second end blocks and at least one base block between the end blocks constituting an intermediate block each of said base blocks having a bottom, top, sides and ends, said base blocks being assembled with one side of the first end block, constituting its inside face, in face-to-face relation with one side of the adjacent intermediate block and with one side of the second end block, constituting its inside face, in face-to-face relation with one side of the adjacent intermediate block, each of said base blocks having a lubricant outlet at each of its ends;
a series of divider valves, one for each of the base blocks, each comprising a valve block having a bottom, top, sides and ends, a bore extending endwise in the block, a set of passages extending up from the bottom to the bore and in communication with the bore at spaced points along the length of the bore, said set comprising an inlet passage for delivery of lubricant to the bore, transfer passages for interconnection of the valves in the series, and outlet passages for delivery of lubricant from the bore, and a piston member axially slidable in the bore by pressure of lubricant in the bore, the piston members of the valves being successively movable to deliver charges of lubricant through the outlet passages in a sequence via the delivery of lubricant under pressure through the inlet passages to the bores and interconnections between the valves established by the piston members and said transfer passages;
said series of divider valves comprising a first and second end valve and at least one intermediate valve each mounted on a respective base block with its bottom in face-to-face relation with the top of the respective base block;
said assembly of base blocks having passaging for delivery of lubricant to the valve inlet passages comprising an inlet manifold formed by a hole in the first end block extending laterally to its inside face, a registering lateral hole in the intermediate block extending through the intermediate block from one side to the other, and a registering hole extending into the second end block laterally from its inside face, said delivery passaging further comprising:
holes extending down from the top of the base blocks to the said lateral holes, said downwardly extending holes being in register at their upper ends with the lower ends of the inlet passages in the valve blocks;
said assembly of base blocks further having passaging for interconnection of the said transfer passages of the valves comprising holes in the end blocks extending laterally to their inside faces, registering holes in the intermediate block extending laterally inward from the sides thereof, and holes extending down from the top of the base blocks to the said lateral holes, said downwardly extending holes having their upper ends in register with the lower ends of the transfer passages in the valve blocks;
and said assembly of base blocks further having passaging for delivery for lubricant from said outlet passages in the valve blocks to the outlets at the ends of the base blocks comprising holes in the end blocks open at their inside faces, registering holes in the intermediate block open at the sides thereof, and holes extending down from the top of the base blocks having their upper ends in register with the lower ends of the outlet passages in the valve blocks.

4,186,822
DISC BRAKE PACK WEAR INDICATOR
Natabara Khuntia, Hudson, and Charles W. Rader, Willowick, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 28, 1978, Ser. No. 919,766
Int. Cl.[2] F16D *66/02*
U.S. Cl. 188—1 A **1 Claim**



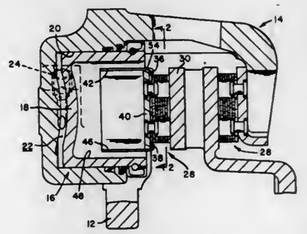
1. In a disc brake having a housing, a pressure chamber formed in said housing, a bore for a piston retracting mechanism formed in said housing, a piston sealingly and reciprocably mounted in said pressure chamber for brake actuation by pressure introduced into said chamber, said piston having a stepped hole in axial alignment with said bore and having a shoulder therein, and a piston retracting mechanism in said bore and hole, said piston retracting mechanism including a return spring guide pin having a head on one end in one end of said bore, a compression piston return spring having one end engaging said guide pin head and the other end engaging a bore cover secured to said housing, said guide pin extending into said piston stepped hole, a cross passage extending through said guide pin and located in said piston stepped hole, and a cross pin in said cross passage of greater length than the diameter of said guide pin and normally engaging said shoulder of said stepped hole and transferring piston retracting force exerted by said spring to urge retraction of said piston, the improvement comprising the combination of: an opening in said housing opening axially into said bore at said one end containing said guide pin head, a selectively removable plug in said opening and normally closing said bore, and means selectively inserted through said opening while said plug is removed and when so inserted engaging said guide pin head with said brake actuated and measuring the amount of movement of said guide pin head relative to said housing required for brake actuation, the amount of movement being a function of brake wear, thus determining the condition of brake wear without disassembly and visual inspection of the brake, said means being removed after determination of the condition of brake wear and said plug then being replaced to close said bore one end.

4,186,823
WHEEL WEDGE
Jack D. White, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio
Filed Sep. 28, 1978, Ser. No. 946,673
Int. Cl.[2] B60T *3/00*
U.S. Cl. 188—32 **7 Claims**



1. A wheel wedge made primarily of an elastomeric material and having a wheel-contacting surface, a first ground-contacting surface comprising a plurality of transversely extending ribs and a second ground-contacting surface comprising a plurality of spaced, generally cylindrical members at least partially embedded in said elastomeric material and having at least a portion of one end section thereof exposed at the face of said second surface, wherein said members have an anchoring portion at one end thereof which extends radially outwardly from the shank of said member, said anchoring portion being completely embedded in said elastomeric material.

4,186,824
ANTI-RATTLE SPRING FOR DISC BRAKE
Gary W. Preston; Donald D. Johannesen, and William J. Kestermeier, all of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.
Filed Jun. 12, 1978, Ser. No. 914,475
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.5 **1 Claim**



1. In a disc brake assembly having a torque member which movably supports a caliper and a pair of friction elements, the caliper cooperating with a piston cup to define a pressure chamber, the piston cup defining a bore opposite the pressure chamber, a resilient member carried within said piston cup bore and cooperating with one of said pair of friction elements to substantially eliminate rattle generated by said one friction element, said resilient member forming a split which permits radial contraction of said resilient member for insertion thereof into said piston cup bore, said resilient member including at least one tab adjacent said split, said one tab extending axially outwardly from said piston cup bore, and said resilient member

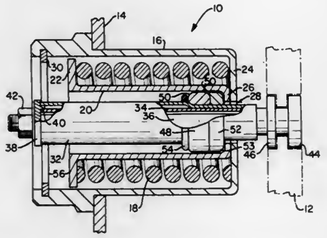
including another tab extending axially outwardly from said piston cup bore substantially diametrically opposite said one tab relative to said piston cup bore, said tabs having radially extending facing portions, said one and other tabs cooperating with each other to expand radially after said resilient member is inserted in said piston cup bore to releasably engage and retain said one friction element therebetween in engagement with said piston cup.

4,186,825

BRAKE ADJUSTER HAVING RESHAPABLE MEMBER DRAWN THROUGH A DIE

Paul E. Milliken, Massillon, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 14, 1978, Ser. No. 933,350
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—196 R **14 Claims**



1. In a braking system including a brake housing and a pressure plate, the improvement of a brake adjuster, comprising:
- a support member maintained in fixed relationship to the brake housing;
- reciprocating means operatively associated with said support member for reciprocating movement between first and second ends thereof;
- a die carried by said reciprocating means and movable therewithin; and
- a tubular member passing through said die and being operatively connected at one end thereof to the pressure plate and movable therewith, said die being in reshaping contacting engagement with said tubular member at a plurality of spaced-apart contact locations, a clearance being maintained between said die and tubular member between said contact locations.

4,186,826

TORQUE LIMITING CLUTCH BRAKE

William J. MacKendrick, Syracuse, and Harold F. Brown, Skaneateles, both of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Feb. 10, 1978, Ser. No. 876,674
Int. Cl.[2] F16D *67/02*
U.S. Cl. 192—13 R **6 Claims**



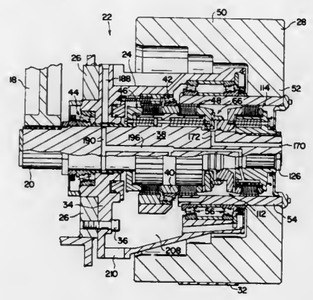
1. A clutch brake unit for retarding the motion of the driven shaft of a clutch assembly wherein the unit is operatively engaged between two coacting members that are adapted to move into contact with the unit to apply a varying load thereto as the clutch is released from engagement with the shaft, the improvement comprising
- a pair of parallely aligned radially extended discs mounted upon the shaft for rotation therewith and being adapted to move along the shaft in an axial direction, the outer end faces of the discs being arranged to initially engage the two coacting members as the clutch is released and to compress the discs inwardly as the load increases thereby causing the motion of the shaft to be braked,
- biasing means acting between the two discs for urging them outwardly against the load applied by said coacting members, and
- a rigid stop means rotatably mounted upon said discs for engaging both coacting members upon the discs being compressed a predetermined distance whereby the amount of braking torque applied to the shaft through the disc is limited.

4,186,827

FLUID OPERATED CLUTCH AND BRAKE

Edwin A. Spanke, Oak Forest, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jun. 22, 1978, Ser. No. 918,101
Int. Cl.[2] F16D *67/04*
U.S. Cl. 192—18 A **20 Claims**



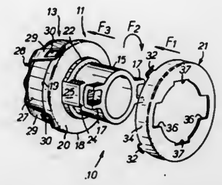
1. A press drive mechanism comprising a housing, shaft means extending through said housing and supported thereby for rotation about an axis, a flywheel at one end of said housing and including sleeve means extending axially inwardly of said housing about said shaft means and having axially inner and outer portions, means supporting said flywheel for rotation relative to said housing and shaft means, primary brake means between said housing and shaft means, primary clutch means between said shaft means and said axially inner portion of said sleeve means, said axially outer portion of said sleeve means surrounding an axial portion of said shaft means in radially spaced relationship therewith to define a circumferential chamber therewith, auxiliary clutch means between said axially outer portion of said sleeve means and said axial portion of said shaft means, said auxiliary clutch means including support means removably mountable in said chamber and carrying auxiliary clutch disc means and auxiliary clutch disc presser means and abutments means for removal therewith as a unit from said chamber, and brake and clutch operating means to alternately engage said primary brake means and said primary clutch means and to simultaneously engage said primary and auxiliary clutch means when said auxiliary clutch means is in said chamber.

4,186,828

CLUTCH RELEASE BEARINGS

Pierre J. Renaud, Le Plessis-Trevise, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jul. 5, 1978, Ser. No. 922,190
Claims priority, application France, Jul. 8, 1977, 77 21044; Jan. 4, 1978, 78 00176
Int. Cl.[2] F16D *19/00*
U.S. Cl. 192—98 **17 Claims**



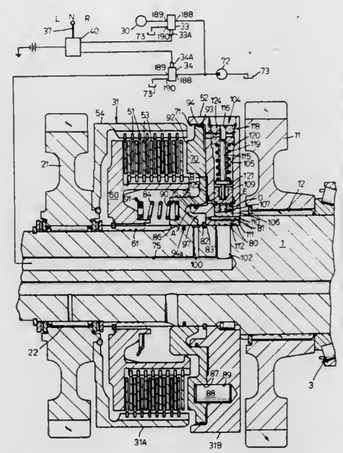
1. Clutch release bearing of the type including an annular operating member having a retaining portion for retaining said operating member axially relative to release fork and displacement therewith, an annular drive member normally disposed coaxially of said operating member and having an actuating part adapted to actuate release means of a clutch, means clamping said drive member to said operating member, said operating member having a transverse face axially intermediate said retaining means and said drive member, an annular bearing plate member overlying said transverse face and providing a bearing surface for a release fork, the improvement comprising at least one notch along the inner periphery of said annular bearing plate member and an interlock portion on said operating member cooperable with said notch for preventing rotation of said bearing plate member relative to said operating member.

4,186,829

MODULATABLE POWER TRANSMISSION CLUTCH

Raymond C. Schneider, and Paul A. Pelligrino, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Nov. 14, 1977, Ser. No. 850,961
Int. Cl.[2] F16D *25/00*
U.S. Cl. 192—109 F **3 Claims**



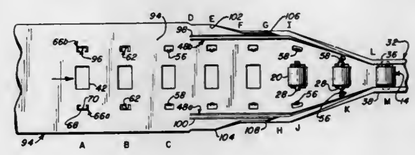
1. In a modulatable power transmission clutch:
- a fluid operated movable piston for effecting clutch operation and having separate fluid application piston areas thereon, one of said piston areas being adapted to have fluid flow directed thereto at a variable fluid pressure whereby said clutch is modulatable, the other of said piston areas being adapted to have fluid flow directed thereto to effect maximum and unmodulatable engagement of said clutch;
- and valve means for controlling fluid flow to said other of said piston areas in response to fluid pressure at said one of said piston areas, said valve means including a normally closed first valve which opens fully to permit fluid flow to said other piston area when fluid pressure at said one piston area exceeds a predetermined value and re-closes when said pressure falls below said predetermined value, said valve means further including a normally open second valve actuatable to closed position by movement of said first valve to open position which closes fully to prevent fluid flow from said other piston area when said first valve opens and which re-opens fully to permit fluid flow from said other piston area when said first valve re-closes fully, said valve means also including spring means for biasing said first valve to closed position and said second valve to open position, said first valve including a surface area against which fluid pressure acts which increases in size when said first valve opens to thereby increase the force with which said first valve moves to fully open position.

4,186,830

ROLLER ASSEMBLY FOR PACKAGE FLOW SYSTEMS

Robert L. Corey, Chicago, and Frederick E. Ullman, Glencoe, both of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Mar. 2, 1978, Ser. No. 882,732
Int. Cl.[2] B65G *39/02*
U.S. Cl. 193—35 R **15 Claims**



1. A roller assembly for use in a package flow system for conveying, supporting and storing a load such as packages, cartons, containers and other articles, upon a support frame, comprising:
- a roller having an outer cylindrical load-supporting surface for engaging, dynamically supporting and conveying said load, said roller rotating about a lateral axis and defining shaft-receiving socket portions providing cylindrical bearing surfaces along said lateral axis; and
- a unitary one-piece rail frame assembly for rigidly and rotatably supporting said roller, said unitary one-piece rail frame assembly including an elongated generally channel-shaped frame having a pair of generally upright side walls and an intermediate section extending between and connecting said side walls; and
- said unitary one-piece rail frame assembly having a pair of generally stationary axially spaced shaft sections positioned in general alignment with each other generally along said lateral axis for insertion into said shaft-receiving socket portions of said roller to rotatably support and engage said cylindrical bearing surfaces of said roller, said axial spaced shaft sections, including a first shaft section extending integrally and laterally inwardly from one of said upright side walls of said channel-shaped frame and a second shaft section extending integrally and laterally inwardly from the other of said upright side walls of said channel-shaped frame in a direction generally towards said first shaft section, and each of said shaft sections having an outer surface extending integrally inwardly from the side walls of said channel-shaped frame with

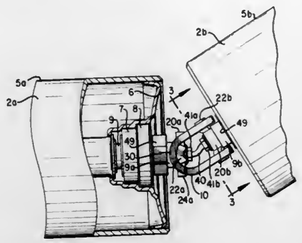
portions facing upwardly to provide an upper bearing frame surface upon which said roller can rotate.

4,186,831

CONNECTOR FOR CATENARY CONVEYOR BELT IDLER ROLLS

Richard N. Mercurio, and Richard B. Graham, both of Columbus, Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 7, 1977, Ser. No. 831,326
Int. Cl.[2] B65G *45/02, 15/60*
U.S. Cl. 198—501 **6 Claims**



1. A pivotal connection for adjacent shafts comprising:
(a) a pair of shafts disposed so that an end of one shaft is juxtapositioned relative to an end of the other shaft;
(b) an idler roller mounted for rotation about each shaft;
(c) pivot means including a pair of oppositely extending, aligned pivots rigidly connected to the juxtapositioned end of each shaft, the pivots on one shaft being oriented 90° relative to the pivots on the other shaft and projecting radially relative to its respective shaft, the side of each pivot facing its respective shaft having a curved surface; and
(d) a connecting link for connecting the shafts through the pivots including an endless loop formed of two pairs of U-shaped sections, each pair being connected to each other through the other pair, the sections in each pair being located in parallel planes and perpendicular to the sections in the other pair, the inner surface of each section cooperating with and engaging a pivot and being shaped to conform to the curved surface of its cooperating pivot, so that each shaft can pivot in one plane through relative movement of the pivot curved surfaces and connecting link inner surfaces, the shafts together pivoting in perpendicular planes relative to each other, the pivot means includes a central body and a pair of pivots, projecting colinearly from opposite sides of the central body, the central body includes a pair of appendages extending perpendicular to the pivots, the distance between the distal ends of the appendages being greater than the width of the cooperating pair of U-shaped sections such that the central body cannot slide free from the connecting link in the direction parallel to a line through the radial centers of the pair of sections.

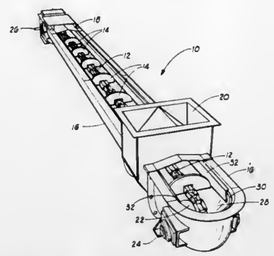
4,186,832

CONVEYOR FOR HANDLING FREE-FLOWING MATERIAL

Hugh D. Kelley, 1451 Morgantown, Wichita, Kans. 67212

Filed Aug. 18, 1978, Ser. No. 934,896
Int. Cl.[2] B65G *21/20*
U.S. Cl. 198—861 **7 Claims**

1. In a conveyor having a round bottom trough for receiving free-flowing material therein, the conveyor having an endless chain with flights thereon or a screw for moving the free-flowing material along the length of the trough, the improvement comprising:
a plurality of "U" shaped liners contoured to fit on top of the round bottom trough, said liners placed end to end on top of the round bottom trough with sufficient space placed between the ends of said liners to allow for lengthwise expansion of said liners; and
a plurality of resilient pressure blocks mounted along the sides of the trough in a spaced relationship to each other and butted against the edges of said liners, said pressure



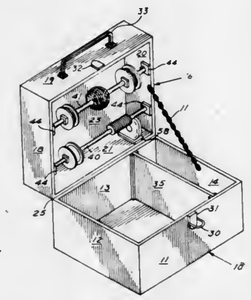
blocks having apertures for receiving bolts therethrough, said bolts received through apertures in the sides of the trough and attached thereto, said pressure blocks permitting said "U" shaped liners to expand and contract transverse to the length of said liners.

4,186,833

GIFT WRAPPING STORAGE CONTAINER

Virginia L. Homan, 11793 E. Jewell Pl., Aurora, Colo. 80012

Filed Sep. 13, 1978, Ser. No. 941,861
Int. Cl.[2] B65D *85/67*
U.S. Cl. 206—225 **2 Claims**



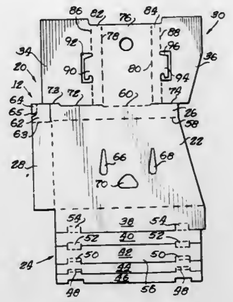
1. In an assembled storage container for gift wrapping materials having an open top box section and a hinged domed top, the improvement of:
(a) at least about two rods spaced apart and releasably mounted from side wall to wall in the top for holding reels of ribbons in position for retrieving portions of the ribbon;
(b) elastic tape means in the hinge side of the domed top including a plurality of loops for securing small items in retrievable storage position;
(c) the bottom section being divided into at least two sections, the first section being large and arranged as a folded paper storage compartment and the second being small, and said sections being divided by wall means; and
(d) pocket means having a closing biased elastic top on said wall means in said small section arranged to hold cards and stickers.

4,186,834

SHIPPING AND STORAGE CONTAINER

George W. Krack, Evansville, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Sep. 11, 1978, Ser. No. 941,056
Int. Cl.[2] B65D *85/54, 85/64*
U.S. Cl. 206—320 **18 Claims**



1. A shipping and storage container for an elongated article, comprising:
a pair of end caps for disposition in surrounding relation to the end portions of the article,
each said end cap being unitary and from a single precut sheet and including
a generally planar outer end wall,
a cushion member hingedly attached along the lower edge of said outer end wall and positioned to extend inwardly and generally normal thereto,
a ledge hingedly attached along the upper edge of said outer end wall and extending inwardly and generally normal thereto, said ledge serving as a support surface when stacking similar containers, and an inner end wall hingedly attached along its upper edge to said ledge and folded to a position generally adjacent the inner surface of said outer end wall, said inner end wall including a portion spaced inwardly from said outer wall and wing portions on either side thereof located immediately adjacent said outer wall, said spaced portion defining a hollow vertical support member and extending generally between said cushion and said ledge and providing support therebetween for the article and the ends of said container when the article is packed in said container and when similarly packed containers are stacked on each other, and said wing portions extending generally between the underside of said ledge and the lower edge of said outer wall and providing additional end wall thickness and additional vertical support for the ends of said container;
and an outer wrapper of foldable material extending around the article and at least the peripheries of said end caps and secured to said end caps to completely enclose said article when packed in said container.

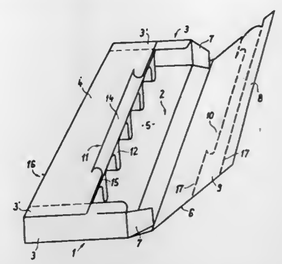
4,186,835

BOX FOR AMPOULES HAVING A PACKAGING INSERT THAT PROVIDES A CLOSURE ARRANGEMENT AND REINFORCEMENT

Otto Hofer, Schaan, Liechtenstein, assignor to Interondo AG, Buchs, Switzerland

Filed Oct. 10, 1978, Ser. No. 950,179
Int. Cl.[2] B65D *5/54, 83/04*
U.S. Cl. 206—443 **5 Claims**

1. A box for packaging elongate articles, such as ampoules, comprising a box body formed by folding and gluing operations and including a rear wall having two side edges, a bottom edge and a top edge, two side walls respectively extending forward from said side edges of said rear wall and having parallel front edges, a front wall extending between said front edges of said side walls, said front wall being of less area than said rear wall, thereby forming with said side walls an open area, a cover extending from said top edge of said rear wall and formed to cover said open area, means for detachably securing said cover to said front wall, and an insert for packaging the elongated articles and including firstly a support formed and secured to lie against the inside surface of said front wall for



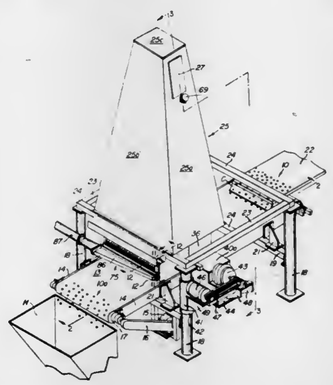
the purpose of strengthening said front wall and secondly a corrugated cardboard strip adhered to said support for receiving the elongated articles respectively in corrugations thereof, said front wall and said support being formed to provide a pocket open toward the top of the box, said means for detachably securing said cover to said front wall comprising a tongue portion formed on said cover for insertion into said pocket.

4,186,836

DIFFERENTIAL REFLECTIVITY METHOD AND APPARATUS FOR SORTING INDISCRIMINATELY MIXED ITEMS

Norman B. Wassmer, and Joseph L. Hodges, both of Ontario, Oreg., assignors to Ore-Ida Foods, Inc., Boise, Id.

Filed Apr. 10, 1978, Ser. No. 895,256
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—565 **24 Claims**



1. Apparatus for sorting indiscriminately mixed items, some of which have a predetermined relationship between two mutually different wavelength bands of energy reflected therefrom, and others of which have other than said predetermined relationship, comprising means defining a viewing area; means defining a removal area; means for passing such a mixture into and through the viewing area as a heterogeneous bed, whose thickness is substantially no greater than the thickness of individual items and wherein the individual items are unsegregated, and for passing said bed into and through the removal area after a predetermined amount of time has passed following its passage through the viewing area; means for flooding the

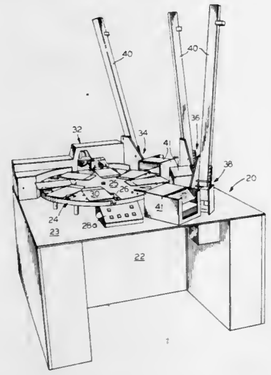
viewing area with radiant energy containing the two mutually different wavelength bands in a substantially integrated spread throughout said viewing area; sensing means including a plurality of paired sensing devices focused on the viewing area so as to view corresponding contiguous sub-areas of said viewing area, the paired devices being adapted to sense the two different wavelength bands, respectively, of energy reflected from the corresponding sub-areas; means for comparing the sensed radiant energy of one wavelength band with the sensed radiant energy of the other wavelength band from each sub-area of said viewing area and for producing data signals, respectively, for those sub-areas as to which the predetermined relationship between the sensed energy of different wavelength bands exists; removal means including a plurality of removal devices arranged in side-by-side contiguous relationship across the width of the removal area and comprehending respective portions of said bed along the width thereof which correspond to a plurality of said contiguous sub-areas of the viewing area; and operating means responsive to data signals, for independently operating the removal devices in accordance with a predetermined number of data signals produced for respective corresponding pluralities of contiguous sub-areas of the viewing area, so as to remove from the bed any of said portions thereof which have produced the predetermined number of data signals.

4,186,837

AUTOMATED FILM CARTRIDGE AND MAILER SORTING AND CORRELATING APPARATUS

Stanley Popiel, Stonington; R. Clark DuBois; Jay L. Carley, both of Fairfield, and John C. Hamma, Milford, all of Conn., assignors to Mystic Color Lab, Inc., Mystic, Conn.

Filed Dec. 27, 1978, Ser. No. 973,612
Int. Cl.[2] B07C *5/34*
U.S. Cl. 209—565 **35 Claims**



1. Apparatus for sorting film cartridges and correlating the cartridges with mailers to be used in returning developed film to their rightful owners; said apparatus comprising in combination:

A. a conveyor having a series of conveyor sections, each accommodating a cartridge and mailer in physically correlated relation;

B. a loading station at which said conveyor sections are successively presented for loading of a cartridge and mailer thereon;

C. means for indexing said conveyor in stepwise fashion;

D. a memory into which data identifying the type of film in each cartridge is successively entered;

E. a dual labeling station to which said conveyor sections are successively presented, said labeling station including transport means for applying to a cartridge and mailer thereat separate labels, each preprinted with unique, correlating indicia;

F. a plurality of discharge stations to which said conveyor sections are successively presented; and

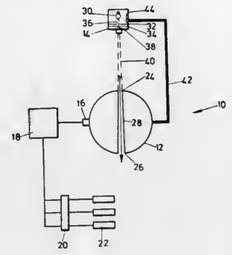
G. means controlled by the data in said memory for off-loading each labeled cartridge into a selected one of said discharge stations in accordance with the type of film therein.

4,186,838

MEASUREMENT OF OPTICAL PROPERTIES

Charlie M. Levitt, 40 Craighall Rd., Victory Park, Johannesburg, and Samuel Chatterley, 1 Reithaan St., Florida Lake, Florida, Johannesburg, both of South Africa

Filed Aug. 17, 1977, Ser. No. 825,390
Claims priority, application South Africa, Aug. 27, 1976, 76/5149
Int. Cl.[2] B07C *5/342*; G01N *21/26*; G01J *3/38*
U.S. Cl. 209—581 **11 Claims**



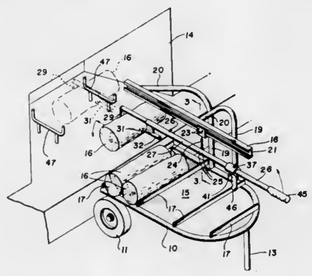
10. A method of sorting articles according to the reflectance of the articles which includes the steps of passing the articles in succession through an integrating sphere, illuminating each article with a beam of radiation of a suitable wavelength directed along the path of the article after the article has passed through the sphere, detecting the radiation reflected by the article onto the internal wall of the sphere, and sorting the article according to the detected radiation.

4,186,839

CRANE FOR HANDLING FIREPLACE OR WOOD STOVE LOGS

Vence V. Majors, Rte. 2, Hardy, Ark. 72542

Filed Apr. 20, 1978, Ser. No. 898,088
Int. Cl.[2] B66C *3/00*; B60P *1/54*
U.S. Cl. 212—135 **4 Claims**



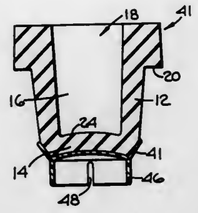
1. A crane for handling fire logs comprising a wheeled support, a substantially horizontal track on said support, a log grapple having relatively movable log engaging grapple jaws and means for releasably locking said jaws in selected relative positions, and a flexible suspension means for said grapple on said track and movable freely with the grapple in opposite directions on said track, said log grapple being a manually operated grapple in which said jaws are relatively movable on a linear path, and said means for releasably locking said jaws comprising a spring-biased manually released friction locking device for one jaw and having engagement with the other jaw.

4,186,840

CANNULAPIERCEABLE, SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, which is a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 942,055
Int. Cl.[2] B65D *39/04*
U.S. Cl. 215—247 **2 Claims**



1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;

(a) a tubular elastomeric body having

(i) flexible, elastic sidewalls;

(ii) an open first end; and

(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls;

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end; and

(c) a protective cap adhered to the outside of said closed second end and

wherein said cap has a shirt portion adapted to be nested in the open end of a tubular container prior to insertion of said closure into an air evacuated container;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;

whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,186,841

PALLET

Albert P. Buckley, Cohasset, and Melville R. Dill, Jr., Boston, both of Mass., assignors to Federal Reserve Bank of Boston, Boston, Mass.

Filed Sep. 29, 1977, Ser. No. 837,739
Int. Cl.[2] B65D *7/26, 21/02*
U.S. Cl. 220—6 **11 Claims**

1. A foldable, stackable pallet comprising:

(a) a support frame;

(b) a plurality of support feet associated with said frame, each having a substantially rectangular cross section;

(c) two inwardly foldable end walls;

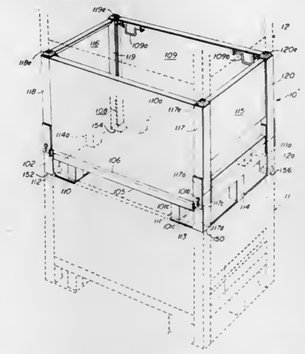
(d) first and second pairs of support columns, each pair associated with a respective one of said end walls and each column having a substantially rectangular cross section;

(e) means for pivotally attaching each of said support columns to a respective one of said support feet;

(f) a pair of removable side walls which are storable on said frame;

each of said support feet and each of said columns having an upwardly extending protrusion formed on an upper end thereof and a cooperative recess formed on a lower end thereof and defined by side walls thereof;

the recess formed on each of said support feet being adapted to selectively receive a protrusion formed on an upward end of a corresponding one of said columns of another pallet stacked therebelow in an extended condition and a protrusion formed on an upward end of a corresponding one of said support feet of another pallet stacked therebelow in a folded condition;



the recess on each of said columns being registrable with a protrusion formed on an upper end of an associated one of said support feet to form a rigid, vertical connection therebetween;

said pivotable attachment means comprising:

a pair of depending plates externally disposed on opposite sides of each of said columns and extending downwardly therefrom to engage the corresponding sides of an associated support foot therebetween;

an elongated slot in at least one plate of each pair of plates and extending longitudinally of the plate;

a transverse pivot pin disposed on each of said support feet and extending therefrom through a respective one of said slots;

a notch formed in at least one plate of each pair of plates; and

a stop registrable with said notch when the recess on said support column is registered with the protrusion in said associated support foot;

said stop, said notch, said pivot pin, said slot, said recess in said support column and said protrusion on said support foot in combination being operable to produce said rigid vertical connection.

4,186,842

DISPOSABLE DRINKING CUP WITH VALVED LID

Kenneth J. Albert, Beverly Hills, Calif., assignor to Inventor's Inc., Los Angeles, Calif.

Filed Oct. 27, 1977, Ser. No. 845,898
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—206 **4 Claims**

1. In a disposable drinking cup with a valved, circular lid including a frusto-conical cup having an open top and of a

good heat-insulating material, said lid comprising a top wall having a periphery with a skirt depending therefrom, said lid being detachably mounted on said open top by a snap connection including an annular groove in the lid immediately adjacent to the periphery of the lid, said lid being of a flexible elastic plastic having heat-insulating properties, the improvement to the lid comprising:

(a) a first arcuate slit, the concave side of said first arcuate slit opening radially inwardly toward the center of said circular lid, the first slit extending through said top wall from its top surface to its under surface in close proximity to the periphery of said circular lid, said slit providing a drinking opening when the material of the top wall adjacent said concave side is depressed, said material providing a valve member which normally resiliently closes said drinking opening;

(b) a second arcuate slit, the concave side of said second arcuate slit opening radially inwardly toward the center of said circular lid, the second slit extending through said top wall from its top surface to its under surface in a position diametrically opposite the first slit providing the drinking opening, and which defines a relief opening when the material of the top wall adjacent said concave side of the second slit is depressed, said material providing a relief



valve which normally resiliently closes said relief opening;

(c) a straight reinforcing rib upstanding from said top wall and extending between said valve member and said relief valve with one end portion of said rib terminating within the area defined and bordered by said first arcuate slit and with the remaining end portion of said rib terminating within the area defined and bordered by said second arcuate slit, the area defined and bordered by the first and second arcuate slits being bounded by an imaginary straight line connecting the end points of the arcs of the respective first and second arcuate slits whereby downward pressure on said rib causes deflection of said top wall to move said valve member and said relief valve, opening said drinking opening and said relief opening; and

(d) a generally circular reinforcing rib upstanding from said top wall and radially inwardly of and concentric with said periphery and spaced radially outwardly of said relief opening with the generally circular formation of said reinforcing rib being interrupted by a U-shaped formation, the open end of said U-shaped formation being directed radially outwardly toward said first arcuate slit, the interposition of said U-shaped formation preventing the otherwise intersection of said generally circular reinforcing rib and said first arcuate slit.

4,186,843

CLOSURE CAP DEVICE FOR A FUEL TANK OF A MOTORCYCLE

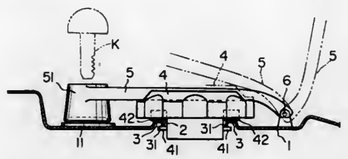
Yoshitaka Omori, Fujimi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1978, Ser. No. 944,394

Claims priority, application Japan, Sep. 28, 1977, 52-130244[U]

Int. Cl.[2] B65D *55/14, 45/23*

U.S. Cl. 220—210 **2 Claims**



1. In a closure cap device for a fuel tank of a motorcycle comprising a fuel tank with a fuel filling port, defined by a wall, formed in one part thereof, a closure cap for said fuel filling port, lever means for said closure cap to prevent the same from demounting from the fuel filling port when said lever means is in one position, and a lock engagement means for said lever means to unmovably fasten the same across said closure cap, the improvement wherein said closure cap and filling port-defining wall provide a bayonet structure and said cap has at least one engagement portion formed diametrically across the top surface part thereof to be engaged with the lever means, said engagement portion being in a tapered form; the lever means is also in a tapered form toward the tip end thereof, conforming with the shape of said tapered engagement portion; pivot means mounted on the top surface part of said fuel tank body near said closure cap, to which the opposite end of said lever means is pivotally mounted to be snugly received and fitted with said diametrically extending tapered engagement portion of said closure cap; said lock engagement means comprises a lock provided at the tip end part of said tapered lever means opposite said pivotally supported end thereof, and a socket is provided on the top surface of said fuel tank body, said engagement means being mutually engaged when said lever means is fitted with said engagement portion in said closure cap at the time of perfect tight-fitting of said closure cap onto said fuel filling port of the fuel tank body; and the top surfaces of said lever means and said lock engagement means, when they are tightly engaged with said closure cap and fastened, are generally flush with the top surface of said fuel tank body to maintain flatness on the top surface of the fuel tank.

4,186,844

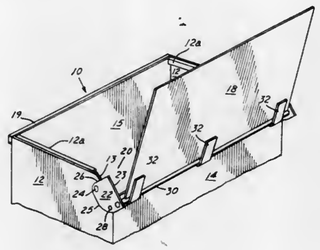
EASY OPENING TRASH BIN LID

Raymond Swanson, 5090 N. 109th, Longmont, Colo. 80501

Filed Jan. 29, 1979, Ser. No. 7,662

Int. Cl.[2] B65D *43/14, 51/04*

U.S. Cl. 220—333 **9 Claims**



1. A hinged lid rectangular trash container comprising:

(a) a container having two side walls, front and rear walls, and a bottom, providing a full open top and planar lid means therefore,

(b) said side walls having opposed cut-off corners adjacent said rear wall,

(c) said rear wall being smaller in height than said front wall and joining at said cut-off of said side walls,

(d) hinge means on each side of said container including plate means mounted on pivot means pivotally connected to each said side wall at a point forward of said rear wall, and each said plate arranged to pivot about said povot means,

(e) stop means associated with each said plate means limiting clockwise and counterclockwise pivotal movement of each said plate means, and

(f) lid hinge means including plate connecting means and pivotal connecting means at the rear edge of said lid means to said plate connecting means, providing pivoting movement of said lid means, independant of said plate means.

4,186,845

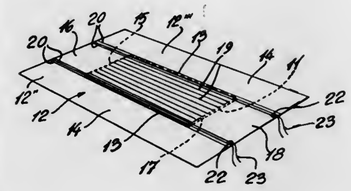
CONTAINER LINER

Victor T. Fodd, 255 Beverly Ave., Montreal, Quebec, Canada

Filed Aug. 1, 1978, Ser. No. 929,964

Int. Cl.[2] B65D *25/14, 25/16*

U.S. Cl. 220—461 **7 Claims**



1. A liquid impervious liner for use in shipping containers, said liner comprising a base sheet of cushioning material and a top cover sheet of polymeric material bonded to said base sheet by a plurality of spaced apart continuous seal strips extending entirely across said base sheet, said top cover sheet having panel portions extending beyond the periphery of said base sheet, said panel portions being portions of said top cover sheet extending beyond a front, rear and opposed side edges of said base sheet to constitute a front, rear and side panels, said top cover sheet being constituted by three rectangular sheets; a first of said sheets being bonded to said base sheet, which is also rectangular, by said plurality of seal strips and protruding beyond said front and rear edges of said base sheet to constitute said front and said rear panel; a second and third one of said sheets overlapping said first sheet at a respective side edge portion thereof and sealed thereto by a plurality of closely spaced continuous seal strips, said second and third sheets constituting said side panels.

4,186,846

BULK MATERIAL CONTAINER

Richard P. Jacalone, Owosso, Mich., and Lewis D. Poggiali, West Chester, Ohio, assignors to Olinkraft, Inc.

Filed Jan. 5, 1979, Ser. No. 1,119

Int. Cl.[2] B65D *1/42, 5/32, 5/48*

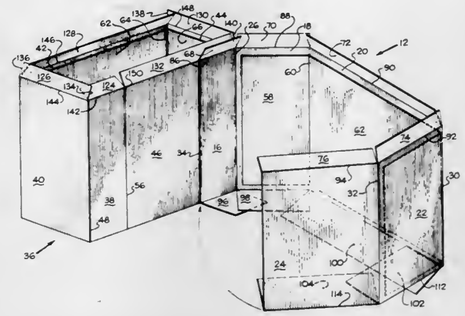
U.S. Cl. 220—468 **8 Claims**

1. A bulk material container having two cells laminated together along one of their respective walls to form a double thickness center partition, said container also being formed with double thickness side and end walls having no external manufacturer's joint, the container comprising:

(a) a first cell formed from a series of hingedly connected wall panels consisting of a first partition panel, a second outer wall panel, a third outer wall panel, a fourth outer wall panel, and a fifth partition panel;

(b) a second cell formed from a series of hingedly connected wall panels consisting of a sixth partition panel, a seventh outer wall panel, and eighth outer wall panel, a ninth outer wall panel, and a tenth partition panel;

(c) a pair of reinforcing liners, each liner being formed from a series of three hingedly connected wall panels, one of said liners being laminated to the second, third, and fourth outer panels of the first cell and the other of said liners being laminated to the seventh, eighth, and ninth outer panels of the second cell;



(d) a double thickness central partition formed by an edge of said first and fifth partition panels of said first cell abutting to form a juncture and an edge of said sixth and tenth partition panels of said second cell abutting to form a juncture, the junctures being offset a pre-determined distance so that the first partition panel of said first cell is laminated to a portion of said tenth partition panel of said second cell and the sixth partition panel of said second cell is laminated to a portion of the fifth partition panel of the first cell, the remaining portions of the fifth and tenth partition panels also being laminated together to complete the formation of the central partition of the bulk material container.

4,186,847

METHOD AND APPARATUS FOR DEFLECTING A STREAM OF SPREADABLE PARTICLES

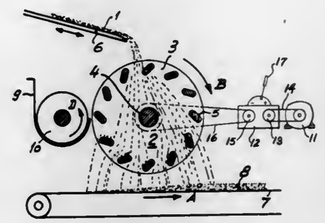
Walter Wirz, Thalwil, Switzerland, assignor to Dr. Peter Fahrni, Kilchberg, Switzerland

Filed Apr. 19, 1976, Ser. No. 678,230

Claims priority, application Switzerland, Apr. 24, 1975, 5258/75

Int. Cl.[2] B65G *31/04*

U.S. Cl. 222—1 **1 Claim**



1. A method for monitoring the operation of an apparatus for distributing particles in order to form a mat of particles wherein said apparatus includes a rotatable hollow cage cylinder having a perforated circumferential shell through which the particles to be distributed normally pass when the cage

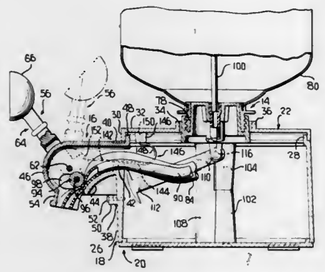
cylinder is rotated in a first direction, said method comprising the steps of: reversing the direction of rotation of the cylinder from said first direction and increasing the speed of rotation of the cage cylinder such that particles fed to the perforated shell cannot pass therethrough but are impelled in a different direction; capturing the impelled particles; and conveying the captured impelled particles to a measuring device for monitoring.

4,186,848

BASE TYPE DISPENSER FOR BOTTLE-LIKE CONTAINER WITH COLLAPSIBLE DISPENSING AND VENT LINES

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Oct. 31, 1978, Ser. No. 956,163
Int. Cl.² B67D *5/12*
U.S. Cl. 222—23 **16 Claims**



1. A dispenser for controllably dispensing a liquid from a product container, said dispenser comprising a base having an upper portion, a fitment carried by said base upper portion in an upstanding position for attaching an end fitment of an inverted product container to said base in sealed engagement with said fitment, a dispensing line and a vent line extending through said fitment for constant communication with the interior of an attached product container, a simulated spigot carried by said base remote from said fitment, said vent line and said dispensing line each having a collapsible tube portion extending from said fitment into said spigot and terminating thereat, said spigot including a fixed backup member and a movable handle member carrying a clamping member cooperable with said backup member normally to collapse said tube portions to prevent both dispensing and venting.

4,186,849

CONTROL CIRCUIT FOR AUTOMATICALLY MONITORING, DISPENSING, AND FILLING A LIQUID IN A CONTAINER

Searle T. Spangler, 2 Forian Ct., Westport, Conn. 06880

Filed Apr. 4, 1978, Ser. No. 893,484
Int. Cl.² B67D *5/08, 5/32;* **G08B** *21/00*
U.S. Cl. 222—25 **7 Claims**

1. A control circuit for automatically monitoring, dispensing and filling a liquid in a container of the type in which a concentrate is first added to the container and then automatically diluted under the control of said control circuit, comprising in combination

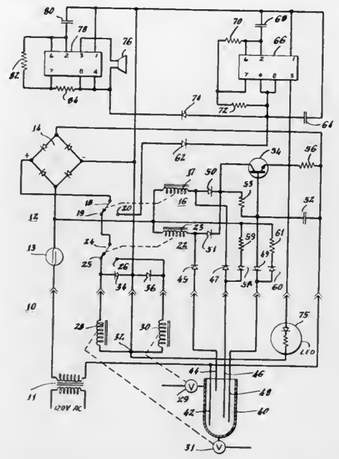
(a) a container for holding and dispensing liquid therefrom having a plurality of separated electrically conductive probes of different lengths extending to different depths within said container,

(b) a drain solenoid valve coupled to said container for dispensing liquid from said container when said drain solenoid valve is activated,

(c) a fill solenoid valve coupled to said container for adding liquid to said container when said fill solenoid valve is activated,

(d) a first relay having first and second contacts, said first contact when closed adapted to apply power to said solenoid valves,

(e) a second relay having first and second contacts coupled to said first contact of said first relay for activating said drain solenoid valve or said fill solenoid valve when said first or second contacts of said second relay, respectively, are closed,



(f) switch means coupled to said first and second relays, and

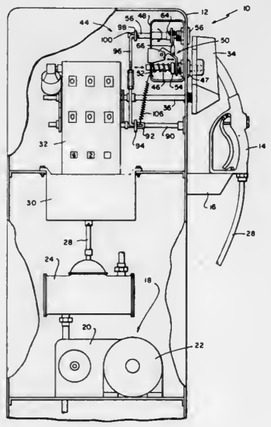
(g) means for coupling at least one of said electrically conductive probes to each of said first and second relays and said switch means for controlling said relays and said switch means in accordance with the amount of liquid in said container.

4,186,850

GASOLINE PUMP ASSEMBLY AND LOCK ARRANGEMENT ESPECIALLY SUITABLE FOR USE THEREWITH

Joseph A. Mahar, San Francisco, Calif., assignor to Mahar & Parsons, Belmont, Calif.

Filed May 1, 1978, Ser. No. 901,650
Int. Cl.² B67D *5/24*
U.S. Cl. 222—28 **14 Claims**



1. A gasoline pump assembly, comprising:

(a) an assembly housing;

(b) a dispensing nozzle located outside said housing;

(c) means including a pump located within said housing for providing a flow of gasoline to said nozzle from a supply thereof;

(d) handle means mounted on said housing for movement between a first position for closing the flow of gasoline from said supply to said nozzle and a second position for opening said flow of gasoline to said nozzle; and

(e) an arrangement connected with said housing for releasably locking said handle means in said first flow closing position, said arrangement including

(i) a longitudinal locking pin at least partially located within said housing,

(ii) means located within said housing and supporting said locking pin for axial movement between a first position such that one end portion of said pin extends out beyond an outer surface of said housing and interlocks with said handle means when the latter is in its flow closing first position for preventing said handle means from moving to its flow opening second position and a second non-interlocked position longitudinally inward from its first position out of the path of movement of said handle means, and

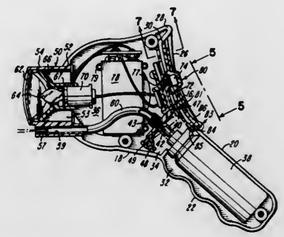
(iii) key actuated means located within said housing for moving said locking pin from its interlocked position to its non-interlocked position, said key actuated means including a key hole accessible from outside said housing and adapted to receive a key for moving said locking pin to its non-interlocked position.

4,186,851

NON-LETHAL PERSONAL DEFENSE WEAPON

Burton M. Cantor, Las Vegas, Nev., assignor to Personal Security Concepts, Inc., Columbus, Ohio

Continuation of Ser. No. 771,786, Feb. 24, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,270
Int. Cl.² B67D *5/66*
U.S. Cl. 222—113 **15 Claims**



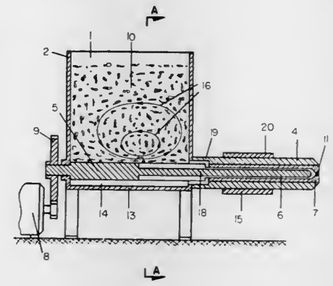
1. A non-lethal personal defense weapon comprising a housing, means for delivering from said housing a jet-like discharge of fluid having a capability of deterring attackers including means operable to activate the fluid discharge, means connected with said housing for emitting a beam of light, an operator device in connection with said housing movable in a substantially linear path, said operator device including, in association therewith and responsive to movement thereof means to actuate said light emitting means and substantially immediately after the actuation of said light emitting means to actuate said means operable to activate a discharge of fluid, said means to actuate said light emitting means and responsive to movement of said operator means including a normally open circuit, a circuit closure means being provided in connection with a portion of said actuating means and said actuating means being inclusive of a further portion which functions to induce the operation of said means operable to activate a discharge of fluid in the course of its movement in said substantially linear path, said housing comprising a rigid grip portion embodying a container of said fluid and a main body portion housing a power source for said light emitting means, said fluid delivery means being extended through said main body portion to and through an opening in a wall portion of said main body portion of said housing which mounts therein said light emitting means and said operator device being reciprocably movable along and in contact with an edge wall portion of said main body portion adjacent said rigid grip.

4,186,852

APPARATUS FOR MELTING AND EXTRUDING THERMOFUSIBLE MATERIAL

Luigi F. Braga, Milan, Italy, assignor to Viscodynamics Corporation, Bure, Switzerland

Filed Jun. 3, 1977, Ser. No. 803,146
Claims priority, application Italy, Jun. 7, 1976, 24007 A/76
Int. Cl.² B67D *5/62;* **G01F** *11/22*
U.S. Cl. 222—146 HE **8 Claims**



1. An apparatus for the continuous melting and extrusion of thermofusible materials which are poor conductors of heat, which comprises a feeding and a prefusion chamber, means for heating said feeding and prefusion chamber, a shaft capable of rotation at the base of said chamber and located along a substantial portion thereof, said shaft while in rotation mixing and recycling said thermofusible material, means for activating said shaft, said shaft comprising a first cylindrical portion and a second portion in the form of a first helicoidal screw, extrusion means comprising an extrusion screw axially connected to said shaft, said extrusion screw being located in a cylindrical tubular structure extending from said chamber, exit means for the thermofusible material in said cylindrical tubular structure, said extrusion screw comprising a second helicoidal screw, said first helicoidal screw being of greater diameter than said second helicoidal screw, said cylindrical tubular structure being divided into two portions, the first portion engaging said first helicoidal screw and being of greater internal diameter than the second portion, whereby at least a portion of said thermofusible material is axially recycled to said feeding and prefusion chamber, prior to reaching said second helicoidal screw.

4,186,853

CONTINUOUS AEROSOL DEVICE

Barry F. White, Merrimack, N.H., assignor to Summit Packaging Systems, Inc., Manchester, N.H.

Filed Jan. 22, 1979, Ser. No. 5,484
Int. Cl.² B65D *83/14*
U.S. Cl. 222—182 **7 Claims**

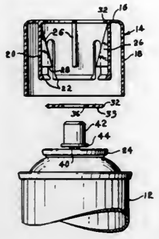
1. An aerosol dispensing device adapted for continuous dispensing until exhausted comprising:

(a) an aerosol container having a valve at its upper end actuateable by downward movement and having lateral projection means disposed about the valve;

(b) an inverted generally cup-shaped overcap normally installed on the container and having downward portions with nibs adapted for snap engagement with the projection means, and shoulder means on the inside of the overcap spaced below the top wall, the top wall of the overcap

having an opening, and an annular portion secured within the opening by break-away means to the top wall of the overcap; and

(c) actuating means adapted when the annular portion is



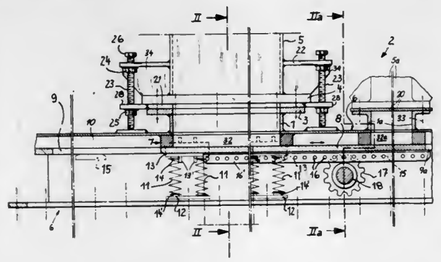
broken away from the top wall of the overcap and placed inside the overcap against the shoulder means and the overcap is reinstalled on the container, to press down the valve so that it discharges through the opening as long as the overcap remains in place.

4,186,854

GATE FOR STORAGE-TANK OUTLET

Lothar Teske, Industriestr. 30, 5000 Cologne 90, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,832
Int. Cl.[2] B65D *47/00*
U.S. Cl. 222—185 **8 Claims**



1. In a storage facility for bulk material, including a container body with a discharge port surrounded by a bottom flange above a base forming a channel for bulk material discharged from said port,

the combination therewith of:

a funnel supported on said base and provided with a top flange underlying said bottom flange in substantial alignment therewith, said funnel forming an outlet for said bulk material;

a sealing frame underneath said funnel rimming said outlet;

a slider having a solid portion in direct fluidtight contact with the underside of said sealing frame in a closure position, said solid portion being withdrawable from said outlet in an unloading position;

pressure means bearing upon said slider from below for maintaining said fluidtight contact;

fixed support means on said base for guiding said slider between said closure position and said unloading position;

drive means on said base for displacing said slider into either of said positions;

a spacer frame interposed between said top and bottom flanges; and

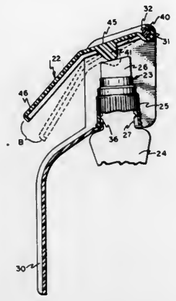
lifting means on said body for increasing the separation of said flanges to facilitate extraction of said spacer frame and replacement thereof by a substantially coextensive shutter plate.

4,186,855

SPRAY PUMP ACTUATING AND BOTTLE HOLDING DEVICE

Walter W. Edman, Westport, and Irving L. Farer, Rowayton, both of Conn., assignors to Zotos International, Inc., Darien, Conn.

Filed Jun. 19, 1978, Ser. No. 916,928
Int. Cl.[2] G01F *11/02*
U.S. Cl. 222—321 **17 Claims**



1. A pump valve actuating and bottle holding device removably mountable to a bottle having a pump-type spray valve threadedly engaged therewith, said device comprising:

(A) mounting means removably engageable with the threaded cap of the valve for secure interconnection therewith when the cap is threadedly engaged with the bottle and incorporating

(a) means forming a bottle neck portion entry and holding zone, comprising a front entry portal zone formed therein, for easy, slide-on mounting of said pump valve actuating and bottle holding device on the bottle without requiring removal of the pump spray valve threadedly engaged with the bottle, and

(b) an upturned flanged member positioned about the neck portion entry and holding zone for cooperative interengagement between the lower section of the bottle neck portion and the lower section of the threaded cap of the valve;

(B) a bottle supporting handle cooperatively associated with the mounting means; and

(C) a pump actuating lever,

(a) pivotally mounted in juxtaposed spaced relationship to the handle and the pump valve of the bottle,

(b) incorporating valve actuating means positioned for direct actuating contact of the valve, and

(c) easily movable between a first valve raised position and a second valve actuated position,

whereby simple downward movement of the lever causes the pump valve to produce a burst of product in a fine spray mist with the lever being returned to its first position through the return action of the valve.

4,186,856

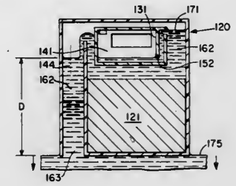
SELF-PRIMING PASSIVE DOSING DISPENSER

Robert S. Dirsking, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 14, 1978, Ser. No. 933,400
Int. Cl.[2] E03D *9/02*
U.S. Cl. 222—424.5 **11 Claims**

1. A passive dosing dispenser comprising an internal reservoir for containing a quantity of a solution, and means for causing a predetermined dose-volume of a liquid to be conducted into said reservoir so that a dose-volume of said solution is displaced from said reservoir and caused to issue from said dispenser in response to the level of a body of said liquid being lowered from a first elevation to a second elevation, said

means comprising a dose-volume measuring cavity, an inlet conduit, and a discharge standpipe, said inlet conduit having a top end in fluid communication with the interior upper reaches of said reservoir and a bottom end in fluid communication with the bottom portion of said measuring cavity, said standpipe having an upper end in fluid communication with the interior upper reaches of said reservoir and an open lower end, said reservoir being in fluid communication exclusively with said inlet conduit and said standpipe, said reservoir being adapted to hold a quantity of a solid-state product which is solvable in said liquid and for being flooded with said liquid to form said solution in said reservoir by dissolving some of said product, said dispenser further comprising means for being so disposed in said body of liquid that said measuring cavity is filled with said liquid whenever the level of said body of liquid is raised to said first elevation from said second elevation and so that said dose-volume of said liquid will be vacuum-transferred from said measuring cavity via said inlet conduit to said reservoir and said dose-volume of said solution will be displaced from said reservoir into said standpipe and thence from said dis-



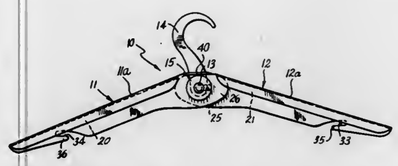
penser whenever the level of said body of liquid is lowered to said second elevation, said measuring cavity including means for making said dispenser self-priming, said means comprising a first inlet port pervious to the passage of liquid located at a sufficiently high elevation with respect to the upper end of said standpipe that said reservoir is filled by liquid entering through said standpipe when said dispenser is initially immersed in said body of liquid, said means also including a second inlet port in said measuring cavity having means for making said second inlet port impervious to the passage of liquid for a period of time sufficient for said reservoir to be filled by liquid entering through said standpipe upon immersion of said dispenser in said body of liquid, said means for making said second inlet port impervious to the passage of liquid being soluble upon sustained immersion in said liquid, said second inlet port being located at a sufficiently low elevation with respect to the upper end of said standpipe that said measuring cavity is filled through said second inlet port before the level of said body of liquid reaches the upper end of said standpipe whenever the level of said body of liquid rises from said second elevation to said first elevation.

4,186,857

COLLAPSIBLE COAT HANGER

Walter C. Helms, Jr., 1001 N. Highland St., Arlington, Va. 22210

Filed Jun. 6, 1978, Ser. No. 913,235
Int. Cl.[2] A47J *51/10*
U.S. Cl. 223—94 **21 Claims**



1. A collapsible coat hanger comprising:

(a) a pivot pin defining a pivot axis about which the coat hanger collapses;

(b) a first arm having a slot therein which receives said pivot pin wherein said first arm rotates about said pin and slides relative to said pin, said first arm having a projection thereon;

(c) a second arm pivotal about the axis defined by said pin to rotate toward said first arm and having an abutment thereon which is engagable by said projection on said first arm when said first and second arms are slid toward one another when the arms are substantially in the extended configuration, so as to lock said arms with respect to one another; and

(d) slot means intermediate the ends of each of said arms wherein the slot means on one arm receives a portion of the other arm to hold the arms in overlapped relationship when the hanger is collapsed; and

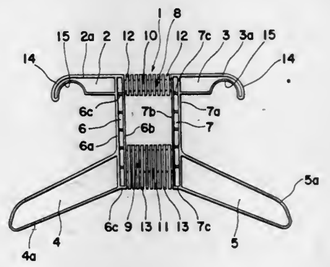
(e) hook means pivoted on said pin with said arms for extending from said arms when the arms are extended and for overlying said arms when the coat hanger is collapsed.

4,186,858

FOLDABLE HANGER

Shunji Tatematsu, 11-2, Shinnyo-cho, Jodo-ji, Sakyo-ku, Kyoto-shi, Kyotofu, Japan

Filed Dec. 26, 1978, Ser. No. 973,170
Claims priority, application Japan, Dec. 29, 1977, 52-178325[U]
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—94 **6 Claims**



1. A foldable hanger of one piece-construction made of synthetic resin for hanging a garment such as a coat or a suit thereon, said hanger comprising, in combination;

a substantially elongated connecting member bendable about a line substantially intermediate of the width of said connecting member;

a pair of hands extending from one end portion of the connecting member in the opposed directions with respect to each other, each of respective free ends of said hands being formed into a hook through which hanger is adapted to be engaged on an external support means, and;

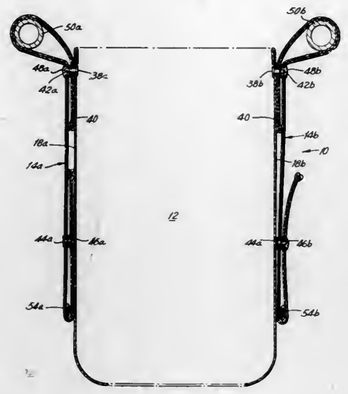
a pair of shoulders extending from the other end portion of the connecting member in the opposed directions with respect to each other for the support of the garment thereon, said hands of the pair and said shoulders of the pair being, when the hanger is folded with said connecting member bent about said line substantially intermediately of the width of the connecting portion, pivotable in a direction close towards each other.

4,186,859

CONVERTIBLE BAG APPARATUS

Roberta L. Frankfort, 165 West End Ave., New York, N.Y. 10023, and Donna L. Madonna, 120 Cabrini Blvd., New York, N.Y. 10033

Filed Jul. 31, 1978, Ser. No. 929,522
Int. Cl.[2] A45C *9/00*
U.S. Cl. 224—205 **3 Claims**



1. Bag apparatus adapted to be convertible between a shoulder carried mode and a mode wherein the bag is suspended from support members, such as handle bars of a carriage or the like, comprising:

a bag member including opposed front and rear wall portions, a pair of opposed side wall portions and a bottom wall portion;

a pair of elongate, flexible strap members, each of said strap members being affixed at one end portion thereof to a respective side wall portion of said bag member;

first means provided on said strap members for releaseably fastening the free end portions thereof to each other wherein said bag apparatus is in said shoulder carried mode, said first releaseable fastening means comprising on each strap member outer and inner mutually engageable first connector elements, said outer first connector element being provided on the free end portion of said strap member and the inner first connector element being provided on said strap member longitudinally spaced a predetermined distance from said outer first connector element in a manner such that the outer first connector element provided on one of said strap members is engageable with the inner first connector element on the other strap member and the inner first connector element provided on said one of said strap members is engageable with the outer first connector element on said other strap member;

second means provided on each of said strap members for releaseably forming a closed loop defined by a relatively short length of said strap member folded over itself in the vicinity of the respective upper edge of said bag side wall portion to which said strap member is affixed, said loop being formable about one of the support members to convert the bag to the suspended mode, said second means comprising on said length of each strap member outer and inner mutually engageable second connector elements, said outer second connector element being provided in the region of the affixed end portion of said strap member and the inner second connector element being provided on said strap member length longitudinally spaced a predetermined distance from said outer second connector element in a manner such that upon folding each of said strap member lengths over itself to form a closed loop, said outer and inner second connector elements are located in opposed relationship to each other whereby they are mutually engageable to form a closed loop;

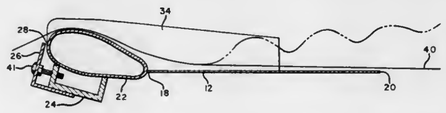
said first releaseable fastening means further further constituting means for releaseably fastening the free end portions of said strap members to respective bag side wall portions when the bag apparatus is in the suspended mode, said releaseable fastening means further including a loop member provided on each of said bag side wall portions having its ends affixed thereto, whereby upon forming said closed loop sections, said strap member free end portions are each passed through a respective loop member and folded upon itself so that the inner and outer first connector elements are located in opposed relationship to each other whereby they are mutually engaged to form a closed loop around a respective loop member so that each strap member is thereby fastened to a respective side wall portion.

4,186,860

WEB THREADING SYSTEM

Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Oct. 16, 1978, Ser. No. 951,560
Int. Cl.[2] G03B *1/56*; B65H *25/06*
U.S. Cl. 226—91 **10 Claims**



1. Apparatus for directing a web of flexible material to a predetermined location comprising:

a wall element having side edges and a web entry end and a web exit end;

a Coanda nozzle located at the wall element web entry end to direct a gaseous flow therealong toward said web exit end;

venting means in operative association with said wall element and extending from said Coanda nozzle to a location between the web entry and web exit ends of said wall element for laterally venting portions of said gaseous flow past opposed side edges of the wall element whereby a web will have lateral forces exerted thereupon by said gaseous flow portions to spread and stabilize said web as the web is propelled forward by the remainder of said gaseous flow.

4,186,861

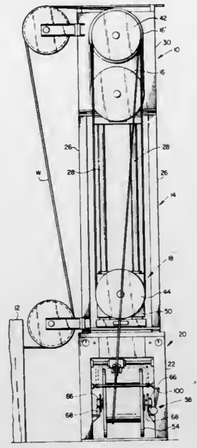
WIRE ACCUMULATOR TOWER

Wilhelm A. Steinhilber, Guilford, Conn., assignor to Orion Machinery and Engineering Corporation, Branford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,698
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—118 **15 Claims**

1. In a machine for processing a continuous strand of wire the combination comprising a vertically elongated frame, a pair of capstans supported for rotation on said frame for receiving portions of the strand looped therearound and including a first capstan supported for rotation about a horizontal axis and a second capstan supported above said first capstan for rotation about an axis parallel to and vertically spaced from the axis of said first capstan, means for driving said capstans in timed relation to each other, and a festoon assembly for accumulating and storing a portion of the strand and including a first set of sheaves supported on said frame for coaxial free rotation relative to each other about an axis below and parallel to the axes of said capstans and a second set of sheaves supported on said

frame above said first set and journalled for coaxial free rotation relative to each other and to said capstans, one of said sets



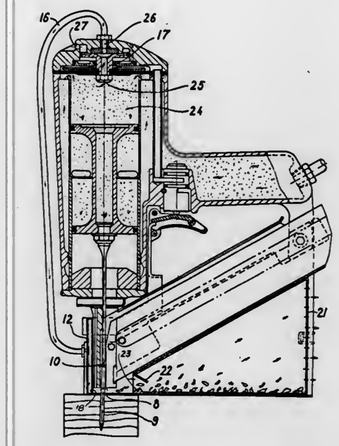
being supported for vertical movement relative to said frame and toward and away from the other of said sets.

4,186,862

DEBRIS COLLECTING MECHANISM FOR PNEUMATIC DRIVING TOOLS

Arthur Klaus, Bad Homburg von der Hohe, Fed. Rep. of Germany, assignor to Signode Corporation, Glenview, Ill.

Filed Mar. 13, 1978, Ser. No. 885,544
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718070
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—130 **9 Claims**



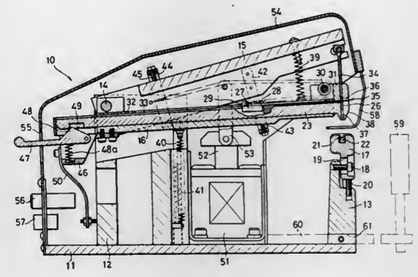
1. A pneumatic fastener driving tool having an outlet barrel, a magazine containing a strip of adhered fasteners and a driving plunger positioned to engage sequentially a fastener at the end of each strip for ejecting an individual fastener from the outlet barrel, a container mounted adjacent the barrel of the driving tool, which container defines an opening adjacent the barrel outlet, conduit means containing air under pressure received from the driving tool, one end of which conduit means is in communication with the end of the barrel through which a fastener moves, whereby air under pressure flows across the barrel and into the opening of the container to direct from said barrel into the container any particulate matter broken off from the fastener strip during the driving action.

4,186,863

STAPLE FASTENER APPLYING MACHINE

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,269
Claims priority, application Japan, Mar. 25, 1977, 52-33774
Int. Cl.[2] B25C *1/06*
U.S. Cl. 227—131 **8 Claims**



1. A staple fastener applying machine, comprising:

(a) a base having first and second supports mounted thereon and spaced from each other;

(b) a driver arm pivotally supported on said first support, said driver arm carrying a driver;

(c) a holder arm pivotally supported on said first support, said holder arm releaseably holding a removable magazine for storing therein a plurality of staple fasteners positioned in sequence along a path defined by said magazine;

(d) guide means provided jointly on said holder arm and said magazine, said driver being movable through said guide means;

(e) means on said magazine for feeding the staple fasteners one at a time into the path of movement of said driver in said guide means;

(f) a clinching anvil mounted on said second support and located in registry with said path of said driver; and

(g) powered drive means mounted on said base between said first and second supports and remotely from the second support, said drive means being connected to said driver arm for angularly moving said driver arm so as to enable said driver to move through said guide means toward said anvil.

4,186,864

METHOD FOR PRODUCING A WELDED JOINT

Yasuo Ishimaru; Hiroshi Kobayashi, and Junji Tamura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 14, 1977, Ser. No. 842,358
Claims priority, application Japan, Oct. 29, 1976, 51-129517; Jul. 29, 1977, 52-90352
Int. Cl.[2] B23K *33/00*
U.S. Cl. 228—226 **4 Claims**

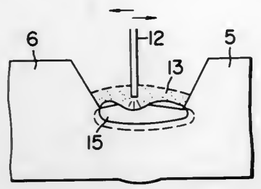
1. A method for producing a welded joint in a groove between metal components forming a weld preparation by multiple superimposed layers of deposited metal comprising the steps of:

(a) providing a base layer of deposited metal of a small thickness and a large width by producing a quantity of molten metal in said groove of the weld preparation in such a manner that that the molten metal spreads thinly and widely crosswise of the groove;

(b) providing an underlying layer of deposited metal of a small thickness and a large width by producing a quantity

of molten metal in the groove of the weld preparation in such a manner that the molten metal spreads thinly and widely crosswise of the groove upon the layer therebeneath;

(c) providing an overlying layer of deposited metal of a small thickness and a large width by producing another quantity of molten metal on the surface of said underlying layer of deposited metal in such a manner that the molten metal spreads thinly and widely crosswise of the groove, said another quantity of molten metal having heat of an



amount sufficiently large to transform, by the heat transmitted from said overlying layer, both the coarse structure of said underlying layer into a fine metal structure as well as increase the fineness of the metal structure of the layer beneath said underlying layer;

(d) repeating the steps of (b) and (c); and

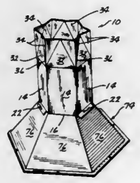
wherein the layers of deposited metal are produced with a shape such that the layers have a smaller thickness at end portions thereof adjacent the metal components as viewed widthwise of the groove of the weld preparation than at their central portion.

4,186,865

MEANS FOR SECURING THE BOTTOM CLOSURE OF A POLYGONAL CONTAINER

Tim McConnel, Omaha, Nebr., assignor to International Drum Corporation, Des Moines, Iowa

Filed Jun. 13, 1978, Ser. No. 915,015
Int. Cl.[2] B65D *5/12, 5/36*
U.S. Cl. 229—5.7 **4 Claims**



1. A clip for securing the bottom wall of a polygonal container, said container having a plurality of side panels and a strong, weight supporting bottom comprising a plurality of generally triangular bottom panels equal in number to the side panels and a plurality of interconnecting webs each extending between a pair of adjacent bottom panels and being folded into a reinforcing rib, each bottom panel being hingedly connected to one of the side panels and being inclined upwardly from the bottom edge of the side panel to which it is connected so as to form an acute angle therewith, said reinforcing ribs being arranged with respect to one another in spoke-like fashion with each rib having one end adjacent a center location and said ribs extending radially outwardly therefrom, said clip comprising:

an annular member having a central hub portion and a plurality of fingers extending radially outwardly from said hub, said fingers being circumferentially spaced to provide therebetween a plurality of radially extending slots;

said annular member being positioned with said hub adjacent said center location and with said one ends of said ribs extending within said slots of said annular member,

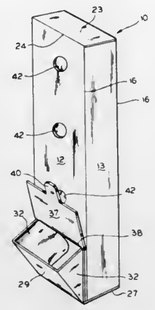
said ribs extending axially completely through said slots of said annular member whereby said annular member can slide frictionally in an axial direction with respect to said spoke-like arrangement of said ribs.

4,186,866

DISPENSER CONTAINER WITH COVER

James A. Zicko, Natick, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 25, 1979, Ser. No. 6,560
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 B **1 Claim**



1. A dispenser container formed from a cut and scored blank of paperboard or the like, comprising:

(a) front, rear and side walls hingedly interconnected along parallel fold lines and defining a tube;

(b) flap elements forming a closure for one end of said tube;

(c) a dispenser bin structure at the other end of said tube comprising an outer closure flap foldably connected to said rear wall, a dispenser bin front panel foldably connected to said closure flap, bin forming side flaps foldably connected to said bin front panel and foldable into position along the inner faces of said side walls of said tube;

(d) a dispenser bin cover formed in said front wall of said tube adapted to overlie said bin front element in the closed position of the latter;

(e) said bin cover being defined by a transverse score line in said front wall of said tube with the side edges of said cover being formed by broken score lines which are a continuation of the fold lines connecting said front wall and said side walls;

(f) said bin cover being foldable relative to said front bin element by fracturing said broken score lines and folding said cover along said transverse score line.

4,186,867

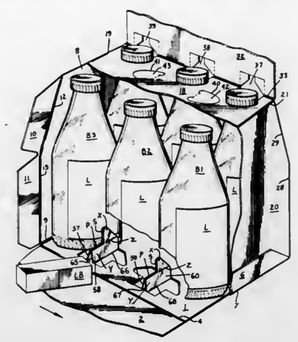
MEANS FOR PREVENTING THE DISFIGUREMENT OF BOTTLE LABELS

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 14, 1978, Ser. No. 933,488
Int. Cl.[2] B65D *75/72, 1/22*
U.S. Cl. 229—40 **6 Claims**

1. In a preformed sleeve type bottle carrier arranged for loading at least two bottles having labels through an open side wall of the sleeve and including a bottom wall (1) with two bottles disposed thereon, a label saving tab (57–64) struck from said bottom wall and being joined thereto along a transverse fold line (65–72) disposed perpendicular to the side wall and interposed between said two bottles, and characterized in that

said label saving tab has a cutaway portion disposed in the upper outer corner of said tab, and said cutaway portion is



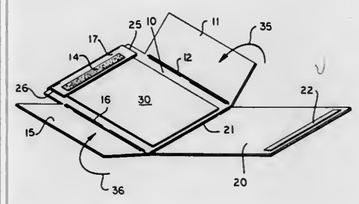
defined by a primary edge (P) disposed below the lowermost part of the label of the associated one of said bottles.

4,186,868

SPECIALTY ENVELOPE

John D. Coleman, 26 A Great Woods Ct., Fairport, N.Y. 14450

Filed May 1, 1978, Ser. No. 901,502
Int. Cl.[2] B65D *27/14*
U.S. Cl. 229—92.1 **2 Claims**



1. An envelope assembly comprising

a writing surface having a first length, a right side flap disposed so that said right side flap may be folded to cover a portion of said writing surface;

a left side flap disposed so that said left side flap may be folded to cover a portion of said writing surface;

a front flap having a second length, having a lower surface, and having a front flap upper surface with a first adhesive means disposed thereon for fastening a foreign object to said front flap;

a rear flap having a third length and having a rear flap upper surface;

said third length being substantially the same as said first length;

said rear flap being disposed so that it may be folded to cover a portion of said writing surface;

second adhesive means disposed on said front flap lower surface for attaching said rear flap upper surface to said lower surface when said rear flap is folded over said writing surface subsequent to said front flap being folded over said writing surface; and

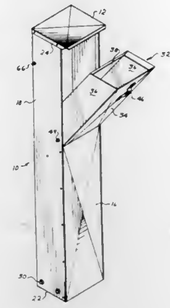
wherein the sum of second second length and said third length is greater than said first length.

4,186,869

MAIL BOX

Charles E. Brown, P.O. Box 1875, Hereford, Tex. 79045

Filed May 11, 1978, Ser. No. 904,903
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—17 **16 Claims**



1. A mail box comprising:

a. a housing having the shape of a rectangular prism,

b. said housing having

(i) a cap,

(ii) a back,

(iii) a front,

(iv) a blank side, and

(v) a flag side,

c. the back and each of the sides being rectangular and extending from the bottom to the top of the housing,

d. the back rigidly attached to the two sides,

e. the cap rigidly attached to the back and two sides with

f. a cap lip enclosing the back and two sides,

g. the front extending from the bottom to past halfway to the top, and rigidly attached to the two sides,

h. anchor means on the bottom of the housing for attaching the housing to supporting structure,

j. a letter box having at least the following elements rigidly attached together,

(i) a front, and

(ii) two sides,

k. the letter box pivoted to the housing near the bottom and front of the letter box sides,

m. the letter box front filling the housing from the housing front to the cap,

n. a false bottom rigidly attached to the back, sides, and front of the housing below the letter box,

o. the cap having an overhang over the letter box front, and

p. a flag pivoted to the flag side,

q. said letter box having a back rigidly connected to the letter box sides,

r. a flag rod to which the flag is rigidly attached,

s. said flag rod pivoted through the flag side and blank side,

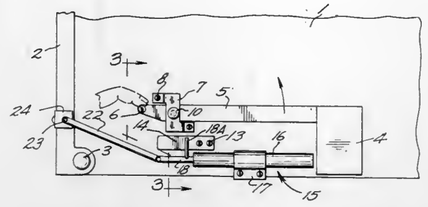
t. said flag rod having a radial extension thereon in the same plane with the flag,

u. said flag rod being below the top of the back of the letter box,

v. so that the back of the letter box contacts said radial extension when the box is closed thereby holding the flag in a full up position or a full down position when the letter box is closed, and

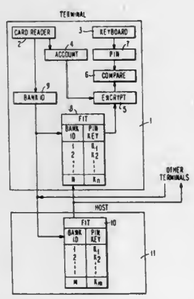
w. said flag being free to rotate by gravity when the letter box is pivoted open.

4,186,870
MAILBOX ATTACHMENT
Frank B. Walden, Space 38 2395 Redwood Ave., Grants Pass, Oreg. 97526
Filed Jul. 5, 1978, Ser. No. 921,966
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—35 **1 Claim**



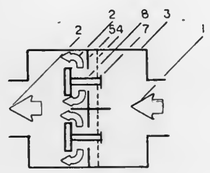
1. A mailbox attachment permitting fingertip raising and automatic lowering of the mailbox flag, said attachment comprising,
a flag assembly including a flag arm mounted to the mailbox for pivotal movement about a horizontal axis, said flag arm having a horizontally extending projection at its lower end to receive fingertip pressure for raising of the flag arm,
a friction lock secured to said mailbox and having a bowed flexible segment disposed for friction contact with the lower end of the flag arm when the flag arm is in a raised position,
biased means including a housing attached to the lower side edge of the mailbox, a spring within said housing, a rod having one end within said housing and acted upon by said spring for rod retraction, said rod including an upright arm also contactable with said horizontal projection on the flag arm for imparting lowering pivotal movement to the arm during rod extension,
a clip mounted to the mailbox door, and
a link pivotally connected to said clip and to the exposed end of said rod whereby said rod is extracted by door opening movement to cause the arm on said rod to contact said flag arm extension and impart lowering movement to said arm.

4,186,871
TRANSACTION EXECUTION SYSTEM WITH SECURE ENCRYPTION KEY STORAGE AND COMMUNICATIONS
Robert W. Anderson, Morgan Hill; Steven F. Brock, and May L. Gee, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 1, 1978, Ser. No. 882,529
Int. Cl.[2] G06K *5/00*; H04Q *3/54*
U.S. Cl. 235—380 **18 Claims**



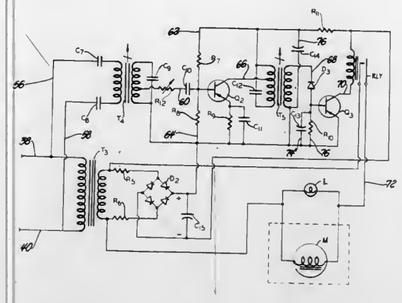
1. A transaction terminal connectable to a host having a virtual storage means with a plurality of issuer unique control blocks, the transaction terminal comprising:
terminal storage means for storing at least one issuer unique control block, each such block including an encryption key, and including at least one but less than all of the plurality of control blocks in the virtual storage means;
card reader means for reading encoded data on an identification card presented to the terminal by an individual, said encoded data including issuer identification data and card verification data;
means responsive to said issuer identification data for searching said terminal storage means for a corresponding control block;
means for communicating said encoded data to the host when a corresponding control block is not found in said terminal storage means and for receiving from the virtual storage means at the host a corresponding control block for writing into said terminal storage means; and
means responsive to said encryption key data from said corresponding control block for encrypting said card verification data to generate a card check number.

4,186,872
ALTERNATE PATH COOLING SYSTEM FOR LIQUID COOLED DEVICES SUCH AS ENGINES
William M. Bland, Jr., 18575 Martinique Dr., Nassau Bay, Tex. 77058, and Edison M. Fields, 5314 Valkeith, Houston, Tex. 77096
Filed Apr. 22, 1976, Ser. No. 679,150
Int. Cl.[2] F01P *7/02*
U.S. Cl. 236—34.5 **2 Claims**



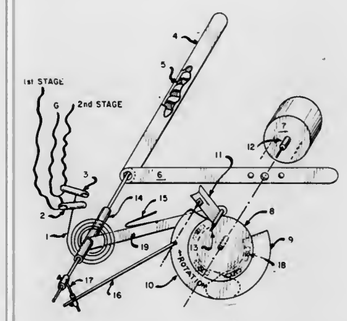
1. A coolant temperature-control assembly outer housing, said housing being connected at one of its ends to a heat producing device and connected at its other end to a liquid coolant radiator, said housing being divided internally into two coolant flow passages with both passages being the same size and with each passage being capable of providing the full coolant flow rate required by the heat producing device, and each said passage having a valve attached internally by suitable means to the housing for the purpose of controlling the flow of coolant independently through each passage between the heat producing device and the said liquid coolant radiator, with each passage so proportioned that either of said passages can provide the required full coolant flow through all phases of heat producing device operation with the other passage failed closed, without interruption of heat producing device operation, or any damage, repair, adjustment, or maintenance to the heat producing device, or knowledge of the occurrence of the failure by the operator of the heat producing device, with said valves being thermostat valves of conventional construction and alike in all respects and each containing a movable part that is caused to open and close in response to the temperature of the coolant surrounding the valve, with both valves opening at the same preset temperature.

4,186,873
HUMIDITY CONTROL SYSTEM AND CIRCUITRY
Russell W. Geisler, 31100 Hunters Dr., Farmington Hills, Mich. 48018, and Walter H. Geisler, New Orleans, La., assignors to Russel W. Geisler and Joseph C. Pansing, both of Farmington Hills, Mich.
Filed Apr. 25, 1978, Ser. No. 899,802
Int. Cl.[2] B01F *3/02*; G05D *21/00*
U.S. Cl. 236—44 A **4 Claims**



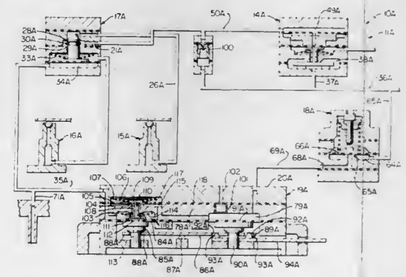
1. A humidity control system and circuitry, comprising:
a carrier current transmitter and receiver in combination and for use within a conventional electrical wiring system for a building,
said transmitter including a step-down transformer and a humidity sensing switching device compactly housed together,
and said humidity sensing device being provided within the power supply line for said transformer to provide only intermittent actuation thereof for improved sensitivity to humidity demands without having to compensate for temperature rises in an operating transformer closely adjacent thereto.

4,186,874
TARGETING THERMOSTAT
Ronald N. Jensen, 208 Greenwell Dr., Hampton, Va. 23666
Filed Jan. 5, 1979, Ser. No. 1,063
Int. Cl.[2] F23N *5/20*; G05D *23/00*
U.S. Cl. 236—46 R **9 Claims**



1. A thermostatic control that operates a heating system to regulate temperature to a prescribed schedule, comprising
a switch or switches operated from a temperature sensitive element which operates a heating system depending on the difference between the space temperature and the scheduled space temperature setting,
and a device which modifys the space temperature setting of the control by adjustment of the said temperature sensitive element through a temperature adjustment arm,
and a timer driven cam that repositions the said temperature adjustment arm in a prescribed manor,
and an outside sensor that repositions a rider lever in respect to the ambient temperature,
and a secondary cam rider pivoted on the said temperature adjustment arm which is positioned by the said outside temperature sensor's rider lever and operating so that the cam rider interacts with the timer driven cam,
and which varies the rate of change to the set point control during the heating system's warm up period in respect to the outside temperature.

4,186,875
TWO-TEMPERATURE PNEUMATIC THERMOSTAT CONTROL SYSTEM AND UNIT THEREFOR
Jay L. Lewis, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Mar. 20, 1978, Ser. No. 888,500
Int. Cl.[2] G05D *23/00*
U.S. Cl. 236—47 **10 Claims**



1. In a two-temperature pneumatic thermostat control system having an output device, a two level source of pneumatic pressure, a first temperature sensor for controlling the flow of pneumatic fluid from said source to said device when said source is at a first level thereof, a second temperature sensor for controlling the flow of pneumatic fluid from said source to said device when said source is at a second level thereof, a switching means for automatically switching said device to be controlled by said first sensor when said source is at said first level thereof and by said second sensor when said source is at said second level thereof, and manual reset means for causing said switching means to switch said device to be controlled by said first sensor even though said source is at said second level thereof when said reset means is moved to a reset position thereof, said reset means including a pivotally mounted lever having pneumatic means for acting on one end thereof and valve means at the other end thereof to be controlled thereby, the improvement wherein said valve means comprises a close-before-open valve means operatively interconnected to said inlet means and said switching means to be controlled by said other end of said lever of said reset means to cause said switching means to switch said device to be controlled by said first sensor even though said source is at said second level thereof when said reset means is moved to said reset position thereof.

4,186,876
SYSTEM POWERED DAMPER BLADE ASSEMBLY FOR USE IN AN AIR CONDITIONING SYSTEM
William E. Clark, Syracuse; Carl C. Herb, Camillus, and Reginald S. Greene, Rochester, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 7, 1977, Ser. No. 858,140
Int. Cl.[2] F24F *7/00*
U.S. Cl. 236—49 **2 Claims**

1. An air conditioning system including a conditioned air

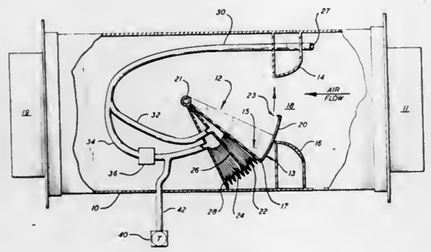
supply duct for delivering conditioned air to an enclosure comprising:

a damper assembly for modulating the flow of conditioned air including a housing positioned within the air flow path through said duct and having a damper blade pivotally mounted therewithin;

at least one cutoff plate mounted in said housing with said damper blade and cutoff plate defining therebetween a flow path for said conditioned air;

a first plate pivotally mounted within said housing about the same center of rotation as said damper blade and being spaced therefrom for defining a first space;

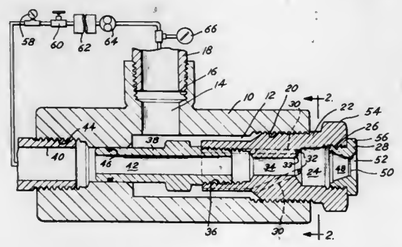
a second plate mounted within said housing in a predetermined position spaced from said first plate for defining a second space, said first plate being located between said damper blade and said second plate;



a first inflatable bellows disposed within a selected one of said spaces, the degree of inflation of said bellows varying directly with the pressure of said conditioned air in said housing upstream of said damper assembly, said damper blade moving relative to said second plate in response to inflation of said bellows to maintain a substantially constant flow of air to said enclosure irrespective of changes in said conditioned air supply pressure; and

temperature override means including second inflatable bellows disposed within the other of said spaces and connected to said damper blade to move said blade relative to said second plate, the degree of inflation of said second bellows varying inversely with the difference between sensed air temperature of said enclosure and a predetermined set point temperature, with the damper blade being moved thereby to reduce the flow of air below said substantially constant level as the temperature of the air in said enclosure approaches said predetermined set point.

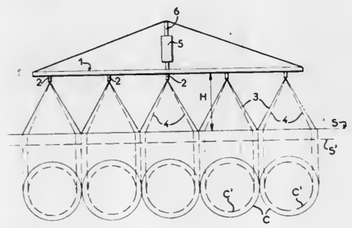
4,186,877
BY-PASS NOZZLES
Richard L. Wilcox, Adel, and Sherman E. Conrad, Des Moines, both of Iowa, assignors to Delavan Manufacturing Company, West Des Moines, Iowa
Filed Jun. 25, 1976, Ser. No. 699,858
Int. Cl.[2] B05B *9/00*
U.S. Cl. 239—124 **8 Claims**



1. In a fluid by-pass nozzle having a chamber, inlet orifice means for introducing fluid to said chamber, discharge orifice means for discharging fluid from said chamber, and by-pass means for selectively removing a predetermined portion of the fluid introduced by said inlet orifice means to said chamber to regulate the quantity of fluid discharged from said discharge orifice means, the improvement comprising:

the ratio of the total cross-sectional area of said inlet orifice means to the cross-sectional area of said discharge orifice means is less than 1.50.

4,186,878
SYSTEM FOR POSITIONING THE SPRAY BOOM OF AGRICULTURAL SPRAYERS
Maurice C. J. Lestradet, 291 rue du Maréchal de Lattre de Tassigny, 51230 Fere Champenoise, France
Filed Oct. 26, 1978, Ser. No. 954,778
Claims priority, application France, Jul. 21, 1978, 78 21717
Int. Cl.[2] B05B *15/08*
U.S. Cl. 239—160 **6 Claims**



1. Device for the automatic regulation of the height with respect to the plane of the surface to be treated, of a boom (1) equipped with conical jet spraying nozzles of a sprayer, particularly an agricultural sprayer, in accordance with the pressure in the boom of the fluid to be sprayed, characterized in that it comprises a system for the translatory displacement of the boom perpendicularly to the plane of the surface to be treated, mounted on the chassis of the sprayer, means (7 to 9) for detecting the position of the boom in respect to the said chassis, means (12) for comparing the signals coming from the detection means with a value representing the said fluid pressure in the boom, and means connected to the comparison means for operating the said displacement system in one direction or the other in accordance with the differences detected, for the purpose of keeping substantially tangent the circles or ellipses at which the conical spray jets intersect with the plane of the said surface to be treated.

4,186,879
DRIFT FREE SPRAYING APPARATUS
Leon Kinder, 400 Hunter's Creek Rd., Denton, Tex. 76201
Filed Oct. 11, 1977, Ser. No. 840,656
Int. Cl.[2] B05B *1/20, 1/28*
U.S. Cl. 239—172 **6 Claims**

1. An improved spraying apparatus for pulling behind a vehicle over rough terrain and having a spray mechanism mounted in communication with a fluid pump and reservoir assembly adapted for emitting fluid in a mist upon a surface to be sprayed, said apparatus comprising:

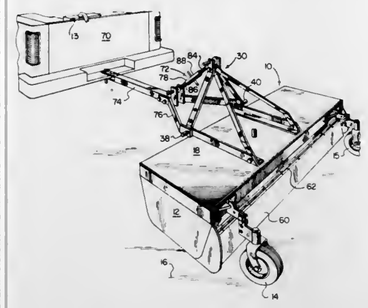
an elongated housing having fore and aft walls adjacent first and second end walls and including the spray mechanism mounted therein for confined spraying;

said housing having a top wall interconnecting said fore, aft and end walls and opposite an open lower portion opening toward the surface to be sprayed;

said fore and aft walls each including an elongated section attached to said fore and aft walls and suitable for passing in close proximity to non-planar areas of the surface for confining spray within said housing;

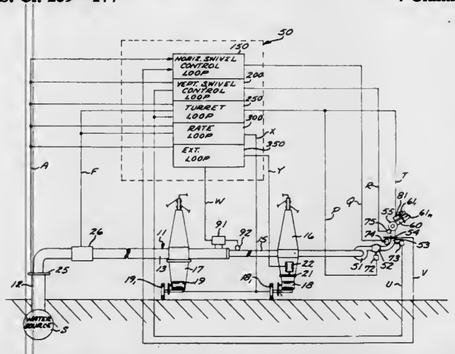
said first and second end walls depending from said top wall for rigidly supporting said housing upon the surface to be sprayed during travel thereover and confining the sprayed mist therebetween and between said fore and aft walls;

said housing including at least one wheel for engaging the surface to be sprayed, said wheel being disposed to the rear and outwardly of said aft wall in rearward support of said housing, wherein said housing is adapted to be coupled to said vehicle in towable interconnection through a yoke assembly secured thereto;



said yoke assembly comprising a tongue having means for coupling to said vehicle on one end and a split yoke secured from the other end, said split yoke being attached to said spraying apparatus for towable engagement therewith, and having an adjustment linkage upstanding thereon for determining the angular orientation of said spraying apparatus relative to the surface to be sprayed.

4,186,880
PROGRAM CONTROL FOR CENTER POST IRRIGATION SYSTEM
Edgar F. Jacobi, Huntington Beach, Calif., and Mark R. Madden, Plainsfield, Wis., assignors to Colkhi, Inc., San Diego, Calif.
Filed Oct. 13, 1978, Ser. No. 950,991
Int. Cl.[2] B05B *3/12*
U.S. Cl. 239—177 **4 Claims**



1. In a center post irrigation system including a telescoping extension supported on a steerable carriage for pivotal translation, the improvement comprising:

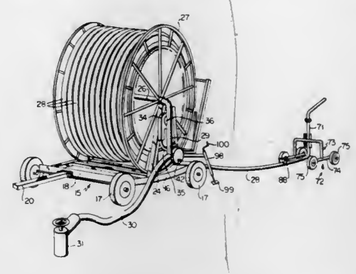
angular measuring means attached to said irrigation system for providing an angular signal indicative of the pivotal advance thereof;

angular rate control means connected to said irrigation system and adapted to receive said angular signal for controlling the angular rate of said system in response thereto;

a rotatable turret mounted on the end of said telescopic extension including a plurality of radially disposed nozzles each selectively aligned with said end; and

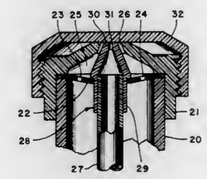
pressure control means mounted in said extension for regulating the pressure of liquids propagated therethrough in response to said angular signal.

4,186,881
IRRIGATION MACHINE
William R. Long, Tarboro, N.C., assignor to Long Mfg. N. C., Inc., Tarboro, N.C.
Filed Nov. 9, 1978, Ser. No. 959,284
Int. Cl.[2] A01G *25/09*; B05B *3/18*
U.S. Cl. 239—198 **12 Claims**



1. An irrigation apparatus comprising, a vehicle, a reel support frame carried by said vehicle, a reel rotatably mounted on said reel support frame and in spaced relationship to the earth, an elongated flexible hose carried by said reel, means for supplying water under pressure to one end of said hose, the opposite end of said hose being connected to a water gun movably mounted on a travelling carriage, parallelogram means mounting said water gun on said carriage and permitting limited movement of said water gun along a generally vertical plane, means urging said water gun toward an upper position, and means for rotating said reel in one direction to cause said hose to be wound thereon and move said travelling carriage toward said vehicle, whereby the weight of said hose and the water carried thereby normally maintain said water gun in a lowered position until said carriage is located near said vehicle and said reel supports the weight of said hose which permits said urging means to raise said water gun.

4,186,882
ATOMIZING LIQUID DISPENSER
Harry Szczepanski, 755 Oakleigh Rd., NW., Grand Rapids, Mich. 49504
Filed Dec. 8, 1977, Ser. No. 858,849
Int. Cl.[2] B05B *11/04*
U.S. Cl. 239—327 **1 Claim**



1. An atomizing liquid dispenser including a manually deformable container having an opening, and a closure member for said opening provided with a discharge orifice, and also including a liquid-dispensing nozzle operative to discharge liquid via a liquid outlet through said orifice, and a cap extending over said orifice and the end of said nozzle, said orifice and

nozzle defining between them an air passage communicating with said container, wherein the improvement comprises:

a transverse perforate plate supporting said nozzle,

(a) said plate being interposed between said container and said closure member,

(b) said nozzle having a portion containing said outlet normally projecting outwardly beyond said closure member,

(c) said cap and closure member being in threaded engagement, and

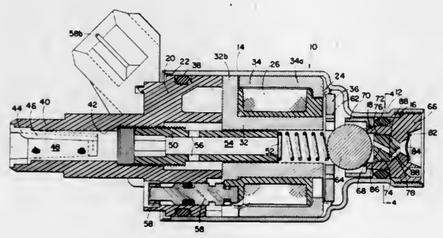
(d) said plate being resilient as a diaphram to a degree such that manually tightening said cap induces at least partial retraction of said nozzle within said orifice, and resilient closure of said outlet and subsequent closure of said orifice around said outlet.

4,186,883

ELECTROMAGNETIC FUEL INJECTION VALVE WITH SWIRL MEANS

Marc E. Robling, Warren, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 8, 1978, Ser. No. 904,077
Int. Cl.² B05B *1/34*
U.S. Cl. 239—491 **1 Claim**



1. An electromagnetic fuel injection valve, comprising:

a tubular housing including inlet means and outlet means axially aligned at opposite ends of said housing;

an electromagnetic actuator situated axially within said housing including a spool-shaped bobbin, an electromagnetic coil wound upon said bobbin, and a frame assembly comprising inner and outer frame pieces arranged to form a pole piece at the outlet end of said actuator;

a washer-shaped electromagnetic armature situated axially between said pole piece and said outlet and arranged to be axially attracted to said pole piece, said pole piece and said armature being of such configuration so that there is substantially no magnetic force of attraction between them other than at right angles to the face of said armature;

a valve seat downstream from said electromagnetic armature;

a spherically-shaped valve member attached to said armature and arranged to cooperate with said valve seat to control flow of fuel therethrough;

spring biasing means acting to urge said spherical valve member toward the closed position;

an orifice downstream of said valve seat; and

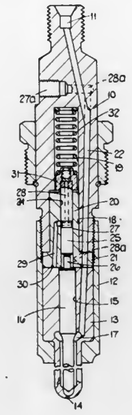
swirl means located between said valve seat and said orifice for imparting a radial velocity component to fuel flowing through said valve seat, said swirl means comprising a plug member occupying the cavity between said valve seat and said orifice, said plug member separting the cavity between said valve seat and said orifice into an entrance cavity at the outlet of the valve seat and an exit cavity adjacent to said outlet orifice, said exit cavity being defined by a conical extension of said plug member and a corresponding conically shaped wall on said housing, passageways in said plug member inclined at angle with respect to the valve axis for imparting a radial velocity to fuel flowing from the valve.

4,186,884

LIQUID FUEL INJECTION NOZZLES

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 13, 1978, Ser. No. 968,929
Claims priority, application United Kingdom, Jan. 11, 1978, 991/78
Int. Cl.² F02M *47/02*
U.S. Cl. 239—533.8 **4 Claims**



1. A liquid fuel injection nozzle for an internal combustion engine comprising a nozzle body and a nozzle head adapted to be connected together, a fluid pressure operable resiliently loaded valve member for controlling the flow of fuel through an outlet orifice from an inlet, the inlet in use, being connected to a fuel pump actuated by the engine, the fuel pressure at the inlet acting on a surface defined on the valve member to lift the valve member and thereby to permit fuel flow through the outlet orifice, a cylinder, a piston slidable in said cylinder and having a smaller cross-sectional area than said surface of the valve member, a conduit through which in use fuel can be supplied to one end of said cylinder at a pressure substantially the same as the pressure of fuel supplied to said inlet, a non-return valve in said conduit and acting to prevent flow of fuel out of said end of said cylinder through the conduit and means coupling the piston and the valve member so that the force developed on said piston due to the fuel pressure acting thereon is applied to the valve member to assist the action of the resilient means loading the valve member, the closing force exerted on the valve member increasing as the pressure of fuel supplied to the inlet increases, said cylinder being defined in a flanged insert which extends within a bore defined in the nozzle body, the flanged portion of said insert being clamped between the nozzle body and the nozzle head, the piston being located in said cylinder and extending into a portion of said bore remote from the nozzle head, the cylinder and piston defining an annular groove forming part of said conduit, a further part of said conduit being formed by a drilling in the piston which extends between said groove and said portion of the bore, said non-return valve being disposed in said further part of the conduit whereby fuel leaking past the said piston from said portion of the bore is collected in said groove and returned to said inlet.

4,186,885

TRUCK MOUNTABLE ROADSIDE SPRAY DEVICE

Paul T. Christian, 528 E. Astor, Colville, Wash. 99114

Filed Jun. 12, 1978, Ser. No. 914,533
Int. Cl.² A01C *15/04, 23/00*
U.S. Cl. 239—654 **9 Claims**

1. A spray apparatus for broadcasting solid particles, such as seeds or fertilizer, comprising:

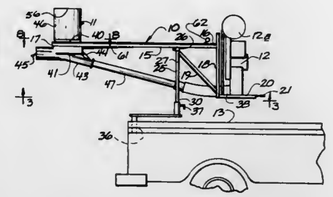
an upright storage hopper;

particle discharge means at the lower end of the hopper for dispensing an even flow of particles from within the hopper;

a radial vaned broadcast disk mounted beneath said particle discharge means for rotation about a central upright disk axis;

a blower;

a duct having one end operably connected to the blower for receiving a stream of pressurized air therefrom, said duct extending from said one end to a discharge nozzle at its remaining end;



said duct being bifurcated with a first branch thereof forming a main airstream;

and pneumatic drive means operably connected to said disk, comprising:

a second branch of the duct leading to the disk for directing forced air against the disk vanes for rotating the disk about its axis to move particles which fall onto the disk from within the hopper;

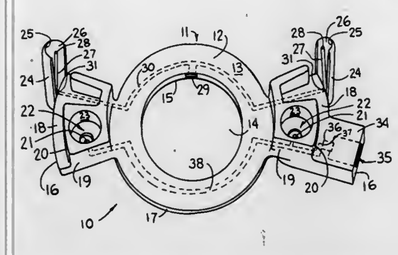
a manifold openly communicating with both branches of the duct for receiving particles from the disk and pressurized air from the blower and for mixing the air and particles to form the spray.

4,186,886

ADAPTING MEANS PROVIDING DETACHABLE MOUNTING OF AN INDUCTION-CHARGING ADAPTER HEAD ON A SPRAY DEVICE

James E. Sickles, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1978, Ser. No. 931,062
Int. Cl.² B05B *5/02*
U.S. Cl. 239—691 **10 Claims**



1. Adapting means for providing detachable mounting of an electrostatic induction charging adapter head onto a spray device, the adapter head comprising a housing fabricated of dielectric material, the housing having attached thereto at least one induction charging electrode and high voltage contact means connected to the induction charging electrode, the spray including a spray-forming nozzle having an axis generally parallel with the axis of a stream of spray particles formed by the nozzle, said adapter means comprising:

(a) a plate-like frame comprised of dielectric material;

(b) first securing means included on said plate-like frame for detachably securing said induction charging adapter head onto said frame, so that said induction charging electrode of the adapter head is disposed outwardly of a spray-forming nozzle, when said frame is mounted on said spray device and when the induction charging adapter head is detachably mounted on said frame; and

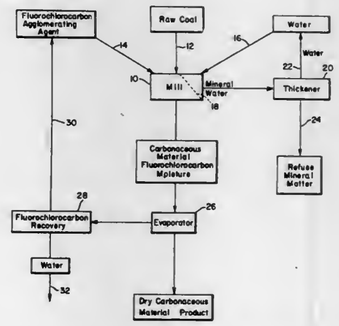
(c) first high voltage contact means on said plate-like frame for making a detachable electrical connection to high voltage contact means on the induction charging adapter head.

4,186,887

PROCESSES FOR RECOVERING COAL

Douglas V. Keller, Jr., LaFayette, and Andrew Rainis, Syracuse, both of N.Y., assignors to Otisca Industries, Ltd., Syracuse, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,845
Int. Cl.² B02C *23/18*
U.S. Cl. 241—20 **12 Claims**



1. A process for dissociating coal from a composite in which mineral matter is associated therewith and recovering said coal in agglomerated form, said process comprising the steps of: forming an aqueous slurry containing said composite and a fluorochlorocarbon with respect to which said coal is hydrophobic; milling said composite until the composite has been resolved into particles of mineral matter and particles of coal and the latter have been coalesced into agglomerates of product coal; and recovering the agglomerates from the slurry.

4,186,888

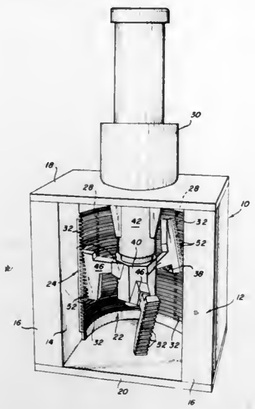
COMMINUTOR FOR SEWAGE FLOWING IN LIQUIDS

William B. Galanty, 1 Argyle Ct., Livingston, N.J. 07039

Filed Sep. 18, 1978, Ser. No. 927,492
Int. Cl.² B02C *23/30*
U.S. Cl. 241—46.06 **6 Claims**

1. An improved comminutor for a sewage channel comprising a semi-cylindrical cage member forming a concave surface traversely disposed in said sewage channel along a flow path of said channel, said cage having a plurality of slotted openings cutting said cage member in planes perpendicular to an axis thereof and said slotted openings forming a plurality of spaced apart arcuate bar-like elements extending along the full concave length of said cage and extending along the axial dimension of the concave surface of said cage; a plurality of removably fixed comb-tooth cutting and shredding members having a plurality of spaced apart teeth formed along an inner surface thereof, said cutting and shredding members being disposed parallel to the axis of said cage having said inner surface teeth extending radially toward said axis in alignment along the axis of said cage with a corresponding plurality of spaced apart bar-like surfaces of said cage and said cutting and shredding teeth extend radially toward the axis of said cage a distance greater than that of said bar-like surfaces of said cage; and a plurality of cutting and shredding arms mounted for rotation

about the axis of said cage member and located on the upstream side of said concave surface of said cage and having a plurality of teeth on each of said arms for interengaging said teeth of said fixed comb-tooth member and extending into said slotted opening of the bar-like surface of said cage and driving



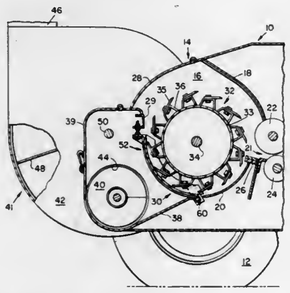
means for rotating said plurality of cutting and shredding arms along the inner concave surface and slots of said cage and comb-tooth member for inter meshing with said slots of the cage over the the full concave peripherical length of said slots of said cage.

4,186,889

FORAGE HARVESTER RECUTTER SCREEN

Robert D. Black; John J. Hennen, and Jerry L. Krafka, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 18, 1978, Ser. No. 907,126
Int. Cl.[2] B02C *18/22*
U.S. Cl. 241—89.2 **7 Claims**



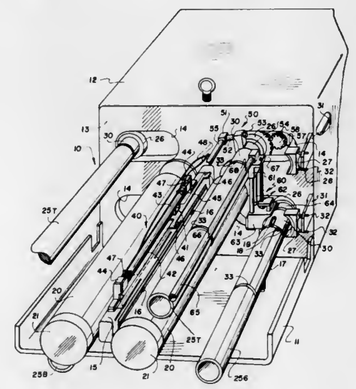
1. In a forage harvester comprising (a) a mobile frame, (b) a cutterhead housing mounted on the frame and having a crop inlet opening and a discharge opening, (c) a rotary cutterhead mounted in the housing and having a plurality of knives with cutting edges at the cutterhead periphery, the knife cutting edges generating a cylinder as the cutterhead rotates, said cutterhead engaging and reducing crop material that moves through the housing inlet opening and impelling said material through the discharge opening, (d) an arcuate recutter screen in the form of a section of a cylinder, the screen including a plurality of elongated apertures, each aperture having a longitudinal edge extending diagonally relative to the cutting edges of the cutterhead knives and the cutterhead axis; and (e) means removably mounting the recutter screen over the discharge opening adjacent the cutterhead periphery and generally coaxial with the cutterhead, the improvement comprising the apertures arranged in at least two transversely extending rows, said aperture edges in one row being substantially mutually parallel and canted relative to the knife cutting edges to form an angle of less than 90° measured from the knife edge to the aperture edge in a first clock direction, said aperture edges in a second row adjacent said one row canted relative to the knife edges to form an angle of less than 90° measured from the knife edge to the aperture edge in a second clock direction opposite from the first direction.

4,186,890

MECHANISM AND METHOD FOR TRANSFERRING YARN FROM A FULL PACKAGE TO AN EMPTY BOBBIN

Harry B. Miller, Charlotte, N.C., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 809,676, Jun. 24, 1977, abandoned. This application Dec. 5, 1978, Ser. No. 966,670
Int. Cl.[2] B65H *54/06, 67/04*
U.S. Cl. 242—18 A **10 Claims**



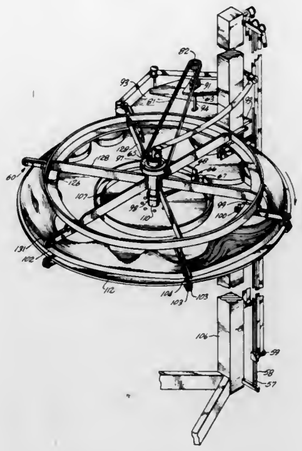
1. A method of transferring a yarn or the like, being cross-wound by traverse means into a yarn package, on a substantially full bobbin mounted on a first chuck, and rotated at a high speed by a drive roller, to an empty bobbin having a starting end, mounted on a second chuck arranged in spaced relation to the first chuck, and initially disengaged from the drive roll, without loss of yarn speed and with little or no waste of yarn, said method comprising the steps of moving the substantially completed yarn package, still rotating at a high speed, out of engagement with the drive roll to leave a space between the yarn package and the drive roll; engaging the empty bobbin with the drive roll for high speed rotation by the drive roll; disengaging the yarn from the traverse means to interrupt such cross-winding for linear feeding of the yarn across such space to the yarn package still rotating at high speed; guiding the disengaged yarn into alignment with the starting end of the empty bobbin; providing an elongated element extending, substantially parallel to the chucks, throughout substantially the full length of the chucks; swinging such elongated element about the axis of the first chuck to engage the yarn traversing said space and move the yarn into engagement with the starting end of the empty bobbin, now rotated at a high speed by the drive roll, for catching and severing of the yarn being fed to the completed yarn package and winding of the yarn on the empty bobbin; and re-engaging the yarn in the traverse means for cross-winding a new yarn package on the previously empty bobbin.

4,186,891

ENDLESS TAPE WINDING DEVICE

Joseph R. Johnson, La Place, La., assignor to Electro Mag Sales, La Place, La.

Continuation-in-part of Ser. No. 736,277, Oct. 27, 1976, Pat. No. 4,066,221. This application Oct. 21, 1977, Ser. No. 844,469
Int. Cl.[2] B65H *17/48*
U.S. Cl. 242—55.19 R **7 Claims**



2. A tape-handling apparatus comprising:
a turntable rotatable about an axis;
means for holding a tape wound on the turntable on edge against the turntable along a plurality of radii of the turntable and permitting movement of the tape radially along each of the plurality of radii while preventing circumferential movement of the tape across each of the plurality of radii, the holding means comprising at least one radially extending rotatable continuous-loop belt on each side of the tape at each radius and cooperating to prevent circumferential movement across the radius while permitting radial movement;
means for mounting the belts remote from the surface of the turntable for rotation about the axis of the turntable; and
means for rotating the turntable and the mounting means in synchronism.

4,186,892

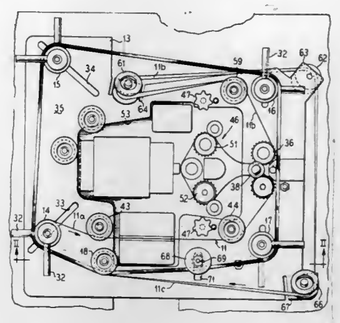
NON-SEIZING CLOSED LOOP FILM TRANSPORT SYSTEM

Gerald C. Woythal, Greenfield, Wis., assignor to Borg-Textile Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 817,565, Jul. 21, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 915,167
Int. Cl.[2] G11B *23/06*
U.S. Cl. 242—55.19 R **8 Claims**

1. In a film transport system of the type adapted to trasnsport a closed loop of film continuously about a defined pathway, said pathway including a convolutely wound subpathway whose general perimeter is substantially less than the perimeter of said closed loop, and whereabout multiple strip segments of said closed loop are positioned in a slidable, adjacent, face-to-face contact with one another, said transport system including a deck member, on plurality of film guide means positioned said pathway, and film drive means, said film guide means being associated with said deck member and being arranged to define said pathway, including said subpathway, and also including a cross-over pathway extending from the inside convolution of said subpathway, over one edge of said subpathway, and to the outside convolution of said subpathway in which the film travels in a direction from the inside convolution of said subpathway over one edge of said subpathway and to the outside convolution of said subpathway, the improvement which comprises:

(A) engaging means for contacting an inside portion of said wound subpathway film, said engaging means being spatially positioned at a location adjacent said film subpathway between two longitudinally adjacent film guide means,



(B) thrust means functionally associated with said engaging means for reciprocatorily deflecting sidewards said engaging means into said film subpathway, and

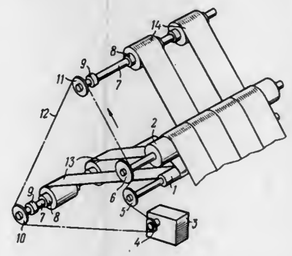
(C) a powerhead functionally associated with said thrust means for so deflecting said thrust means.

4,186,893

APPARATUS FOR WINDING STRIPS

Ivan A. Kolosov, ulitsa Astrakhanskaya 118, kv. 54; Jury E. Ivanyatov, ulitsa M. Zatonskaya, 21, and Vladimir N. Pevnev, ulitsa Ogorodnaya 223, kv. 31, all of Saratov, U.S.S.R.

Filed Oct. 7, 1976, Ser. No. 730,650
Claims priority, application U.S.S.R., Oct. 14, 1975, 2180721[I]
Int. Cl.[2] B65H *19/04, 35/02, 17/20*
U.S. Cl. 242—56.9 **6 Claims**



1. An apparatus for winding strips in longitudinal cutting of a tape which provides for uniform tensioning of the tape along the entire width thereof, the apparatus comprising: at least two substantially parallel drawing rollers adapted to initially engage all the strips and advance the same, prior to separation, at a substantially uniform velocity; at least two spaced receiving shafts substantially parallel to said drawing rollers; a plurality of spools spaced from each other on said receiving shafts and positioned to receive associated strips from said drawing rollers, said spools being supported on predetermined portions of said receiving shafts and having recesses; locking means associated with each of said spools for locking said spools to said receiving shaft in only one relative rotational direction therebetween, comprising a plurality of longitudinal slots along at least said predetermined portions of said receiving shafts and

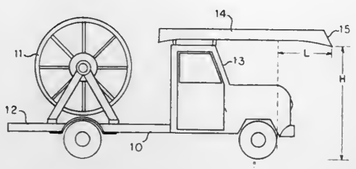
slot engaging means on said spools, said slot engaging means comprising leaf springs extending through said recesses and into engagement with said slots, each of said spools being selectively rotatable in the other relative rotational direction with respect to its associated receiving shaft to thereby permit selective tensioning of the strips and to permit substantial equalization of the tension in all the strips; and drive means for simultaneously rotating said drawing rollers and receiving shafts to cause the movement of the strips and winding of the same on said spools at substantially uniform tensions and speeds.

4,186,894

VEHICLE AND PROCESS FOR RETRIEVING FLEXIBLE PIPE

Thomas Brown, Casper, Wyo., assignor to Chinook Utility Products, Inc., Douglas, Wyo.

Filed Apr. 24, 1978, Ser. No. 898,934
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—86.6 **14 Claims**



1. A pipe-laying vehicle for laying and retrieving flexible plastic pipe comprising:
a self-propelled vehicle having a forward driving compartment;
rear support means for supporting a large reel onto which flexible plastic pipe is carried;
a pickup tube having its rearward opening directed towards said reel and an elevated forward opening visible from the driving compartment, said forward opening having receiving means to receive flexible plastic pipe from directions of up to about 90° to either side of the longitudinal axis of the vehicle at forward openings.

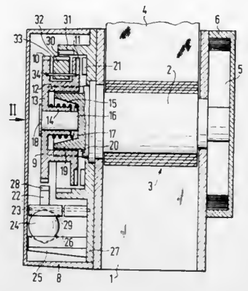
4,186,895

SAFETY BELT RETRACTOR

Wilfried Burghardt, Prittlbach; Rolf Vogel, Althegnenberg, and Ludwig Zauser, Gernlinden, all of Fed. Rep. of Germany, assignors to Hans Kolb GmbH & Co., Grossberghofen, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,620
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733008
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 B **38 Claims**

1. A device for rolling up a belt of a safety belt assembly for automobiles and the like, said device comprising:
(a) a housing,
(b) a reel spindle for said belt, said reel spindle being rotatably mounted in said housing,
(c) a first spring means urging said reel spindle in belt rolling-up direction, and
(d) means for locking said reel spindle in said housing against rotation in the belt withdrawal direction in response to a sudden movement of the belt in said withdrawal direction, said locking means comprising:
(e) a locking wheel provided with lateral teeth and having a screw engagement with said reel spindle,
(f) first teeth on said housing facing said lateral locking wheel teeth,
(g) a second spring means urging said locking wheel into a rest position in which said lateral locking wheel teeth are out of engagement with said first housing teeth,
(h) second teeth on said housing,
(i) a locking member movably mounted on said locking wheel adjacent to said second housing teeth,
(j) a third spring means urging said locking member into a rest position out of engagement with said second housing teeth, and
(k) means for moving said locking member from said rest position into engagement with said second housing teeth to stop said locking wheel positively in a predetermined angular position with respect to said first housing teeth,



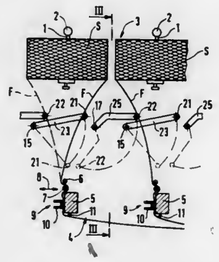
said locking member moving means being responsive to a predetermined acceleration of said locking wheel by said reel spindle upon said sudden movement of the belt in the withdrawal direction, and
said mutual screw engagement of said locking wheel and said reel spindle driving said stopped locking wheel axially by further rotation of said reel spindle in said belt withdrawal direction for engagement of said lateral locking wheel teeth with said first housing teeth to obtain said reel spindle locking in said housing.

4,186,896

APPARATUS FOR BALLOON LIMITING AT A BOBBIN CREEL

Albert Brandenberger, Oberuzwil, and Manfred Bollen, Zuzwil, both of Switzerland, assignors to Maschinenfabrik Benninger AG, Uzwil, Switzerland

Filed Oct. 10, 1978, Ser. No. 949,765
Claims priority, application Switzerland, Oct. 24, 1977, 12933/77
Int. Cl.[2] B65H *49/14, 57/22*
U.S. Cl. 242—131 **9 Claims**



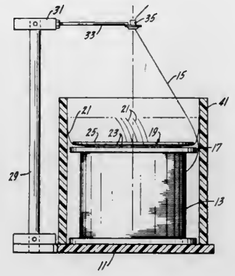
1. An anti-ballooning apparatus for a bobbin creel arranged between a bobbin mounted upon a bobbin holder of the creel and a thread guide and thread monitoring device operatively associated with such bobbin, the anti-ballooning apparatus preventing contact, entanglement, or both, of the thread balloon formed during withdrawal of the thread from the bobbins of the creel, comprising:
two parallel rods located at a central region between the thread guide and monitoring device and the bobbin and extending in a plane substantially perpendicular to the direction of withdrawal of the thread from the bobbin;
means mounting said two parallel rods for movement between a functional position and a manipulation position;
said mounting means enabling said two parallel rods to be rocked out of said functional position each parallel to itself away from the bobbin holder into the manipulation position where the spacing from the end of the bobbin holder enables doffing of a bobbin mounted on the bobbin holder and a donning of a bobbin upon such bobbin holder.

4,186,897

WIRE CONTROL MECHANISM

Maurice H. Brown, 11655 S. Mayfield, Worth, Ill. 60482

Filed Jul. 31, 1978, Ser. No. 929,658
Int. Cl.[2] B65H *59/06*
U.S. Cl. 242—147 R **4 Claims**



1. A wire control mechanism including:
a disc adapted to be mounted on an axial end of a spool of wire,
said disc having a plurality of radially extending resilient filaments that protrude beyond the periphery of the axial end of the spool of wire,
said filaments engaging the wire as it is uncoiled from the spool over the axial end of the spool to thereby apply a resistance to the uncoiling of said wire, and
means encircling said disc and engaging the free ends of said filaments to bend said filaments so that they extend axially of said spool in the direction of uncoiling movement of the wire,
said wire passing between said encircling means and the bent ends of said filaments and engaging said filaments to apply a resistance to said wire as it is uncoiled over the axial end of said spool.

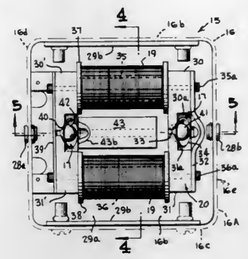
4,186,898

YARN TENSION CONTROL APPARATUS OF THE BALL AND FUNNEL TYPE

Marlin V. Wilson, Barboursville, Va.; Lawrence C. Nickell, Fairlea, and Larry C. Nickell, Lewisburg, both of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Jul. 27, 1978, Ser. No. 928,571
Int. Cl.[2] B65H *59/24*
U.S. Cl. 242—152.1 **17 Claims**

1. Yarn tensioning apparatus for tensioning a running length of yarn such as textile yarn or the like being drawn from a supply package for delivery at predetermined desired tension level to yarn utilization apparatus such as a beamer or the like, comprising an electronically controlled yarn tensioning device to be controlled by electrical signals from a remote control station and including a housing having yarn inlet and yarn outlet openings for passage of yarn therethrough along a predetermined yarn path, a first yarn tensioning station including a pair of aligned, spaced metallic pole pieces extending transversely within the housing perpendicularly intersecting the yarn path and defining a narrow gap for passage of the yarn through the gap, the pole pieces having shaped recesses therein adjacent the gap collectively defining a seat for a funnel member, a ceramic funnel member defining a truncated conical cavity opening toward the yarn outlet opening supported in said seat and a magnetic spherical ball member located in the truncated conical cavity, the funnel member being located relative to the yarn path so that the yarn extending along said path passes substantially horizontally below the ball member between said ball member and for confronting surface portion



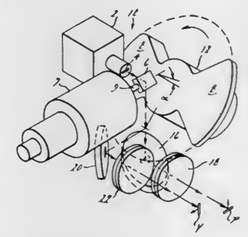
of the truncated conical cavity, an electromagnet coil structure within said housing magnetically linked with said pole pieces for generating magnetic flux to pass through the pole pieces and the gap therebetween exerting magnetic attractive forces on said ball member for varying attraction of the ball member toward the confronting surface portion of the funnel member along which the yarn passes and thereby varying tension of the yarn leaving the yarn tensioning device, and electronic control circuit means remote from said yarn tensioning device and electrically coupled to said electromagnet coil structure for regulating the electrical current supply to said coil structure and thereby regulating the magnetic forces exerted on said ball member.

4,186,899

CONTROLLED BEAM PROJECTOR

George W. Stewart, Jr., Costa Mesa, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1977, Ser. No. 859,616
Int. Cl.[2] F41G *9/00;* **F42B** *15/02*
U.S. Cl. 244—3.13 **12 Claims**



1. A controlled beam projector for alternately generating two orthogonally oriented and orthogonally scanned rectangular cross-section beams of radiation, comprising:
means for selectively generating a plurality or orthogonally oriented beams of radiation;
means for selectively energizing said generating means to alternately generate orthogonally oriented beams of radia-

tion having a corresponding predetermined cross-sectional area;

means connected to said energizing means for modulating respective alternately generated beams at pulse rates which vary over respectively non-overlapping predetermined ranges of pulse rate frequency;

means located in the path of said modulated beams for scanning each beam over controlled angles orthogonal with respect to its cross-sectional length dimension;

means in the path of said scanned beams for optically projecting said scanned beams substantially parallel to a central projection axis; and

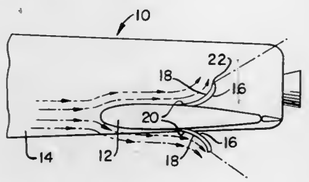
means connected to said scanning means for controlling the angle of each said orthogonal scan according to a time variable function.

4,186,900

DISINTEGRATABLE AERODYNAMIC BRAKE

Carl M. Loeb, Jr., New York, N.Y., assignor to Carl M. Loeb Trust, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,615
Int. Cl.[2] B64C *9/32*; B64G *1/20*
U.S. Cl. 244—113 **13 Claims**



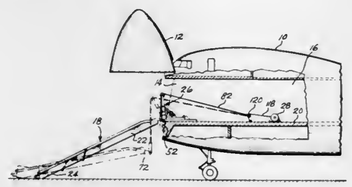
1. A disintegratable aerodynamic brake for use on a vehicle in a relation of symmetry with another brake for retarding vehicle speed upon re-entry into the earth's atmosphere from space, said brake in the form of a thin, stiff sheet-like member fabricated from a refractory material, said brake presenting a surface of substantial area which is curved concavely toward the direction of vehicle travel and including an inner leading edge portion adapted to be attached to the vehicle and an outer trailing edge portion extending substantially perpendicularly to the direction of vehicle travel, said material of said brake capable of fusing and disintegrating from its outer trailing edge portion progressively toward its inner leading edge portion at a rate substantially equal to the rate said other brake fuses and disintegrates as a consequence of elevated temperatures generated in response to encountering increasing atmospheric resistance upon re-entry of the vehicle from space into the atmosphere thereby to retard the speed of said vehicle.

4,186,901

CARGO RAMP HOIST MECHANISM

Thomas H. Shorey, Freeland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 30, 1978, Ser. No. 873,668
Int. Cl.[2] B64D *9/00*; B60P *1/00, 1/48*
U.S. Cl. 244—137 R **7 Claims**



1. A portable cargo ramp hoist for mounting within an aircraft to facilitate the installation and removal of an elongate cargo ramp that is positioned to extend between the sill region of a cargo opening and the surface of the ground to provide an inclined plane over which cargo can be moved between ground level and the floor of the aircraft cargo compartment, said cargo ramp hoist comprising:

base means positionable inside said aircraft on said cargo compartment floor proximate to said sill region of said cargo opening, said base means including restraint means for removably affixing said base means to said aircraft;

elongate arm means having the first end thereof pivotably attached to said base means for swinging the second end of said elongate arm means inwardly and outwardly through said cargo opening; said second end of said elongate arm means including cable guide means;

actuator means interconnected between said base means and said elongate arm means, said actuator means being operable for swinging said elongate arm means between a first position in which said second end of said elongate arm means is located inside of said cargo compartment and above said cargo compartment floor and a second position in which said second end of said elongate arm means is located outside of said cargo compartment and above said sill region of said cargo opening; and,

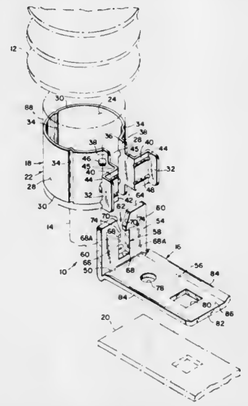
cable harness means having a first end adapted for removable interconnection with the upper end of said cargo ramp, said cable harness means being routable through said cable guide means of said elongate arm means.

4,186,902

SNAP-LOCK TERMINATOR MOUNTING BRACKET ASSEMBLY

Craig W. Simons, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,821
Int. Cl.[2] F16L *3/08*; H01B *17/16*
U.S. Cl. 248—73 **11 Claims**



1. A terminator mounting bracket assembly of the type for releasably securing and supporting an electrical terminator for electrical cables, said assembly comprising:

(a) a tubular-shaped sleeve member including a wall with opposed edges and an opening extending between said opposed edges, said opening defining two confronting spaced end portions of said wall, said wall comprising resilient material so as to permit said two confronting spaced ends to be movable from a first position where said two ends are normally spaced from each other to a second position where said two ends are spaced closer to one another and are resiliently urged to return to said first position;

(b) a bracket member having a detent means therein; and

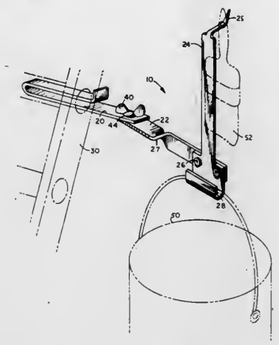
(c) a fastener means defined by said two confronting ends and said detent means, said detent means being adaptable to receive and enclose said two ends when inserted therein only upon said two ends being displaced into said second position, said detent means being adapted to permit said two ends to spring apart in an attempt to return to said first position from said second position and being further adapted to arrest said two ends in a third position wherein said two ends are displaced relative to each other with respect to said first position thereby to effect snap-locking of said sleeve within said detent means.

4,186,903

PAINTER'S FIXTURE

Herbert M. Fazakerley, 16 Westdale Rd., Canton, Mass. 02021

Filed May 9, 1977, Ser. No. 795,300
Int. Cl.[2] E06C *7/14*
U.S. Cl. 248—210 **2 Claims**



1. A painter's fixture for a hollow ladder rung comprising:

(a) a base member having an insert section at one end thereof, then extending substantially horizontally for a portion thereof, then twisted and extending in a substantially perpendicular portion to the end thereof, said insert section moveable between a first expandable open position and a second contractable closed position, compressing against the inner surface of said hollow ladder rung to retain the fixture in place;

(b) means to detachably attach a paint-brush by a hole in the handle thereof, including a holder member formed at an upper end with a hook to engage said paint-brush by the hole in the handle thereof and forming a broadened upwardly curling tip thereof to engage a paint-can handle when holder member is fixed to said base member, generally perpendicular and generally vertically to said substantially perpendicular portion of said base member.

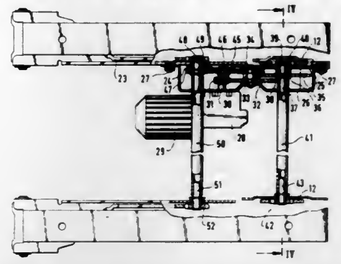
4,186,904

ADJUSTABLE MOTOR VEHICLE SEAT

Adolf Reinmöller, Remscheid; Hans W. Voss, Wuppertal, and Bernd Klüting, Radevormwald, all of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GMBH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,334
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641243
Int. Cl.[2] A47C *1/02*; A47D *19/04*
U.S. Cl. 248—395 **11 Claims**

1. In a motor driven seat adjuster, particularly for use in a vehicle, a combination comprising a guide rail assembly including a seat rail secured to the seat; a carrier rail movably supporting said seat rail and being pivotally connected at one end thereof to the floor of the vehicle; displacing means including longitudinally directed advancing means attached to said seat rail; tilting means attached to the vehicle floor in operative proximity to the other end of said carrier rail; a driving motor secured to said carrier rail; and coupling means arranged on said carrier rail for coupling said motor to said advancing



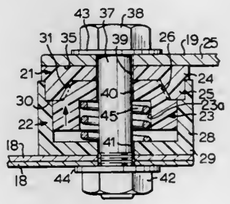
means and to said tilting means to simultaneously displace said seat rail relative to said carrier rail and said other end of said carrier rail relative to the vehicle floor.

4,186,905

RETRACTABLE TRUCK MIRROR

Otto Brudy, Windsor, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada

Continuation of Ser. No. 585,136, Jun. 9, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 722,473
Int. Cl.[2] A47G *1/24*; E05D *11/08*
U.S. Cl. 248—478 **1 Claim**



1. In a mirror, the combination comprising

pivot means comprising a first pivot member,

a second pivot member,

each said pivot member comprising a cylindrical wall and a base,

said cylindrical walls of said first and second pivot members telescoping within one another and including abutting portions limiting axially inward telescoping movement between said pivot members to define a closed chamber,

said abutting portions comprising longitudinally spaced radially extending surfaces,

a movable member in said closed chamber having a cylindrical portion, a frusto conical portion and a base on the frusto conical portion,

the diameter of said cylindrical portion of said movable member being substantially equal to the internal diameter of said cylindrical wall of said second pivot member,

a mirror,

a mounting bracket,

one of said pivot members being mounted on said mirror and the other being mounted on said bracket,

means extending axially through said pivot members and said movable member for holding said pivot members in assembled relation to maintain said chamber closed while permitting relative rotational movement between said pivot members,

axially extending ribs on the cylindrical portion of said movable member and complementary grooves on the cylindrical wall of said second pivot member for guiding said movable member for axial movement relative to said second pivot member and restraining said movable mem-

ber against angular movement relative to the inner surface of said cylindrical wall of said second pivot member,

the inner surface of said cylindrical wall of the first said pivot member being frusto conical and having a plurality of circumferentially spaced generally axially extending grooves therein,

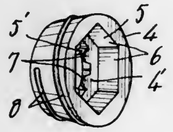
said frusto conical portion of said movable member having a plurality of circumferentially spaced axially extending generally complementary projections thereon,

each of said grooves and said projections on said first pivot member and said movable member having an axis inclined to the axis of the respective members,

and a spring interposed between the base of said second pivot member and the base of said movable member whereby said pivot members are held in angularly related fashion with respect to one another to hold the mirror in position but may be moved to a new angularly related position by moving the mirror angularly with respect to the bracket to cause said projections to move axially out of engagement with said grooves and circumferentially and axially into engagement with others of said grooves,

said movable member including a recess surrounded by the cylindrical portion thereof such that the spring extends into said recess and is surrounded by the cylindrical portion of said movable member.

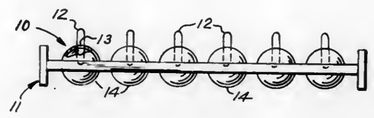
4,186,906
CONCRETE MOLD FASTENING DEVICE AND TOOL FOR SAID DEVICE
Noboru Koga, 4-13-5 Shimoshakujii, Nerima-ku, Tokyo, Japan
Filed Apr. 13, 1978, Ser. No. 896,045
Int. Cl.[2] E04G *17/06, 17/08*
U.S. Cl. 249—41 **1 Claim**



1. A concrete mold fastening device for use in conjunction with a concrete mold having opposing mold members, comprising a horizontal separator adapted to extend between and through the mold members with the opposite extreme ends protruding outwardly of the mold members and each end provided with an annular recess adjacent to and inwardly of each of the opposing mold members, said separator having an integral stop flange formed adjacent each annular recess, a detachable synthetic resin frusto-conical holder having a spiral rib on the outer surface, a polygonal cavity therein, a bottom wall defining one side of said cavity and having a center through hole and a plurality of pliable tongue pieces extending radially inwardly toward the axis of said separator, said bottom wall through hole being disposed on an end of said separator closer to said separator end than said stop flange, and a washer mounted on said separator in abutment against the outer surface of said bottom wall.

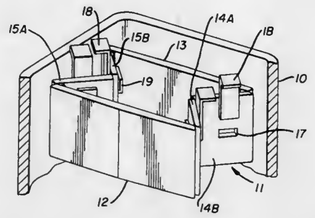
4,186,907
NON-WEIGHT FISHING BAIT CASTER
Bert L. Snodgrass, Rte. 2, Box 2443, Selah, Wash. 98942
Filed Mar. 26, 1979, Ser. No. 24,473
Int. Cl.[2] B22D *5/00*
U.S. Cl. 249—94 **4 Claims**

1. A set for making a non-weight fishing bait caster, comprising, in combination, a tray with a plurality of compartments for receiving water to be frozen, and a cover removably received an said tray for supporting and confining a plurality of rubber



bands, and rubber bands which will be frozen in each of the non-weight fishing bait casters.

4,186,908
EXPANDABLE HOT TOP FOR INGOT MOULDS
Micheal D. La Bate, Ellwood City, and Joseph A. Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio
Filed May 30, 1978, Ser. No. 910,866
Int. Cl.[2] B22D *7/10*
U.S. Cl. 249—197 **5 Claims**



1. An expandable hot top for ingot moulds comprising two pairs of preshaped end panels, flexible means hinging said end panels to one another, two preshaped side panels, flexible means hinging said side panels to said end panels in an arrangement wherein the two pairs of end panels fold inwardly against each other to a position between the side panels, hangers with inturned and upturned lower ends and outturned upper ends positioned in apertures in said end panels, whereby movement of the end panels into end-to-end to end relation, moves the side panels outwardly to form the hot top, locking bars positioned across the inside of said end panels between and in engagement with the upturned ends of the hangers hold the hot top in expanded open position in the ingot mould.

4,186,909
FAIL-TO-NEUTRAL MODULE
Kishor Patel, Camilla, Wis., assignor to Dynex/Rivett, Inc., Pewaukee, Wis.
Filed May 23, 1978, Ser. No. 908,793
Int. Cl.[2] F15B *13/042;* **F16K** *31/383*
U.S. Cl. 251—31 **7 Claims**

1. A hydraulic control comprising:

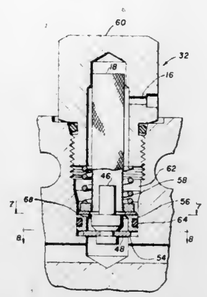
(a) a main spool;

(b) a fluid flow path operatively connected to said main spool and comprising a bridge circuit containing a plurality of orifices at least one of which is a variable orifice; and

(c) means defining a fail-to-neutral orifice which

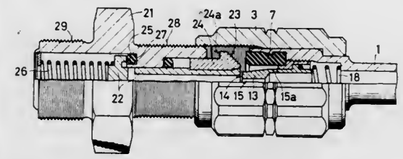
(i) has a flow area large enough so that it does not cause an appreciable pressure drop but a maximum dimension smaller than the smallest orifices in the bridge circuit, said maximum dimension being small enough so that the fail-to-neutral orifice serves as a filter for contaminants in fluid passing through said fluid flow path, and

(ii) is located in said fluid flow path upstream of the bridge circuit,



said means comprising a pin positioned through a hole, the fail-to-neutral orifice being the clearance between the pin and the boundary of the hole.

4,186,910
HOSE CONNECTING MOUTHPIECE
Masanobu Higami, 14-10, 2-chome, Asahi-machi, Takarazuka-shi, Hyogo-ken, Japan
Filed Jun. 8, 1978, Ser. No. 913,556
Int. Cl.[2] F16L *37/28*
U.S. Cl. 251—149.6 **1 Claim**



1. A hose connecting mouthpiece comprising:

(a) an insert (1) having a large diameter portion front end and a small diameter portion (6) rear end to be connected to the hose of a gas filling device;

(b) a union nut (3) loosely fitting around the insert (1) and having an internally threaded front portion engagable with the externally threaded portion of a known nipple, said union nut (3) also having an internal rear flange (5) formed at its rear end fitting around the small diameter of the insert (1);

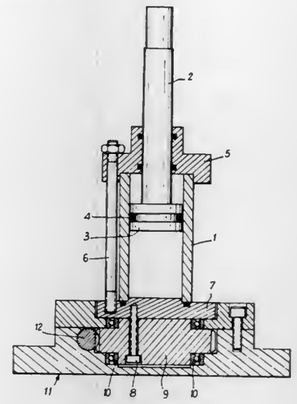
(c) a packing (7) attached to the front end inner periphery of the insert and adapted for contact with a sealing face at the forward end of known nipple;

(d) a core stopper (9) threadly fastened in the insert (1) with an internal small diameter part (11) positioned towards the front end of the insert (1) and a large diameter portion (12) towards the rear end of the insert (1);

(e) a valve core pushing member (13) with a peripheral wall slidably fitted in the core stopper (9) and retractable therein by being pushed by the forward end of the valve core of a nipple, said pushing member (13) including a front end (14) for pushing the valve core of a nipple, a gas flow passage (15) extending therethrough, a gas flow aperture (15a) in its peripheral wall, a small diameter section (16) fitting into the small diameter portion (11) of the core stopper (9) and a flange member (17) fitting into the large diameter portion (12) of the core stopper (9); and,

(f) spring means (18) housed in said insert (1) engaging the valve core pushing member (13) and biasing said valve core pushing member towards the open end of said insert (1) but retained in position by the abutting contact of said flange means (17).

4,186,911
JACK WITH TRANSLATION AND ROTATION MOVEMENTS
Jean P. Huet, rue de Villiersfins, and Alain Courtois, "La Picardiére" Villiersfins, both of 41000 Blois, France
Filed May 17, 1978, Ser. No. 906,885
Claims priority, application France, May 20, 1977, 77 15599
Int. Cl.[2] F01B *21/00*
U.S. Cl. 254—93 R **2 Claims**



1. A jack comprising a cylinder, a piston mounted at the end of a rod which is moved in translation in said cylinder by any pressurizing agent such as hydraulic, pneumatic or oleopneumatic, said jack including a translation bearing mounted in the end of the head of said cylinder, said bearing having a bore of substantially polygonal, curvilinear or oval cross-sectional shape, said rod being slidably mounted in fluid-type manner in said bore and having over the major part of its length a cross-sectional shape corresponding to the cross-sectional shape of said bore so that said rod and said bearing rotate together and said rod is movable in translation in a guided manner in said bearing bore, a base, means for rotatably mounting said cylinder in said base for rotation about the longitudinal axis of said cylinder, a rotation actuating device for rotating said cylinder and hence indirectly said bearing and said rod so that said rod can be actuated selectively with a movement of translation or a movement of rotation or with a combination of these two movements.

4,186,912
ACCIDENT SCREEN
Clyde L. Byrd, Jr., 10505 Burman St., Houston, Tex. 77029
Filed Nov. 29, 1978, Ser. No. 964,596
Int. Cl.[2] E04H *17/00*
U.S. Cl. 256—1 **10 Claims**

1. An accident screen for obscuring the site of motor vehicle or other accident comprising

an elongated screen strip of highly light reflective fabric in suitable safety colors,

a pair of supporting posts secured to opposite ends of said fabric strip,

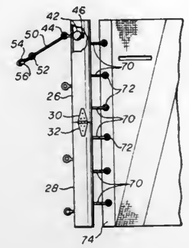
each of said posts being formed of two sections of substantially equal length,

a pair of hinges, one for each post, secured to said post sections to permit said posts to be folded for storage,

means to secure said post sections against folding when unfolded in an erect position,

a plurality of supporting cables secured to and supported on

each of said post section and adjustable in position longitudinally of said sections, and

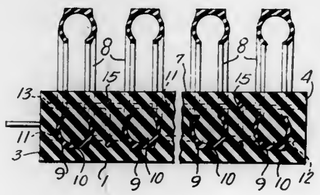


said posts being operable, when erect, to support said screen strip to obscure an accident site, and when folded, to be wrapped into a roll for storage.

4,186,913
BARRIER

A. J. Bruner, 2166 Katherine St., Ft. Myers, Fla. 33901; Edward T. Foster, 1050 Hollywood Blvd., Hollywood, Fla. 33019, and Thomas N. Kearns, 3500 Pembroke Rd., Hollywood, Fla. 33021

Filed Dec. 18, 1975, Ser. No. 642,199
Int. Cl.[2] E01F *15/00, 13/00;* E02B *3/06*
U.S. Cl. 256—13.1 **2 Claims**



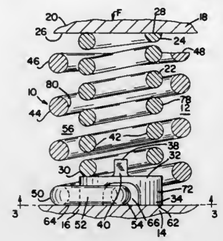
1. A barrier section comprising:
(i) a moulded rubber base block of elongated configuration having a top and bottom and sides, and ends normal to said top and bottom,
(ii) a plurality of vehicle tires having beads and a center opening, said tires or fragments thereof being axially aligned and spaced apart and being partially embedded side by side in the top of said block to a depth at least below the beads and being positioned along the length and top of said block and extending in greater part above said block,
(iii) tie rod means extending in said block through the tire center openings, and through the lower part of said block, at opposite sides thereof.

4,186,914
DUAL RATE SPRING DEVICE FOR RAILROAD CAR TRUCKS

Robert P. Radwill, Oak Lawn, and Charles Moehling, Arlington Heights, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jun. 16, 1978, Ser. No. 916,106
Int. Cl.[2] B61F *5/06;* F16F *3/04*
U.S. Cl. 267—4 **4 Claims**

1. A dual rate spring device particularly adapted for use between a bolster and a side frame of a railroad car truck where said truck is used with a railroad car body operated in a lightly loaded condition or in a heavily loaded condition, said device comprising,
a heavy duty spring having one end formed with a convolution projecting inwardly to define an inner receiving space,
a spring retainer element loosely disposed within said inner receiving space of said heavy duty spring end convolution and in contact with said end convolution to inhibit movement of said spring when said device is in a lightly loaded condition, and
a light duty spring having one end disposed within said heavy duty spring to contact said spring retainer and an

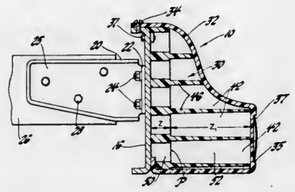


opposite end extending outwardly from an opposite end of said heavy duty spring,
wherein said device may be conveniently supported on a horizontal tension member forming in part a pocket in said side frame with said heavy duty spring in contact with said member and only said opposite end of said light duty spring in contact with said bolster to support such in a resilient manner when said car truck is lightly loaded with said heavy duty spring restrained from movement by said retainer.

4,186,915
ENERGY ABSORBING CELLULAR MATRIX FOR VEHICLES

Gary P. Zeller, and DeWayne A. Landwehr, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1976, Ser. No. 653,348
Int. Cl.[2] B60R *9/08*
U.S. Cl. 267—140 **2 Claims**



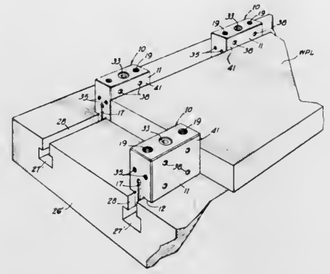
1. A resilient multicelled matrix of plastic material for absorbing energy of an impact load applied thereto comprising a plurality of longitudinally extending cells disposed adjacent to one another, said cells being formed by a plurality of first and second wall means which intersect one another to form polygonal cell spaces therebetween, each cell extending from a back support surface to an outer impact surface so that all impact loads are transmitted to all walls of said cells simultaneously, each of said cells having a polygonal base section of predetermined thickness providing a secondary deflecting zone and comprising a first portion of said first and second wall means of a predetermined thickness extending longitudinally from one end of said matrix to predetermined points between the front and rear ends thereof, each of said cells further having an outer section polygonal in cross section and providing a primary deflecting zone and comprising a second portion of said first and second wall means integral with said first portion and extending directly outwardly from said predetermined points

to the other end of said matrix, said wall means being stepped in thickness at said predetermined points forming a discrete plane so that said first portion is substantially thicker at said plane than said second portion to thereby separate said matrix into said primary and secondary working zones.

4,186,916
PRECISION WORKPIECE POSITIONING MEANS FOR MACHINE TOOLS

Paul Varga, Salisbury, Md., assignor to Salisbury Special Tool, Salisbury, Md.

Filed Sep. 18, 1978, Ser. No. 943,144
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—303 **12 Claims**

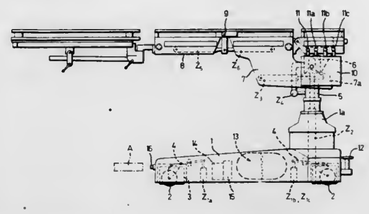


1. A precision workpiece positioner for use with machine tools comprising a rectangular parallelepiped body portion adapted to rest on a machine tool workpiece support table, a divided extension of reduced width projecting from one face of said body portion and adapted to enter the mouth of a machine tool table T-slot, adjustable spreader means for said divided extension on the body portion adapted to expand opposite side portions of the extension into gripping engagement with the mouth of the T-slot, a T-nut engageable adjustably into a T-slot of a machine tool workpiece support table below said body portion, and a bolt threadably engaged with the T-nut and engaged rotationally within a passage through said body portion.

4,186,917
OPERATING TABLE FOR MEDICAL PURPOSES

Arnold Rais, Basel, and André Liissi, Ostermundigen, both of Switzerland, assignors to M. Schaerer A.G., Wabern, Switzerland

Filed Sep. 2, 1977, Ser. No. 830,220
Claims priority, application Switzerland, May 27, 1977, 6595/77
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—325 **2 Claims**

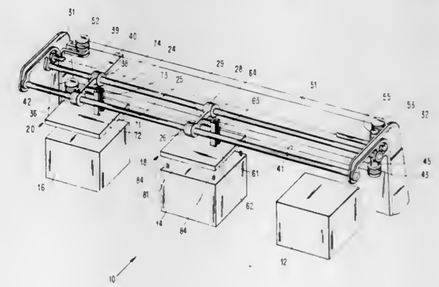


1. In an operating table for medical purposes, of the type having a plurality of mutually adjustable table parts including a foot and a plurality of rollers accommodated in said foot, a plurality of hydraulic working cylinders for adjusting said table parts with respect to one another, and control means for controlling said cylinders, said rollers being lowerable to enable displacement of said table, the improvement comprising:
a pressure tank connected to said working cylinders under control of said control means for providing a self-contained pressure fluid source when said operating table is in use, said pressure tank having a capacity for operating said working cylinders through, in the order of, several hundred strokes, a charging unit accommodated in said foot including an electrically operated motor, and a pump driven by the motor for charging said pressure tank, and means for coupling said charging unit to an electrical supply cable, said charging unit being designed to operate only when said operating table is not in use.

4,186,918
METHOD AND APPARATUS FOR LOCATING AND ALIGNING FLIMSY SHEETS

Walter W. Ficker, Fishkill, N.Y.; David E. Lonser, Light House Point, Fla.; William G. Rance, Del Ray Beach, Fla.; Alfred A. Stricker, and Walter von Kaenel, both of Pompano Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,777
Int. Cl.[2] B65H *5/22, 9/08*
U.S. Cl. 271—232 **9 Claims**



5. A system for transporting the aligning flimsy sheets including:
an alignment station with input transfer means to pick up and transfer sheet to said alignment station and output transfer means to pick up and transport said sheets av ay from said station in an aligned state,
said alignment station including alignment means for locator surfaces in said sheets, and said system including pressure control means for suspending the sheets between opposed positive pressure zones derived from the input transfer means and the alignment station to permit general engagement of the alignment means with the locator surfaces in the sheet.

4,186,919
DOCUMENT HANDLING APPARATUS

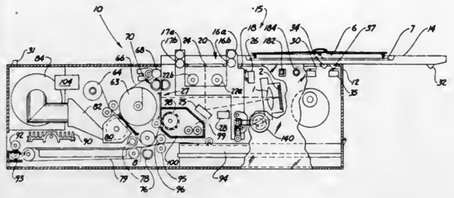
Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney-Bowes Inc., Stamford, Conn.

Filed Oct. 11, 1977, Ser. No. 840,794
Int. Cl.[2] B65H *5/04, 5/06, 5/26*
U.S. Cl. 271—267 **9 Claims**

1. A document handling apparatus for a copying machine having a frame and means mounted on the frame defining an illuminating station where a document traversing the illuminating station is illuminated for making a copy of the document, said document handling apparatus comprising:
A. a carriage for supporting a thin or thick document,
B. means for mounting said carriage on said frame and for moving said carriage along a path across said means defining said illuminating station for causing a document on said carriage to traverse said illuminating station,

C. a thin document feeding means mounted on said frame, said document feeding means including

(1) cooperating feed rollers normally positioned in the path of said carriage for feeding a document across said illuminating station independently of said means for moving said carriage and

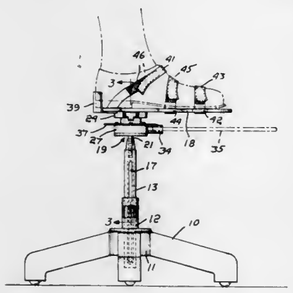


(2) means mounted by said frame for moving said cooperating feed rollers in a direction transversely out of the path of said carriage and back to said normal position in order to allow said carriage to move along the path across the illuminating station when said document feeding means is disposed out of said normal position.

4,186,920
EXERCISER FOR LOWER LEG, ANKLE, AND FOOT MUSCLES

Russell D. Fiore, 3 Fuller Rd., Attleboro, Mass. 02703, and Russell D. Fiore, 24 Princess Ave., Cranston, R.I. 02920

Filed Nov. 21, 1977, Ser. No. 853,450
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—96 **6 Claims**

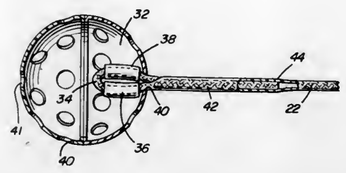


1. An exerciser for use in rehabilitation of lower leg, ankle, and foot muscles, said exerciser including a base, a support for a foot, a connection between the base and the central part of the heel area of the support to be tilted in any direction by a foot held by said support and said connection including adjustable means operable to provide a wanted uniform resistance to such tilting of said support, said adjustable means including first and second relatively movable parts, one part including an arcuate scale parallel to the support with a portion exposed laterally thereof of graduations which are calibrated in terms of pounds of torque required to overcome the existing resistance and the other part counter-traversing said scale as the resistance is varied, the first graduation represents a prevailing resistance that holds the foot support against tilting in response to gravity.

4,186,921
METHOD OF MAKING A TETHERED BALL APPARATUS

Daniel W. Fox, 202 E. Sharon, Phoenix, Ariz. 85022

Filed Apr. 18, 1978, Ser. No. 898,218
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 E **6 Claims**

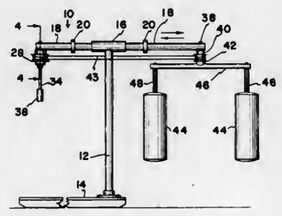


1. In a method of making a tether ball practice device comprising a handle, an elongated hollow flexible braided plastic line connected to the handle and a hollow plastic ball connected to the end of the flexible line remote from the handle, whereby the ball and flexible line are swung in an orbital path about the handle so that the ball passes over a plate where a batter practices swinging at the ball as it passes over the plate, said ball being in the form of a substantially rigid plastic member having a plurality of holes therein, the improvement comprising the steps of attaching said ball to the end of said line remote from the handle by inserting a plastic sleeve through one of said holes in said ball, passing the end of said line remote from the handle through one of said holes and thence in sequence through said plastic sleeve, forming within said ball a closed loop by turning back and inserting the end of said line into an opening along said braided plastic line within said ball so as to include the plastic sleeve within the loop, securing said handle to the end of said line remote from said ball by providing a unitary resilient hollow plastic handle open at an upper extremity and a lower extremity with a neck at its upper extremity narrow than its lower extremity and wider than the diameter of said line, passing the end of said line through said upper extremity and thence through said lower extremity, and knotting said line projecting through said lower extremity to prevent the knotted line from being pulled outwardly through the neck.

4,186,922
FOOTBALL OFFENSIVE PLAYER TRAINING APPARATUS

John L. Ketchum, 3200 SW. 84th Pl., Miami, Fla. 33165

Filed Apr. 25, 1978, Ser. No. 899,843
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 R **9 Claims**

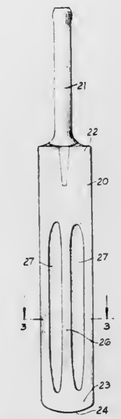


1. A football offensive player training apparatus (**10**) comprising a substantially horizontally extending rod support (**16**) circular in cross-section, and having a hollow interior and open ends, a rod (**18**), said rod supported for sliding motion therethrough and rotary motion about its longitudinal axis thereon, trainer manually operable means (**30, 34, 36**) mounted on one end of said rod for movement relative thereto, defensive player simulating spaced apart vertically extending dummy means (**44**) mounted on the other end of said rod for movement about a substantially vertical axis, and means (**28, 42, 43**) operatively connecting said trainer manually operable means to said defensive player simulating spaced apart dummy means to control said movement of said defensive player simulating spaced apart dummy means, said apparatus being suitably supported for proper training of football players.

4,186,923
CRICKET BAT

Arthur W. B. Garner, Middlefield Cottage, Great Shelford, Cambridge, England, and John L. Newbery, Robertsbridge, England, assignors to Arthur Winston Buckton Garner, Great Shelford, England

Filed Aug. 14, 1978, Ser. No. 933,493
Int. Cl.[2] A63B *59/08*
U.S. Cl. 273—67 D **11 Claims**



1. A cricket bat comprising an elongated handle connected to an elongated blade along the longitudinal axes of said blade and handle to form a continuous elongated implement, said blade shaped to provide a front striking surface and a rear surface at the side opposed to the striking surface, characterised in that said rear surface is formed with at least one depression so configured that the thickness of said blade, in the region of its sweet spot, is greater than the maximum thickness of said blade at that part of the depression edge which is closest to the edge of said blade.

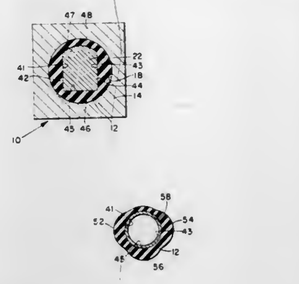
4,186,924
ARTHRITIC GOLF CLUB GRIP

Robert G. Southey, Akron, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 24, 1978, Ser. No. 889,781
Int. Cl.[2] A63B *53/14*
U.S. Cl. 273—81.4 **6 Claims**

1. A golf club grip adapted to be mounted on a shaft of a golf club comprising, an elongate body formed from a moldable resilient material, said body having a longitudinal axis and an external surface having a substantially circular external cross sectional configuration taken approximately perpendicular to said longitudinal axis when said grip is not mounted on a shaft of a golf club, an elongate cavity disposed coaxial to the longitudinal axis of said body and adapted to receive a shaft, having a substantially cylindrically shaped external surface, of a golf club therein, said elongate cavity being defined by first and second planar internal surfaces disposed substantially parallel to each other, a third planar internal surface disposed substantially perpendicular to said first and second planar internal surfaces and an arcuate internal surface disposed between said first and second internal surfaces when said grip is not mounted on a shaft of a golf club.

4. A golf club grip mounted on a shaft of a golf club comprising, an elongate body formed from a moldable, resilient material, said body having a longitudinal axis and an external surface, an elongate cavity disposed coaxial to the longitudinal axis of said body and receiving a shaft, having a substantially cylindrically shaped external surface, of a golf club therein, said elongate cavity being defined by first and second planar internal surfaces disposed substantially parallel to each other, a

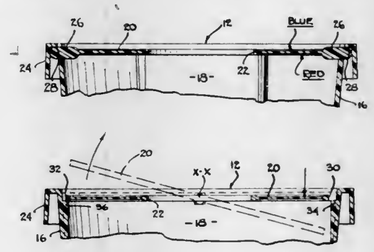


third planar internal surface disposed substantially perpendicular to said first and second planar internal surfaces and an arcuate internal surface disposed between said first and second internal surfaces, said first, second, and third planar internal surfaces conforming to the cylindrically shaped external surface of a gold club shaft received therein to expand said external surface of said body outwarly in a direction perpendicular to the longitudinal axis of said body to form first, second and third elongate projections respectively disposed substantially parallel to the longitudinal axis of said body.

4,186,925
COMPETITIVE TOSS GAME

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif., and Don Robinson, Manhattan Beach, Calif., assignors to Adolph E. Goldfarb and Elisabeth Benkoe, executrix for the estate of Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 10, 1978, Ser. No. 876,659
Int. Cl.[2] A63B *63/04*
U.S. Cl. 273—389 **17 Claims**



1. A competitive toss game apparatus for two players comprising:

(a) a plurality of tossable play objects for each player, the objects for each player having indicia thereon associated with that player, indicia on the objects of each player being different from the indicia on the objects of the other player,

(b) a frame for being disposed on a supporting surface,

(c) a plurality of tiltable sections movably supported on said frame above the supporting surface and each overlying a receiver area,

said sections each having a plurality of surfaces with indicia thereon, at least one of said surface indicia being related to said object indicia for one player and at least another of said surface indicia being related to said object indicia for the other player, said sections each being supported for movement incident to being engaged by one of said play objects between a first position where one of its said surface indicia is exposed and a second position where a different one of its surface indicia is exposed,

said apparatus being constructed and arranged to permit play objects to enter each receiver area without moving the associated section to a different one of its said positions, whereby each player may attempt to toss his or her play objects so as to cause them to directly enter receiver areas or to engage said sections so that desired indicia surfaces are exposed,

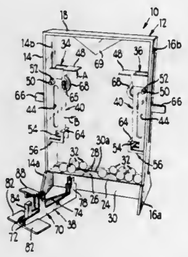
said sections each comprising a generally flat disc having opposite faces, said sections each being pivotally mounted for rotation about a generally horizontal transverse axis disposed generally centrally of said disc so that said discs can each pivot to have opposite faces exposed upwardly, each of said discs having an opening large enough for passage therethrough of one of said play objects.

4,186,926

GAME WITH UPSTANDING TRANSPARENT ENCLOSURE AND MOVABLE FIRING MEANS

Ralph J. Kulesza, Chicago, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 31, 1977, Ser. No. 829,566
Int. Cl.² A63F 7/00; A63B 63/04
U.S. Cl. 273—340 **20 Claims**



1. An amusement device for use by two players in competition comprising:

an upstanding enclosure having spaced apart transparent side walls permitting the interior to be viewed by opposing players on opposite sides thereof, said enclosure having a bottom wall with a pair of spaced apart parallel openings adjacent said opposite side walls,

a plurality of projectiles in said enclosure adapted to be projected upwardly of said bottom wall between said side walls, said openings being dimensioned small enough in a first direction so said projectiles do not fall through said openings, said openings being larger than a plurality of projectiles in a second direction,

selectively repositionable firing means for each player positioned outside said enclosure and separate and apart therefrom for movement to any point below one of the paralleled openings with a firing element thereof spaced below one of said parallel openings in said bottom wall and capable of movement to various points within said opening in a second direction, said firing means manually operable by a player to move said element thereof upwardly into a portion of one of said openings to engage and fire a selected projectile upwardly in said enclosure without directly striking other projectiles positioned in said openings, and

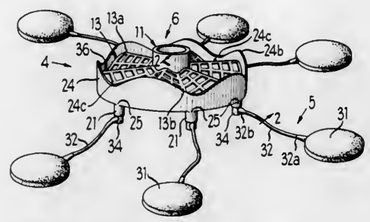
target means for each player mounted in said enclosure having an open upper end for receiving and containing projectiles fired upwardly in said enclosure and including means for holding a selected number of said projectiles, selectively operable releasing means for releasing projectiles within said target means, a player being able to first collect said selected number of projectiles in his target means winning the competition.

4,186,927

PNEUMATIC PROJECTOR GAME WITH CENTRAL TARGET

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 13, 1978, Ser. No. 885,972
Int. Cl.² A63B 63/02
U.S. Cl. 273—357 **2 Claims**



1. A competitive game apparatus, comprising:

a generally circular frame defining a playing area;

a target mounted in the center of the frame;

a plurality of color-coded playing pieces, at least one for each player of the game;

a plurality of selectively operable pneumatic propulsion means radially positioned remote from said target for propelling the playing pieces toward the target, each of said propulsion means including a movable projectile impeller secured to a piston within a slave cylinder and a compressible chamber in fluid communication with said slave cylinder to provide pressurized fluid to the cylinder to drive the impeller into contact with a playing piece thereby launching it toward the target;

wall means surrounding the playing area for containing the playing pieces and for suporting the playing pieces and for supporting the playing pieces in an off axis position relative to the axis of the movable piston to assure launching of the playing pieces toward the target; and

support means on the playing area in the form of radially extending ridges and valleys for catching and directing inadvertently launched playing pieces toward at least one of the propulsion means to define which player may operate the selected propulsion means so that selective operation of the propulsion means by the selected player may continue until one player has accurately launched all of the associated playing pieces into the target.

4,186,928

BASKETBALL GAME

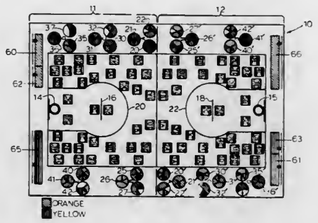
C. D. Hunt, Jr., Durham, N.C., assignor to Tinker, Inc., Durham, N.C.

Filed Jun. 29, 1978, Ser. No. 920,549
Int. Cl.² A63F 3/02
U.S. Cl. 273—244 **2 Claims**

1. A basketball game comprising:

(a) a game board provided with a field of play having a defined pair of half-courts each with a foul line, goal and time zone designations, each said half-court having indicated thereon a selected plurality of player positions some of which are designated offensive by one color and some of which are designated defensive by a contrasting color and with each such position having a number selected from the numbers **1-5** and being additionally designated as belonging to one of five play areas within the respective court and identified by respective letters A-E, selected offensive-defensive positions in each half-court being positioned within said defined time zone and the same and other selected offensive-defensive positions being located to simulate offensive positions and defensive interference to offensive movements, passes or shots during play of the game;

(b) for each play area in each said half-court, a set of three pointer dial means located outside the boundaries of said half-courts and field of play, one of said dial means in each said set having an offensive color designated face and a preselected number of unequal segments numerically labeled **1, 2, 3, 4,** or **5** to correspond to an available player



position, another of said dial means in each set having a defensive color designated face and three unequal segments numerically labeled **1, 2,** or **3** and the third said dial means of each said set having a face with a first segment having an offensive color designation labeled "offense rebound", a second segment having a defensive color designation labeled "defense rebound" and a third segment devoid of either offensive or defensive coloring and labeled "score," the size of said various segments being of predetermined varying size;

(c) a set of twenty player game pieces representative of two opposing sets of teams for each said half-court, ten being of one color and ten of a second color designation, each said player game piece being adapted to loosely receive a ball game piece thereon and each having a letter designation corresponding to one of said letter designated play areas; and

(d) a game piece representative of the ball and adapted to loosely mount on any one of said player game pieces.

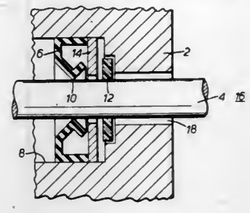
4,186,929

HYDRAULIC PUMP WITH AN IMPROVED SEALING ARRANGEMENT

Geoffrey W. Burton, Braydon, Nr. Swindon, and Edward G. Morley, Malmesbury, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Nov. 2, 1978, Ser. No. 957,023
Claims priority, application United Kingdom, Nov. 24, 1977, 48886/77
Int. Cl.² F16J 15/38, 15/40
U.S. Cl. 277—27 **6 Claims**

1. A pump comprising a casing, a shaft which rotates in the casing when the pump is in use, a seal which is subjected to pump inlet pressure, a flexible ring member positioned between the seal and an inlet for the pump, and a non-flexible ring member positioned between the seal and the flexible ring member, the pump being such that one of the flexible or non-flexible ring members is mounted on the shaft for rotation with the shaft and the other flexible or non-flexible ring member is mounted around the shaft but spaced from the shaft, whereby when the flexible ring member is not flexed pump inlet fluid can pass to the seal and whereby any sudden increase in pump inlet pressure causes the flexible ring member to flex and sealingly engage with the non-flexible ring member to prevent the sudden increase in pump inlet pressure reaching the seal.

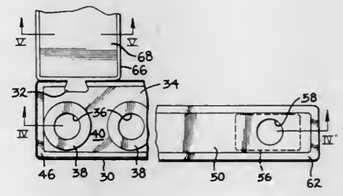


4,186,930

VIBRATION AND DUST ISOLATION SYSTEM

David D. Shulke, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1978, Ser. No. 961,151
Int. Cl.² B62D 27/04; F16J 15/10
U.S. Cl. 277—166 **9 Claims**



1. In a vibration and sealing isolation system of the type including first and second, spaced elements (**20,22**) at least one of which is capable of undergoing undesirable vibration, and which together form at least part of a structure (**14**) to be sealed, a resilient strip (**30**) interposed between said first and second elements, and a fastener (**26**) securing said elements in sandwiching relation to the strip such that the strip seals the interface between the elements and impedes the transmission of vibration across said interface, the improvement wherein said strip is generally planar with a considerable majority (**40**) of the strip having a first thickness less than the spacing between said first and second elements when said strip is installed therebetween, the strip further including an elongated edge (**44,60**) having a second thickness somewhat greater than said spacing so as to deflect when installed and seal against one of said elements, and a load bearing portion (**38,56**) comprising the remainder of the strip and of a thickness somewhat greater than said spacing, said load bearing portion being the predominant part of the strip contacting both said elements while constituting a considerable minority of the surface area of the strip.

4,186,931

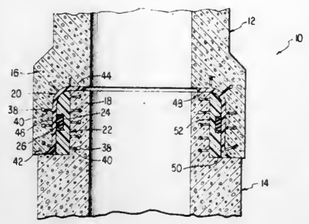
PIPE END SEALING SYSTEM

Kenneth W. Anderson, 20 White Fence Acres, Rochester, Ill. 62563

Filed Dec. 2, 1977, Ser. No. 856,761
Int. Cl.² F16J 15/10; F16L 21/02
U.S. Cl. 277—207 A **10 Claims**

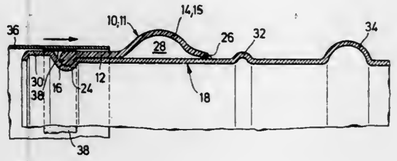
1. A system for joining pipe sections in end-to-end relation comprising at least a first pipe and a second pipe, said first pipe having a bell end and said second pipe having a spigot end, said ends defined by seal members embedded therein, said bell end being configured to receive said spigot end to form a joint between said first and second pipes, said bell end having an

inner surface having at least a portion thereof formed by a bell end seal, said spigot end having an outer surface having at least a portion thereof, formed by a spigot end seal, said inner surface of said bell end circumscribing said outer surface of said spigot end when said pipes are in a joined relationship; so that said end seals engage one another when said pipes are in a joined relationship to seal said pipes at said joint between said seal members;



said end seal members further including integral means for sealing the interface defined between said end seal member and respectively, said bell end and said spigot end of said pipes, said means including a series of continuous ridges extending from said seal members and embedded in said pipe, whereby said end seals are in a joined relationship with the respective pipe ends to seal the interfaces therebetween..

4,186,932
RESILIENT SEALING RING
Roland Emhardt, Henggart, and Erich Wachter, Zurich, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Jul. 10, 1978, Ser. No. 923,299
Claims priority, application Switzerland, Jul. 14, 1977, 8714/77
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—207 A **12 Claims**



1. A resilient sealing ring for sealing an annular gap between two overlapping tubes disposed in coaxial moveable relation, said ring having a predetermined cross sectional shape including a pair of arms disposed in folded relation to each other to define a fold therebetween with at least one of said arms being disposed axially of said ring and a second of said arms being foldable into coaxial relation to said one arm to dispose facing sides of said arms in resilient contact with one of the tubes.

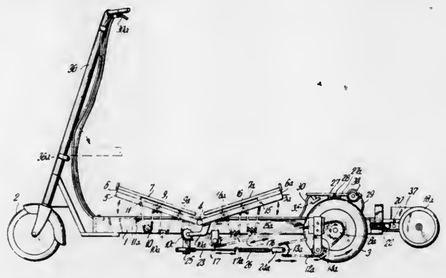
4,186,933
KEYS FOR DRILL CHUCKS
George C. Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Co., Ltd., Sheffield, England
Division of Ser. No. 753,578, Dec. 22, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,975
Int. Cl.[2] B25B *13/44*
U.S. Cl. 279—1 K **3 Claims**

1. A key for a drill chuck comprising in combination, a geared head component and a handle component connected to the geared head component, said geared head component having a handle component connecting portion at one end, a pilot portion at the other end, and a tapered beveled gear portion located between the handle component connecting portion and the pilot portion, said handle portion being made of a synthetic plastic material and in cross section being further formed in the shape of two triangular sections with the sides of each tapering symmetrically toward respective apexes located



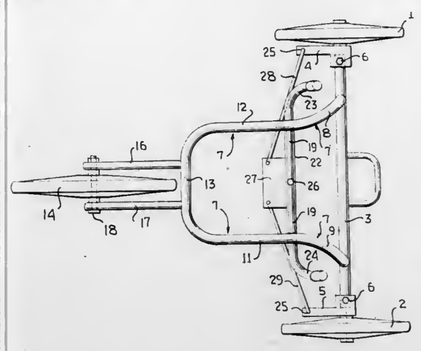
on a common center line, said handle component being rotatably mounted on the geared head component and being provided with an overload release mechanism for limiting the amount of torque which can be applied to the geared head component, said overload release mechanism having a spring element housed within the handle component and bearing against a flat surface formed on the handle component connecting portion of the geared head component.

4,186,934
SCOOTER VEHICLE
Thomas J. Collings, 52 Railroad Ave., Glen Head, N.Y. 11545
Filed Sep. 27, 1978, Ser. No. 946,155
Int. Cl.[2] B62M *1/04;* **B62K** *9/00*
U.S. Cl. 280—221 **5 Claims**



1. A scooter vehicle comprising:
a chassis,
a front wheel mounted on the center line of the chassis,
a rear wheel mounted on the chassis,
a steering column attached to the front wheel,
a pair of ratchet gears, one connected to each side of the rear wheel,
a dual foot platform rotatively mounted on the chassis,
the platform having front and rear foot portions mounted with an angle of less than 180° between them,
first chain and sprocket means connecting the front platform constituting a compounding energy actuating gear mechanism for driving one of the ratchet gears and
second chain and sprocket means connecting the rear platform constituting compounding energy actuating gear mechanism for driving the other of the ratchet gears,
a set of two auxiliary wheels positioned on opposite sides of the scooter frame said wheels being joined for coordinated movement on a common axle mounted on the scooter frame,
means for permitting the set of auxiliary wheels to be swivelled to the rear and locked into an above ground position to avoid riding interference with the two centered main scooter wheels
means for swivelling the auxiliary wheels to ground contact position for four wheel riding balance and manuverability and means for positioning the auxiliary wheels to elevate the scooter drive wheel above ground contact for free standing pedal operation as an exercising unit.

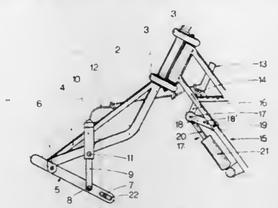
4,186,935
THREE-WHEELED VEHICLE
Lawrence A. Rudwick, 2718 N. Randolph, Arlington, Va. 22207
Continuation-in-part of Ser. No. 600,953, Aug. 1, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,988
Int. Cl.[2] B62K *9/02*
U.S. Cl. 280—269 **10 Claims**



1. A multi-wheeled vehicle comprising
an elongated cross member,
at least three wheels each rotatable about a stub shaft,
means mounting a first and a second wheel, one at each end of said cross member for rotation in a plane perpendicular to the elongated axis of said cross member,
means mounting a third of said wheels rearward of said cross member,
a main frame member extending between said cross member and said mounting means,
said main frame member comprising a U-shaped anti-sway bar lying in a plane and having a base and two legs having ends,
said legs having end sections thereof curved at a relatively sharp angle to said plane and terminating at said ends of said legs,
said ends being rigidly secured to said cross member equidistant between said first and second wheels with said plane being generally horizontal.

4,186,936
FRONT SUSPENSION, IN PARTICULAR FOR A VEHICLE HAVING TWO WHEELS AND VEHICLE PROVIDED WITH SAID SUSPENSION
Eric Offenstadt, 58 Avenue G. Clemenceau, 94700 Maison Alfort, and Michel Houze, 43 rue St Louis en l'Ile, 75004, Paris, both of France
Filed Apr. 26, 1977, Ser. No. 791,032
Claims priority, application France, Apr. 26, 1976, 76 12245
Int. Cl.[2] B62K *21/02, 25/18*
U.S. Cl. 280—277 **4 Claims**

1. A front suspension for a vehicle having an unsuspended part which comprises two vehicle wheels and a suspended part which comprises a frame and a steering framework forming a fork structure pivotally mounted on the frame, the front suspension comprising a substantially U-shaped pivotal suspension arm having two branches pivotally mounted on the steering framework and a transverse portion extending across and around a front wheel of said two wheels, which front wheel has a spindle, the branches carrying the spindle adjacent ends of the branches, a shock-absorbing system comprising at least one telescopic shock-absorber including a suspension spring, the shock-absorber having a part pivotally mounted on said suspended part of the vehicle and a shock-absorber actuating rod axially slidable in said shock-absorber part, a link pivotally mounted on said suspended part, a first pivotal connecting means pivotally connecting the link to the rod, and a hydraulic transmission pivotally connecting the arm to the link, the angular relationship between the link and the rod of the shock-absorber being such that a tangent to the arc travelled through by said first pivotal connecting means and located at said first pivotal connecting means progressively approaches an orientation in which it is parallel to the rod as said first pivotal connecting means travels for a first position corresponding to an outermost position of the rod relative to the shock-absorber part and corresponding to an undepressed state of the front suspension to a second position corresponding to an innermost position of the rod relative to the shock-absorber part and corresponding to a fully depressed state of the front suspen-



sion, said front suspension further comprising at an end of said transmission adjacent the arm a member which has an axis along which it is movable, and second pivotal connecting means pivotally connecting said member to the arm, the angular relationship between the arm and said member being such that a tangent to the arc travelled through by said second pivotal connecting means and located at said second pivotal connecting means progressively approaches an orientation in which it is parallel to said axis along which said member is movable as said first pivotal connection means travels from said first position to said second position thereof, said hydraulic transmission comprising a conduit interconnecting two jacks, one of said jack being connected to the framework and to the pivotal arm and the other jack being connected to the frame and the link.

4,186,937
MOTORCYCLE BACKREST DEVICE
Sargent B. Schultz, N168 W16852 Ridgeway Dr., Jackson, Wis. 53037
Filed Apr. 14, 1978, Ser. No. 896,453
Int. Cl.[2] B62J *1/28*
U.S. Cl. 280—289 E **3 Claims**



1. In a cycle having an elongated seat for accomodating both an operator and a passenger in a tandem relationship and a sissy bar carriage structure including a pair of upright frame members that are inclined rearwardly and toward each other, the improvement comprising a backrest device including a backing

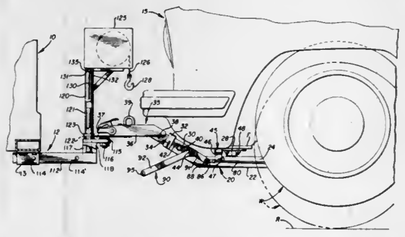
plate, a padded backrest secured to said backing plate and means for selectively positioning said backrest and backing plate between a first position adjacent said frame members for accomodating the back of said passenger and a second position longitudinally spaced from said frame members for accomodating the back of said operator in the absence of said passenger, said selectively positioning means comprising: a pair of laterally spaced flanges mounted on said backing plate; a horizontally positioned pivot stud on each of said flanges; a pair of laterally spaced swing arms, a first end of each of said arms being pivotally mounted on one said pivot stud respectively; a horizontally positioned pivot stud on each of said upright frame members, the other end of each of said arms being pivotally mounted on one said upright frame member pivot stud respectively whereby said backrest pivots relative to said arms in a first direction as said backrest moves from said first to said second position; snubber stop means interconnecting said arms, abutment of said stop means with said backing plate in said second position preventing further pivotal movement of said backrest in said first direction and engagement of said backrest with said seat in said second position preventing further pivotal movement of said backrest in a direction opposite to said first direction; and means for latching one of said arms to one of said upright frame members when said backrest is in said first position.

4,186,938

VEHICLE TOW BAR

John W. Youngblood, 3201 Franklin Ave., Waco, Tex. 76710

Filed Apr. 10, 1978, Ser. No. 894,783
Int. Cl.[2] B60P *3/06*; B62D *53/04*
U.S. Cl. 280—402 **15 Claims**



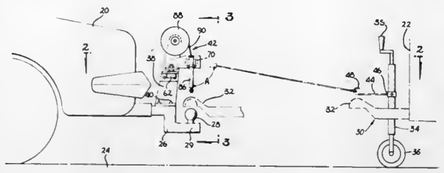
1. A vehicle tow bar adapted to be secured to the chassis of a towed vehicle and to extend outwardly from the front end of the towed vehicle for connecting the towed vehicle to a hitch on a towing vehicle, the tow bar comprising: a tongue; a suspension support beam; means securing said suspension support beam to said tongue; a pair of suspension support pins; means moveably securing one of said suspension support pins to each end of said suspension support beams, said means moveably securing one of said suspension support pins to each end of said suspension support beams comprises a hollow tubular sleeve and means securing said hollow tubular sleeve to said suspension support beam, each of said suspension support ends being slideably disposed in said hollow tubular sleeve; actuating means secured to said suspension support beam and associated with said suspension support pins for moving said suspension support pins between a first position spaced from the wheel suspension mechanism of the towed vehcile and a second position engaging the wheel suspension support mechanism of the towed vehicle; a tongue extension connector on the tongue, said tongue extension connector being upwardly inclined relative to said tongue; a tongue extension; means adjustably and detachably securing said tongue extension to said tongue extension connector; and a hitch coupler secured to said tongue extension, said coupler being adapted to engage the hitch on the towing vehicle.

4,186,939

ELECTRO-MECHANICAL DOCKING APPARATUS AND METHOD

Leslie A. Woods, 24021 Mill Valley Rd., Valencia, Calif. 91355, and Christopher Van Peski, 5386 Jed Smith Rd., Hidden Hills, Calif. 91302

Filed Aug. 21, 1978, Ser. No. 935,488
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—477 **19 Claims**



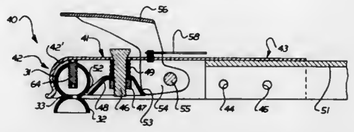
5. An apparatus for mating a first object having a predetermined axis with a second object, comprising:
housing means attached to the first object;
yaw sensing means mounted to the housing means for sensing the yaw angle between the predetermined axis of the first object and a straight line defined by predetermined points on the first and second object;
bracket means coupled to the yaw sensing means capable of being revolved around the yaw sensing means;
pitch sensing means attached to the bracket means for sensing the distance between predetermined points on the first and second objects;
reel means revolvably mounted to the housing means and capable of storing a cable;
cable means attached to the reel means for attachment to the predetermined point of the second object;
tension means operably connected to the reel means for keeping the cable means taut;
follower tube means rotatably connected to the pitch sensing means and surrounding a portion of the cable means for coupling directional information from the cable means to the pitch and yaw sensing means.

4,186,940

LOCKING-BALL FOR TRAILER HITCH

Arthur W. Pillars, Clearwater Rd., Star Rte. B, Satsuma, Fla. 32089

Filed Feb. 12, 1979, Ser. No. 11,119
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—507 **7 Claims**



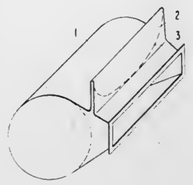
1. In a trailer coupling which includes a ball-type connector carried by a tow vehicle, and an apparently unprotected trailer hitch carried by the trailer, said trailer hitch being of the lever type, and having an elongated channel portion, with a socket in one end, in which channel portion a cam means is disposed for actuation against a jaw by said lever, and said jaw in cooperation with said socket snugly holds said ball in position, the improvement comprising,
a locking-ball means removably disposed within said socket, said locking-ball means comprising,
(i) a substantially spherical shell having no visible locking means,
(ii) a hardened steel bolt threadedly disposed for vertical axial movement in said spherical shell so as to exert, with said bolt's upper end, a biasing force against the inner surface of said socket, whereby sufficient force is exerted by said shell against said inner surface so that said lever is locked in position, said bolt's lower end being adapted to matingly receive an end of
(iii) a key means introduced from under said spherical shell, said key means when mated to said bolt's lower end being effective to rotate said bolt into, and out of biasing engagement with said inner surface of said socket.

4,186,941

INFLATABLE IMPACT PROTECTION CUSHION

Hansjürgen Scholz, Echterdingen; Luigi Brambilla, Böblingen, and Hans-Gerd Backhaus, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,495
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722551
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—743 **6 Claims**



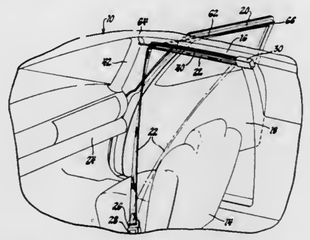
1. An inflatable impact protection cushion for a passenger of a motor vehicle, said cushion comprising a bag expandable to a maximum volume and separating means separating a portion of the bag from the remainder thereof for limiting the degree of expansion of said bag to a volume less than said maximum volume when an internally supplied gas exerts an expansion pressure below a predetermined value, said separating means being constructed for being rendered inoperative when said gas exerts an expansion pressure greater than said predetermined value to enable said bag to be expanded to said maximum volume, and inflation means for initially supplying said gas in a manner exerting said pressure less than said predetermined value to initially expand said bag to said lesser volume and for subsequently supplying an additional amount of gas in a manner exerting a pressure greater than said predetermined value to expand said bag to said maximum volume.

4,186,942

PASSIVE SHOULDER BELT

Chimanbhai M. Patel, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1978, Ser. No. 944,258
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—804 **1 Claim**



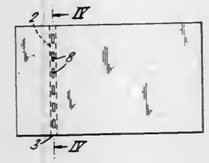
1. In a motor vehicle body having a roof rail defining a door opening, and a door mounted laterally adjacent an occupant compartment having a seat;
a shoulder belt having inboard and outboard ends;
means mounting the inboard shoulder belt end adjacent the inboard occupant hip;
means mounting the outboard shoulder belt end on the roof rail generally adjacent the shoulder of the occupant;
one of said mounting means including a retractor;
a carriage having a guide loop slidably receiving the shoulder belt intermediate the inboard and outboard ends thereof;
a track mounted on the roof rail and mounting the carriage for longitudinal movement between a rearward position and a forward position;
and a drive cable of fixed length having a rearward end attached to the upper rear corner of the door and a forward end attached to the roof rail adjacent the forward end of the track so that the drive cable assumes a position generally coincident with the track when the door is closed and assumes a position angularly divergent from the track when the door is open;
said drive cable extending slidably through the guide loop to permit rearward retraction of the carriage by the retractor as the drive cable converges with the track during door closing movement to establish the belt in the restraining position and to drive the carriage forward as the cable diverges from the track during door opening movement to unwind the belt from the retractor and move the shoulder belt forwardly of the occupant to facilitate ingress and egress.

4,186,943

SECURITY DEVICES

Peter D. Lee, Hertford, England, assignor to The Governor and Company of the Bank of England, London, England

Filed Sep. 23, 1977, Ser. No. 836,139
Claims priority, application United Kingdom, Sep. 24, 1976, 39820/76
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—7 **13 Claims**



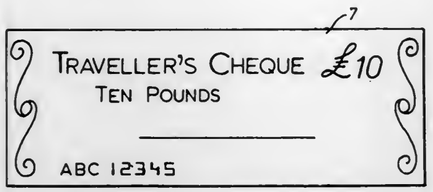
1. A sheet element incorporating an optical authenticating device comprising a thin film dichroic element disposed within the thickness of the sheet element, said thin film dichroic element comprising a stack of thin film layers and having known characteristics of spectral reflectance and transmittance, and wherein the transmissivity of the sheet element varies about the thin film element so that at at least one point where said transmissivity is relatively great said sheet element constitutes a pair of superposed windows between which the thin film element extends so as to be visible though each window, thereby to permit observance of said characteristics of spectral reflectance and transmittance.

4,186,944

SECURITY DOCUMENT

Ralph R. Pearce, West Drayton, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 728,058, Sep. 30, 1976, abandoned, which is a division of Ser. No. 568,530, Apr. 16, 1975, Pat. No. 3,998,160. This application Apr. 28, 1978, Ser. No. 901,229
Claims priority, application United Kingdom, Apr. 17, 1974, 16699/74
Int. Cl.² B42D *15/00*
U.S. Cl. 283—8 R **6 Claims**



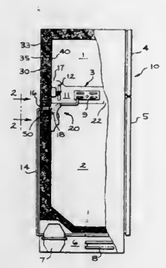
1. A security document including a carrieer of a material having an ink permeable surface and having printed thereon a design delineated by the form of a security ink deposit so that the authenticity of the document can be verified, wherein at least a portion of said document design is printed with a security ink including alignable magnetisable particles said alignable magnetisable particles in at least one selected area of said design being printed in position on said ink permeable surface so that they are substantially aligned in a preselected distinct direction, the distinct direction being detectable to verify the document as authentic.

4,186,945

TRANSITION SLEEVE FOR A CABINET OR THE LIKE

Thomas M. Hahn, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,979
Int. Cl.² F16L *35/00*
U.S. Cl. 285—19 **10 Claims**



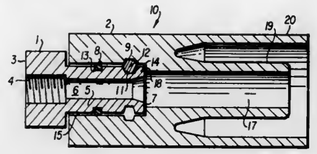
1. In combination a refrigerator cabinet having insulation contained in a cavity formed by first and second walls of said cabinet, the walls having juxtaposed openings therein through which tubing or the like may pass with the opening in the first wall having a plurality of notches and a transition sleeve, said sleeve comprising:
a unitary tubular body of a relatively rigid material;
mounting means formed at a first end of said body securing the body to the opening in the first wall, said mounting means including a plurality of locking tabs telescoped through the opening notches in the first wall and rotated thereabout;
said first end of said body including a first annular flange adapted to seal the opening on the cavity-side thereof;
a second annular flange at the second end of said body adapted to seal the opening in the second wall on the cavity side thereof; and
locating means formed on the second end of the body adjacent said second flange on the side opposite the first flange and inserted through the opening in the second wall on the sleeve.

4,186,946

ROTATABLE HOSE OR TUBE COUPLING

John P. Snow, Sagamore Hills, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1977, Ser. No. 796,533
Int. Cl.² F16L *27/08, 33/20*
U.S. Cl. 285—94 **28 Claims**



1. A rotatable coupling member adapted for attachment to the end of a hose or tube to be used in the conveyance of a fluid under pressure comprising, a first body member in rotatable interlocked relationship with a second body member, said first body member having at least one bore extending therethrough providing a fluid interconnecting relationship between means for connecting the first body member to a source of fluid disposed at a first end thereof and the outer end of a substantially tubular shaped insert extending away from a second end of the first body member and having an annular retainment groove disposed in its outer wall, said second body member having a bore at a first end thereof axially aligned with the insert bore and having an inner wall disposed in receiving relationship about the outer wall of the insert and extending through at least one bore to a second end thereof having means for connecting the second body member to a source of fluid, an annular retainment receiving groove in the inner wall of the second body member receiving bore disposed in substantial axial aligned relationship radially outwardly from the retainment groove in the outer wall of the first body member insert, retainment means between the first and second body members extending radially outwardly from the first body member retainment insert groove into the substantially axially aligned retainment receiving groove in the inner wall of the second body member receiving bore as a result of axially compressing the first body member insert so as to cause the original cross-sectional shape of the insert retainment groove to be altered in such a manner as to displace the retainment means originally disposed therein radially outwardly to provide a rotatable interlocked relationship between the first and second body members, and resilient means for sealing against fluid leakage disposed between the rotatable interlocked first and second body members.

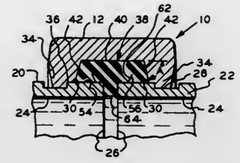
4,186,947

RADIAL COMPRESSION GASKET

Larry R. Nixon, Michigan Center, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 10, 1978, Ser. No. 876,682
Int. Cl.² F16L *17/04*
U.S. Cl. 285—112 **6 Claims**

1. A gasket for coupling grooved end pipe in end-to-end relationship comprising, in combination, an annular gasket member formed of resilient material having a transverse cross section including a base, lateral leg portions and a central portion intermediate said leg portions, said base and leg portions having outer cylindrical and conical coupling recess engaging surfaces, respectively, said leg portions each including an annular lip surface adapted to engage a pipe circumference intersected by an inner leg portions surface disposed toward said central portion, said central portion including an innermost bulbous convex surface merging from slope surfaces each in a spaced opposed relationship to an inner leg portion surface when said gasket is in a relaxed non-compressed condition whereby opposed inner leg portion and slope surfaces define annular cavities, said leg portions deflecting toward said central portion upon engaging a pipe circumference and the configuration of said opposed inner leg portion and slope surfaces being substantially planar in transverse cross section



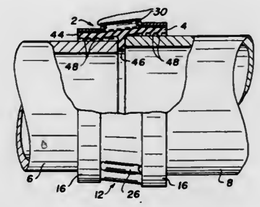
and of substantially equal radial length and intersect to define a first acute included angle when said gasket is in the relaxed state whereby compression of said gasket central portion in use engages said opposed inner leg portion and slope surfaces to completely eliminate said cavities and extrudes said central portion between the opposed ends of the pipe being coupled, said central portion bulbous convex surface being of such configuration and dimension to define a radial compression sealing surface on the pipes' circumferences adjacent the ends thereof to seal the regions of said engaging inner leg portions and slope surfaces.

4,186,948

PIPE JOINT CLAMP

Allan D. Cronk, 950, Greenwood Rd., West Vancouver, British Columbia, Canada (V7S 1X7)

Filed Oct. 2, 1978, Ser. No. 947,378
Int. Cl.² F16L *17/04, 21/06, 33/08*
U.S. Cl. 285—177 **7 Claims**



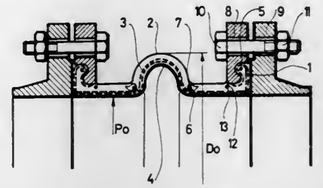
1. A generally circular pipe joint clamp adapted to compress a flexible packer around a joint between substantially aligned pipes, the clamp comprising a plurality of plates forming a flexible shield, each plate overlapping one neighbouring plate and underlying the other neighbouring plate,
a joint in between each pair of neighbouring plates except the plates at each end of the flexible shield to allow the plates to pivot relative to each other; and
clamping means to provide a compressing force to be applied to the flexible shield.

4,186,949

ELASTIC PIPE-CONNECTING COMPONENT FOR PIPES OR PIPELINES, OR THE LIKE

Zoltán Bartha; Péter Szór, and József Haraszti, all of Budapest, Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Apr. 21, 1978, Ser. No. 898,984
Int. Cl.² F16L *27/10, 51/02*
U.S. Cl. 285—226 **2 Claims**



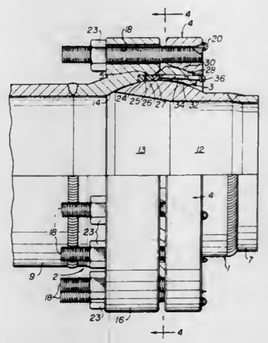
1. An elastic component containing reinforcing fibers, having a pair of radially outwardly extending end flanges and snap-flanges disposed endwise inwardly from said radially extending flanges thereby to define a groove between said radially extending flanges and said snap-flanges for the reception of rings by which each end of the component is secured to an adjacent pipe or pipeline or the like, said component having an outwardly extending annular bulge at its midportion and a locally reinforced cylindrical portion on each side of said bulge between said bulge and the adjacent said snap-flange, in the undeformed condition of the component, said fibers being disposed at an angle less than 55° relative to the axis of the component whereby, upon the imposition of internal pressure to the component, said cylindrical portions of the component can form two additional radially outwardly extending bulges.

4,186,950

COUPLING APPARATUS

Lloyd E. Billingsley, and Raymond E. Latham, both of Houston, Tex., assignors to Comex Marine Services, Inc., Houston, Tex.

Filed Sep. 14, 1977, Ser. No. 833,085
Int. Cl.² F16L *27/06*
U.S. Cl. 285—270 **9 Claims**



1. coupling apparatus capable of joining elongated members in an articulated relationship comprising:
a male member adapted for connection to one of said elongated members and having a radially enlarged end portion with an external spherical surface thereon;
a female member adapted for connection to another of said elongated members and into which said radially enlarged end portion may be inserted for mating engagement therewith;

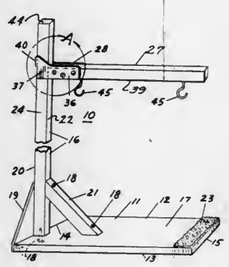
a gripping member, carried by said female member, radially movable from a normally expanded position, in which said male member may be freely inserted and removed from said female member, to a contracted position gripping said enlarged end portion of said male member, preventing removal of said male member and locking it in a fixed articulated relationship with said female member, said gripping member forming a ring comprising a plurality of rigid segments separated by a plurality of resilient segments therebetween, said resilient segments being circumferentially compressible to permit movement of said gripping member to said contracted position;

a load ring carried by said female member and axially movable, in the same direction of insertion of said male member into said female member, from a first positions, allowing said gripping member to assume said normally expanded position, to a second osition engaging and forcing said gripping member into said contracted position; and

an annular seal member carried by said female member for sealing engagement with said male member upon said movement of said gripping member to said contracted position;

at least some of said rigid gripping member segments being provided with pin means movable, from a retracted position within said segment to an extended position engaging said seal member for placing an additional sealing force thereon in an axial direction toward said female member.

4,186,951
MACRAME LOOM
Richard Stephenson, 34450 Dequindre, Sterling Heights, Mich. 48077
Filed Oct. 26, 1977, Ser. No. 845,578
Int. Cl.[2] D03J *3/00*
U.S. Cl. 289—16.5 **1 Claim**



1. In a loom for working macrame having an adjustable beam support means for an elongated substantially parallel sided beam of generally square cross-section horizontally supported on a vertically arranged, substantially parallel sided post of generally square cross-section, said beam having a butt end with a cross-section substantially identical to that of said post;

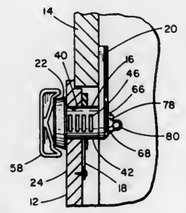
the improvement in the beam adjustment means comprising;

a pair of cantilevered, mirror image, one-piece, sheet metal, fulcrum members disposed on opposite vertical sides of said beam end, each piece having a generally flat guide extension portion having substantially parallel and horizontally disposed top and bottom edges extending in the direction of the beam end axis, each of said beam end extension portions having an inner plane surface aligned with outer vertical plane surface of said beam defining a space gap therebetween approximating the width of one side of the generally square sectioned post, each of said fulcrum members having a guide length portion extending from the guide extension portions beyond the beam end straddling the post and terminating substantially adjacent the rear face of said post defining a slipfit recess for receiving said post therebetween, the rearward extremity of said beam guide length portion having diagonal edges extending rearwardly and upwardly from said guide extension top edges from a point adjacent the front of said post to break corners located congruent with the rear edges of said post;

said guide length portions having tab members inwardly bent at said break corners horizontally at substantially 90 degrees to the planar sides of the guide portions around the rear face of said post towards the center thereof to define generally congruent rectangular pressure flange pads positioned upwardly from said beam and having their inner edges terminating short of the center of said post to define a substantially small clearance gap therebetween to prevent said edges from overlapping each other, and inner flange planar surfaces abutting flush against the front side of said post at a point locating the inner flange surfaces in spaced relation to the beam at a distance approximating the width of the post between said beam end and said post rear face with the top break corners and edges of said flanges disposed in a horizontal plane substantially three inches above the horizontal plane of the upper surface of said beam, said upper edges and corners of said tab flanges being disposed a substantial distance above the lower edges and flanges of said tabs to define a substantial pressure area for engagment with the front side of said post;

and means clamping said fulcrum guide extension portions rigidly and fixedly to the sides of said beam to secure said tab flanges in cantilevered relationship to said beam end and post.

4,186,952
TURN BUTTON LATCH
Dwight W. Glass, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Jul. 27, 1978, Ser. No. 905,881
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—202 **12 Claims**



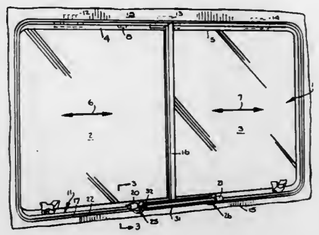
1. A latch assembly comprising, in combination:

a housing having a longitudinal axis, a cylindrical through bore along the axis, a front face, a back face, and a counterbore in the front face;

a latch member including a cylinder projecting through the through bore, a knob on one end of the cylinder for manual rotation of the latch member, a counterbore flange in opposed, cooperative relation with the front face counterbore of the housing, and bolt attachment means on the other end of the cylinder;

a bolt cooperatively engaging the bolt attachment means and rotatable in response to manual rotation of the knob, one of said counterbore flange and said counterbore including at least two recesses and the other of said counterbore flange and said counterbore including at least one projection for cooperation with said recess to maintain the latch member in a fixed position relative to the housing, said latch member being elastic along the longitudinal axis to permit flexure of the latch member and removal of the projection from the recess upon rotation of the latch member about the axis.

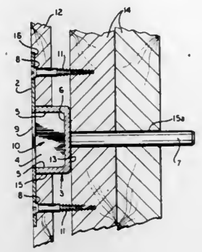
4,186,953
CLOSURE LATCH MECHANISM WITH CLOSING PRESSURE CAM
Daniel P. O'Connor, Parsippany, N.J., assignor to Ellcon-National, Inc., Totowa, N.J.
Continuation of Ser. No. 632,312, Nov. 17, 1975, abandoned.
This application Feb. 4, 1977, Ser. No. 838,521
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—210 **14 Claims**



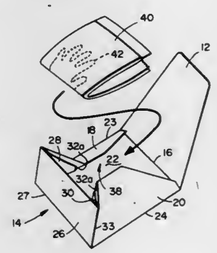
1. In combination with a closure which is mounted on a structure defining an opening and which moves toward and transversely to a plane in which said opening lies for moving a portion of said closure in a direction toward said plane and into engagement with a portion of said structure, a latch assembly comprising a latch bar member, means pivotally mounting said member on one of said closure and said structure, said means providing a pivot axis for said member spaced from said one of said closure and said structure and lying in a plane substantially parallel to said first-mentioned plane and extending transversely to said direction, said member having a portion spaced from said axis, cam means having a cam axis and a cam face which extends at least partly around said cam axis, and means pivotally mounting said cam means on said one of said closure and said structure with said cam face facing away and spaced from said pivot axis, with said cam substantially parallel to said pivot axis and with said cam face intermediate said portion of said member and said pivot axis for engagement with said portion, said cam face increasing in spacing from said pivot axis from an amount less than the spacing between said portion and said pivot axis to an amount greater than said last-mentioned spacing, said cam means including means engageable with the other of said closure and said structure and movable in a direction for urging said closure in said first-mentioned direction and into engagement with said structure whereby pivotal movement of said member causes said portion thereof to engage said cam face and press said closure in said first-mentioned direction against said structure.

4,186,954
LOCK STRIKE PLATE ASSEMBLY
Harry Detlefs, 3701 Clairmont Rd., Atlanta, Ga. 30341
Filed Sep. 14, 1977, Ser. No. 833,136
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—340 **3 Claims**

1. A lock strike plate assembly comprising a keeper plate for attachment to the facing of a door jamb, an opening defined in a central portion of said keeper plate, a lock bolt housing rigidly mounted on said keeper plate for insertion into a recess in the facing of a door jamb, said lock bolt housing including a pair of opposed parallel side walls each connected at one edge to said keeper plate on opposite sides of the opening in said keeper plate, and a pair of opposed top and bottom walls each connected at one edge of said keeper plate on opposite sides of the opening in said keeper plate, and a rear wall opposite said keeper plate opening and connected at all four of its edges to said walls, a rectilinear support rod rigidly mounted at one of its ends directly to said rear wall and extending in a direction approximately perpendicular to the plane of said keeper plate for insertion into a bore extending through a door facing and into wall studs and the like adjacent the door facing, whereby the support rod derives support from the wall studs to hold the lock bolt housing in position in the door facing and the lock bolt housing derives support from the recess in the facing of the door and from the wall studs to hold the lock strike assembly in its proper position at the door jamb facing.

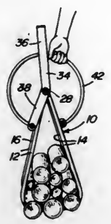


4,186,955
WASTE MATTER REMOVAL IMPLEMENT AND RECEPTACLE
Maury B. Campbell, Palo Alto, Calif., assignor to Owl-Cam Inc., Palo Alto, Calif.
Filed Feb. 1, 1978, Ser. No. 874,211
Int. Cl.[2] A01K *29/00*; A47L *13/52*
U.S. Cl. 294—1 R **7 Claims**



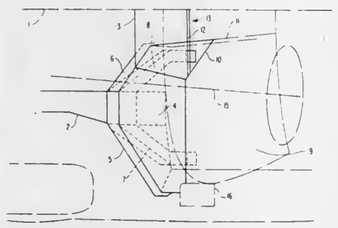
1. A waste matter removal implement and receptacle comprising an envelope formed of sheet material folded along predetermined fold lines, said envelope having a receiving portion forming an enclosure with an opening, and a flap portion joined to said receiving portion along a line of weakness, said receiving portion including a bottom panel, a pair of side panels joined to said bottom panel along a pair of said fold lines on opposite edges of said bottom panel, and an end panel joined to said bottom panel along another of said fold lines and also joined to said side panels, said pair of side panels and said end panel being movable relative to said bottom panel between a collapsed position in which said side and end panels overlie said bottom panel and an open position in which said side and end panels are substantially perpendicular to said bottom panel, said opening extending between said side panels and overlying said bottom panel such that said receiving portion forms a scoop having a bottom wall and three side walls, said flap portion tucking into said opening of said receiving portion to close said envelope, said flap portion being readily detachable from said receiving portion along said line of weakness to form a cooperating member for pushing waste matter into said opening of said receiving portion.

4,186,956
LOG CARRIER
Dennis E. Flynn, 558 W. 11th, Winner, S. Dak. 57580
Filed Jul. 28, 1978, Ser. No. 929,171
Int. Cl.[2] B65G *7/12*
U.S. Cl. 294—16 **6 Claims**



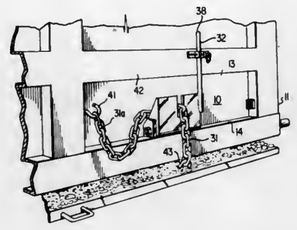
1. A carrier for carrying a plurality of fireplace length logs, said carrier including first and second opposite side pairs of laterally spaced upstanding tong arms defining open sided recesses opening toward each other and including upper and lower base and free ends, respectively, means pivotally connecting the upper base ends of said pairs of tong arms together for relative swinging of the lower free ends of the pairs of tong arms toward and away from each other, a downwardly opening generally C-shaped spring handle including remote handle ends, means pivotally attaching each handle end to a corresponding pair of laterally spaced tong arms intermediate the upper and lower ends thereof for angular displacement of said handle ends relative to said arms about parallel horizontal axes disposed at generally right angles relative to the directions in which said tong arms open, said tong arms being generally L-shaped with the upstanding portions thereof upwardly convergent toward the axis of relative swinging of said tong arms, the lower horizontal portions of the first and second pairs of L-shaped tong arms being laterally spaced, generally straight, horizontally registered and horizontally lengthwise overlapped.

4,186,957
FORWARD LONGITUDINAL BEARER SUPPORTED AT FORWARD END WALL OF SELF-SUPPORTING MOTOR VEHICLE BODY
Hans Lutze, Aidlingen; Dieter Weidemann, Weil der Stadt, and Helmut Weisshappel, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 2, 1978, Ser. No. 911,926
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725084
Int. Cl.[2] B62D *21/00*
U.S. Cl. 296—188 **12 Claims**



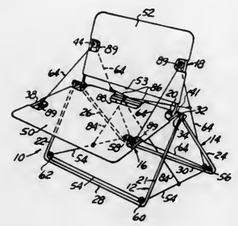
1. A motor vehicle body including a longitudinal bearer and comprising end wall means defining a wall of a passenger compartment and locally bulged out in the direction of the respective vehicle end in a manner forming a rigid body, said longitudinal bearer having an end supported against said end wall and being forked so as to create four arms partially surrounding said rigid body, a lower two of said arms leading to a subfloor forming means and an upper two of said arms terminating within the area of said rigid body.

4,186,958
DUMP-TRUCK TAIL GATE SPREAD CHAIN RELEASE DEVICE
Charlie R. Welch, 200 W. Strathmore, Pontiac, Mich. 48055
Filed Sep. 20, 1976, Ser. No. 724,559
Int. Cl.[2] B62D *25/00*
U.S. Cl. 296—50 **3 Claims**



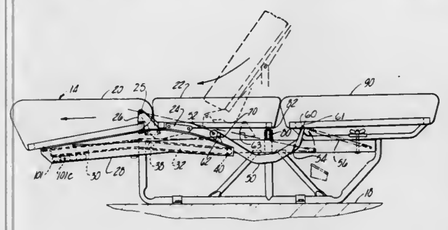
1. A truck tail gate holding and releasing apparatus comprising a tail gate holder means including a pivotable member having a slot therein pivotably mounted on said tail gate;
a tail gate chain adapted to be fastened to the bed of a truck having a link thereof placed in said slot for securing said tail gate;
an elongated cantilevered arm connected to said pivotable member including an extended portion for actuating said pivotable member; and
latch means mounted on said gate for releasably securing said arm to said gate by said arm extended portion.

4,186,959
FOLDABLE CHAIR
Sacha Thebaud, P.O. Box 446, Port-Au-Prince, Haiti
Filed Mar. 27, 1978, Ser. No. 889,937
Int. Cl.[2] A47C *4/02*
U.S. Cl. 297—16 **24 Claims**



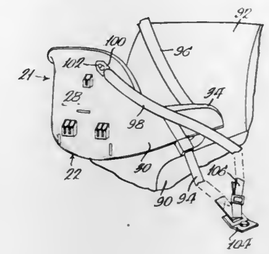
1. A foldable chair comprising a pair of support leg frame members hinged together by means of a pivot rod, each of said leg frame members comprising a single length of rod formed substantially as a rectangular frame having an open side pivotably attached to said pivot rod and one of said frame members being of smaller width and length than the other such as to be disposed within the perimeter of the other when in a folded position, a seat frame member and a back frame member pivotably attached to said pivot rod and having overall dimensions smaller than the smaller of said leg frame members for nesting within the periphery of said smaller leg frame member when in a folded position, first tension cable means interconnecting said leg frame members in a relative angular position when said chair is erected, second tension cable means for interconnecting said seat frame member and said back frame member in relative angular position when said chair is erected, third tension cable means interconnecting said back frame member and the rearmost of said leg frame member when said chair is erected, biasing means urging said cable means toward said pivot rod when said chair is folded, and a body support surface disposed at least on said seat frame member.

4,186,960
CONVERTIBLE VEHICLE SEAT
Ned W. Mizelle, Lexington, Ky., assignor to Hoover Universal, Inc., Saline, Mich.
Filed Jul. 3, 1978, Ser. No. 921,316
Int. Cl.[2] A47C *13/00*; F16M *13/00*; B60N *1/10*
U.S. Cl. 297—63 **19 Claims**



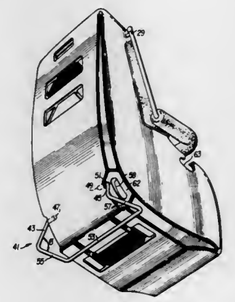
1. A vehicle seat assembly having a frame, a seat member having an inclined support surface and a back member movably mounted on said frame for movement between a seat-defining position in which the seat member is generally horizontal and the back member is upright and a bed-defining position in which the members are in general horizontal side-by-side positions, the back member having upper and lower ends, means pivotally supporting the back member at the lower end thereof for pivotal movement relative to the seat member, coacting track and roller means on said frame and said seat member supporting the seat member for general horizontal reciprocal movement relative to said frame between a forward location in the bed-defining position and a rearward location in the seat-defining position, said track and roller means including a least a pair of track portions and at least a pair of roller members spaced apart longitudinally of said track portions, said pair of roller members being engaged with one of said track portions in said seat-defining position and being movable therefrom into engagement with the other of said track portions in the bed-defining position of said seat assembly, said other track portion and said pair of roller members cooperating to maintain said seat member in a position in which said seat member support surface is generally horizontal, and means cooperating with the seat member to provide for the downwardly and rearwardly pivoting of the back member to its horizontal side-by-side position with the seat member in response to a forward movement of the seat member to its forward location in the bed-defining position of the vehicle seat assembly, and to provide for the upwardly and forwardly pivoting of the back member to its upright position in response to the rearward movement of the seat member to its rearward location in the seat-defining position of the vehicle seat assembly.

4,186,961
CHILD CAR SEATING APPARATUS AND METHOD FOR ASSEMBLING THE SAME
Claude S. Farrell, Jr., Worthington; Richard E. Cone, II, Kent, and Alan D. Ellies, Columbus, all of Ohio, assignors to Buckeye International Inc., Columbus, Ohio
Division of Ser. No. 485,161, Jul. 2, 1974, Pat. No. 3,934,934. This application Nov. 5, 1975, Ser. No. 628,919
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—216 **4 Claims**



1. A child's car seat and side restraint system for use in an automobile to prevent lateral movement of the child's seat toward an adjacent side of the automobile when the child's seat is positioned on the automobile front seat to the right of the driver's seat, said automobile being of a type equipped with adult seat or lap belts, the improvement comprising, in combination, an outer shell having a generally L-shaped center wall comprising a long wall portion and a short wall portion, one of said wall portions serving as a back wall for the child's seat and the other serving as a bottom wall which rests on the bottom of the automobile seat, said outer shell being securable to said automobile seat through use of said adult seat belts which extend around the bottom wall of said outer shell to anchor the shell to the automobile seat, connector means associated with said back wall of said outer shell, and a side restraint strap separate from said adult seat belts, said side restraint strap having first attachment means at one end thereof for releasably attaching the same to said connector means and having second attachment means at the other end thereof for securing the same to the driver's right seat belt anchor on the rear floor of the automobile.

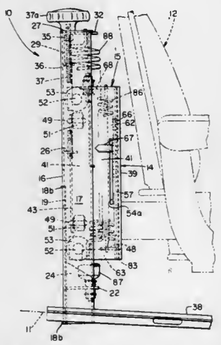
4,186,962
CAR SEAT SUPPORT AND RESTRAINING STAND
Paul K. Meeker, 412 Park Ave., Kent, Ohio 44240
Filed Dec. 22, 1977, Ser. No. 863,308
Int. Cl.[2] A47C *1/08*; A62B *35/00*
U.S. Cl. 297—250 **8 Claims**



1. In an infant car seat having a back, seat and sides, a rigid support and restraining stand comprising

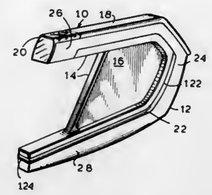
opposed legs;
means for pivotally mounting said opposed legs to said car seat;
a bight member; and
opposed rod members connecting said bight member to the outer ends of said opposed legs, each of said rod members forming an acute angle with said associated opposed leg, said opposed rod members being of a length to allow the bight member to grasp the outer portion of the car seat when said infant seat faces in a rearward direction;
said opposed legs and bight member being of a length and geometrical configuration such that said bight member may be pivoted so as to rest against the underside of said seat while supporting said seat.

4,186,963
UPRIGHT VEHICLE SEAT SUPPORT
L. John Koutsky, Milan, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa
Filed Nov. 1, 1978, Ser. No. 956,776
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—308 **7 Claims**



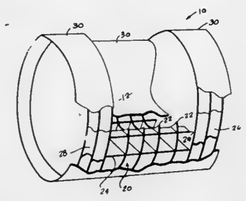
1. A support for a vehicle seat, comprising: roller housing means mountable on the vehicle and extending upright therefrom and including an upright rear main plate disposed transversely to the length of the vehicle and a pair of transversely spaced apart upright roller traces joined to transversely opposite sides of the main plate, each roller trace being of U-shaped section as viewed from above and having their open sides facing toward each other, each roller trace having an upright, laterally in-turned front flange parallel to and spaced ahead of the main plate; upright carriage means of U-shaped section as viewed from above and having an upright front main plate parallel to and spaced ahead of the roller housing means and a pair of parallel upright side members joined to the carriage means front wall and spaced apart transversely a distance less than that of the aforementioned roller trace flanges, said side members extending rearwardly from the carriage means front plate and between and respectively closely adjacent to the roller traces, each side member having an upright laterally out-turned flange entering the proximate roller trace; first roller means carried by the carriage means flanges on fore-and-aft axes for rolling along the respective roller traces; second roller means carried by the carriage means flanges on transverse axes for rolling along the respective roller flanges; an upright height adjustment bracket disposed closely along the rear face of the carriage means main plate; means mounting the bracket means on the carriage means for relative vertical movement; means cooperative between the carriage means and bracket means for selectively locking and releasing the bracket means against and for such vertical movement; helper spring means connected between the bracket means and carriage means and biasing the bracket means upwardly; and suspension spring means connected between the bracket means and the roller housing means for biasing the bracket means and carriage means upwardly as a unit when the locking and releasing means is locked.

4,186,964
SEAT ARMREST
Ralph G. Marrujo, Winston-Salem, and Thomas D. Hire, Lewisville, both of N.C., assignors to Fairchild Industries, Inc., Germantown, Md.
Filed Oct. 23, 1978, Ser. No. 953,889
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—422 **11 Claims**



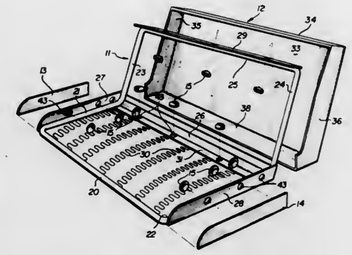
1. An armrest for a seat comprising a first shell member and a second shell member, said first and said second shell members being interconnected to form a hollow structure having a rear portion, an upper projecting portion that extends outward from said rear portion, a lower projecting portion that extends outward from said rear portion, said first and said second shell members having means for receiving an armrest insert member, and an armrest insert member positioned between said upper projecting portion and said lower projecting portion, said armrest insert member having an upper portion and a lower portion and a rear portion that interconnects said upper and said lower portions of said armrest insert member, said armrest insert member having means for connecting said armrest to said seat.

4,186,965
FIBERBOARD CHAIR CONSTRUCTION
Jon A. Yarbrough, 5714 Vanderbilt, Dallas, Tex. 75206
Filed Mar. 6, 1978, Ser. No. 883,918
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—442 **7 Claims**



1. A furniture item formed of paperboard, comprising:
A support structure of perpendicularly disposed, interlocking panels, a portion of the topside periphery thereof defining seat bottom and seat back portions;
first and second end panels, each being disposed adjacent the support structure on opposite sides thereof, each panel conforming to the shape of the bottom side periphery of the support structure to be coextensive therewith and extending beyond the topside periphery of the seat structure to define armrests on each side of the seat area and to establish a seat area entirely recessed within the periphery of the end panels; and
a rectangular panel of foldable material having two parallel cuts therein that extend longitudinally of the panel for a distance equal to the linear length of the topside periphery portion of the seat structure which defines the seat bottom and seat back portions and that are spaced a distance from each side of the panel equal to the width of the first and second end panels,
the panel being wrapped around the seat support structure and the end panels with the portion of the panel between the cuts being depressible into the recessed seat area defined by the end panels to overlay the seat bottom and seat back portions of the support structure.

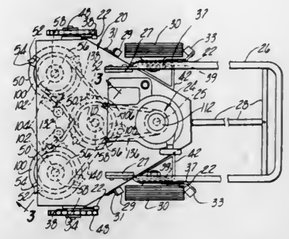
4,186,966
METAL SEAT FRAME WITH ADHESIVELY SECURED EXTERIOR PLASTIC PARTS
Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach & Car Equipment Corporation, Elk Grove Village, Ill.
Filed May 5, 1978, Ser. No. 903,232
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—452 **8 Claims**



1. In a seat, the combination comprising:
a metal seat frame member;
an exterior plastic part having an inner surface facing said frame member;
a securing element having a relatively wide head portion and a relatively narrow shank portion extending from said head portion and terminating at a terminal end;
an opening extending through said frame member for receiving said shank portion;
a first surface on said frame member located around said opening, said first surface facing said inner surface on said exterior plastic part;
a second surface on said frame member, opposite said first surface and located around said opening;
means on said head portion of the securing element for engaging against said second surface on the frame member;
and non-metallic adhesive means for adhesively securing said terminal end of said shank portion to said inner surface of said exterior plastic part.

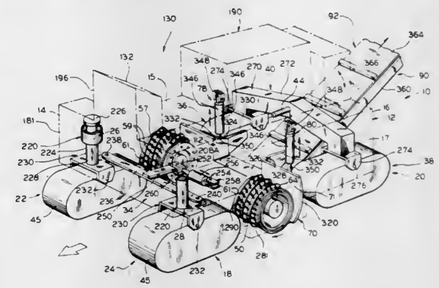
4,186,967
ICE REMOVING MACHINE
Charles D. Kuhmonen, 5574 Ponderosa, Utica, Mich. 48087
Filed Aug. 7, 1978, Ser. No. 931,614
Int. Cl.[2] E01H *5/09*
U.S. Cl. 299—25 **3 Claims**

1. A machine for removing ice from a surface comprising, in combination,
a body maneuverable over a said surface;
means for supporting the body above said surface;
a plurality of cutting heads depending from the body into proximity to the surface, the cutting heads being mounted on the body for rotation about substantially vertical laterally spaced axes;
power means on the body; and
power transmission means coupling the power means to the several cutting heads for concurrent rotation thereof;
each said cutting head comprising a disc and a plurality of chippers fixed to and depending from the disc, each chipper comprising:
a prism of high hardness material with a front, a back and a bottom;
said front being a portion of said prism facing the direction of travel of the chipper;
said back being a portion of said prism facing opposite said front;



said bottom being a portion of said prism furthest from said body and closest to said surface, said bottom comprising a land portion adjacent to the front with a facet substantially parallel to said surface and a relief portion with a facet at an angle from said surface and receding from said surface as it approaches the back of the prism;
each chipper having a beveled radially outer surface providing cutting clearance at the outer edge of the chipper;

4,186,968
ROADWAY PAVEMENT PLANING MACHINE
Robert M. Barton, Oklahoma City, Okla., assignor to Barco Manufacturing Company, Oklahoma City, Okla.
Continuation of Ser. No. 784,556, Apr. 4, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,618
Int. Cl.[2] E01C *23/12*
U.S. Cl. 299—39 **15 Claims**



1. A pavement planing machine for roadways and the like, said machine comprising:
a frame having a forward end and a rearward end,
a pair of forward drive assemblies disposed in side by side spaced apart relation at the frame forward end upon which said frame forward end rests,
said drive assemblies being connected to said frame for independent vertical adjustment of said frame relative to the respective forward drive assemblies,
a rearward drive assembly adjacent the rearward end of said frame on which said frame rearward end rests,
means for pivotally connecting said rearward end drive assembly to said frame for pivotal movement of said frame about a horizontal axis extending forwardly and rearwardly of said frame and centered adjacent the midportion of said frame,

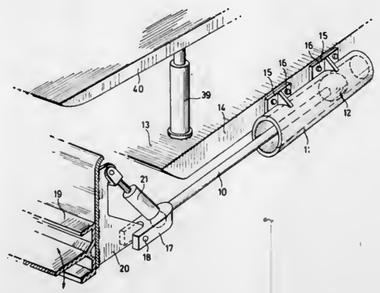
said drive assemblies being at a level that is below said horizontal axis,
said frame having fixed to same on either side of same a depending side sheet,
with said side sheets extending downwardly to said level,
a planing cylinder journaled at said level between said side sheets to extend transversely of said frame and be disposed at said level, for planing engagement with the pavement,
said cylinder being disposed intermediate said frame ends,
whereby vertical adjustment of said frame relative to the respective forward drive assemblies effects truing of said planing cylinder relative to the pavement for planing excisement of same free of vertical adjustment requirement of said frame relative to said frame rear drive assembly,
means for driving said cylinder to rotate relative to said frame in the direction whereby the cylinder underside moves forwardly of said frame, and comprising a separate drive device mounted on said frame at each end of said cylinder and received within the respective cylinder ends and coupled to said cylinder within same,
said cylinder having external surfacing including means for fragmenting the pavement in planing same when rotated in said direction against the pavement surface when said machine is moved forwardly for upcutting excisement of the pavement,
said cylinder surfacing extending lengthwise of said cylinder into close proximity to said side sheets,
said drive assemblies including drive means for moving said machine forwardly along the pavement for moving said planing cylinder, when said cylinder is driven by said cylinder drive means in said direction, relative to the pavement, in the forward direction for planing excisement of the pavement,
with the mass of said machine that is supported by said drive assemblies being oriented to dispose the center of gravity thereof above and in substantial vertical alignment with the forwardly disposed side portion of said planing cylinder external surfacing for countering upward forces acting on said cylinder on forward movement of said machine with said cylinder rotating in said direction thereof for said planing excisement of the pavement,
said machine further including separate power jack means interposed between the respective forward drive assemblies and said frame for selectively shifting said frame forward end vertically of the respective forward drive assemblies and about said axis for effecting setting of said planing cylinder relative to the pavement at the desired planing levels and slope, whereby said machine mass as centered at said center of gravity is available to bear on the pavement being excised, on forward movement of said machine with said cylinder rotating in said direction thereof for said planing excisement of the pavement, through said cylinder, to resist shifting of said cylinder from said setting thereof,
a mold board extending crosswise of said frame adjacent said planing cylinder and disposed rearwardly of and substantially paralleling said planing cylinder,
said mold board being carried by said frame at said drive assembly level forwardly of said rearward drive assembly and said pivotal connecting means thereof,
said mold board being positioned to receive and move forwardly, on forward movement of said machine along the pavement, pavement rubble formed by said rotation of said cylinder and moved over the top of said cylinder by said rotation of said cylinder,
said mold board being formed to define a pavement rubble passing port opening rearwardly of said frame,
an upright pavement rubble retainer fixed to said frame at said drive assembly level adjacent to but forwardly of said cylinder for holding adjacent said cylinder surfacing pavement rubble displaced by said planing excisement of said cylinder for movement over the top of said cylinder under said rotation of said cylinder,
said planing cylinder surfacing including auger means for feeding the pavement rubble adjacent same laterally of said cylinder to said mold board port for passage therethrough rearwardly of said frame,
and conveyor means carried by said frame and having a pavement rubble receiving end disposed at said drive assembly level in pavement rubble receiving relation with said mold board port forwardly of said rearward end drive assembly connecting means and below said horizontal axis level and a pavement rubble discharge end projecting rearwardly of said frame for conveying the pavement rubble for discharge from the rearward end of said frame.

4,186,969

APPARATUS FOR CONTROLLING THE POSITION OF A MINING MACHINE

Klaus Beckmann, Lünen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,582
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633286
Int. Cl.² E21C *35/08*
U.S. Cl. 299—43 **16 Claims**



1. Apparatus for controlling the position of a mineral mining machine guided for movement on guide means, said apparatus comprising at least one beam connected with said guide means, at least one device operable to adjust the angle between the guide means and the beam and further guide means comprising a piston and cylinder unit arranged at a mounting surface of a support which faces an adjacent support of a mine installation, the further guide means serving to pivotably and displaceably connect the end of the beam remote from the first-mentioned guide means to said support and to permit limited angular mobility of the end of the beam to a limited extent wherein the first-mentioned guide means is disposed at one side of a conveyor, and the beam and the adjusting device are connected with bracket means at the opposite side of the conveyor.

4,186,970

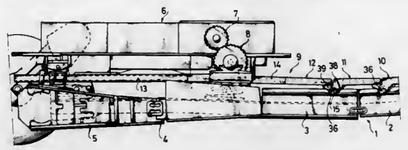
SECTIONAL CONVEYOR WITH SECTIONAL RACK FIXED ON THE CONVEYOR AT ONLY A SINGLE LOCATION

Otto Minke, Essen, and Willy Lanfermann, Bochum, both of Fed. Rep. of Germany, assignors to Ruhrkohle, A.G., Essen, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,564
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633336
Int. Cl.² E21C *27/36*
U.S. Cl. 299—43 **9 Claims**

1. In a mining machine having a movable cutting head with a driving pinion, a thrust device for said machine comprising:
a sectional conveyor lying in the direction of the path of travel of the cutting head, the sections of said conveyor

being linked together for limited relative displacement along the direction of the path of travel; and
a sectional rack extending along said conveyor for receiving said pinion to traverse the cutting head on the conveyor, the sections of said rack being linked together for relative



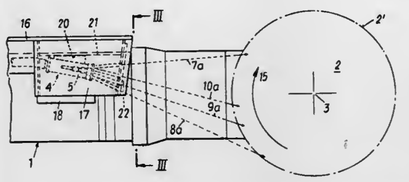
pivotal movement, one section of said rack being fixed to said conveyor at a single location along said rack and conveyor, all other sections of said rack being only slidably retained on said conveyor for movement with respect to said conveyor in the direction of said path of travel.

4,186,971

DEVICE FOR COOLING CUTTING TEETH OF CUTTER HEADS OF CUTTING MACHINES

Wolfgang Gebetsroither, Wolfsberg, and Alfred Zitz, Zeltweg, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 11, 1978, Ser. No. 895,500
Claims priority, application Austria, May 6, 1977, 3251/77
Int. Cl.² E21C *7/08*
U.S. Cl. 299—64 **6 Claims**



1. In a rock cutting machine which includes a cutter arm having an inner end and an outer end carrying a toothed cutter which rotates about an axis transverse to the longitudinal dimension of the arm, an improved cooling device for the cutting teeth of the cutter comprising nozzle means for receiving supplies of compressed air and water and constructed to create and discharge a stream of air in which particles of liquid water are dispersed or atomized, said nozzle means being carried by said cutter arm at a location spaced from the cutter toward the inner end of the arm and arranged in a position to discharge the stream toward the cutter in a spray pattern such that the stream impinges on the teeth of the cutter as the teeth pass through the pattern during rotation of the cutter.

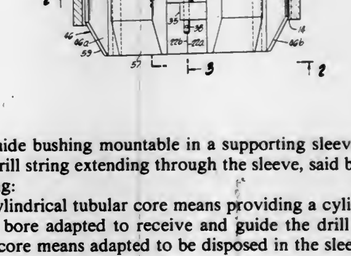
4,186,972

LINEARLY MOVABLE STABILIZER FOR SLIDABLE STRUCTURES

Magnus F. Hagen, 434 Panorama Dr., Laguna Beach, Calif. 92651

Filed May 26, 1978, Ser. No. 909,921
Int. Cl.² F16C *29/04*
U.S. Cl. 308—3.8 **4 Claims**

1. A linearly movable stabilizer means for linearly slidable structures wherein sideward cantering is prevented thereby, said means consisting of:
an elongated track member attached to said slidable structure transversely to the linear movement thereof, said track member comprising a bottom longitudinally extending center wall and a pair of oppositely disposed and outwardly and laterally extending ball raceways, whereby said bottom center wall and said raceways define an elongated channel;
a slide mechanism adapted to be slidably supported within said channel, said mechanism comprising an inner slide member having a bottom wall and oppositely disposed ball raceways arranged to be oppositely positioned to respective adjacent ball raceways of said track member, ball-retainer means being positioned between said track member and said inner slide member, wherein ball bearings are operably positioned in said corresponding raceways;



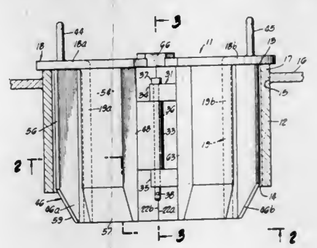
a first long arm member having one end thereof pivotally mounted to a fixed support, and the end opposite thereof pivotally connected to said inner slide member to traverse longitudinally within said channel;
a second short arm member interconnected between said first arm member and said track member, thereby defining a substantially "Y"-shaped configuration, wherein one end of said second arm is pivotally attached intermediate the ends of said first arm member, the opposite end of said second arm being pivotally attached adjacent one end of said track member; and
pivot means provided at each attaching end of each arm member to allow a controlled movement of said arms and said slide mechanism.

4,186,973

DECK-MOUNTED SHAFT BUSHING

John T. Work, Anaheim, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Continuation of Ser. No. 773,082, Feb. 28, 1977, abandoned.
This application Jul. 25, 1978, Ser. No. 927,868
Int. Cl.² F16C *21/00*
U.S. Cl. 308—3.9 **18 Claims**



1. A guide bushing mountable in a supporting sleeve for a guiding drill string extending through the sleeve, said bushing comprising:
rigid cylindrical tubular core means providing a cylindrical axial bore adapted to receive and guide the drill string, said core means adapted to be disposed in the sleeve and around the drill string;
means for mounting said core means substantially coaxially

in the sleeve while allowing relative transverse movements between said core means and the sleeve, and being operative to prevent any substantial rotation of said core means while permitting unrestricted rotation of the drill string relative to said core means; and

resilient, elastomeric cushion means mounted on the exterior of said core means and adapted to coact with the interior wall of the sleeve to cushion said relative transverse movements.

4,186,974

DEVICE FOR INTRODUCING A FORCE-TRANSMITTING MACHINE ELEMENT INTO A VESSEL

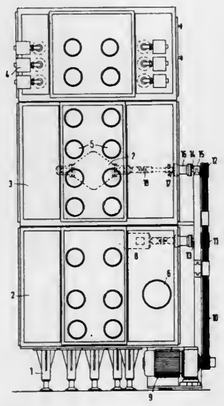
Helmut Grün, Hanau, Fed. Rep. of Germany, assignor to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,568

Claims priority, application Fed. Rep. of Germany, May 10, 1976, 2620636

Int. Cl.² F16C *13/00*

U.S. Cl. 308—15 **2 Claims**



1. Device for introducing a power-transmitting machine element into a vessel containing an aggressive atmosphere and having a wall formed with openings, to the defining margin of which gloves are, respectively, secured, comprising: a flange set into the wall, a sealing bearing for a force-transmitting machine element mounted on said flange at the outside of the vessel, and threaded fastening means accessible from the interior of the vessel for threadedly fastening the machine element to said flange, said flange having an outer peripheral surface formed with a bead-like projection at the outside of the vessel to which a covering is securable.

4,186,975

BEARING SEAL AND LUBRICATING DEVICE

Alois Schwarz, Putzbrunn; Karlheinz Mautz, Ottobrunn, and Hubert Frommlet, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

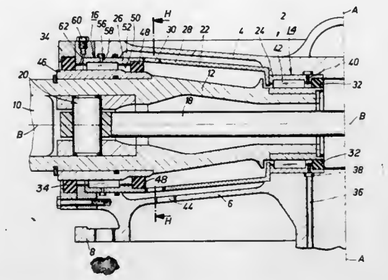
Filed Dec. 16, 1977, Ser. No. 861,560

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658409

Int. Cl.² F16C *33/76*

U.S. Cl. 308—187 **10 Claims**

1. A bearing seal and lubricating device for the bearings of a rotor, comprising rotor housing means, radially outer bearing means located in said housing means and radially inner bearing means also located in said housing means, lubricating oil chamber means in said housing means operatively interconnecting said radially outer bearing means and said radially inner bearing means, each bearing means having a first side facing away from said lubricating oil chamber means and a second side facing said lubricating oil chamber means, sealing means sealing said inner and outer bearing means at said first side thereof, shielding means operatively arranged to shield said second side of said radially outer bearing means relative to said lubricating oil chamber means, receptacle means in the form of groove-like contamination accumulating dead end sink means suitably located in said lubricating oil chamber means adjacent said shielding means and open toward said lubricating oil chamber means against the direction of centrifugal force for collecting particles separated under the effect of centrifugal force from



lubricating oil in said lubricating oil chamber means to thereby prevent the entering of such particles into said radially outer bearing means, and conduit means operatively interconnecting said radially outer bearing means to said lubricating oil chamber means thereby substantially bypassing said groove-like dead end sink means, said shielding means comprises sealing ring means sealing said lubricating oil chamber means from the radially outer bearing means, said bypassing conduit means opening into said lubricating oil chamber means ahead of said groove-like dead end sink means as viewed radially inwardly in the direction toward the radially inner bearing means.

4,186,976

FABRICATED DESK

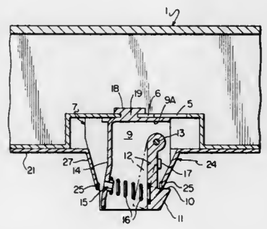
Akihiro Okada, Neyagawa, Japan, assignor to Itoki Kosakusho Co., Ltd., Joto, Japan

Filed Mar. 30, 1978, Ser. No. 891,810

Claims priority, application Japan, Aug. 31, 1977, 52-105139

Int. Cl.² A47B *17/00*

U.S. Cl. 312—194 **28 Claims**



1. A desk comprising:

a top board;

a plurality of mounting apertures located on an underside of the top board;

a plurality of top board supporting members;

a plurality of mounting parts located in each of the supporting members; and

a plurality of locking means, each locking means including a first portion adapted for attachment to a selected one of the top board mounting apertures and a second portion adapted to be inserted into a selected one of the supporting member mounting parts for mounting the top board to the

supporting members, said second portion comprising a detent having a hook-like protrusion at a lower end and being pivotally supported at an upper end and a spring biasing the detent to an outwardly extending position for engagement with the supporting member mounting parts.

4,186,977

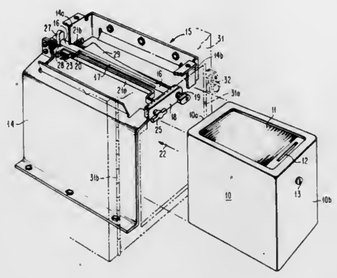
SELF-LOCKING DEPOSITORY CONTAINER

Paul A. Gilovich, Saratoga, and John J. Lynott, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,436

Int. Cl.² E05B *65/46*; G07B *15/00*

U.S. Cl. 312—215 **9 Claims**



3. Apparatus for securing, in a predetermined location within a substantially stationary housing and controlling access to the interior of, a portable depository having a member that is normally locked closed, said apparatus comprising:

barrier means supported by the housing and rotatable between one position in which it permits insertion/removal of the depository into/from the housings, and another position in which it prevents such insertion/removal;

key means secured to said barrier means and insertable into the depository for unlocking the member to permit access to the interior of the depository only when said barrier means is in said other position;

means movable translationally and rotationally relative to said barrier means; and

means for selectively retaining the last-introduced means in one or the other of two rotative positions, in one of which it can move translationally one way and the opposite way for moving the member to access-providing and access-denying positions, respectively, and in another of which it is ineffective to do so.

4,186,978

TILT DOWN RECEPTACLE FOR REFRIGERATOR DOOR

Eugene F. Thomson, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 17, 1978, Ser. No. 925,418

Int. Cl.² A47F *3/00*; F25D *25/00*

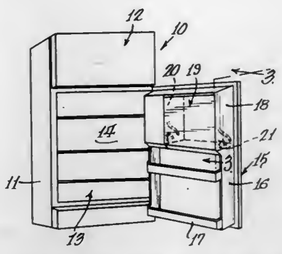
U.S. Cl. 312—138 A **8 Claims**

1. In a refrigeration apparatus having wall means defining a refrigerated space, an opening to said space, and a door for selectively closing said opening, a receptacle in said space defining an access opening, and a lid pivotally mounted to said receptacle for selectively closing said receptacle opening, improved means for movably mounting said receptacle and lid in said space comprising:

mounting means for pivotally mounting said receptacle in said door for movement between a vertical retracted position therein and a horizontal access position projecting outwardly from the door with said access opening uppermost, said mounting means defining a horizontal pivot axis at the bottom of said receptacle when said receptacle is in said vertical position;

a follower pin carried by said lid and extending therefrom in a direction generally parallel to said pivot axis;

a guide carried by said door adjacent said follower for contacting and guiding the movement of said follower as an incident of movement of said receptacle, said guide having a first portion which is generally arcuate about said pivot



axis for guiding said follower as said receptacle is moved between said retracted position and an intermediate position such that said lid remains closed, and a second portion which extends away from said pivot axis for guiding said follower as said receptacle is moved between said intermediate position and said access position such that said lid is thereby moved to an open position providing access to said receptacle opening.

4,186,979

DRAWERS

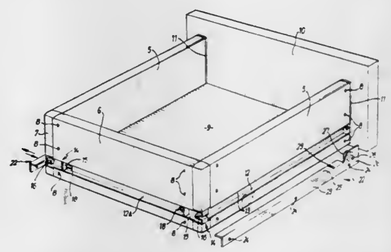
Leon G. Litchfield, both of Derby, England, assignor to L. B. (Plastics) Limited, Derby, England

Filed Jul. 12, 1978, Ser. No. 923,795

Claims priority, application United Kingdom, Jul. 23, 1977, 31040/77

Int. Cl.² A47B *88/16*

U.S. Cl. 312—333 **18 Claims**



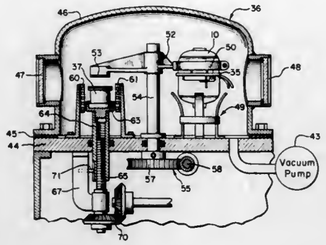
1. A drawer having a front wall, a rear wall and opposed side walls, longitudinal tracks formed in said side walls, and a pair of guide members mounted at the rear corners of the drawer and moveable between retracted positions in which the guide members are clear of the rear ends of the associated tracks and operative positions in which the guide members extend across the ends of the respective tracks, the guide members being adapted to engage with respective drawer runners mounted in a supporting structure in which the drawer is mounted in use to support and guide the rear end of the drawer on the runners, and each of said guide members including an actuating member to facilitate sliding movement of said guide member between said retracted and operative positions.

4,186,980

METHOD AND APPARATUS FOR CONSTRUCTING ELECTRONIC DEVICES

Adolph Wolski, Morton Grove, Ill., assignor to Ni-Tec, Inc., Niles, Ill.

Filed Jan. 3, 1966, Ser. No. 518,479
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **5 Claims**



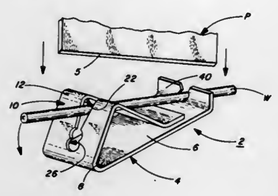
1. A method of contructing an electronic device comprising the following steps:
processing at least a portion of a first component of said device in a first chamber having an environment free of contaminants harmful to the processed portion;
locating a second component of said device in a second chamber, separated from said first chamber by a barrier, and having an environment which may contain said harmful contaminants;
protectively covering said processed portion of said first component;
breaking said barrier between said chambers;
and removing said protective cover from said processed portion during assembly of said first and second components without substantially exposing said processed surface of said first component to said second environment.

4,186,981

GROUNDING DEVICE

Robert J. Holton, North Caldwell, N.J., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 4, 1978, Ser. No. 930,969
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—14 R **7 Claims**



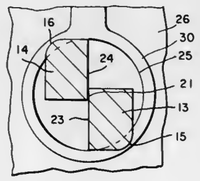
1. A grounding device for mounting an electrical element, such as a ground wire or the like, to a support member comprising a body having a base member, a resilient spring-arm integral with and extending outwardly from said base member, said spring-arm including a first inclined leg portion made integral with and extending angularly outwardly from one end of said base member and a second inclined leg portion made integral with and extending angularly inwardly from said first leg portion, said spring-arm having a slot disposed in said leg portions adapted for slidably receiving said electrical element and support member therein, and said spring-arm having projection means extending into said slot adapted for gripping engagement with the confronting surfaces of said support member for holding said electrical element in substantially aligned relation with a confronting edge of said support member in the installed position thereof, said second leg portion including an integral generally laterally extending flange portion, and said laterally extending flange portion being spaced from said base member and adapted for abutting movement toward and away from said base member upon mounting of said electrical element with said support member.

4,186,982

CONTACT WITH SPLIT PORTION FOR ENGAGEMENT WITH SUBSTRATE

Robert F. Cobaugh, Elizabethtown, and James R. Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 698,240, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 481,577, Jun. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 440,899, Feb. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,852, Aug. 1, 1973, abandoned. This application Jun. 28, 1977, Ser. No. 810,703
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 C **38 Claims**



1. A contact for insertion into an aperture extending between upper and lower surfaces of a substrate comprising:
a pair of offset legs extending along a longitudinal axis adapted to extend at least part way through said aperture and to tightly engage the peripheral surface of said aperture;
said legs being joined at their ends for compliant movement throughout their offset lengths relative to each other in a first direction substantially normal to said axis during insertion into said aperture so as to reduce their combined cross-sectional dimension thus permitting accommodation by said aperture;
said legs being in a mutually touching relationship for a majority of the distance they extend into said aperture along longitudinally extending friction surface means in a plane constructed between said legs upon completion of insertion of said legs to their final position of stable support within said aperture;
said plane being so constructed that the maximum combined cross-sectional dimension of said legs is reduced during insertion into said aperture without causing any increase in the combined cross-sectional dimension of said legs in a direction perpendicular to said plane; and
said friction surface means resisting said compliant movement of said legs relative to each other in said first direction.

4,186,983

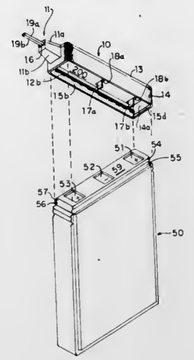
BATTERY CONNECTOR

Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 30, 1978, Ser. No. 956,130
Int. Cl.[2] H01M *2/20;* **H01R** *13/54*
U.S. Cl. 339—91 R **9 Claims**

1. A connector, adapted to be connected to a battery having substantially planar terminals on a wall thereof and to an electrical device to provide electrical connection between said electrical device and said battery; said connector comprises a

housing and conductive means adapted to electrically contact said battery terminals and said electrical device, said conductive means being partially contained within said housing and partially extending from said housing for electrical connection to said electrical device and said conductive means further partially extending from said housing at a region of said housing adapted to be directly adjacent said battery wall when said



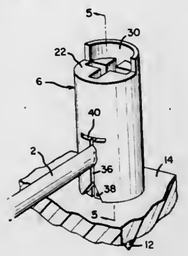
connector is connected to said battery, said connector further comprising resilient connection means to grip said battery, said connection means extending from the periphery of said housing region with said connection means being adapted to snap over said battery wall and cooperatively grip corresponding holding means on said battery with said holding means being located adjacent to the periphery of said battery wall.

4,186,984

STRAIN RELIEF COVER FOR A BARREL TERMINAL

Robert P. Reavis, Jr., Statesville; Melvin A. Soderstrom, Advance, and Vasantrai A. Vachhani, Kernersville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 857,068, Dec. 5, 1977, Pat. No. 4,141,618. This application May 5, 1978, Ser. No. 903,367
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 R **2 Claims**



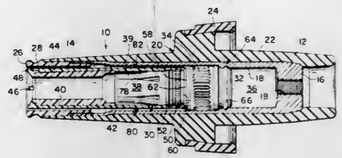
1. A wire inserter and strain relief cover for a slotted barrel terminal comprising:
a sleeve of dielectric material having a closed end and an open end,
said closed end including a pair of intersecting recesses,
said sleeve having a lengthwise wire receiving slot communicating with said open end and extending toward said closed end and terminating in a transverse slot,
said wire receiving slot having an enlarged flared entryway communicating with said sleeve open end, and
a projecting portion on said closed end internally of said sleeve and concentric therewith, whereby said projecting portion engages a wire entering into said wire receiving slot and into an open end of a slot provided longitudinally in a barrel terminal which is to be covered by said cover.

4,186,985

ELECTRICAL CONNECTOR

Frank M. Stepniak, Long Valley, and Andrew A. Kominiak, Flanders, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Aug. 29, 1978, Ser. No. 937,737
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **19 Claims**



1. A female electrical connector for use in separably connecting a male contact element with an energized high voltage circuit, said connector comprising a rigid conductive housing having a first end adapted to receive said male contact element, a second end adapted to be substantially closed and an internal wall surface providing an axially extending opening therebetween, an elongate female contact assembly including a tubular piston of conductive material within and in electrically conductive relationship with said housing and axially movable between a first position wherein said piston is maximally spaced from said first housing end and a second position wherein said piston is minimally spaced from said first housing end, said piston providing said connector with a chamber adjacent said second housing end, and female contact means for engaging said male contact element, said female contact means being carried by and movable with and in electrically conductive relationship with said piston, said female contact assembly being configured to transmit to said chamber arc-quenching gas which is generated in response to an arc being struck between said male contact element and said female contact means as said male contact element approaches said female contact means, said connector further comprising a latch mechanism for retaining said piston in said first position until the gas pressure of such evolved arc-quenching gas in said chamber attains a predetermined value and for releasing said piston to cause the same to move toward said second position when said pressure exceeds said predetermined value, under the influence of gas pressure exerted on said piston in said chamber.

4,186,986

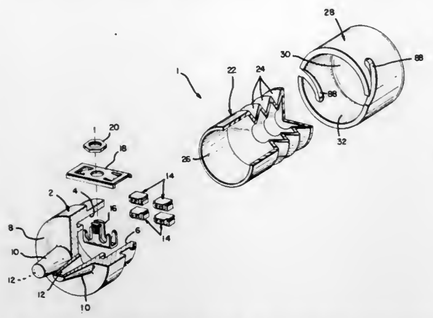
SEALED SPLICE

John R. Shoemaker, Reidsville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 16, 1978, Ser. No. 961,302
Int. Cl.[2] H01R *3/02*
U.S. Cl. 339—114 **4 Claims**

1. A connector having an interior which is self-sealing by distribution of sealant material, comprising:
a connector shell having an interior cavity and wire receiving openings through the exterior of said shell which communicates with said cavity,
said cavity having a wire receiving section for receiving a plurality of wires passing through said openings to be electrically joined within said cavity,
said cavity having another section containing a volumetrically collapsable container filled with a fluid sealant material, and

means for closing said connector shell compressibly over said wires and said container and for volumetrically collapsing said container to expel said sealant and distribute the same throughout the cavity.

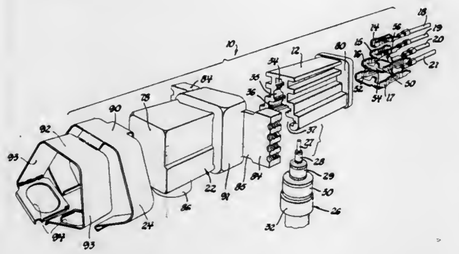


4,186,987

ELECTRICAL SOCKET CONNECTOR AND TERMINAL THEREFOR

Warren Pearce, Jr., Warren, and Charles W. Ramsey, Niles, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1978, Ser. No. 953,412
Int. Cl.[2] H01R *9/12*
U.S. Cl. 339—116 C **6 Claims**



1. An electrical socket connector for a post terminal having axially arranged multiple contacts comprising:

a molded one-piece connector body having a plurality of longitudinal cavities extending therethrough and defining openings at its front and rear ends,

said connector body having a pair of exterior longitudinal walls and a partition wall between each adjacent pair of cavities,

one of said exterior walls and each partition wall having a longitudinal slot extending therethrough which is open at the front end of the connector body, said longitudinal slots being in vertical alignment to receive a post terminal and dispose a portion thereof in each longitudinal cavity,

a terminal disposed in each of said cavities, each terminal having a channel-shaped contact portion at one end and an attachment portion at an opposite end secured to a lead wire and being longitudinally insertable into its associated cavity via the opening at the rear end of the connector body,

each said contact portion comprising a pair of side rails connected by forward and rearward webs longitudinally spaced from each other,

said forward web spanning an associated one of said longitudinal slots adjacent the opening at the front end of the connector body, and

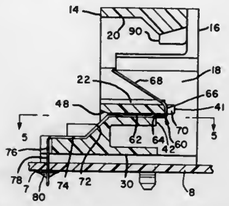
said side rails having central portions between the webs which are displaced toward each other and project over the associated slot for engaging a portion of a post terminal when the post terminal is inserted into the connector body via the vertically aligned longitudinal slots.

4,186,988

ELECTRICAL CONNECTOR RECEPTACLES

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 20, 1978, Ser. No. 944,095
Int. Cl.[2] H05K *1/10*
U.S. Cl. 339—176 MP **6 Claims**



1. An electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said plug-receiving opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely directed external sidewalls and oppositely directed external endwalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a contact spring portion extending from one of said internal sidewalls at a location adjacent to said plug-receiving end diagonally into said opening and towards the opposite internal sidewall, and each conductor having a lead portion extending from said plug-receiving end through said housing between said one internal sidewall and the adjacent external sidewall and towards said rearward end, said plug-receiving opening being dimensioned to receive a connector plug having spaced apart contact members therein which engage said contact spring portions of said conductors, said connector receptable being characterized in that:

said housing has a single conductor-receiving opening extending therethrough from said rearward end to said plug-receiving end, said conductor-receiving opening being between said one internal sidewall and said adjacent external sidewall, said opening having a width which is sufficient to receive said conductors in side-by-side coplanar relationship,

said conductors being of stamped and formed sheet metal and having intermediate portions disposed in said conductor-receiving opening, said intermediate portions constituting said lead portions, said conductors having reversely bent portions at said plug-receiving end which extend from said conductor-receiving opening to said plug-receiving opening and having first end portions which extend into said plug-receiving opening, said first end portions constituting said contact spring portions,

each of said conductors having a second end portion which extends beyond said rearward end,

said housing having an apron extending from said rearward end between said conductor-receiving opening and said adjacent external sidewall, said conductors extending across said apron, and

conductor positioning and retaining means on said apron, said conductor positioning and retaining means being effective to secure said second end portions of said conductors against lateral movement towards each other whereby,

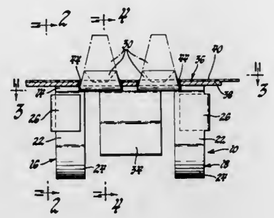
said intermediate portions, said reversely bent portions, and said first end portions of said conductors are maintained in spaced-apart relationship at predetermined locations in said conductor-receiving opening and said plug-receiving opening.

4,186,989

FEMALE TERMINAL FOR PRINTED CIRCUITS

Andrew F. Rodondi, Sharpsville, Pa., and Alfred V. Rossi, Cortland, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1978, Ser. No. 960,581
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **2 Claims**



1. In a unitary sheet metal female terminal having a pair of lateral mounting flanges adapted for attaching the mounting flanges to a flexible printed circuit and a resilient, laterally spreadable female contact portion joined to laterally spaced, longitudinal edge portions of the respective mounting flanges; the improvement comprising:

said laterally spaced mounting flanges having adjacent longitudinal end edge portions which are laterally spaced from the longitudinal edge portions joined to the female contact portion, and

a pair of longitudinally spaced upright posts joined to the longitudinal end edge portions,

each post comprising a pair of flat leg portions joined to a respective mounting flange and clamped together adjacent the mounting flanges by an integral tab of one of said leg portions which is wrapped over the other of said leg portions to prevent the mounting flanges from spreading apart when the female contact portion is laterally spread upon receipt of a mating blade terminal therein.

4,186,990

LEAD SOCKET INSERT

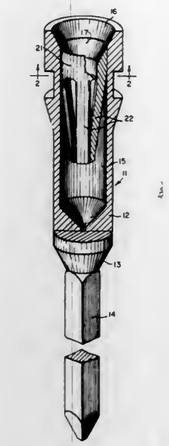
Guido Bertoglio, Viganello, Switzerland, assignor to Augat Inc., Attleboro, Mass.

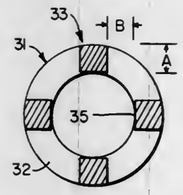
Filed Jul. 19, 1978, Ser. No. 926,227
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **15 Claims**

1. A socket contact comprising:

an elongated sleeve member formed with an internal bore opening into one end and a projection adapted for electrical interconnection by means such as soldering or wire wrapping extending from the other end, said bore being blind at one end and having a tapered entry at the open end; and

a machined insert within said bore, said insert having a hollow body portion of generally cylindrical configuration with a tapered entry at one end aligned with and forming a continuation of said bore tapered entry, said body being integrally formed with a plurality of flexible fingers at the other end, each of said fingers having a substantially flat inner surface, said fingers being bent and biased inwardly at their point of connection with said body toward the axis of said insert thereby providing a converging configuration, said converging fingers being





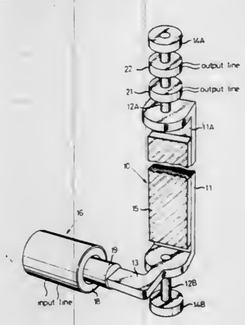
adapted to receive and frictionally engage an electrical component lead therebetween.

4,186,991

ANGULARLY ROTATABLE MIRROR APPARATUS

Hiroshi Koide, Sagamihara; Junichi Watanabe, Kawasaki, and Shigemoto Tenmyo, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Jun. 27, 1978, Ser. No. 919,630
Claims priority, application Japan, Jun. 30, 1977, 52-78261
Int. Cl.[2] G02B *23/00*
U.S. Cl. 350—6.91 **6 Claims**

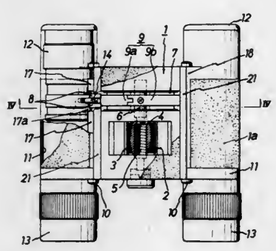


1. An angularly rotatable mirror apparatus comprising:

a bracket including an elongated mirror support portion;

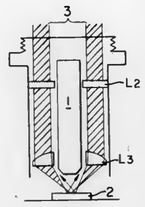
a rotary shaft extending from opposite ends of said bracket and having a single axis;
a planar mirror attached to said mirror support and having a reflective surface;
arm means extending from the bracket in a plane perpendicular to the rotary shaft;
linear motor means for driving said bracket to pivot the same about said axis, said linear motor means comprising first and second members movable relative to each other along a path substantially tangential to the path of movement of the outer end of said arm means, said first member comprising a center pole extending generally tangentially to the path of movement of the outer end of said arm means, an outer yoke extending generally along the center pole and at least partially enclosing at least a portion of said center pole, said center pole and said outer yoke defining an elongated gap therebetween, said second member comprising a cylindrical coil located in said gap and reciprocably movable substantially in the direction in which said center pole extends; and
means for rigidly connecting one of said first and second members of said linear motor means to said arm means.

4,186,992
BINOCULAR WITH AN ARRANGEMENT FOR ADJUSTING THE DISTANCE BETWEEN TWO TELESCOPES
Ichiro Kamakura, c/o Kamakura Kohki Kabushiki Kaisha, No. 6-12, Tsukagoshi 3-Chome, Warabi-shi, Saitama-Ken, Japan
Filed Jul. 24, 1978, Ser. No. 927,523
Int. Cl.² G02B *7/06*
U.S. Cl. 350—36 **2 Claims**



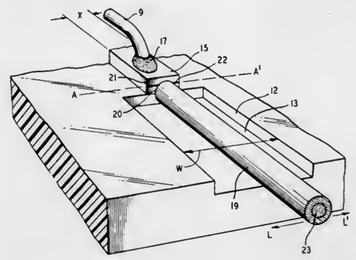
1. A binocular, comprising first and second telescopes each including an ocular lens housing and an objective lens housing; a central body positioned between the first and second telescopes and having a channel; a focus adjusting ring built in the central body, said telescopes and central body being rotatably linked with each other by a plurality of screw-type pins each engaging screw-type pin receiving portions disposed on both sides of the central body as well as adjacent each end of each telescope, the built-in focus adjusting ring including a sliding pin engaged therewith, the sliding pin being fixed with a bar accommodated is said channel of the central body and including two opposite ends both having respective bifurcate fitting members, said bar having a width smaller than that of said channel, each of the bifurcate fitting members being freely fitted with a feed pin fixed with the objective lens housing, whereby by rotating the built-in focus adjusting ring, the sliding pin and the bar are moved back and forth so that consequently the objective lens housing fixed with the feed pin is moved back and forth.

4,186,993
EPIDARK ILLUMINATION SYSTEM
Yoshiyuki Shimizu, and Takeshi Sudo, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Sep. 22, 1977, Ser. No. 835,786
Claims priority, application Japan, Sep. 30, 1976, 51/130525[U]
Int. Cl.² G02B *21/10*
U.S. Cl. 350—91 **3 Claims**



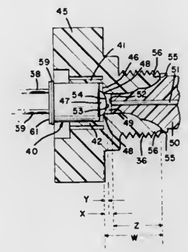
1. An epidark illumination system for use with a microscope in which a sample is illuminated from around an objective by a ring-shaped light flux having its center coincident with the optical axis of the objective to enable the sample to be observed in a dark field of view, said system comprising;
a ring-shaped condenser lens member disposed adjacent to the forward end of said objective with the center of said lens member being coincident with the optical axis of said objective to condense said light flux upon the sample; and
a ring-shaped transparent scattering member for scattering said ring-shaped light flux in the light pass upstream of said ring-shaped condenser lens member and located at a position between the middle of the length of the lens barrel of the objective and the vicinity of the portion thereof attached to the body of the microscope.

4,186,994
ARRANGEMENT FOR COUPLING BETWEEN AN ELECTROOPTIC DEVICE AND AN OPTICAL FIBER
Nathan M. Denkin, Aberdeen, and Peter K. Runge, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 21, 1978, Ser. No. 898,926
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.17 **7 Claims**



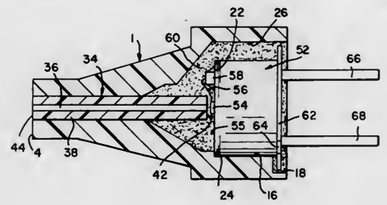
1. Apparatus for coupling an electrooptical device to an optical fiber including
a header (**10**) having a plateau (**11**) and a trough (**12**) with a flat bottom (**13**) disposed adjacent to said plateau and characterized in that the depth (D) of said trough is configured so that when a light emitter (**15**) is mounted on said plateau and the fiber (**19**) is fully inserted with a portion of said fiber's circumference in direct contact with the flat bottom of said trough, the center of the light guiding core of said fiber lies in a plane (A-A') of maximum light emission, said plane being parallel to the trough bottom and passing through the point of maximum light emission within the emitting region (**22**) of said emitter, and the width (W) of said trough being substantially greater than both the width (X) of said emitter and the diameter of said fiber to permit lateral displacement of said fiber.

4,186,995
LIGHT DEVICE, LENS, AND FIBER OPTIC PACKAGE
William L. Schumacher, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 30, 1978, Ser. No. 891,793
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.20 **3 Claims**



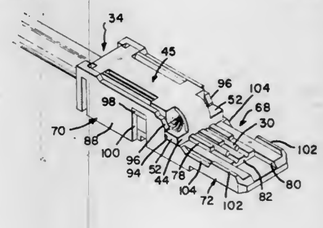
1. In an assembly for coupling a photoelectric element and an optical fiber, the improvement comprising:
a single piece coupling body of molded insulation material having a first cavity concentrically receiving a first subassembly of a radially resilient ferrule secured concentrically over an end portion of an optical fiber,
said body including a second cavity opening into said first cavity and receiving a second subassembly of a photoelectric element and a lens,
said second cavity containing a plurality of partitions integrally molded with said body and constructed for frictional encirclement of said second subassembly, and
said body having a rigid section encircling said partitions and constructed to define a clearance receiving flexure of said partitions toward and away from said rigid section.

4,186,996
OPTIC ADAPTOR JUNCTION
Terry P. Bowen, Etters, and Leonard F. Bendiksen, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 22, 1978, Ser. No. 944,937
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.20 **6 Claims**



1. A coupling connector for connecting between an optic waveguide transmission line and an optoelectronic circuit device, comprising:
a ferrule of resilient material provided with a cylindrical end having a concentric bore therein,
an opposite end of said ferrule provided with a cavity communicating with said bore and being adapted for receiving an optoelectronic circuit element,
a length of optic waveguide mounted in said bore and having a polished first end substantially flush with said cylindrical end of said ferrule,
a polished second end of said waveguide projecting into said cavity at a precise location within said cavity,
first means for seating and positioning an optoelectronic circuit element at a precise location in said cavity, and
second means for bonding said optoelectronic device and said waveguide in said bore .

4,186,997
OVERLAP TYPE WAVEGUIDE CONNECTOR ASSEMBLY AND METHOD
William L. Schumacher, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 14, 1977, Ser. No. 768,512
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **16 Claims**



1. In an optical waveguide overlap connector, the improvement comprising:
a pair of optical waveguides mounted in a pair of intermateable rigid connector bodies having identical mating faces which are provided with rigid grooves receiving therein said optical waveguides, said mating faces abuttingly cooperating to bring said grooves into mutual alignment enclosing said optical waveguides,
pads of resilient compressible material initially projecting from mounted positions recessed within said mating faces, said pads being provided with grooves which are colinear with the rigid grooves of said mating faces and which initially receive therein corresponding end portions of said optical waveguides, and
said pads being resiliently compressed together sealably surrounding said waveguide end portions upon cooperation of said mating faces, and said pads being yieldably compressed into enclosing relation with said end portions of said waveguides colinearally aligning the central axes thereof.

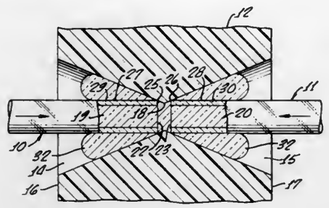
4,186,998
OPTICAL INTERCONNECTING DEVICE HAVING TAPERED SURFACES
Melvyn A. Holzman, Boulder, Colo., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.
Filed Jun. 14, 1978, Ser. No. 915,462
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **17 Claims**

9. An optical fiber connector comprising
a duality of optical fibers,
each of said optical fibers having a central core, a cladding around said core defining a cylindrical outer surface, a substantially flat end face perpendicular to the axis thereof, and a corner between said end face and said outer surface,
a member having an opening therethrough,
said opening having two outer ends, an intermediate portion of relatively small lateral dimension, and two axially

aligned tapered portions positioned one on either side of said intermediate portion,

each of said tapered portions being defined by a wall tapering inwardly toward said intermediate portion, said intermediate portion of said opening having a diameter which is less than that of said outer surfaces of said fibers and greater than that of said cores of said fibers,

means for engaging each of said optical fibers for pressing the



same axially into one of said ends of said openings so that said corner thereof engages

said wall of one of said tapered portions, for thereby causing said optical fibers to become axially aligned with said tapered portions and with each other, and positioning said end faces of said optical fibers opposite each other and closely spaced apart,

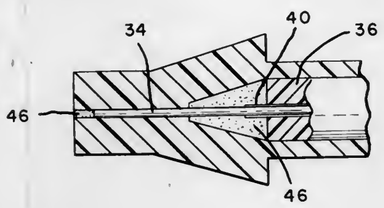
and an optical material in said opening filling the space between said end faces.

4,186,999

CONNECTOR FERRULE FOR TERMINATING OPTICAL FIBER CABLES

Robert G. Harwood, Mechanicsburg, and Terry P. Bowen, Etters, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 25, 1977, Ser. No. 844,869
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.21 **16 Claims**



1. An improved ferrule member for a fiber optics cable connector, each connector having a housing member with at least one ferrule receiving cavity therein and means to secure a ferrule member in each said cavity, said ferrule member comprising:

a body having a profiled passage extending therethrough from a cable receiving rear portion to a bore of sufficient size to allow only the passage of an unclad optical fiber core therethrough,

an optic cable having a light transmitting core projecting from a light refracting cladding,

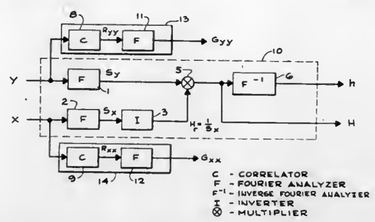
at least that portion of the ferrule body defining said passage being formed of a material having an index of refraction approximating that of said cladding and snuggly encircling said projecting core inserted in said passage.

4,187,000

ADDRESSABLE OPTICAL COMPUTER AND FILTER

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 587,323, Jun. 16, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 860,725
Int. Cl.² G06G 9/00
U.S. Cl. 350—162 SF **54 Claims**



1. A system for optical real time analog computation by manipulating optical signals in two spatial dimensions simultaneously, including in combination:

first and second terminal means for coupling beam signals, respectively, as inputs;

optical computation means;

first means for coupling said first terminal means to said computation means as an input;

second means for coupling said second terminal means to said computation means as an input;

said computation means having the outputs of said first and second coupling means as inputs and providing a mathematical relationship of its inputs, as an output,

said computation means including at least one spatial light modulator (SLM) for recording first input images and for reproducing output images when illuminated by second input images,

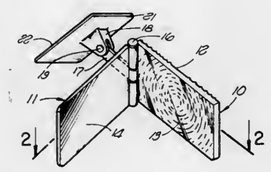
said SLM including a free carrier source for recording and reproducing optical images by forming charges in potential wells created by applying voltages to electrodes in said free carrier source.

4,187,001

VIEW EXPANDING APPARATUS

Robert F. Redwitz, S. Laguna, and William G. Baker, Rolling Hills Estates, both of Calif., assignors to Redwitz Baker Incorporated, Irvine, Calif.

Continuation-in-part of Ser. No. 758,216, Jan. 10, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 848,833
Int. Cl.² G02B 17/00
U.S. Cl. 350—202 **18 Claims**



1. A view expanding apparatus comprising:

a lens having a negative focal length for providing an expanded field of view,

a mirror secured to one edge of said lens and angularly displaced therefrom, said mirror having a reflecting surface for reflecting the expanded field of view,

arm members including means for mounting said apparatus on a surface, and

a pin, said lens, said mirror and said arm members being secured to said pin for pivoting relative to each other about said pin, said securing providing adjustability of said angular displacement.

5. A system for expanding the side and rear view of a vehicle driver comprising:

a lens having a negative focal length for providing an expanded side and rear view,

a mirror having a reflecting surface for reflecting the expanded view in the direction of the driver to enable the driver to observe the expanded view,

securing means for securing one edge of said lens to one edge of said mirror at an angular displacement therefrom,

arm members connected to said securing means for mounting said system to the interior of the windshield of the vehicle,

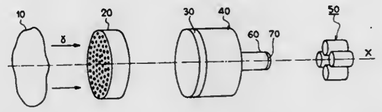
said securing means including pin means, said lens, said mirror and said arm members being secured to said pin means for pivoting relative to each other about said pin means, said securing providing adjustability of said angular displacement.

4,187,002

FILM FOR CORRECTING SPATIAL IRREGULARITY IN THE GAIN OF OPTICAL IMAGES OF INTENSIFIER TUBES

Guy Roziere, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 688,611, May 21, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,581
Claims priority, application France, May 21, 1975, 75 16406
Int. Cl.² G02B 5/22; H01J 31/50
U.S. Cl. 350—314 **9 Claims**



1. A film for correcting spatial irregularity in the gain of luminescent screen optical images, in combination with said screen in the path of the optical images from said screen, characterised in that said film surface is comprised of a plurality of elementary zones, each one of which exhibits a constant average transparency different from other zones and at least some of which are surrounded by other elementary zones and are made of opaque parts separated by transparent parts.

4,187,003

ELECTROLYTE FOR ELECTROCHROMIC DISPLAY DEVICE

Donald J. Barclay, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,399
Claims priority, application United Kingdom, Nov. 2, 1977, 45500/77
Int. Cl.² G02F 1/17, 1/23
U.S. Cl. 350—357 **7 Claims**

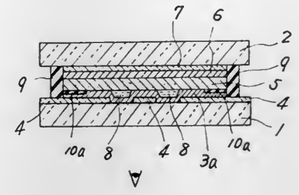
1. In an electrochromic display device which comprises a display electrode, an anode, and an aqueous electrolyte solution disposed therebetween which produces a display effect by electrodeposition of a colored species from the electrolyte onto the display electrode as a result of a redox reaction, the improvement according to which the electrolyte comprises an anion which is either hypophosphite or phosphite and a cation which has a bipyridinium structure.

4,187,004

NEGATIVE TYPE DISPLAY IN ELECTROCHROMIC DISPLAY DEVICE

Kohzo Yano, Tenri; Tadanori Hishida, Kashihara; Yasuhiko Inami, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1978, Ser. No. 872,315
Claims priority, application Japan, Jan. 28, 1977, 52-9055; Aug. 16, 1977, 52-99747
Int. Cl.² G02F 1/17
U.S. Cl. 350—357 **11 Claims**



1. A negative type electrochromic display cell comprising:

a front transparent substrate;

a transparent electrode means formed on said front transport substrate to provide a desired display configuration;

a first continuous electrochromic layer overlying said transparent electrode and formed on the portions of said front transparent substrate not having said transparent electrode means formed thereon;

a rear substrate;

a counter electrode formed on said rear substrate;

a second electrochromic layer formed on said counter electrode;

a background creating member disposed between said first and said second electrochromic layers, said background creating member exhibiting a color sensation which is different from the coloration state exhibited by said electrochromic layers; and

an electrolyte impregnated into said background creating member.

4,187,005

MICROSCOPE SUPPORT SYSTEM FOR USE IN EXAMINING EYES IN VIVO AND ENUCLEATED

Harold E. Rosenberger, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,231
Int. Cl.² A61B 3/00
U.S. Cl. 351—38 **8 Claims**

1. A system for supporting and positioning a microscope to permit both the examination of the cornea of an eye in vivo and the examination of an enucleated eye with the same optical and illumination systems, said optical system including a corneal contact element, said system comprising:

(a) a head rest mechanism for supporting and positioning a head to thereby position an eye in vivo in a fixed location;

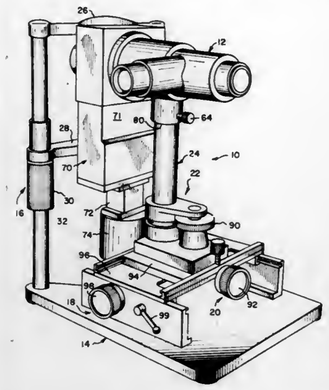
(b) a first means for supporting and positioning said microscope relative to said head rest mechanism, said first means including means for moving said microscope toward and away from said head rest mechanism to thereby permit said corneal contact element to be brought into and out of contact with the cornea of an eye in vivo;

(c) means for supporting an enucleated eye in a substantially horizontal plane;

(d) a second means for supporting and positioning said microscope relative to said enucleated eye support; and

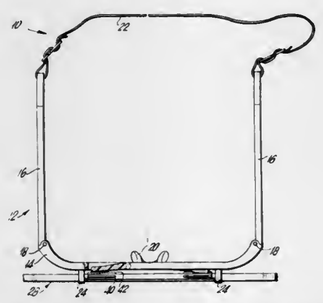
(e) means for varying the relative distance between said

microscope and said enucleated eye support to thereby permit said corneal contact element to be brought into and



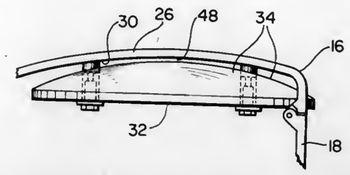
out of contact with the cornea of an enucleated eye for microscopic examination thereof.

4,187,006
FLIP-DOWN SUNGLASSES
Saul Neidell, Fairlawn, N.J., assignor to Premier Athletic Products Corp., East Rutherford, N.J.
Filed Jul. 26, 1978, Ser. No. 927,955
Int. Cl.² G02C *13/00*
U.S. Cl. 351—44 **7 Claims**



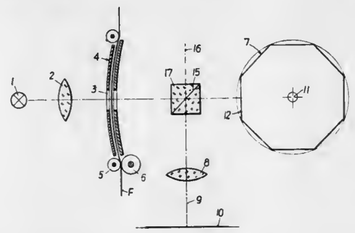
1. Sunglasses comprising a fixed part, means for attaching said fixed part to a wearer above said wearer's eyes, a moveable part pivotably joined to said fixed part, said moveable part including means for attenuating sunlight, said moveable part having a first position in which said sun attenuating means are positioned outwardly from said wearer so that said sun attenuating means are not positioned over the wearer's eyes, said moveable part having a second position in which said sun attenuating means are positioned over said wearer's eyes, said fixed part having at least one flexible arm disposed thereon, the longitudinal axis of said flexible arm extending parallel to the longitudinal axis of said fixed part, rib means disposed on at least one of said flexible arm and said moveable parts, and groove means for engagement with said rib means disposed on the other of said flexible arm and said moveable part, said rib and groove means releasably securing said moveable part of said first and said second positions.

4,187,007
EYEGLASS CONSTRUCTION
John R. Lauffer, Seekonk, Mass., assignor to Martin-Copeland Company, East Providence, R.I.
Filed Sep. 18, 1978, Ser. No. 944,659
Int. Cl.² G02C *1/04*
U.S. Cl. 351—108 **3 Claims**



1. An eyeglass construction including in combination a frame having a generally laterally extending eyebrow bar, at least one lens having a relatively pronounced convex curved outer face and a rear face having a peripheral edge defining a substantially flat plane, and means affixing said outer lens face to said bar at spaced portions adjacent the top peripheral edge of said lens so as to suspend said lens from said bar, said means comprising openings extending through said lens at said spaced portions, said openings extending substantially perpendicular to said rear flat plane, a pair of posts operatively associated with said bar and extending at least partially through said lens openings, a bushing mounted on each post and positioned between said brow bar and said other lens face, said bushing being of sufficient length so as to maintain the entire top peripheral portion of said outer lens face in spaced relation to said bar and at the same time maintain said rear flat plane in substantially straight downward disposition no matter what curvature exists in said outer lens face, and fastening means in engagement with the free ends of said posts.

4,187,008
PHOTOGRAPHING OR PLAYBACK-DEVICE
Eduard Keznickl, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria
Filed Mar. 12, 1979, Ser. No. 19,540
Claims priority, application Austria, Mar. 23, 1978, 2068/78
Int. Cl.² G03B *41/06*
U.S. Cl. 352—108 **5 Claims**



1. In a photographing- or playback- device for a continuous photo picture carrier which is moved along a guide track by means of a drive device, particularly for motion picture film, with an optical imaging system and at least one mirrored surface which is movable about a mirror axis, particularly a polygonal set of mirrors for the optical equalization of the image migration as well as a light source if necessary, the improvement further comprising

a partially-mirrored surface disposed in the optical path between the guide track of the picture carrier and the at least one mirrored surface, a ray axis being defined runing between the guide track and said at least one mirrored surface,

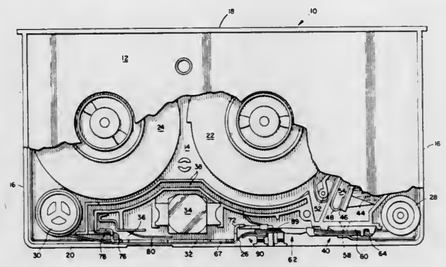
said partially-mirrored surface is inclined relative to the optical path and forms a part of an autocollimation system, the latter including the optical imaging system,

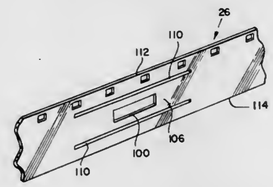
said partially-mirrored surface constituting means for deflecting a part of the rays,

the axis of the optical imaging system being transverse relative to the ray axis and running to, and respectively from, said partially-mirrored surface,

the mirror axis of the at least one mirrored surface being aligned with said ray axis.

4,187,009
SLIDE VALVE DISPLACING ARRANGEMENT FOR MULTIPURPOSE CASSETTE
Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 2, 1979, Ser. No. 157
Int. Cl.² G03C *11/00*
U.S. Cl. 352—130 **3 Claims**





1. A motion picture film handling cassette for use with other apparatus for first exposing a strip of photographic film material and then treating the film strip with processing fluid to develop viewable images on the film strip, said cassette comprising:

a strip of photographic material;

a housing for retaining said film strip, said housing including an opening for exposing progressive incremental sections of said film strip;

means responsive to drive means of said other apparatus for advancing said film strip in a given path within said housing, said given path traversing said opening;

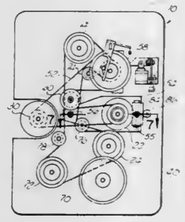
a pressure plate located within said housing at said opening, said pressure plate being configured to engage and support a length of one side of said film strip so as to support progressive incremental sections of said film strip passing thereby in a given focal plane;

film processing means for depositing a layer of processing fluid on said one side of said film strip following exposure thereof, including a nozzle opening configured for releasing said fluid;

selectively operable means for disabling said film processing means following deposit of said fluid layer, said means for disabling comprising a valve member configured for movement responsive to film strip advancement in a given direction between a first position along said film path at a location between said pressure plate and said nozzle opening and a second position wherein said valve is in blocking engagement with said nozzle opening, said valve including a pair of parallel spaced apart film strip guiding fingers located immediately adjacent the end of said pressure plate nearest said slide valve and configured to engage respectively the margins of the opposite side of said film strip from that engaged by said pressure plate, said spaced fingers being positioned with respect to said pressure plate so as to guide said film strip from said given focal plane defined by said pressure plate to a second plane substantially parallel to and spaced from said focal plane to thereby guide said film strip passing from said pressure plate, in said given direction, into engagement with said fingers through a substantially S-shaped path, said slide valve further including a third finger located between said spaced film guiding fingers and extending from said slide valve toward said pressure plate and lying in a plane intermediate said focal plane and said second plane defined by said guide fingers; and

said film strip being provided with an elongated aperture therein intermediate said film margins, said elongated aperture being at least as wide as said third finger carried by said slide valve, said film strip further including a pair of elongated through slits therein extending on opposite lateral sides of and beyond the longitudinal extremities of said centrally disposed aperture, said slits being spaced from one another a distance less than the spacing between said pair of parallel spaced film engaging fingers carried by said slide valve, said centrally disposed aperture and the accompanying film strip slits being positioned along the length of said film strip at a location such that said aperture will approach said S-shaped path substantially simultaneous with completion of deposition of processing fluid upon the usable length of film strip, said elongated slits resulting in the portion of said film strip lying between said slits, which portion includes said elongated aperture, following a substantially straight path from said focal plane to said second plane defined by said pair of spaced film guiding fingers of said slide valve thereby resulting in the engagement of said third finger with said film strip aperture as said film strip is advanced thereby and, further, wherein continued advancement of said film strip in said given direction will result in positive displacement of said slide valve to its said second position.

4,187,010
FRAME POSITIONING APPARATUS
Charles G. Ajar, 4265 Clybourn Ave., North Hollywood, Calif. 91602
Filed Sep. 30, 1977, Ser. No. 838,423
Int. Cl.² G03B *21/46*
U.S. Cl. 352—162 **3 Claims**



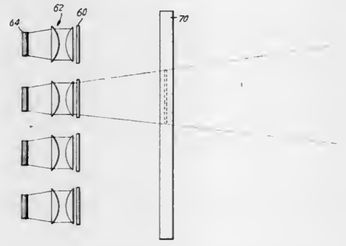
1. In a motion picture projector having a film gate, upper and lower sprockets relative to said film gate, a mechanism for intermittently pulling down said film through said gate and a means for having each film frame centered within said gate at the completion of each intermittent pull-down cycle, the improvement according to which said centering means comprises:

a plate having first and second opposite sides;
said intermittent pull-down mechanism having film engaging portions mounted on the first side of said plate and a first pulley connected thereto on the second side of said plate;
a belt for driving said first pulley;
a drive pulley located off one end of said plate for driving said belt;
a pivot for said plate aligned with and between said drive pulley and said first pulley; and
means for rotating said plate about said pivot so that said pull-down mechanism is moved relative to said gate whereby centering of said frames can be adjusted.

4,187,011
ARRANGEMENT FOR APPLYING CODED ILLUMINATED PATTERNS TO AN OBJECT

Paul L. Di Matteo, Melville; Joseph A. Ross, Fort Salonga; Howard K. Stern, Greenlawn, and Lawrence Waszak, Coram, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 608,265, Aug. 27, 1975. This application May 8, 1978, Ser. No. 903,769
Int. Cl.[2] G03B *21/02;* G01B *11/24*
U.S. Cl. 353—122 **12 Claims**



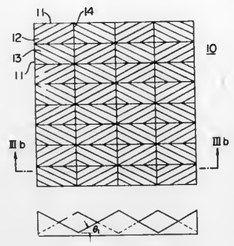
1. An arrangement for projecting a sequence of coded patterns onto an object surface, comprising: a plurality of stationary masks each carrying a predetermined coded pattern of at least one line for forming parallel bands to be projected in sequence, the coded pattern being projected onto the object surface by passing electromagnetic radiation through the mask; a plurality of sources of electromagnetic radiation for irradiating said masks, each mask having a separate associated source of electromagnetic radiation; and cylindrical projection lens means for defining sharply boarded lines between bands in substantially only one direction and being located between said mask and said object surface for receiving energy rays from said masks as selected in sequence by operating the source associated with the mask selected and projecting the energy rays from the masks onto said object surface; coded patterns being selectively projected in sequence onto said object surface by operating selectively in sequence said sources of electromagnetic radiation.

4,187,012
METHOD AND APPARATUS FOR EXPOSURE OF PHOSPHOR SCREEN

Takehiko Ueyama; Masahiro Nishizawa, both of Mobara; Eiichi Yamazaki, Ichihara, and Iwao Ogura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1978, Ser. No. 869,665
Claims priority, application Japan, Mar. 2, 1977, 52/21517
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—1 **14 Claims**

10. Exposure apparatus for forming a phosphor screen on the inner surface of a face plate of a color picture tube, comprising a single real linear light source disposed at a position spaced apart by a predetermined distance from the inner face of the face plate of the color picture tube while extending in parallel therewith, and a prism device disposed between said linear light source and the inner surface of said face plate, said prism device including a plurality of prisms closely arranged so as to constitute a means for causing said single linear real light

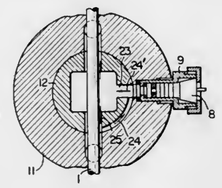


source to be observed as a plurality of virtual linear light sources from every point on said face plate, wherein said prisms are juxtaposed such that light-refracting surfaces of prisms, adjacent to each other in the direction of the length of said linear real light source, cross each other.

4,187,013
PHOSPHOR SCREEN EXPOSURE APPARATUS

Takasi Fujimura, and Syokichi Endo, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 710,306, Jul. 30, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,038
Claims priority, application Japan, Oct. 6, 1975, 50-11973375
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—1 **5 Claims**

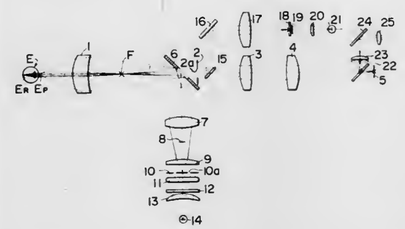


1. A phosphor screen exposure apparatus for color picture tubes containing a lamp housing, a light receiving system fitted in said lamp housing, an exposure object panel, a luminance correcting filter for correcting distribution of luminance on said panel, and a correction lens for aligning locus of a light emitted from said lamp housing with the actual path of an electron beam,
said lamp housing comprising:
a light source exposing a slurry coated on an inner surface of said exposure object panel through a shadow mask disposed near said inner surface of said panel;
a housing body portion holding said light source in place, said housing body portion including a space serving as a cooling water container, a first cooling water channel passing through said space and enclosing said light source therein for cooling said light source, a second cooling water channel connected between a portion of said first cooling water channel and said space, cooling water being adapted to flow in said first channel through said space and said second channel to cool said light source and said lamp housing;
a transparent upper plate transmitting light emanating from said light source toward said panel and making the cooling water container watertight; and
an opening provided to receive light emitted from said light source, said light receiving system being fitted in said opening;
said light receiving system comprising:
a light receiver receiving the light emanating from said light source and generating, in response thereto, a control signal which controls the brightness of said light source;
a light receiver holder holding said light receiver in a predetermined position in said light receiving system, said light receiver holder being disposed in said opening of said lamp housing;
a transparent water sealing plate for sealing water and transmitting part of said light toward said light receiver;
a pinhole plate provided between said transparent water sealing plate and said light receiver for passing a part of the light entering said sealing plate; and
a spectral filter, disposed between said pinhole plate and said light receiver, for selecting and transmitting light having a predetermined wavelength range;
said light receiver being disposed in a recess in said light receiver holder,
said light receiving system being adapted to be cooled via heat transmission from said light receiving system to said lamp housing,
said second cooling water channel serving to prevent retention of bubbles in front of said transparent water sealing plate, and
said cooling water between said transparent water sealing plate and said light serving to absorb heat ray components in the light emitted from said light source and entering said sealing plate.

4,187,014
EYE FUNDUS CAMERA

Yasuo Kato, and Kazuo Nunokawa, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1978, Ser. No. 873,719
Claims priority, application Japan, Jan. 29, 1977, 52-8900; Jun. 28, 1977, 52-77040
Int. Cl.[2] A61B *3/14;* G03B *29/00*
U.S. Cl. 354—62 **9 Claims**

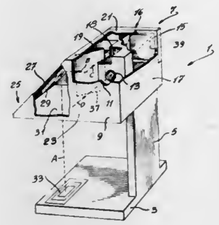


1. An eye fundus camera comprising a photographic optical system which includes at least an objective lens having an optical axis, an imaging lens and axially movable focusing means for adjusting the photographic optical system to obtain a desired focus condition; an eye fundus illuminating system including illuminating light source means directing light along an illuminating optical axis and an apertured reflecting means disposed in the optical axis of the objective lens in the photographic optical system for directing illuminating light from the illuminating optical axis to the objective lens so that the illuminating light is projected through the objective lens; and a focusing mark projecting system having an optical axis and which is separate from said illuminating optical axis including light splitting means provided behind the reflecting means adjacent to a position conjugate with an eye to be inspected with respect to the objective lens, mark projecting means for projecting a focusing mark along the optical axis of said mark projecting system through the light splitting means and the objective lens to the eye to be inspected, and means for interconnecting the mark projecting means with the focusing means so that focusing of the photographic optical system can be judged by the mark projected on the eye.

4,187,015
CAMERA SYSTEM

Barry Katsof, Montreal, and Joel Matlin, Dollard-des-Ormeaux, both of Canada, assignors to Camtron Electronics International Ltd., St. Laurent, Canada

Filed Nov. 18, 1977, Ser. No. 852,679
Int. Cl.[2] G03B *17/24*
U.S. Cl. 354—109 **24 Claims**



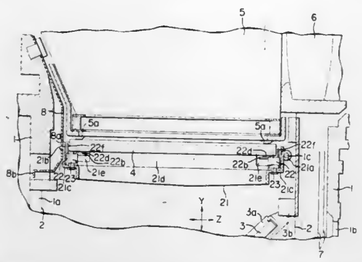
1. In a system for simultaneously photographically reproducing, on an instant film the images of two separate objects, a camera box comprising;
a first and second chamber disposed in side by side relationship within said camera box;
a first lens associated with said first chamber;
a second lens associated with said second chamber;
a first shutter associated with said first lens and having first adjustment means and first means operatively connected to said adjustment means of said first shutter;
a second shutter associated with said second lens and having second adjustment means and second means operatively connected to said adjustment means of said second shutter;
said first and second means being disposed to be readily accessible to an operator of said camera;
a first cable release mechanism associated with said first shutter, and a first cable operatively connected, at one end thereof, with said first release mechanism;
a second cable release mechanism associated with said second shutter, and a second cable operatively connected, at one end thereof, with said second release mechanism;
said first and second cables being connected, at the other ends thereof, to a single, common switch means;
whereby said first and second shutters can be opened and shut together and at the same time;
a front wall having an aperture therein in line with said first lens;
a back wall including means for mounting said instant film thereat;
a top wall and a bottom wall;
an extension housing extending outwardly from a side wall of said camera box and adjacent to an aperture therein;
said housing comprising;
a top wall extending at an angle to and downwardly with respect to the top wall of said camera box;
an aperture at the bottom surface of said housing;
a mirror on the inner surface of said top wall of said housing; and
a second mirror disposed in said camera box adjacent said second chamber and positioned to receive reflections from said first mirror and to direct them to said second lens.

4,187,016

VIEWFINDER FOCUSING SCREEN SUPPORTING APPARATUS FOR SINGLE-LENS REFLEX CAMERA

Sunao Ishizaka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,211
Claims priority, application Japan, Aug. 17, 1977, 52/109154[U]
Int. Cl.[2] G03B *13/00, 19/12*
U.S. Cl. 354—152 **2 Claims**



1. A viewfinder focusing screen supporting apparatus for a single-lens reflex camera comprising:
(a) a focusing screen support frame provided with resilient support means for resiliently supporting a viewfinder focusing screen, said support frame being rotatable in the body of said camera so as to allow replacement of said focusing screen through the front opening of the camera body;
(b) positioning means provided under a pentaroof prism; and
(c) engaging means provided on said support frame and said camera body for mutual integral engagement of the two, said engaging means being adapted to press said focusing screen against said positioning means and fix said focusing screen in this position upon engagement of said support frame with said camera body by said engaging means, wherein said focusing screen support frame is composed of four side walls adapted to surround the periphery of said focusing screen, shoulder portions extending inwardly from said side walls, and an opening provided in the vicinity of each end of two mutually facing walls of said four side walls and above said shoulder portions; and said resilient means is composed of two arcuate spring members of a projected length somewhat larger than the length of said side walls not provided with said openings, said spring members being secured approximately at the center portions thereof to said shoulder portions of said side walls not provided with said openings, said spring members being adapted for insertion at the end portions thereof into said openings and maintained in pressure contact with the upper sides of said openings by the resilient force of said spring members when said focusing screen is positioned against said positioning means.

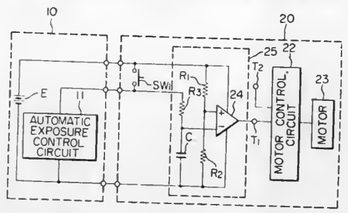
4,187,017

MOTOR DRIVE DEVICE IN A CAMERA

Sakuji Watanabe, Warabi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 956,901
Claims priority, application Japan, Nov. 11, 1977, 52/134703
Int. Cl.[2] G03B *1/00, 9/64*
U.S. Cl. 354—173 **4 Claims**

1. In a motor drive device capable of being coupled to a camera having an automatic exposure control circuit for determining the aperture value and/or the shutter speed during exposure in accordance with the brightness of an object to be photographed and wherein upon depression of a shutter release button provided on said device, a main switch for said automatic exposure control circuit and a second switch for supplying a photography signal to a control circuit for operating a motor for driving said camera are closed, the improvement comprising:
(a) delay circuit adapted to start operating upon closing of said main switch and generate a stability signal after the lapse of a predetermined time equal to the time equal to



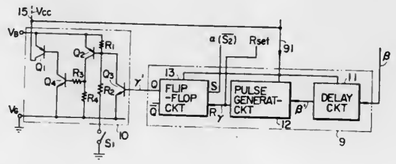
the time required for said automatic exposure control circuit to become stable in condition after being supplied with power; and
(b) means for operating said control circuit upon reception of both said stability signal and said photography signal.

4,187,018

AUTOMATIC CONTROL CIRCUIT SYSTEM FOR CAMERAS PROVIDED WITH A FOCAL-PLANE SHUTTER HAVING FRONT AND REAR SCREENS

Kenji Kanemaru, Chiryu, and Takashiroh Iwasaki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,197
Claims priority, application Japan, Jul. 18, 1977, 52-85061
Int. Cl.[2] G03B *7/08, 17/38*
U.S. Cl. 354—266 **5 Claims**



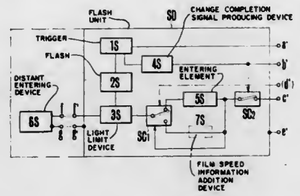
1. An automatic control circuit system for cameras provided with a focal-plane shutter having front and rear screens, and a two-step release switch comprising a first release switch serving when it is closed to supply a battery voltage into said automatic control circuit system via power switching means and a second release switch serving when it is closed to start the running of said rear screen after a lapse of time corresponding to a predetermined shutter speed, wherein said power switching means includes at least a semiconductor switching element having first and second electrodes and a control electrode, the electrical conduction and non-conduction between said first and second electrodes are controlled by electric signals applied to said control electrode, and said first and second electrodes are connected to a battery and a power supplying line in said automatic control circuit system, respectively, wherein said automatic control circuit system is provided with an electric signal holding circuit which is triggered with an electric signal generated by the closing action of said second release switch to hold an output terminal by an output signal which holds at said control electrode an electric signal which conducts electrically between said first and second electrode of said semiconductor switching element, and wherein said electric signal holding circuit is reversely triggered with an electric signal which is generated based on the closing of said second release switch when an instruction to start the running of said rear screen of said focal-plane shutter is given or after a predetermined period of time has elapsed after said instruction was given, to end the hold at said output terminal of said output signal,
characterized in that said control electrode of said semiconductor switching element is actuated by a closing action of said first release switch to conduct electrically between said first and second electrodes without any mechanical or electrical holding operations, so that said semiconductor switching element can end the supply of the supply voltage from said battery to said power supplying line according to the opening action of said first release switch before a closing action of said second release switch.

4,187,019

FLASH LIGHT PHOTOGRAPHIC SYSTEMS

Takashi Uchiyama, Yokohama; Zenzo Nakamura, Urawa; Tokuichi Tsunekawa, Yokohama; Masanori Uchidoi, Yokohama; Yukio Mashimo, Tokyo, and Shyohei Ohtaki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 625,711, Oct. 24, 1975, Pat. No. 4,078,242. This application Aug. 12, 1977, Ser. No. 824,102
Claims priority, application Japan, Oct. 29, 1974, 49-124612; Oct. 30, 1974, 49-125110
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.[2] G03B *7/16*
U.S. Cl. 354—33 **22 Claims**



1. A flash unit usable with either a first camera having a terminal for receiving a diaphragm aperture control signal from the flash unit and/or a second camera, which controls the amount of light emitted by the flash unit by applying a signal corresponding to a preset diaphragm aperture value into flash unit, said unit comprising:
(a) flash means for generating a flash of light;
(b) diaphragm aperture control signal forming circuit to form a diaphragm aperture control signal corresponding to a diaphragm aperture value suitable for flash photography,
(c) a light emission control circuit coupled to said flash means for controlling the amount of light emitted by said flash means,
(d) a diaphragm aperture information input means coupled to said light emission control circuit for inputting a signal corresponding to the diaphragm aperture value preset into the second camera to set a diaphragm aperture value information into said light emission control circuit,
(e) a signal transmission circuit for outputting the diaphragm aperture control signal from the flash unit and for inputting said signal corresponding to a preset diaphragm aperture value selectively, said signal transmission circuit including switching means for alternately selecting said diaphragm aperture control signal forming circuit or said diaphragm aperture information input means so that when diaphragm aperture control signal forming circuit is selected by the switching means, a signal corresponding to a diaphragm aperture value is outputted from the signal transmission circuit to the first camera so as to allow a flash photography with the first camera and when the diaphragm aperture information input means is selected by switching means, a preset diaphragm aperture value information is set to the light emission control circuit so as to allow a flash photography with the second camera.

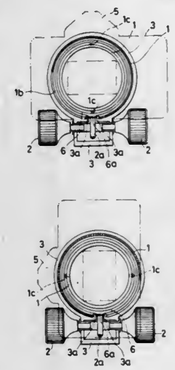
7. A flash unit according to claim 1, in which said second camera includes a light measuring circuit for producing an output corresponding to the intensity of light to be photographed and shutter time control circuit for controlling the shutter time based on the output of said light measuring circuit, said shutter time control circuit including shutter time regulating circuit for regulating the shutter time suitable for flash photography when the shutter time corresponding to the output of said light measuring circuit is not suitable for flash light photography.

4,187,020

TRIPOD RACK AND PINION FOCUSSING MECHANISM ROTATABLE RELATIVE TO LENS

Tadayoshi Ishii, Hannou; Zenichi Okura, Omiya, and Takeshi Machida, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,206
Claims priority, application Japan, Oct. 15, 1977, 52/123927
Int. Cl.[2] G03B *3/00, 17/00*
U.S. Cl. 354—195 **4 Claims**



1. In a rack and pinion type focussing mechanism for a camera, a lens having a tripod mounting seat, the improvement comprising; focussing operational means disposed on said tripod mounting seat rotatable with respect to the lens around the optical axis of the lens.

4,187,021

ADJUSTABLE FLASH BRACKET

John L. Balser, 413 New York Ave., McComb City, Pike County, Miss. 39648

Filed Jun. 28, 1978, Ser. No. 919,817
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—293 **19 Claims**

1. A flash bracket for a camera comprising:
an elongated base frame having a longitudinal axis;
first and second elongated handle members mounted on opposite ends of said elongated base frame and having parallel axes in a common plane with and oriented perpendicular to the longitudinal axis of said base frame;
a camera connection and support means on said elongated base frame intermediate said first and second elongated handle members for supporting a camera attached thereto;
a flash support head for releasably supporting a flash unit; and
selectively positionable support means for said flash support head including:
swing linkage means extending between said first elongated handle means and said flash support head for permitting selective positioning of said flash support

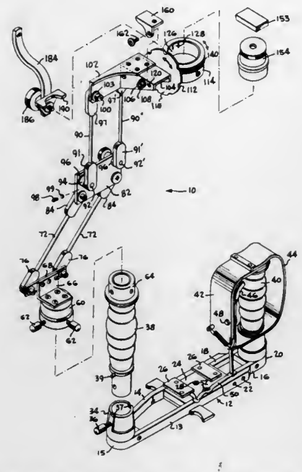
head in a swing plane parallel to the plane in which the axes of said first and second elongated handle means are located;

head tilt pivot means for permitting said flash support head to be selectively rotated about a tilt axis in a plane parallel to said swing plane to a desired tilt position;

releasable means for maintaining said flash support head in said desired tilt position; and

wherein said swing linkage means includes:

an inner pair of parallel swing links pivotally connected



on one end to the upper end of said first elongated handle means for pivotal movement about spaced parallel pivot axes;

a swing plate pivotally connected to the opposite ends of said inner pair of parallel swing links;

an outer pair of swing links pivotally connected at one end to said swing plate for pivotal movement about spaced parallel pivot axes; and

a carrier bracket pivotally connected to the opposite end of said outer pair of parallel swing links, said head tilt pivot means being mounted on said carrier bracket.

4,187,022

APPARATUS FOR TRANSPORTING WEBS OF PHOTOSENSITIVE MATERIAL

Karl Walter, Penzberg, Fed. Rep. of Germany, assignor to Labortechnik M. R. Walter, Penzberg, Fed. Rep. of Germany

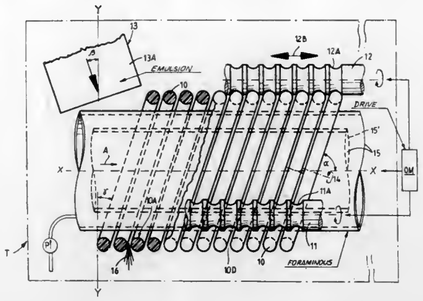
Filed Feb. 5, 1979, Ser. No. 9,513

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804724

Int. Cl.² G03D *5/06*

U.S. Cl. 354—318 **13 Claims**

1. Apparatus for transporting webs of photosensitive material along a helical path, comprising a plurality of parallel ring-shaped advancing elements disposed in planes making acute angles with the axis of said path and having inner surfaces adjacent to said path; and means for rotating said elements about their respective axes in a predetermined direction



so that a web whose leader is introduced into said path is engaged and entrained by said inner surfaces.

4,187,023

APPARATUS FOR WET TREATMENT OF RUNNING WEBS OF PHOTOGRAPHIC MATERIAL

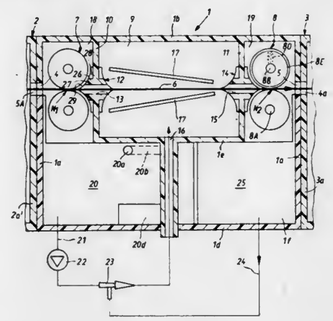
Helmut Schausberger, Unterhaching, and Rudolf Brunner, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 919,271

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2731045

Int. Cl.² G03D *3/02*

U.S. Cl. 354—321 **28 Claims**



1. Apparatus for wet treatment of webs of photographic material, comprising a housing having an inlet and an outlet, said housing including spaced-apart first and second internal partitions which divide the interior of said housing into a processing chamber between said partitions, a first compartment between said inlet and said first partition, and a second compartment between said second partition and said outlet; a source of processing liquid; means for supplying liquid from said source to said chamber and for maintaining a body of the liquid in said chamber at a predetermined level; means for passing webs of photographic material between said compartments and said chamber through said first and second partitions, including first and second flow restrictors respectively having aligned substantially horizontal first and second slots communicatively connecting said chamber with the corresponding compartments below said predetermined level and having such dimensions as to permit the webs to pass therethrough without hindrance and to restrict the outflow of the liquid therethrough from said chamber into said compartments to a minimum; and means for transporting webs of photographic material from said inlet to said outlet via said first and

second slots and through said body of liquid below said predetermined level, including a first pair of horizontal advancing rolls installed in said first compartment and having a nip adjacent to said first slot and a second pair of advancing rolls installed in said second compartment and having a nip adjacent to said second slot.

4,187,024

ELECTROSTATIC COPYING MACHINE

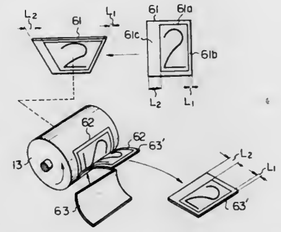
Toyokazu Satomi; Yutaka Koizumi; Isao Nakamura; Yasuhiro Tabata, and Tamaki Kaneko, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 7, 1978, Ser. No. 884,137

Claims priority, application Japan, Mar. 9, 1977, 52-25769; Apr. 6, 1977, 52-39190

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 R **12 Claims**



1. An electrostatic copying machine comprising:

a moving photoconductive member;

imaging means for forming first and second toner images of first and second original documents respectively on the photoconductive member;

transfer means for moving a copy sheet into engagement with the photoconductive member to transfer the first and second toner images onto first and second sides of the copy sheet respectively; and

control means for controlling the imaging means and transfer means so that the first and second toner images are superposed on the copy sheet in such a manner that the centers of the toner images on the opposite sides of the copy sheet are coincident with each other, the first and second toner images being offset from a center of the copy sheet.

4,187,025

DEVICE FOR PRODUCING A LIGHT SIGNAL CORRESPONDING TO THE REFRACTIVE INDEX OF A FLUID

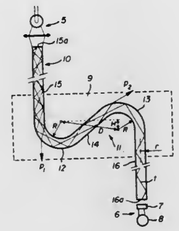
Alan L. Harmer, Geneva, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 28, 1978, Ser. No. 919,981

Claims priority, application Switzerland, Jul. 1, 1977, 8105/77

Int. Cl.² G01N *21/46*

U.S. Cl. 356—133 **11 Claims**



1. A device for producing a light signal corresponding to the refractive index of a fluid, comprising an elongated light-conducting body consisting of an input section and an output section connected to each other by an intermediate curved section adapted for immersion in said fluid, so that when light is injected into the free end of said input section, the passage of light by refraction into said fluid is a function of the refractive index of said fluid and the light emerging at the free end of said output section provides a light signal corresponding to the refractive index of said fluid, said device being characterized in that said intermediate curved section has a profile comprising a plurality of curvatures arranged successively so as to be alternately bent in opposite directions to one another, whereby said curvatures together provide passage by refraction into said fluid of an amount of light which varies as a function of the refractive index of said fluid, this variation being notably higher than can be obtained with a curved section bent in a single direction, to thereby provide said light signal with a high sensitivity.

4,187,026

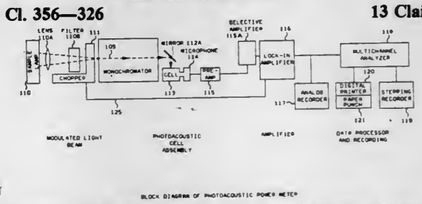
PHOTOACOUSTIC METHOD AND APPARATUS FOR MEASURING INTENSITY OF ELECTROMAGNETIC RADIATION

Arnold M. Schaffer, and John A. Favre, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1977, Ser. No. 838,030

Int. Cl.² G01J *3/28*

U.S. Cl. 356—326 **13 Claims**



BLOCK DIAGRAM OF PHOTOACOUSTIC POWER METER

1. A method of measuring the intensity of a beam of electromagnetic radiation, said method comprising:

(a) passing said beam of electromagnetic radiation into a monochromator and into a chopper in either possible order, thereby producing a periodically pulsed monochromatic beam of electromagnetic radiation having a chopping frequency f;

(b) passing said periodically pulsed monochromatic beam of electromagnetic radiation into a cell which contains carbon black and a gas, at least one wall of said cell being made of a material which transmits electromagnetic radiation substantially independently of wavelength of incident electromagnetic radiation, and said pulsed monochromatic beam of electromagnetic radiation being directed so that it impinges upon said carbon black, thereby producing changes in pressure of said gas located within said cell;

(c) detecting said changes in pressure of said gas located within said cell with a microphone which operates in cooperation with said cell and which has a diaphragm that forms a flexible wall of said cell, said microphone producing electrical signals which are representative of said changes in pressure of said gas located within said cell, each of said electrical signals having a component which is out of phase with said pulsed monochromatic beam of electromagnetic radiation and having a component which is in phase with said pulsed monochromatic beam of electromagnetic radiation;

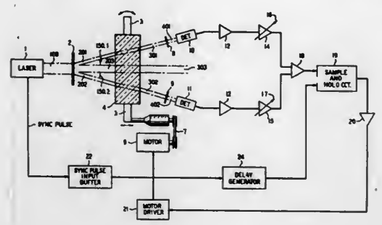
(d) amplifying said component which is in phase with said pulsed monochromatic beam of electromagnetic radiation with use of a lock-in amplifier which is locked in to the chopping frequency f, thereby producing an amplified signal; and

(e) recording said amplified signal,

said carbon black being such that it has a specific surface

area (SSA, which is measured in M^2/g per CTAB absorption test) within the range from about 20 to about 700 m^2/g.

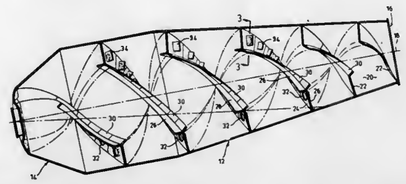
4,187,027
SERVO-CONTROL ALIGNMENT OF NONLINEAR CRYSTALS
Gary C. Bjorklund, West Windsor, and Ralph H. Storz, Freehold, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 20, 1978, Ser. No. 898,371
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—400 **5 Claims**



1. Apparatus for servo-locking the angular orientation of a nonlinear crystal having a front surface and a back surface with respect to the direction of an input laser beam comprising:
means disposed adjacent to said first surface of said nonlinear crystal, for splitting said input laser beam into a main beam traveling in substantially the same direction as said input laser beam, a first secondary beam disposed at a first angle relative to the direction of said main beam and a second secondary beam disposed at a second angle relative to the direction of said main beam and on the opposite side of said main beam from said first secondary beam, said first angle being substantially equal to said second angle;
means for supporting said nonlinear crystal in a rotatable mounting in such a manner that said first secondary beam, said second secondary beam, and said main beam all pass through said nonlinear crystal to form a first secondary output beam from said first secondary beam, a second secondary output beam from said second secondary beam and a main output beam from said main beam so that said first secondary output beam, said second secondary output beam, and said main output beam all contain a further frequency component produced by the nonlinear optical mixing process in said nonlinear crystal;
a first radiation detector means for generating a first electric signal in response to the intensity of said further frequency component of said first secondary output beam;
a second radiation detector means for generating a second electric signal in response to the intensity of said further frequency component of said second secondary output beam;
means for producing a discrimination signal in response to the difference between said first electric signal and said second electric signal; and
means for rotating said rotatable mounting in response to said discrimination signal.

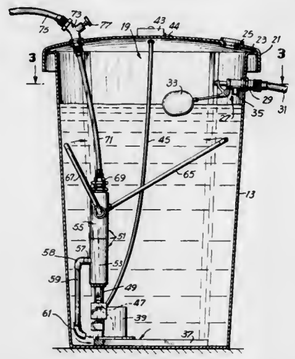
4,187,028
MIXING BLADE FOR CONCRETE MIXER
Jess W. Pawley, London, Canada, assignor to London Concrete Machinery Co., London, Canada
Filed Nov. 6, 1978, Ser. No. 957,936
Int. Cl.[2] B28C *5/18, 7/16*
U.S. Cl. 366—44 **5 Claims**

1. In a rotary concrete mixing drum mounted for rotation about a rotary axis, said mixing drum having a mixing chamber formed therein, said mixing chamber having a head end and a discharge end arranged opposite one another, a mixing blade disposed within said mixing chamber, said mixing blade having a mixing face directed toward said head end to establish a fluid flow in a direction toward said head end of said chamber in response to rotation of said blades in a mixing direction about said rotary axis and a discharge face directed toward the discharge end of said mixing drum to establish a fluid flow in a direction toward said discharge end of said chamber in response to rotation in said discharge direction, the improvement of;
(a) a plurality of mixing passages opening through said mixing blade between said mixing face and said discharge face



whereby wet concrete will pass through said mixing passages from said mixing face to said discharge face in response to rotation of said drum in said mixing direction and thereby establish turbulence in the mixing chamber,
(b) a deflector blade mounted on said discharge face of said mixing blade in advance of each mixing passage in the discharge direction, said deflector blade being adapted to deflect the flow of wet concrete away from its associated mixing passage to permit discharge of wet concrete from said discharge end in response to rotation in said discharge direction.

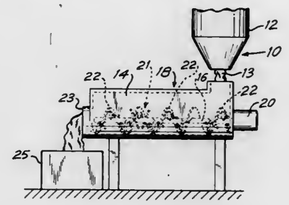
4,187,029
APPARATUS AND METHOD FOR PREPARING LITHOGRAPHIC FOUNTAIN SOLUTION
Ralph D. Canale, 11-09 43rd Rd., Long Island City, N.Y. 11101, and Albert S. Canale, 226-27 B Kingsbury Ave., Bayside, N.Y. 11364
Filed Aug. 8, 1978, Ser. No. 931,988
Int. Cl.[2] B01F *3/12, 13/00, 15/02*
U.S. Cl. 366—153 **14 Claims**



1. An apparatus for agitating and circulating a fountain solution for lithographic printing operations comprising:
a container for said solution, said container having a depth,
suction pump means for drawing said solution from the bottom of said container,
said suction pump having a discharge outlet through which solution is pumped after it is drawn into said pump means;
manifold means, operatively connected with the discharge outlet of said pump means, for receiving solution from said pump means,

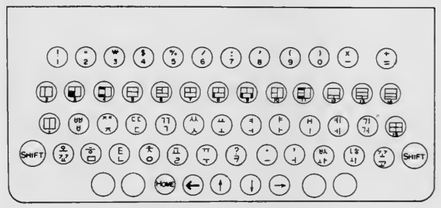
said manifold means provided with a plurality of outlet means for discharging solution drawn by said suction pump means, out of said manifold means;
arm means operatively associated with said outlet means for directing solution discharged through said manifold outlet means into said container at at least two different depths within said container, and oriented to form a circulating pattern for said solution in said container thereby to mix and agitate said solution in said container.

4,187,030
MIXER-AUGER MECHANISM FOR XEROGRAPHIC DEVELOPER COMPOSITIONS
William P. Godley, Sandy Hook, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Dec. 20, 1978, Ser. No. 971,203
Int. Cl.[2] B01F *7/08*
U.S. Cl. 366—319 **7 Claims**



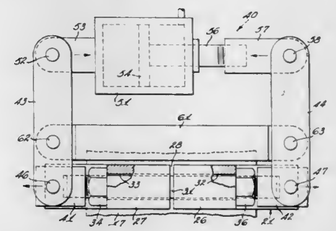
1. In a xerographic copying machine in which a toner developer composition is to be mixed and conveyed to a central point, the improvement in the means for mixing and conveying said toner, comprising:
a shaft;
a plurality of fin sections defining a helical conveyer structure, each fin section including a hub member having key means whereby said plurality of fin sections can be linked longitudinally with respect to said shaft, said fin sections having spaced bypass openings therein, and at least one of said sections having paddles or fins extending angularly from one side of said openings so as to produce thorough mixing of said toner and another of said fin sections including primary fins which are wound in a first helical direction and secondary fins which extend in a reverse helical direction through said bypass openings.

4,187,031
KOREAN (HANGUL) ELECTRONIC TYPEWRITER AND COMMUNICATION EQUIPMENT SYSTEM
Chan H. Yeh, 532 Mercury Dr., Sunnyvale, Calif. 94086
Filed Mar. 13, 1978, Ser. No. 885,571
Int. Cl.[2] B41J *3/10, 3/46, 5/10*
U.S. Cl. 400—83 **4 Claims**



1. A Korean language typewriter system for reproducing Korean words, comprising a keyboard means having keys corresponding to each of the arrangements in which Korean alphabet elements are arranged into words and means connected to the respective keys for generating a binary number signal corresponding to a respective one of said arrangements when the corresponding key is actuated, further keys for each of the plurality of alphabet elements of the Korean alphabet and means connected to the respective further keys for generating a binary number signal corresponding to a respective one of said alphabet elements when the corresponding further key is actuated; storage means for storing sets of hexadecimal numbers each representing an elementary alphabet element on a matrix of a predetermined size; computer means connected between said signal generating means and said storage means and having a display means for displaying a word arrangement pattern of spaces corresponding to one of the arrangements of Korean alphabet elements into words in response to a binary number signal for such a word arrangement from said keyboard means and for retrieving stored sets of hexademical numbers respresenating alphabet elements in response to binary number signals for such elements to fill the spaces in said word arrangement pattern from said keyboard means, changing the size of the matrix pattern of the retrieved sets of hexadecimal numbers for causing the matrix patterns to fit in the corresponding spaces in the word arrangement pattern and then displaying the matrix patterns in the spaces in the sequence in which the binary number signals for the alphabet elements are received from said keyboard means; and matrix printer means connected to said computer means for printing out only the said matrix patterns for the alphabet elements arranged in the word arrangement pattern of spaces for representing a Korean word.

4,187,032
HYDRAULIC PRESTRESSING DEVICE FOR SHEAR LEVER BOLTS
Thomas R. Schucker, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Oct. 20, 1978, Ser. No. 952,997
Int. Cl.[2] F16D *1/00;* **F16L** *17/00, 29/00*
U.S. Cl. 403—15 **2 Claims**



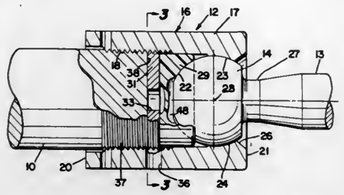
1. A prestressing device for a threaded clamping bolt utilized to frictionally clamp a first operating member to a second operating member;
a clamp bolt extending through the first operating member;
lever means pivotally connected to the extending ends of said clamp bolt;
a fulcrum bar interconnected between said lever means;
a pressure fluid operator means interconnected between said lever means and operable when energized to move said lever means on said fulcrum bar to effect prestressing of said clamp bolt; and,
means on said clamp bolt engageable with the first operating means to effectively clamp said first operating member to the second operating means after said pressure fluid operator is deenergized.

4,187,033

VARIABLY PRELOADED BALL JOINT ASSEMBLY

Leonard J. Zukowski, Sterling Heights, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 16, 1977, Ser. No. 833,739
Int. Cl.² F16D *1/12*; F16C *11/06*
U.S. Cl. 403—137 **23 Claims**



1. An apparatus for connecting a drive member and a tie rod member in a dirigible wheel steering system comprising a ball stud formed with a ball end, a socket assembly including a tubular housing having an internal thread extending inwardly from one end and adapted to have one of said members threaded therein, said tubular housing enclosing said ball end at its other end, said socket assembly providing a pair of opposed bearing surfaces engaging opposite hemispheres of said ball end and journaling said ball stud for tilting and rotational movement with respect to said socket assembly, a disc forming part of said socket assembly threaded into said internal thread, high rate spring means operable between said disc and at least one of said bearing surfaces, said disc being threaded to a preload position in which it preloads said spring means and is locked in said position, said spring means causing said bearing surfaces to be resiliently biased against said ball end with a predetermined preload force due to preloading by said disc, the threaded connection between said disc and said internal thread being sufficiently strong to maintain said preload but insufficiently strong to safely support loads applied to said one bearing surface, said ball and socket assembly being installed in the steering system by threading said internal thread over the threaded end on one of said members until said threaded end engages said disc, said threaded end providing sufficient support for said disc when installed to safely support the loads applied to said one bearing surface during the use, and said internal thread and threads on said disc providing sufficiently small clearance in relation to the spring rate of said spring means to prevent the preloading force on said bearing surface from being excessively increased when said socket assembly is threaded onto said one member.

4,187,034

RIGID JOINT ASSEMBLY

Richard Dziewolski, 8 Bis rue Jules Ferry, 92100 Boulogne, France

Filed Apr. 29, 1977, Ser. No. 792,127
Claims priority, application France, May 5, 1976, 76 13324; May 20, 1976, 76 15290; Jul. 28, 1976, 76 22925
Int. Cl.² F16D *1/00, 3/00*; F16G *11/00*
U.S. Cl. 403—217 **4 Claims**

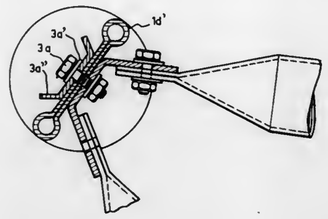
1. A structural joint comprising, in combination:

(a) first and second longitudinal metallic tubular members of generally circular cross section, arranged in coaxial, longitudinally abutting relationship, adjacent end portions of said longitudinal tubular members being flattened over a predetermined length into a configuration in which they jointly define two flat, mutually spaced, external longitudinal wall portions which are parallel to each other and are parallel and symmetrical with respect to the common geometrical axis of said longitudinal tubular members;

(b) an external butt-strap member having a flat wall portion placed in engagement with one of said flat wall portions of the longitudinal members over at least a major portion of said predetermined length thereof;

(c) a connecting member having a central flat wall portion engaging the other of said flat wall portions of the longitudinal members over a major portion of the length thereof, and having two lateral flat wall portions each forming a predetermined dihedral angle with said central wall portion;

(d) an internal butt-strap member, at least a major portion of which is received in the space between said flat wall portions of the longitudinal members, and which extends over at least a major portion of said predetermined length thereof;



(e) first connecting means rigidly interconnecting said flat wall portions of the longitudinal tubular members, said external butt-strap member, said internal butt-strap member, and said connecting member along said predetermined length;

(f) at least two further tubular members of generally circular cross section having each a flattened end portion containing the geometrical axis of the related one of said further members and symmetrical to said axis of the related further member; and

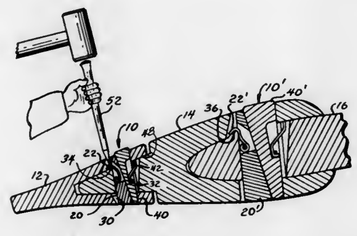
(g) second connecting means rigidly securing the flattened end portions of said further members to at least one of said lateral flat wall portions of said connecting member.

4,187,035

KEEPER PIN SYSTEM FOR SHOVEL TEETH

Edward N. Colburn, 5312 Vincent Ave. South, Minneapolis, Minn. 55410

Filed Feb. 14, 1979, Ser. No. 12,011
Int. Cl.² B25G *3/00*; F16B *3/00*
U.S. Cl. 403—318 **9 Claims**



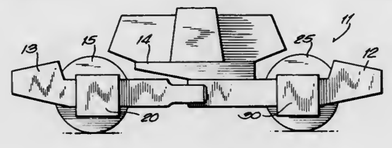
1. A keeper pin locking system for positively retaining a replaceable excavator tooth member having a tapered female internal contact surface in firm locking engagement with a complementary tapered male external contact surface on a tooth supporting base member comprising a pair of first and second wedge members which are adapted, respectively, to engage each other and portions of one of the opposite sides of vertically aligned transverse apertures formed through said tooth member and base member in the region of said complementary tapered internal and external contact surfaces; retaining means on each of said pair of wedge members which extend beyond the wedge surfaces in the longitudinal direction of the tooth member; said retaining means being adapted to engage retaining portions on said tooth or on said tooth supporting base member; said retaining means being engageable with said retaining portions when said wedge members are in contacting overlying relationship with each other to prevent the removal of said wedge members from said transverse apertures.

4,187,036

VIBRATION CONTROL FOR ASPHALT ROADWAY COMPACTOR

Edwin J. Haker, Elm Grove; Charles F. Riddle, Brookfield, and Ralph F. Bielinski, South Milwaukee, all of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Sep. 7, 1978, Ser. No. 940,416
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **5 Claims**



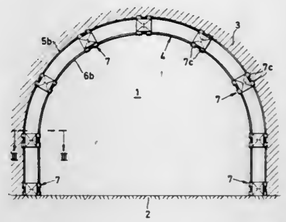
5. A self-propelled dual vibratory roll roadway compactor having a single lever control which initiates travel in a forward or reverse direction and thereupon through an electrical system initiates the desired vibration of the two rolls, each roll having a drive motor and a motor which effects such vibration, said control being connected to said motors to control their operation as aforesaid; said electrical system including (1) a speed control for each motor which determines the frequency level of roll vibration in response to a control voltage, sources of control voltages including at least one adjustable control voltage and a voltage providing a zero frequency level, that is no vibration, (2) first and second sets of switches operated by said lever, the first set being closed by lever control movement which initiates forward travel of the machine and the second set being closed by movement of the lever control which initiates reverse travel of the machine, and (3) a mode control switch having means selectively connecting selected voltage sources with said speed controls through said first set of switches whereby the forward and rear rolls are vibrated respectively at selected levels when the machine travels forwardly, said mode control switch also having means connecting selected voltage sources with said speed controls through said second set of switches whereby the rear and forward rolls are vibrated respectively at selected levels when the machine travels rearwardly, said means including a reversing switch connected to said other switches to reverse said connections whereby the rear and forward rolls are vibrated respectively at said first mentioned selected levels when the machine travels rearwardly and the forward and rear rolls are vibrated respectively at the second mentioned selected levels when the machine travels forwardly.

4,187,037

WALL SUPPORTING ARRANGEMENT, ESPECIALLY FOR SUPPORTING MINE GALLERY WALLS

Rudolf Seiz, H. Rainer Str. 10, 8036 Herrsching (Ammersee), Fed. Rep. of Germany, and Lothar Sebastian, Essen, Fed. Rep. of Germany, assignors to Rudolf Seiz, Herrschin, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,568
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709242; Sep. 10, 1977, 2740908
Int. Cl.² E21D *11/00*
U.S. Cl. 405—150 **27 Claims**



1. A wall supporting arrangement, especially for supporting mine gallery walls, comprising

a supporting frame for a wall and including at least two frame elements spaced from one another in a direction transverse to the direction of elongation of the wall; and

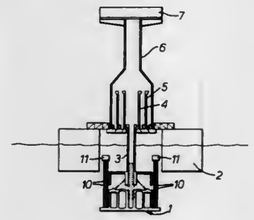
connecting means including a plurality of shape-retaining shell-shaped connecting elements distributed along said frame elments, each of said connecting elements including at least two shape-retaining shell portions each having two side edges facing away from the side edges of the other shell portion and connected with at least one of the frame elements, and a bottom wall facing toward and connected with the bottom wall of the other shell portion in the region which is located substantially centrally between said frame elements so that the latter are connected with one another in spatially fixed relationship and rigidly, both in the direction of elongation of the wall and in the transverse direction.

4,187,038

EQUIPMENT FOR EXTRACTING OIL OR GAS FROM UNDER THE SEA BED AND METHOD OF INSTALLING SUCH EQUIPMENT

Reginald S. Taylor, Gerrards Cross, England, assignor to Taylor Woodrow Construction Limited, Middlesex, England

Filed Aug. 29, 1977, Ser. No. 828,864
Claims priority, application United Kingdom, Aug. 27, 1976, 35844/76
Int. Cl.² E02D *25/00*
U.S. Cl. 405—204 **15 Claims**



1. A method of providing an installation for extracting oil or gas from under the sea bed at a deep water site, which installa-

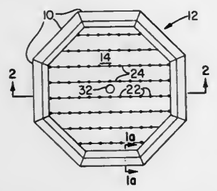
tion comprises a base structure anchored to the sea bed so as to be below the surface and a column which extends from the base structure to above the surface, the column being in the form of a hollow pre-stressed concrete tube for accommodating conductors for oil or gas extending from the sea bed, through the base structure and the column to above the surface, the method comprising constructing at a dry or relatively shallow water site the base structure and at least two elongate hollow pre-stressed concrete column sections arranged telescopically one within the other and providing the base structure and the column sections with sufficient buoyancy for them to float; floating and transporting the base structure and the column sections to a deep water site; and sinking the base structure and in upright position one or more of the column sections successively relative to the column section that is next above it; joining the column sections to each other and to the base structure if not already so joined to form a column connected to the base structure, the joint between each two adjacent column sections comprising overlapping portions of these two sections defining an annular gap which is filled with fast setting cementacious material while the joint is still above the water level.

4,187,039

METHOD AND APPARATUS FOR CONSTRUCTING AND MAINTAINING AN OFFSHORE ICE ISLAND

Hans O. Jahns, and Newton K. Maer, Jr., both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Sep. 5, 1978, Ser. No. 939,538
Int. Cl.² E02B *17/00*; E02D *23/16*
U.S. Cl. 405—217 **22 Claims**



1. An apparatus for constructing an offshore ice island in an Arctic environment comprising:

a plurality of caissons, having a top and bottom, adapted to be submerged to the bottom of a body of water and arranged in a ring configuration defining an enclosure for maintaining a body of water therein, and

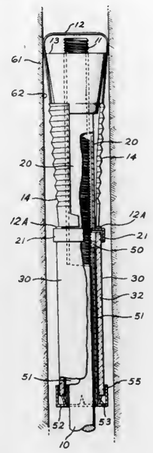
means for passively extracting heat from the water within said enclosure and soil below said caissons wherein said passive heat extracting means is located within said enclosure extending substantially to the soil below said enclosure and said passive heat extracting means is located within said caissons extending from the top of said caissons through the bottom of said caissons and into the soil below said caissons such that said passive heat extracting means accelerates the freezing of the water within the enclosure and the soil below said caissons in a unitary manner forming a mass of frozen material having a frozen soil ring below said island which improves the lateral stability of said island.

4,187,040

MINE ROOF BOLT SPIKE CHEMICAL DISPENSER ASSEMBLY

David C. Donan, Jr., Hopkins County, Ky., assignor to Waiamea Company, Inc., Manitou, Ky.

Filed May 31, 1978, Ser. No. 911,225
Int. Cl.² E21D *21/00*
U.S. Cl. 405—259 **9 Claims**



1. In combination with an expansion type mine roof bolt assembly, including a roof bolt having a stem, a roof bolt base plate, and a roof bolt expansion shell unit adapted for selective engagement with a roof bolt hole drilled in a mine roof, a chemical dispenser assembly comprising:

a. a base flange unit which is supported from the threaded upper part of the stem of the mine roof bolt;

b. a chemical container inserted down over the stem of the roof bolt and placed in position on top of the base flange unit, the container having a cavity for storage of chemicals,

c. a pressure sleeve unit which is slipped over the upper threaded portion of the roof bolt stem so that it may slide freely along the roof bolt stem, and being in a selective relationship between the roof bolt expansion shell assembly and the top of the chemical container, whereby upon tightening the roof bolt the pressure sleeve transmits a rupture force to the chemical container to cause the contents of the container to be expelled into the roof bolt hole.

4,187,041

METHOD FOR CONSOLIDATING A BODY OF EARTH

Per Boman, Täby, and Bengt Broms, Vällingby, both of Sweden, assignors to Linden-Alimak A.B., Skellefteå, Sweden

Continuation of Ser. No. 637,169, Dec. 3, 1975, abandoned. This application Jan. 18, 1979, Ser. No. 4,344
Int. Cl.² E02D *3/14*
U.S. Cl. 405—263 **3 Claims**

1. A method for consolidating a body of earth including substantially horizontal layers of varved clay by vertical draining and loading, comprising

drilling a plurality of holes down into said body of earth substantially transverse to said layers of varved clay and injecting lime into the earth through said holes under pressure without substantial disturbance of said layers during the drilling and injecting steps, to chemically react with at least one of the natural constituents of the earth to thereby increase the permeability in spaced regions extending in the vicinity of each of said holes and having essentially direct contact with said layers, and

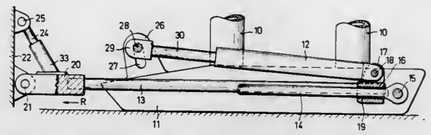
loading said body of earth by a static pressure means so as to cause water outflow from the earth through said increased permeability regions from the natural draining layers of the earth along the layers of varved clay.

4,187,042

ADVANCE MECHANISM FOR A MINE ROOF SUPPORT UNIT

Lubomir Plevak, Lunen, and Jürgen Dodt, Menden, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,380
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744992
Int. Cl.² E21D *15/44*
U.S. Cl. 405—291 **13 Claims**



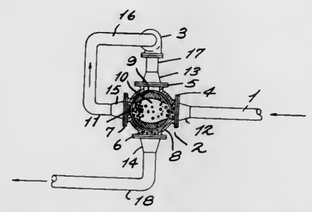
1. In a roof support unit for use in a longwall face of a mineral mining working, the roof support unit having a floor sill, a roof shield supported on the floor sill by hydraulic prop means, and an advance mechanism comprising a hydraulic advance ram and guide means, the improvements comprising constituting the guide means by guide rod means and a guide rail, one end of the guide rod means being attached to a conveyor extending along the longwall face, the other end of the guide rod means being attached to a guide element, the guide rail extending slidably through a guide aperture in the guide element and being pivotally attachable to the roof support unit for pivotal movement in a vertical plane perpendicular to the longwall face, the hydraulic advance ram being attached to the guide element and acting on a member fixed to the support unit.

4,187,043

METHOD AND APPARATUS FOR BOOSTING PRESSURE IN A COAL PIPELINE

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Jul. 23, 1974, Ser. No. 491,132
Int. Cl.² B65G *53/30*, *53/58*
U.S. Cl. 406—105 **20 Claims**



11. Apparatus for boosting the fluid pressure of a liquid transporting particulate solids in a pipeline from a first point of low fluid pressure in the pipeline to a higher fluid pressure at a second point, closely adjacent said first point, in said pipeline downstream of said first point without directly acting on the particles being transported by the liquid, said apparatus comprising

(a) means for confining an established confined continuous flow of liquid and solid particles from said first point along a continuous flow path to said second point,

(b) means for substantially continuously removing from communication with said flow path at a transfer point successive volumes of solid particles larger than a predetermined size entrained in liquid from said liquid while permitting liquid with solid particles smaller than said predetermined size to flow along said flow path downstream of said transfer point,

(c) means for boosting the fluid pressure of the liquid flowing in said flow path at a boosting point downstream of said transfer point,

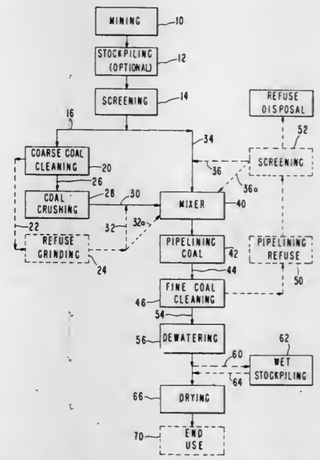
(d) means for substantially continuously communicating said successive removed volumes of solid particles entrained in liquid with said liquid of boosted fluid pressure flowing along said path downstream of the boosting point, said means for substantially continuously communicating said successive removed volumes of solid particles with said liquid of boosted fluid pressure comprising a rotor having two pairs of passageways therethrough, one passageway of each pair being disposed substantially perpendicular to the other passageway of said pair, and said passageways of one pair being offset substantially 45° from the passageways of the other pair, and means for continuously rotating said rotor.

4,187,044

COAL SLURRY PIPELINING

Pierre J. Chassagne, San Mateo, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 26, 1978, Ser. No. 900,230
Int. Cl.² B65G *53/30*
U.S. Cl. 406—197 **6 Claims**



1. A method for preparing a mined ore having a broad spectrum of particle sizes for low energy slurry pipelining which comprises:

(a) dividing the ore into a first fine fraction and a coarse fraction;

(b) separating from said coarse fraction most of the refuse and grinding sufficient refuse to −200 mesh to augment the amount of −200 mesh required for a low energy pipeline slurry;

(c) crushing said coarse fraction to substantially the same particle distribution as said fine fraction to provide a second fine fraction;

(d) combining said first and second fine fractions, to form a combined fine fraction and mixing with sufficient −200 mesh refuse and water to provide a low energy mineral particle slurry at a combining site;

(e) pipelining said slurry to a destination;

(f) cleaning said combined fine fraction of refuse; and

(g) dewatering said cleaned combined fine fraction.

4,187,045

DRILLING ASSEMBLY AND A DRILLING TOOL THEREOF

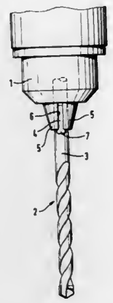
Artur Fischer, Weinhalde 34, 7244 Waldachtal 3, Tumlingen, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 965,299

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754383

Int. Cl.[2] B23B *31/12, 51/02*

U.S. Cl. 408—240 **6 Claims**



1. A drilling tool to be clamped in a jaw chuck of a drilling machine, which chuck has at least two jaws bounding slots therebetween and each having an end face and two lateral faces, the drilling tool comprising an elongated shaft having an axis, a circumferential surface, a trailing end portion arranged to be inserted into the jaw chuck, and a leading end portion axially spaced from said trailing end portion and having a tip; an elongated projecting portion projecting from said circumferential surface of said shaft in a radial direction and extending in an axial direction of the same, said projecting portion having a leading end facing toward said tip of said shaft; and an elongated abutment portion at said leading end of said projecting portion and also projecting from said circumferential surface of said shaft in the radial direction but extending in a direction which is transverse to said axis of said shaft and to said projecting portion laterally outwardly beyond the latter, so that said projecting portion engages in one of the slots between the chuck jaws with lateral abutment against the lateral faces of the latter so as to prevent relative rotation of said shaft and the chuck, whereas said abutment portion abuts against the end faces of the chuck jaws so as to prevent axial rearward displacement of said shaft relative to the chuck.

4,187,046

POWER TOOL

Henry Atherton, 1536 Vine St., #201, Denver, Colo. 80206

Filed Dec. 29, 1977, Ser. No. 865,745

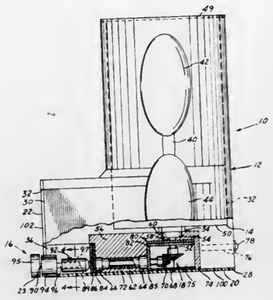
Int. Cl.[2] B27C *5/10*

U.S. Cl. 409—180 **18 Claims**

1. A power tool comprising:

cutter means driven by a motor for rotation about an axis for cutting a workpiece; and

guide means including a first guide surface arranged substantially parallel to the axis of said cutter means and approximately flush with the outer peripheral surface of said cutter means for supporting and guiding said cutter means relative to a first surface of the workpiece in a first operable position, a second guide surface arranged substantially perpendicular to the axis of the cutter means for supporting and guiding said cutter means relative to said first surface of the workpiece in a second operable position, said cutter means having a mounting end portion, the planes of said first and second guide surfaces intersecting at a point axially remote from said mounting end portion and defining an included angle therebetween, said mounting end portion being located substantially within said included angle, said mounting end portion projecting axially away from one side of said second guide surface, said cutter means further having a leading end portion having said cutting edge and projecting axially away from the opposite side of said second guide surface to precede said second guide surface in said axial direction, said first guide surface being delimited in the axial direction of said cutter means in a direction opposite to said mounting end portion of said cutter means by a plane substantially parallel to and substantially flush with said second guide surface, and a cylindrical guide surface mounted at one end of said cutter means remote from said second guide surface and having an outside diameter approximately equal to the diameter of the outer peripheral cutting edge of said cutter means for contacting a second surface of the workpiece for guiding the cutter means and limiting the movement of the cutter means from passing into the plane of the second surface of the workpiece in said second operable position.



4,187,047

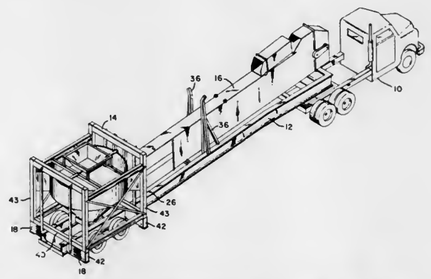
SYSTEM AND APPARATUS FOR ERECTING A PORTABLE SILO AND ELEVATOR STRUCTURE

Edmond C. Squifflet, Sr., Issaquah, Wash., assignor to Boeing Construction Equipment Company, Seattle, Wash.

Filed Mar. 9, 1978, Ser. No. 884,931

Int. Cl.[2] B60P *1/00*

U.S. Cl. 414—332 **4 Claims**



1. A portable self-erecting folded up silo and elevator structure carried on a trailer, comprising in combination:

(a) A trailer bed carrying a silo with telescoping legs, said telescoping legs extending downwards adjacent said trailer bed;

(b) hinge plate mounting bracket means, comprising a first hinge plate and a second hinge plate, hingeably connected by a hinge bolt, operatively connected by said first hinge plate to each of said telescoping legs and mounted by said second hinge plate to said trailer bed, for securing said silo structure to said trailer bed for portable and self-erecting purposes;

(c) an elongated elevator structure disposed on said trailer bed and secured thereon by one pivot hinge means at said elevator bottom side adjacent said silo structure and for pivoting said elevator in upright position next to and adjacent with said silo structure when said silo structure is erected by telescoping said silo legs in expanded condition;

(d) actuator means mounted on said silo structure for raising said silo structure through expansion of said telescoping legs and said actuator means provided with remounting attachment means on one end for connection from said silo to said elevator for raising said elevator about said pivot hinge means, and

(e) support means for mounting and supporting said silo telescoping legs extending downwards adjacent said trailer bed onto ground surface.

4,187,048

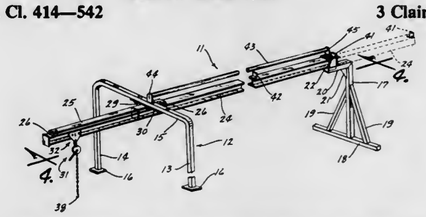
LOADING AND UNLOADING APPARATUS FOR A VAN

Orville R. Bohlmann, Box 369, Denison, Iowa 51442

Filed Feb. 22, 1978, Ser. No. 880,193

Int. Cl.[2] B60P *1/00*

U.S. Cl. 414—542 **3 Claims**



1. An apparatus for loading and unloading heavy objects to and from a van having a loading door opening therein, comprising:

a U-shaped framework having a central portion, a first leg portion connected to one end of the central portion and extending to the floor of the van and a second leg portion connected to the other end of said central portion and extending to the floor of the van, said U-shaped framework being positioned adjacent to said van loading door opening whereby said legs are positioned on each side of said van loading door opening;

a support post in abutment with the floor of the van at the bottom thereof and extending upwardly;

an elongated beam being I-shaped in cross-section;

means for slideably attaching said beam to a top portion of said support post including a sleeve means for receiving said beam and allowing the beam to slide within said sleeve means;

support means connected to the top of said sleeve means and to the top of the central portion of the U-shaped member for stabilizing said apparatus.

means for slideably attaching said beam to the central portion of said U-shaped member;

winch means connected to said beam for selectively raising heavy objects towards said beam and lowering said heavy objects away from said beam, including means for attaching an object to be lifted to said winch means;

roller means for attaching said winch means to said beam for allowing said winch to be moveable along said beam; and

stop means connected to said beam for allowing movement of said beam with respect to said framework between a first position whereby said beam extends out of said van loading door opening to a second position whereby said beam is located entirely within said van.

4,187,049

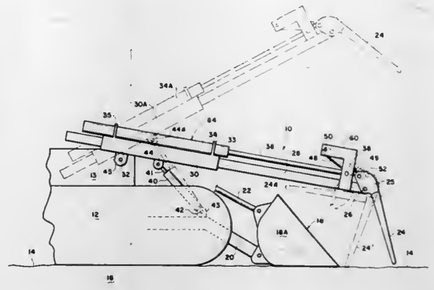
GATHERING BLADE APPARATUS FOR ASSISTING IN LOADING THE BUCKET ON A FRONT-END LOADER

Fred E. Jones, Rte. 4, Box 50 D, Tulsa, Okla. 74354

Filed Jun. 24, 1977, Ser. No. 809,635

Int. Cl.[2] E02F *3/81*

U.S. Cl. 414—704 **2 Claims**



1. A gathering blade apparatus for attachment to a vehicle having an earth-moving bucket supported by longitudinal operating arms, of conventional design, comprising;

(a) a gathering blade comprising a blade positioned transverse to the longitudinal axis of the vehicle, by hinge means near its top edge, to a pair of spaced-apart, parallel blade support arms;

means to rotate the plane of said gathering blade a selected angle from forward of the vertical, to substantially horizontal, under said blade support arms, the transverse length of said blade being less than the transverse length of said bucket;

(b) a pair of guide means supported by horizontal hinge means to said vehicle, and extending parallel to the longitudinal axis of said vehicle, said guide means adapted to receive and to longitudinally guide said blade support arms;

(c) a pair of hydraulic cylinders and pistons attached to said guide means, and piston rod means, attached at their outer ends to the outer ends of said blade support arms; whereby operation of said piston serves to move said support arms and said blade between positions forwardly or rearwardly, with respect to said bucket;

(d) means to rotate said guide means about said horizontal hinge means with respect to said bucket operating arms; whereby said blade can be raised and lowered independently; and wherein, said blade will be raised whenever said bucket is raised.

4,187,050

QUICK-DISCONNECT MECHANICAL COUPLING

Gail G. Barbee, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 15, 1978, Ser. No. 878,140

Int. Cl.[2] E02F *3/70*

U.S. Cl. 414—723 **10 Claims**

1. A quick-disconnect coupling for affixing tools to a powered arm or the like, comprising:

a base;

means on said base for affixing the same to an arm or the like;

a pair of hooks having facing openings;

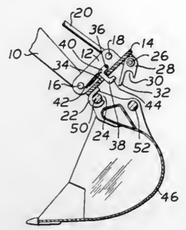
means immovably mounting one of said hooks on said base;

means movably mounting the other hook on said base for movement between tool engaging and tool disengaging positions;

a latch movably mounted on said base and engageable in a latching position with said other hook for preventing movement thereof from said tool engaging position;

cooperating means on said other hook and said latch for moving said latch out of said latching position as said

other hook moves from said tool disengaging position toward said tool engaging position; and



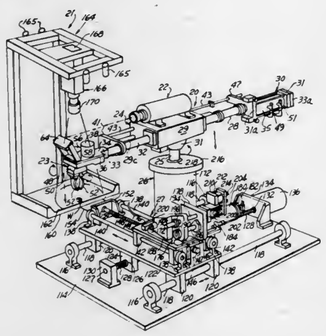
means for moving said latch to said latching position in response to said other hook moving into said tool engaging position to engage said other hook and hold the same in said tool engaging position.

4,187,051

ROTARY VIDEO ARTICLE CENTERING, ORIENTING AND TRANSFER DEVICE FOR COMPUTERIZED ELECTRONIC OPERATING SYSTEMS

Jerry Kirsch, and Kerry F. Kirsch, both of 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Filed May 26, 1978, Ser. No. 910,136
Int. Cl.[2] B25J *9/00*
U.S. Cl. 414—744 **12 Claims**



1. A rotary video article centering, orienting and transferring machine adapted to be installed in a computerized electronic operating and control system with a memory section therein and operable to transport articles from a loading station to an unloading station outside said machine, said machine comprising

an article carrier disposed at the loading station,

a machine-supporting structure adapted to be disposed between said stations,

a first X-Y axis positioner including

a first X-axis carriage mounted on said structure for horizontal reciprocation longitudinally of said article carrier and

a first Y-axis carriage mounted on said X-axis carriage for horizontal reciprocation laterally of said X-axis carriage,

means for so reciprocating said first X-axis and said first Y-axis carriages,

a lifting and horizontally swinging device mounted on said first Y-axis carriage,

an article transporter mounted on said device for lifting and swinging thereby and having an article gripper connected thereto and movable thereby between the loading and unloading stations,

a first video camera mounted in optical alignment with said article carrier for rotation around its optical axis and having a focal plane disposed in focus with said article carrier for imaging articles thereon in said focal plane,

said first video camera having means thereon adapted for the electrical connection thereof to the computerized electronic operating and control system for transmitting the image of a randomly-positioned article on said carrier in said focal plane to the operating and control system for comparison with the image of a previously-properly-positioned article on said article carrier previously recorded in the memory section,

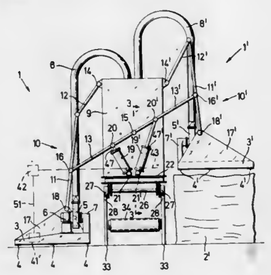
and means responsive to the bringing of the video camera image of the randomly-positioned article on said workpiece carrier into coincidence with the image in the memory section of the computerized electronic operating and control system for rotating said first video camera and moving said X-axis carriage and said Y-axis carriage to move said article gripper into a position adjacent the randomly-positioned article for pickup thereof.

4,187,052

METHOD OF OPENING BALES

Herbert Hergeth, Dulmen, Fed. Rep. of Germany, assignor to Hergeth KG. Maschinenfabrik und Apparatebau, Dulmen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 890,215, Mar. 27, 1978, which is a continuation of Ser. No. 609,923, Aug. 12, 1975, abandoned.
This application Mar. 27, 1979, Ser. No. 24,250
Int. Cl.[2] B65G *65/02*
U.S. Cl. 414—786 **3 Claims**



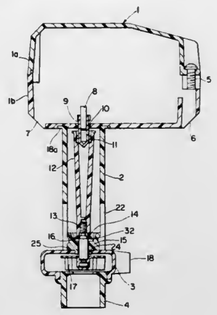
1. A method of removing a generally uniform layer portion of fibrous material from the top of a bale of compressed fibrous material and loosening the fibers of the layer portion during the removal thereof comprising the steps of providing a bale of relatively compressed fibrous material having a predetermined upper surface area, providing a suction hood having an overall area corresponding in size generally to the upper surface area of the fibrous bale, creating at least two spaced linear areas of suction across the overall area of the hood while preventing the creation of suction between the two linear suction areas, positioning the suction hood in overlying contiguous relationship to the bale upper surface area whereby the suction draws the fibrous material upwardly across the overall area and loosens the compressed condition thereof to a generally fluffed state through a uniform depth thereof, raising the suction hood to remove a generally uniform depth of the loosened fibrous material across generally the entirety of the predetermined surface area, and subsequently discontinuing the suction to release the loosened fibrous material layer portion from the suction hood for subsequent processing.

4,187,053

CENTRIFUGAL PUMP

Norbert Tunze, Seeshaupter Str. 68, 8122 Penzberg, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,283
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 7623892[U]
Int. Cl.[2] F04B *17/00*
U.S. Cl. 415—111 **8 Claims**



1. The combination which includes

(a) a motor housing **1**,

(b) an impeller housing **3** containing an impeller **17**,

(c) a hollow shaft tube **2** extending downwardly from said motor housing **1** to the upper surface of said impeller housing **3**, said shaft tube having an annular inward projection on its lower interior surface,

(d) a drive shaft **12** extending centrally down through said hollow shaft tube **2**,

(e) a metallic impeller arbour **14** having its upper end connected to the lower end of drive shaft **12** its lower end connected to said impeller **17**, and an intermediate portion extending downwardly through said impeller housing **3**,

(f) a bearing flange **15**,

(1) having a central inner opening surrounding the said intermediate portion of said metallic impeller arbour **14**,

(2) having an outer circumferential surface that is press fitted against the inner side surfaces of the lower end of said shaft tube **2**, said outer circumferential surface having an arresting groove that engages said annular inward projection on the lower interior surface of said shaft tube **2**,

(3) having an under side that is press fitted into the upper surface of said impeller housing **3**, and

(g) an antifriction thrust bearing **16** and a steel spacer **32** extending between the lower end of said drive shaft **12** and a portion of the upper surface of said bearing flange **15** whereby one lower face of the drive shaft **12** rests downwardly against said spacer which in turn rests against said antifriction thrust bearing.

4,187,054

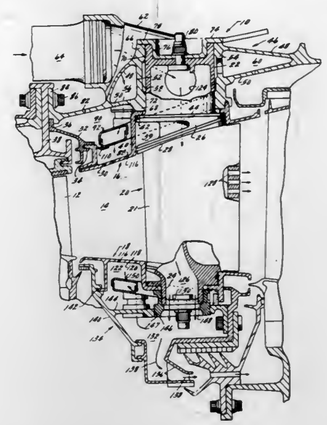
TURBINE BAND COOLING SYSTEM

Delmer H. Landis, Jr., Loveland; Paul W. Lozier, North Bend; Louis Lievestro, West Chester; Thomas A. Auxier, and John H. Starkweather, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 20, 1978, Ser. No. 898,061
Int. Cl.[2] F01D *5/18, 9/04*
U.S. Cl. 415—115 **10 Claims**

1. A gas turbine comprising a number of annular wall sectors forming a complete circular wall having first and second faces, the first face bounding a hot gas passage and the second face defining a radially inner portion of an annular chamber; a plurality of hollow impingement vessels disposed in a circular array within said chamber, means for introducing cooling fluid into said impingement vessels and means for directing cooling fluid from said vessels into impingement against the second face to provide cooling thereof;

said turbine further comprising a plurality of variable area vanes each having an airfoil portion and a trunnion ex-



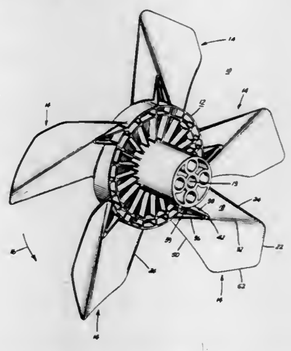
tending through said wall sectors and journaled for rotation within said annular chamber, and wherein said impingement vessels are contoured to fit between adjacent vane trunnions to provide impingement cooling of those portions of the second face between adjacent vanes.

4,187,055

FLEXIBLE FAN

John W. Barnstead, Kokomo, Ind., assignor to Vernco Corporation, Columbus, Ind.

Filed Apr. 3, 1978, Ser. No. 892,658
Int. Cl.[2] F04D *29/38*
U.S. Cl. 416—132 A **17 Claims**



1. In a flexible fan which automatically reduces its pitch in response to increased rotational speed and comprises a hub having an axis of rotation and a plurality of blades extending radially outwardly therefrom; each blade having a leading surface, a root portion joined to said hub, a tip portion, leading and trailing edges, and a relatively stiff leading portion joined to a relatively flexible trailing portion by a relatively narrow hinge zone which extends diagonally across the blade from generally the trailing edge of said root portion to generally the leading edge of said tip portion, said leading portion being defined by said hinge zone, root portion and leading edge and said trailing portion being defined by said hinge zone, tip portion and trailing edge, the pitch of each blade at rest being substantially greater at said tip portion than at said root portion

thereof; each blade having a mode of vibration about said hinge zone the frequency of which increases as the rotational speed of the fan increases, and a second mode of vibration about a line generally perpendicular to said hinge zone; the improvement comprising a stiffening portion on said leading surface of said leading blade portion of each blade extending outwardly from said root portion adjacent and generally parallel with said hinge zone for stiffening the junction of said trailing portion with said hinge zone and all portions of each blade lying substantially forwardly in the direction toward said leading edge of a radial line extending from said axis of rotation through the junction of said trailing edge and said hub whereby the frequency of said second mode vibration is higher than and does not approach the frequency of said first mode vibration as said rotational speed is increased.

4,187,056

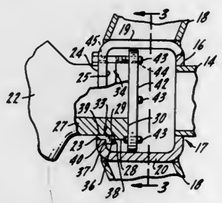
FAN BLADE ASSEMBLY AND COUPLING

Joseph M. Schwinn, Windsor, and Tony E. Maynard, Santa Rosa, both of Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Continuation-in-part of Ser. No. 792,740, May 2, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 891,220

Int. Cl.[2] F04D *29/36*

U.S. Cl. 416—207 **27 Claims**



1. A fan blade assembly comprising:

(a) a hub adapted to be connected to a power driven shaft, a plurality of radial spokes extending outwardly from said hub, a hollow coupling housing attached on one side to the radially outer end of each radial spoke, there being a hole through the radially opposite side of each housing, circumferential spokes connecting adjacent radial spokes;

(b) a fan blade connected to each housing, each blade having a radially inwardly directed end shank portion with an enlarged shoulder extending into one of said housings through its hole; and

(c) means for attaching each blade to its coupling housing comprising, a split ring comprising a pair of separate members each having an outwardly protruding rim, each pair of members extending through the hole in one of said housings with their rims held in abutment against the inside of said housing around its hole by the shoulder of its associated blade, said members encircling said shank portion of such blade and substantially filling said hole around said shank portion, and removable yoke means in said housing held in tight frictional engagement against said shank portion by a plurality of fasteners passing through apertures located in said housing and being adjustably connected to said yoke means.

4,187,057

PERISTALTIC INFUSION PUMP AND DISPOSABLE CASSETTE FOR USE THEREWITH

Piritheous Xanthopoulos, Cupertino, Calif., assignor to Stewart-Naumann Laboratories, Inc., Santa Clara, Calif.

Filed Jan. 11, 1978, Ser. No. 868,525

Int. Cl.[2] F04B *43/12, 45/08;* **A61M** *5/00*

U.S. Cl. 417—63 **14 Claims**

1. A disposable cassette for use in a peristaltic pump which includes means defining a cassette support surface for supporting the cassette between a first inoperative position and a second operative position and vertically extending guide tracks located on opposite sides of said surface and extending between said inoperative and operative positions, said disposable cassette comprising:

(a) a tubular arrangement including

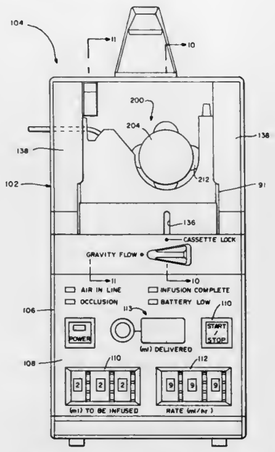
(i) a flexible first tubular section having opposite end portions and an intermediate portion joining said end portions,

(ii) a second tubular section distinct from but joined with one end of said first section, and

(iii) a third tubular section distinct from but joined with the other end of said first tubular section; and

(b) a cassette body including

(i) surface means adapted to sit on and be supported by said cassette support surface,



(ii) an arcuate tube supporting surface located above said surface means, having a predetermined radius of curvature, and being readily accessible along its length from the top of said cassette body,

(iii) first and second means for fixedly supporting the opposite end portions of said first tubular section in place adjacent the opposite ends of said tube supporting surface, said first and second supporting means together fixing said intermediate portion of said first tubular section in place entirely across and in continuous contact with said tube supporting surface, and

(iv) first and second guide members on opposite sides of said surface means and extending out beyond said first and second tube supporting means, said first and second guide members being adapted to cooperate with said guide tracks whereby to guide said cassette between said inoperative and operative positions.

4,187,058

PORTABLE AIR COMPRESSOR

Darrell D. Fish, Timonium, Md., assignor to Universal Security Instruments, Inc., Owings Mill, Md.

Filed Jun. 22, 1978, Ser. No. 917,936

Int. Cl.[2] F04B *21/00*

U.S. Cl. 417—234 **5 Claims**

1. A portable device for inflating inflatables, comprising:

a housing having front and rear walls of generally triangular configuration, and left, right and bottom walls extending between said front and rear walls;

a dividing wall subdividing the interior of said housing into upper and lower compartments;

an air compressor;

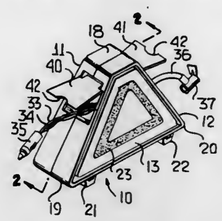
a drive motor for said air compressor, said drive motor being operable when energized with twelve volts direct current;

means mounting said air compressor and said drive motor in said lower compartment;

a pair of electrical leads for supplying energizing voltage to said motor and extending from said motor through a suitable provided opening in said dividing wall into said upper compartment;

adapter plug means connected to the ends of said electrical leads remote from said motor and adapted for insertion into a standard cigarette lighter socket of a vehicle;

a hose for delivering pressurized air from said air compressor and extending therefrom through a suitably provided opening in said dividing wall into said upper compartment, said hose being terminated at a nozzle connector which is adapted to supply air to a standard automobile tire inflation stem;



at least one selectively movable access panel provided in at least one of said left and right walls at said upper compartment to permit said electrical leads and said hose to be extended outside of said housing; and

reflective means in the shape of the outline of a triangle secured to the outer surface of at least one of said front and rear walls;

wherein said upper compartment is sufficiently large to contain said electrical leads, said adapter plug means, said hose and said nozzle connector when said device is not in use.

4,187,059

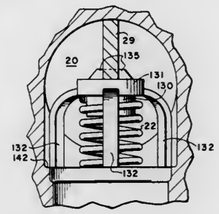
VALVE GUIDE FOR POPPET VALVE

Curtis J. Parker, Orangefield, and Kenneth H. McGill, Beaumont, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 599,285, Jul. 25, 1975, abandoned. This application Mar. 16, 1978, Ser. No. 887,285

Int. Cl.[2] F04B *39/14*

U.S. Cl. 417—454 **2 Claims**



1. In a reciprocating pump having a housing with a piston reciprocatingly mounted in one end of a pumped fluid chamber, an inlet passageway to said fluid chamber, an outlet passageway from said fluid chamber and a spring biased normally closed intake valve member mounted at the juncture of said inlet and said pumped fluid chamber and having a stem extending from said valve member into said pumped chamber with a spring positioned around said stem, an improved inlet valve mounting assembly, comprising:

a ledge formed in said housing around and radially outward of said intake valve at the juncture of said inlet passageway at said pumped fluid chamber;

a support plate extending across said inlet passageway, three legs mounted on said support plate and extending therefrom in a tripod relation with end portions of said legs resting on said ledge, said support plate having a guide passage therein to slidably receive and guide said valve stem;

a support bar mounted between said support plate generally aligned with said guide passage and an inner wall of said pumped fluid chamber and generally longitudinally aligned with said piston, said support bar being forcibly slid between said support plate and said inner wall to hold said support plate in tight engagement with said ledge; and

means to secure said support bar in fixed position between said support plate and said inner wall including a shoulder on said support bar mounted in a housing recess adjoining said pumped fluid chamber between said recess and a bore plug which is removably mounted in said housing at said pumped chamber in general longitudinal alignment with said piston.

4,187,060

LIQUID FUEL INJECTION PUMPS

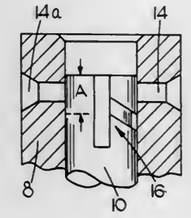
Arthur J. Ellis, Cheltenham, and Alan Howarth, Churchdown, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 7, 1978, Ser. No. 875,786

Claims priority, application United Kingdom, Apr. 30, 1977, 18174/77

Int. Cl.[2] F04B *7/04;* **F02M** *59/44*

U.S. Cl. 417—490 **6 Claims**



4. A liquid fuel injection pump of the kind comprising a reciprocal pumping plunger, a cylinder in which the plunger is slidable, the plunger extending from one end of the cylinder, means for effecting reciprocation of the plunger, a pair of ports formed in the wall of the cylinder, a fuel supply channel communicating with said ports, said ports being uncovered by said plunger as the plunger moves outwardly towards its outermost position to allow fuel into said cylinder, said ports being gradually covered by said plunger during the inward movement thereof, an outlet from the other end of said cylinder and through which fuel is displaced from the cylinder during further inward movement of the plunger after the ports have been covered, groove means defined in the plunger for registration with one of said ports towards the end of said further movement, the registration of said groove means with said one port terminating the flow of fuel through said outlet and allowing fuel to flow from the cylinder through said one port, this fuel flow acting to displace any cavities in the fuel within the one port into the supply channel, characterized by channel means which communicates with the cylinder and with said other port following the covering of said other port by the plunger, said channel means allowing a limited flow of fuel from said cylinder to flow through said other port to displace any cavities in the fuel in the other port into the supply channel before the ports are uncovered again by the plunger.

4,187,061

ROTARY HELICAL FLUID MOTOR WITH DEFORMABLE SLEEVE FOR DEEP DRILLING TOOL

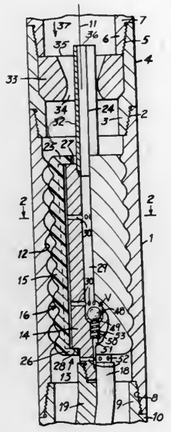
Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Apr. 27, 1978, Ser. No. 900,428

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720130

Int. Cl.[2] **F01C** *1/10, 5/02;* **F03C** *3/00;* **E21B** *3/12*

U.S. Cl. 418—48 **17 Claims**



2. In a progressing cavity fluid motor for driving a drill bit for deep drilling tools adapted to be mounted on a drill string and powered by a fluid such as drilling mud, said motor including a housing, a stator with female helical threads within the housing, a rotor with male helical threads inserted within the stator and mounted to rotate a drill bit, the improvement wherein the rotor has a threaded surface which is formed of an elastically deformable sleeve supported by a carrier shaft, means for preventing rotary movement between said elastically deformable sleeve and the carrier shaft, and means for introducing a pressure medium inside of the elastically deformable sleeve to provide a pressure for expanding said sleeve radially outwardly, said pressure being greater than the fluid pressure existing in the working cavity between the facing surfaces of the male and female threads.

4,187,062

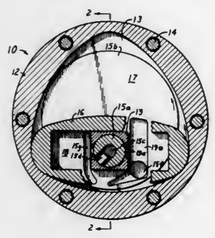
BYPASS ROTARY GAS EXPANSION MOTOR

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Filed Jul. 17, 1978, Ser. No. 925,642

Int. Cl.[2] **F01C** *1/02, 21/12*

U.S. Cl. 418—61 B **4 Claims**



1. A rotary gas expansion motor comprising:
a generally triangular chamber,
an elongate rotor,
said rotor being rotatable end-over-end inside said chamber and serving to divide same into two compartments,
a shaft with crank,
a sliding block,
said sliding block surrounding said crank and being rotatable thereupon,
said crank and said block extending into a slot in said rotor and serving to divide said slot into two cells,
said crank including a hole which communicates with a gas inlet in said motor and with a hole in said block during part of the rotation of said block, to admit gas to one of said slot cells as same is increasing in size,
a disk,
said disk being coaxially affixed to said shaft adjacent said chamber and said rotor,
said disk including a bypass port,
said bypass port communicating with one said slot cell and one said chamber compartment when both are increasing in size,
exhaust means,
so as to cause charges of pressurized gas entering said motor to expand against said block and said rotor before being exhausted.

4,187,063

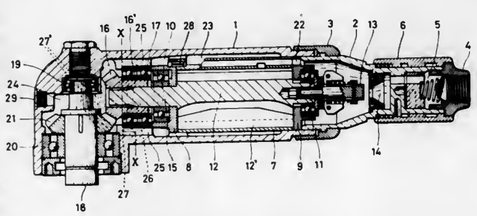
AIR MOTOR WITH DISCHARGE THROUGH GEAR CHAMBER AND SILENCER

Dan Yoshida, Osaka; Tatsumi Onaka, Amagasaki, and Yasuhiro Horiuchi, Ikoma, all of Japan, assignors to Fuji Kuuki Kabushiki Kaisha and Hitachi Zosen Kabushiki Kaisha, both of Osaka, Japan

Filed Nov. 10, 1977, Ser. No. 850,488

Int. Cl.[2] **F01C** *13/02, 21/04, 21/06*

U.S. Cl. 418—90 **1 Claim**



1. An air motor comprising:
a casing having therein a rotor chamber and a gear chamber;
a rotor positioned within said rotor chamber and having a rotor shaft;
a power output shaft extending from said casing;
gear means, positioned in said gear chamber, for drivingly coupling said rotor shaft and said power output shaft;
air inlet means, extending into said casing, for admitting air containing a mist of lubricant into said motor chamber to rotate said rotor and rotor shaft, and thereby said power output shaft;
air silencer means, positioned on the exterior of said casing, for exhausting and muffling the air employed for rotating said rotor;
first passageway means, extending directly from said rotor chamber to said air silencer means, for passing a first portion of said air directly from said rotor chamber to said air silencer means; and
second passageway means, extending from said rotor chamber to said gear chamber and then from said gear chamber to said air silencer means, for passing a second portion of said air from said rotor chamber to said gear chamber, for therein cooling and lubricating said gear means, and for then passing said second portion of said air to said air silencer means, said second passageway means comprising at least one inlet hole extending through said casing from said rotor chamber to said gear chamber and at least one outlet hole extending through said casing from said gear chamber to said air silencer means.

4,187,064

ROTARY MACHINE

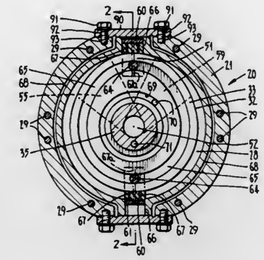
Colin Wheeler, 14 Hope Rd., Applecross, Australia (6153)

Filed Aug. 18, 1977, Ser. No. 825,787

Claims priority, application Australia, Aug. 19, 1976, PC7062

Int. Cl.[2] **F04C** *27/00*

U.S. Cl. 418—187 **11 Claims**



1. A rotary machine including an outer housing, an annular surface in said housing and having a longitudinal axis, at least one rotor in said housing and rotatable about an axis coincident with the annular surface, said rotor having an outer surface including at least one sealing portion disposed in close sealing relation with the annular surface, said rotor surface having convexly curved cam surface portions on either side of said at least one sealing portion, said cam surface portions each merging into a segmental surface portion of the rotor surface concentric with the annular surface, at least two sealing members supported upon said housing and equally spaced around the annular surface, each said sealing member having a surface confronting said rotor outer surface and forming a sealing surface, said sealing surface being complementary to the segmental surface portion of said rotor for sealing engagement therewith, said sealing surface being non-complementary to the sealing portion and the cam surface portions of said rotor, means causing each said sealing member to move to position its sealing surface in sealing engagement with the segmental surface portion of said rotor when adjacent thereto, an inlet passage opening to the outer surface of said rotor predominantly through a cam surface portion and partly through a segmental surface portion on one side of said at least one sealing portion, an exit passage opening to the outer surface of said rotor predominantly through a cam surface portion and partly through a segmental surface portion on the other side of said at least one sealing portion, said inlet and exit passages communicating with ports for admitting working fluid to and exhausting working fluid from said housing, respectively, the length of the inlet and outlet passage openings at the outer rotor surface, when measured in the direction of rotor rotation, being greater than the length of the sealing surface for each said sealing member, whereby said inlet and outlet passages are continuously open to a respective working space between the rotor and the housing thereby maintaining substantially continuous and constant admission and exhaustion of working fluid during rotation of said rotor, the distance between the leading end of the opening of a said outlet passage and the trailing end of the opening of the inlet passage on the opposite side of the intervening segmental surface being greater than the distance between any pair of adjacent sealing members, whereby the inlet and outlet passages on either side of the intervening segmental surface portion will not be simultaneously open to the same working space between the pair of sealing members, the length of the at least one sealing portion of said rotor, when measured in the direction of rotor rotation, being greater than the length of the sealing surfaces for each sealing member, each said sealing member having at least one port therethrough opening through said sealing surface at one end and into a space within said housing at the surface of said sealing member opposite said sealing surface, whereby when each said sealing member is in sealing engagement with a majority of a said segmental surface portion of said rotor there will be no fluid flow through said port, but when each said sealing member is aligned with an inlet or outlet passage opening, including that part of the opening through said segmental surface portion, fluid flow occurs through said port to equalize fluid pressure at said sealing surface and said opposite surface of said sealing member.

4,187,065

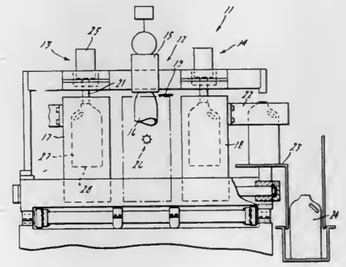
BLOW MOLDING MACHINE

Julio C. Perez, Saline, Mich., assignor to Roman Machine Co., Milan, Mich.

Filed Mar. 20, 1978, Ser. No. 890,623

Int. Cl.[2] **B29C** *17/07*

U.S. Cl. 425—136 **8 Claims**



1. In a blow molding machine of the type having a continuous parison extruder station, a blow molding station, mold halves movable between said parison and blow molding stations, means for moving said mold halves, control means for said moving means parison sensing means actuatable in response to a descent of a parison to a predetermined point for actuating said control means, and means for detaching said parison, the improvement comprising a timer, means responsive to completion of a parison for starting said timer, means responsive to running out of said timer before actuation of said parison sensing means by the next parison for disenabling said blow molding machine, and means responsive to actuation of said parison sensing means by the next parison before said timer has run out for setting and stopping said timer.

4,187,066

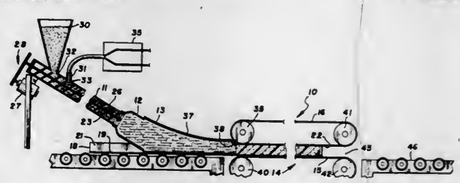
APPARATUS FOR THE PREPARATION OF DISPLAY BLOCKS OF UREA FORMALDEHYDE FOAM

John A. Hobson, Minneapolis, and Paul K. Schilling, St. Paul, both of Minn., assignors to H & S Industries, Inc., St. Paul, Minn.

Filed Oct. 7, 1977, Ser. No. 840,225

Int. Cl.[2] **B29D** *27/00*

U.S. Cl. 425—327 **4 Claims**



1. Apparatus for the continuous preparation of frothed thermosetting plastic resinous products including:
(a) extruder means having an auger confined within a barrel

and defining an extruder chamber, and first and second feed inlets to said chamber, and an outlet from said chamber;

(b) chamber means defining a surge chamber in communication with the outlet from said extruder chamber, and the outlet from said extruder chamber to said surge chamber having a cross-sectional area which is significantly less than the cross-sectional area of said surge chamber;

(c) an elongated expansion chamber in communication with the outlet from said surge chamber, said expansion chamber having a cross-sectional area which decreases generally uniformly and gradually by approximately 25% along substantially the entire length thereof, and having a product extrusion outlet at the end thereof; and wherein:

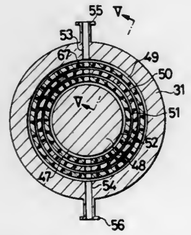
(d) the outlet from said expansion chamber has a cross-sectional configuration substantially as desired in the final frothed thermosetting plastic resinous product.

4,187,067

DIE FOR PRODUCING PLASTIC RESIN PELLETS

Haruyuki Mizuno; Atsushi Idemoto, and Kunihiro Horie, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,675
Claims priority, application Japan, Sep. 13, 1977, 52-109481
Int. Cl.² B29C *17/14*
U.S. Cl. 425—313 **10 Claims**



1. A plastic resin die for the production of pellets comprising;

an outer sleeve, said outer sleeve having a pair of ports extending through said sleeve, an inner body disposed coaxial with said outer sleeve, said outer sleeve and inner body defining an annular space therebetween, a plurality of annular rings assembled in said annular space, each of said annular rings having at least one nozzle extending in the axial direction and at least one groove formed in one wall portion to define at least one annular jacket, wherein said ports are in communication with said annular jacket.

4,187,068

VARIABLE PROFILE EXTRUSION APPARATUS

Clyde W. Vassar, Winooski, Vt., assignor to W. James Kemerer, Long Beach, Calif., a part interest

Filed Jul. 5, 1977, Ser. No. 815,699
Int. Cl.² B29F *3/04*
U.S. Cl. 425—381 **26 Claims**

1. An apparatus for extruding an elongated article having a cross section profile which varies along the length of the article comprising:

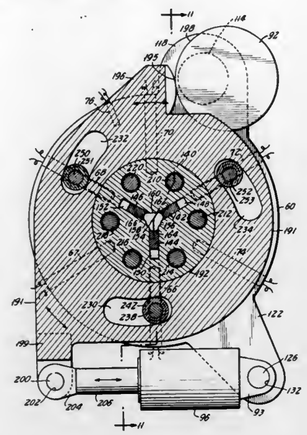
a die plate having an aperture formed therein,

a stationary die block,

a plurality of movable die members,

said stationary die block and said movable die members being mounted on said die plate and forming an extrusion orifice communicating with said aperture and having a peripheral extrusion profile which varies as seen in cross section with movement of said movable die members,

means for forcing an extrudate stock through said aperture and through said orifice to form an elongated extrudate article having a cross sectional profile conforming at each moment to the cross sectional profile of said orifice at the moment when said extrudate stock is being forced through said orifice, and



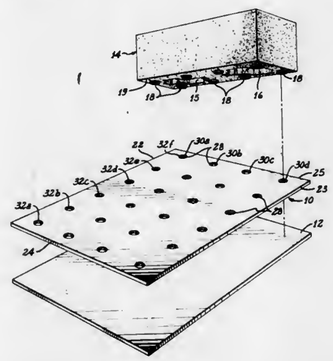
means for causing the simultaneous movement of each of said movable die members during the passage of stock extrudate through said orifice for providing a varying peripheral orifice profile.

4,187,069

COMBINATION DIE AND PALLET ASSEMBLY

Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Filed Oct. 2, 1978, Ser. No. 947,452
Int. Cl.² B28B *1/14*
U.S. Cl. 425—470 **6 Claims**



1. A combination die and pallet assembly upon which mortarless interlocking cementitious blocks are cast and subsequently transported, said combination die and pallet assembly comprising:

(a) a die and pallet plate having top and bottom planar surfaces, said die and pallet plate formed of solid heavy gage metal having a thickness dimension of at least one-quarter inch and having a plurality of apertures formed therethrough with those apertures arranged in a predetermined array; and

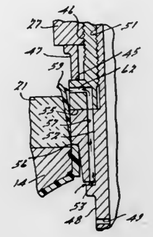
(b) a backing plate of planar configuration in contiguous engagement with the bottom planar surface of said die and pallet plate during block casting operations and separable therefrom for subsequent block transport.

4,187,070

BLOW MOLDING MACHINE

Merritt W. Martin, Jr., Saline, Mich., assignor to Roman Machine Co., Milan, Mich.

Filed Mar. 20, 1978, Ser. No. 890,626
Int. Cl.² B29C *17/07*
U.S. Cl. 425—525 **7 Claims**



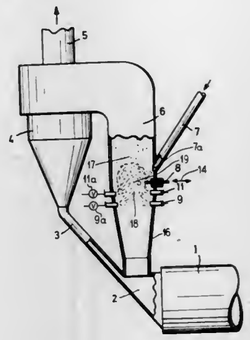
1. A blow molding machine for a product such as a bottle having a neck, comprising a pair of mold sections which together form a cavity and at their upper ends an annular blow pin assembly receiving surface, said surface being flared upwardly in the direction of the blow pin assembly, and a downwardly extending blow pin assembly above said mold sections having actuating means for moving it downwardly to enter said flared surface and a lower portion adapted to fit within said mold cavity so as to form the inside surface of the product neck, a wider portion on said blow pin assembly above said lower portion, and a sharp shoulder between said portions, the diameter of said shoulder being such that when said blow pin assembly enters said flared surface the outer edge of said shoulder will engage said flared surface with an interference fit, thereby completely severing the neck portion of the product from the flash thereabove, said blow pin assembly further comprising a blow pin having a central compressed air passage, and a shear ring mounted on said blow pin for limited lateral movement, the internal diameter of said shear ring being sufficiently wider than the blow pin diameter to permit the shear ring to have a self-centering action when the blow pin assembly descends, means longitudinally retaining said shear ring on said blow pin so as to permit said self-centering action, said shoulder being formed on said shear ring.

4,187,071

METHOD FOR THE TREATMENT OF FINELY GRAINED MATERIAL, PARTICULARLY FOR THE PRECALCINING OF CEMENT

Kunibert Brachthäuser, Bensberg; Hubert Ramesohl, Bensberg-Refrath; Klaus Beisner, Hoffnungsthal, and Horst Herchenbach, Troisdorf, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt=Deutz Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 665,327, Mar. 9, 1976, Pat. No. 4,066,470.
This application Sep. 14, 1977, Ser. No. 833,231
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1975, 2510312
Int. Cl.² F27B *15/00*
U.S. Cl. 432—106 **3 Claims**



1. A structure for thermally treating material such as for the calcining of cement, comprising in combination:

a rotary kiln,

at least one cyclone separator heat exchanger having a solids discharge and an inlet gas conduit,

a standpipe connecting said rotary kiln to the solids discharge of said cyclone separator,

means for directing a controlled amount of fuel and oxidizing gas into said standpipe to provide a spatially limited preoxidation zone therein,

means in said standpipe providing an admixing zone immediately above said preoxidation zone,

feed means for injecting raw material directly into said admixing zone for admixture with the partially oxidized gas emanating from said preoxidation zone,

means in said standpipe providing a precalcining zone between said admixing zone and the inlet gas conduit of said cyclone separator,

movable deflector means between said preoxidation zone and said precalcining zone, said deflector means being sufficiently porous to adjustably permit partially oxidized gases to flow from said preoxidation zone into said precalcining zone but preventing heavy particles from falling from said feed means into said preoxidation zone, and

means for discharging precalcined particles from said cyclone separator into said rotary kiln.

4,187,072

GELLED NONPIGMENTED WOOD STAINS

Julio A. Fernández, Caledon, Canada, assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 14, 1978, Ser. No. 969,690
Claims priority, application Canada, Apr. 14, 1978, 301204
Int. Cl.² B27K *5/02*
U.S. Cl. 8—6.5 **6 Claims**

1. A gelled nonpigmented wood stain composition comprising:
(a) from 0.3 to 10% by weight of at least one soluble aniline dye;
(b) from 0.5 to 6% of dibenzylidene sorbitol; and
(c) the remainder of the composition being selected from benzyl alcohol, and benzyl alcohol, with a solvent in an amount less than about 20% by weight of the benzyl alcohol and selected from ethyl alcohol and Cellosolve.

4,187,073

SURFACTANT FLOODING OIL RECOVERY PROCESS

Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 9, 1977, Ser. No. 858,926
Int. Cl.² E21B *43/22*
U.S. Cl. 252—8.55 D **5 Claims**

1. In a method of recovering petroleum from a subterranean permeable, petroleum-containing formation, said formation containing water having a salinity of at least 20,000 parts per million total dissolved solids, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, comprising injecting an aqueous, surfactant-containing fluid into the formation via the injection well to displace petroleum toward the production well, from which it is recovered to the surface of the earth, said surfactant fluid containing an alkylpolyalkoxyalkylene sulfonate or alkylarylpolyalkoxyalkylene sulfonate surfactant having the following formula:

$$RO(R'O)_nR''SO_3^-M^+$$

wherein R is an alkyl group having from 9 to 25 carbon atoms, or an alkylaryl group, containing at least one alkyl substituent containing from 9 to 15 carbon atoms, R′ is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene, R″ is ethylene, propylene, hydroxy propylene or butylene, n is a number from 2 to 10 and M^+ is sodium, potassium, lithium or ammonium, wherein said improvement for increasing said phase stability and injectability of a surfactant fluid, and improving its low surface tension oil displacement effectiveness, which comprises:
shearing the surfactant fluid at the surface at a shear rate of at least 150 reciprocal seconds for a period of time of at least 0.1 minutes and sufficient to render the surfactant fluid less turbid prior to injecting it into the formation via the injection well.

4,187,074

WATER-SOLUBLE CATIONIC OLIGOURETHANE RESINS AND THE USE THEREOF FOR THE TREATMENT OF PELTS OR LEATHER

Harro Träubel; Dieter Dieterich, both of Leverkusen, and Helga Heinze, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Aug. 18, 1978, Ser. No. 934,775
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739378
Int. Cl.² C03G *18/30*
U.S. Cl. 8—94.19 **10 Claims**

1. Water-soluble oligourethanes which contain methylol groups and are free from isocyanate groups and have a molecular weight, between about 600 and 5,000, produced by a process comprising reacting
(a) polyethylene glycol ethers having a molecular weight between about 400 and 1,500,
(b) polyisocyanates,
(c) optionally compounds having a molecular weight below about 300 which are mono-functional or poly-functional in the reaction thereof with isocyanates and
(d) formaldehyde, characterized in that components (a) and/or (c) together contain a total of from about 20 to 200 milliequivalents of tertiary nitrogen atoms per 100 g of oligourethane solids content, from about 20 to 95% of which nitrogen atoms have been converted into quaternary ammonium nitrogen or into ammonium salt form by treatment with alkylating agents and/or acids and the resultant oligourethane contains from about 40 to 90% by weight of component (a).

4,187,075

METHOD OF ANALYZING BIOLOGICAL, LIQUID SPECIMENS FOR ANTIGENS OR ANTIBODIES

Hans G. Noller, 1512 Basswood Cir., Glenview, Ill. 60025

Continuation-in-part of Ser. No. 689,335, May 24, 1976. This application Feb. 16, 1977, Ser. No. 769,044
Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523209; Feb. 21, 1976, 2607149
Int. Cl.² G01N *33/16, 21/38, 31/14*
U.S. Cl. 23—230 B **11 Claims**

1. A method of analyzing a volatile liquid for the presence therein of one member of the group consisting of an antigen and an antibody capable of specifically combining with said antigen, said one member being dispersed in said liquid, and the other member of said group carrying a labeling agent which method comprises:
(a) depositing a specimen of said liquid on an inert solid substrate;
(b) volatilizing said liquid under conditions leaving said one member as a deposit on the surface of said substrate;
(c) holding said deposit in contact with a fixing agent for a period sufficient to fix said one member to said substrate;
(d) contacting said surface with said other member for a period sufficient for combining said members if said one member is present;
(e) removing from said surface any amount of said other member not combined with said one member; and
(f) generating a sensible signal indicative of the presence of said labeling agent on said substrate after said removing.

4,187,076

PARAQUAT DETECTION METHOD

Mahmoud A. Elsohly, and Carlton E. Turner, both of Oxford, Mich., assignors to The University of Mississippi, University, Mich.

Filed Jul. 25, 1978, Ser. No. 927,852
Int. Cl.² G01N *31/12, 31/08, 31/22, 33/16*
U.S. Cl. 23—230 PC **31 Claims**

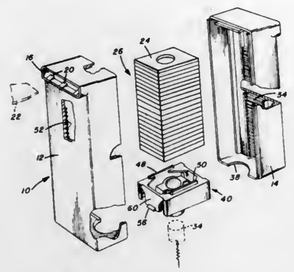
1. The process for detecting the presence of paraquat in a material comprising the steps of converting any paraquat present in the material to a pyrolysis stable salt of 4,4′-bipyridine, converting any said 4,4′-bipyridine salt present to 4,4′-bipyridine and analyzing said sample for the presence of 4,4′-bipyridine, the presence of which indicates the presence of paraquat in the material.

4,187,077

CONTAINER WITH ARTICLE POSITIONING ELEMENT FOR DISPENSING REAGENT COATED SLIDES TO AN AUTOMATED ANALYZER

Roger G. Covington; Stephen H. Miller, both of Rochester, and Archie J. Tucker, Middlesex, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,665
Int. Cl.² G01N *1/28*
U.S. Cl. 422—63 **5 Claims**



1. An article container for dispensing reagent articles to apparatus having an extendable plunger and being adapted to use the articles to carry out quantitative chemical analysis of fluid samples; said container comprising:

wall structure forming a chamber having a dispensing station, said chamber being adapted to receive a stack of articles for movement toward, and sequential removal from, said dispensing station for delivery to the apparatus, said wall structure having an opening through which the plunger may extend into said chamber; and

a stack positioning element separate from the plunger and captured in said chamber between a received article stack and said opening, said element being engageable and movable by the plunger extending through said opening, toward said dispensing station to urge a received article stack toward said dispensing station, whereby the articles are sequentially indexed into said dispensing station as preceding articles in the stack are removed from said container.

4,187,078

COAL DISPERSING OIL

Hirozumi Shimizu; Taizo Igarashi; Takaharu Ishizaki; Toshio Koma, and Hideki Takahashi, all of Amagasaki, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 840,096
Claims priority, application Japan, Oct. 13, 1976, 51/121906; Oct. 22, 1976, 51/126306
Int. Cl.² C10L *1/32*
U.S. Cl. 44—51 **10 Claims**

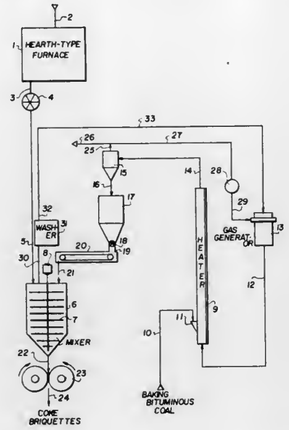
1. Coal dispersing oil compositions containing 30–60% by weight of a petroleum oil, 40–70% by weight of coal powders and 0.01–5% by weight of at least one surface active agent selected from the group of compounds consisting of alkyl esters of sulfosuccinic acids, alkenyl esters of sulfosuccinic acids, α-sulfonated fatty acids, α-sulfonated fatty acid alkyl esters, and metal and amine salts of these compounds.

4,187,079

METHOD FOR PRODUCING FORM COKE

Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen; Horst Dungs, Herne, and Karl-Heinz Wollenhaupt, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,016
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741075
Int. Cl.² C10L *5/00*; C10B *53/04*
U.S. Cl. 44—10 C **9 Claims**



1. A method for the production of form coke comprising: subjecting a highly volatile coal containing at least 35% volatile constituents to a coking in order to remove a substantial amount of the volatile constituents to form a non-baking base coal; mixing a plurality of fine grain coal components together, of which at least one is said non-baking base coal and at least one other comprises a baking bituminous coal in order to form a coal mixture; subjecting the coal mixture to a degassing operation; coking the degassed mixture to form a coke; and pressing the resulting coke to form briquettes.

4,187,080

TREATING CONDENSATE FROM GASIFICATION OF COAL

Carl Hafke, Frankfurt am Main; Roland Weber, Bruchköbel, and Rudolf Kohlen, Wehrheim, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 704,253, Jul. 12, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,433
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607745
Int. Cl.² C10J *3/16*
U.S. Cl. 48—202 **4 Claims**

1. The process for the production of gas from coal which comprises the steps of:

(a) effecting gasification by contacting a packed bed of coal with oxygen and water vapor at a pressure in the range of about 5–150 bars to form a raw gas containing tar, solids and water at a temperature of about 400°–700° C.;

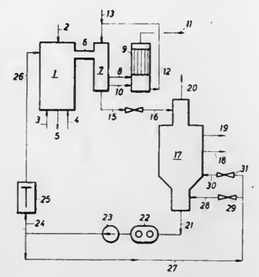
(b) cooling said raw gas to effect condensation of the tar and water by contacting it with a cooling liquid containing water at a temperature of about 160°–220° C., the condensate containing the solids;

(c) separating from the solids-containing condensate a heavy fraction enriched in high-boiling tar with a solids content of about 10–60%;

(d) passing said heavy fraction to a solids disintegrator

wherein substantially all of the solids are reduced in size to a particle size substantially below about 2 mm;

(e) then recycling at least part of said heavy fraction from step (d) to the gasification step (a); and



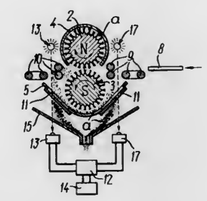
(f) finally recycling the balance of said heavy fraction to the separation step of step (c).

4,187,081

APPARATUS FOR TREATMENT OF SHEET MATERIAL WITH THE USE OF FERROMAGNETIC POWDER

Boris N. Shikhirev; Evgeny A. Matrosov, and Ilya A. Deresh, all of Moscow, U.S.S.R.

Filed Feb. 9, 1978, Ser. No. 876,641
Int. Cl.² B24B *21/00*
U.S. Cl. 51—23 **4 Claims**



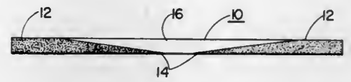
1. In an apparatus for treating sheet material with ferromagnetic powder in a magnetic field, comprising a magnetic system for retaining abrasive ferromagnetic powder in a treating zone formed by two vertically stacked rolls made of ferromagnetic material having a gap therebetween for the passage of the sheet material being treated and rotatable in opposite directions at substantially equal speeds, and a means for exciting a magnetic field with a magnetic circuit positioned at least at one end of the rolls so that the lines of force pass along the axes of said rolls and cross the gap therebetween, said rolls serving as opposite poles of said magnetic system whereby the particles of ferromagnetic powder are retained in the gap between the rolls through which passes the material being treated, and a means for feeding and withdrawing sheet material, the improvement which comprises arranging underneath the bottom roll a net with the mesh size thereof being slightly smaller than the minimum permissible size of the powder grains, said net being disposed within the zone of the magnetic field excited by said magnetic field exciting means which induces the force required to retain the powder on the surface of said rolls whereby the grains of said ferromagnetic powder are lifted from the net and placed onto the surface of the bottom roll.

4,187,082

DENTAL FINISHING STRIPS

Humberto R. Guerra, 4800 Marque Dr., New Orleans, La. 70120

Filed Jun. 17, 1974, Ser. No. 479,729
Int. Cl.² A61C *3/06, 3/12*
U.S. Cl. 51—295 **3 Claims**



1. A dental finishing strip for smoothing and finishing dental work to the level of external tooth structure comprising:

a. an elongated flexible plastic strip, having oppositely disposed ends, a thickness to fit between adjacent teeth, a width to extend between a gum line and a contact point between adjacent teeth, and a length between said oppositely disposed ends for manual holding and pulling back and forth by said ends between adjacent teeth; and

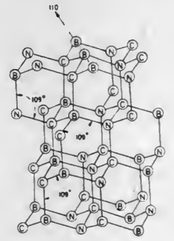
b. abrasive grit coating means in two different grades fixed on a side of said flexible plastic strip and respectively extending in a different grade longitudinally and diagonally from each of said oppositely disposed ends toward the center thereof to define tapering and longitudinally opposed grit coated areas, tapering and transversely opposed grit coated and uncoated areas, and an uncoated center area therebetween, for inserting said flexible plastic strip between adjacent teeth and manually pulling said strip in a back and forth motion between said center and an end in sequence, the grit covered areas in sequence removing surplus and smoothing the rest of said dental work without ridging.

4,187,083

HARD MATERIALS OF BCN IN TETRAHEDRAL FORM AND METHOD OF MAKING IT

Roger J. Wedlake, 289 Lister Rd., Rembrandt Park, Johannesburg, Transvaal, and Anthony L. Penny, 16 High Rise, Primrose Ter., Berea, Johannesburg, Transvaal, both of South Africa

Filed Feb. 16, 1978, Ser. No. 878,472
Claims priority, application South Africa, Feb. 16, 1977, 77/0925
Int. Cl.² C01B *35/14*; C04B *31/16*
U.S. Cl. 51—307 **12 Claims**



1. A hard material consisting essentially of $B_xC_yN_z$, wherein x, y and z can have any value greater than or equal to 1, in tetrahedral form.

4,187,084

FERROMAGNETIC ABRASIVE MATERIAL AND METHOD FOR PREPARING THE SAME

Nikolai S. Khomich, ulitska Karbysheva, 11, kv. 10; Faddei J. Sakulevich, pereulok Dalny, 3, both of Minsk; Boris N. Putimtsev, shosse Entuziastov, 111, kv. 71, Moscow, and Vladimir A. Silaev, stantsia Redkino, prospekt Khimikov, 36, kv. 14, Kalininskaya oblast, all of U.S.S.R.

Filed Jul. 3, 1978, Ser. No. 921,730
Int. Cl.[2] B29C *23/00*
U.S. Cl. 51—308 **7 Claims**

1. A ferromagnetic abrasive material containing:
a ferromagnetic component including an iron-aluminum-silicon-phosphorus-carbon alloy; and
an abrasive component including aluminum and silicon oxides, carbides, nitrides and phosphides;
said ingredients being used in the following proportions (in % by weight):

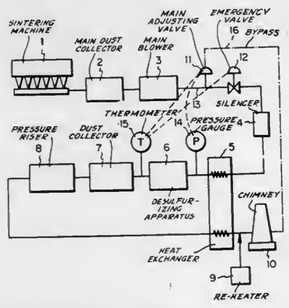
iron	75–97
aluminum	0.2–16.0
silicon	0.2–18.0
phosphorus	0.005– 1.5
carbon	0.005– 4.0
oxygen	0.05 – 3.0
nitrogen	0.01– 0.5
including: aluminum and silicon oxides, carbides, nitrides and phosphides	0.01– 5.0

4,187,085

TREATING FACILITY FOR SINTERING WASTE GAS

Teiji Shibuya, Yokohama; Yasuaki Ishikawa, Kawasaki; Masayuki Saito, and Kiyoharu Ueda, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1978, Ser. No. 883,202
Claims priority, application Japan, Mar. 29, 1977, 52/33969
Int. Cl.[2] B03C *3/36;* **B01D** *50/00*
U.S. Cl. 55—4 **21 Claims**



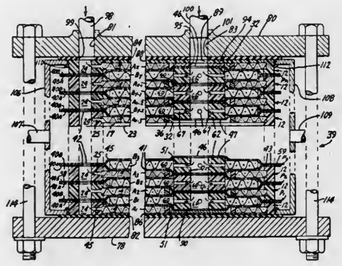
14. A method for purifying sintering waste gas comprising removing dust from the sintering waste gas in a first electric dust collector, and moving said waste gas through said first dust collector by a main blower having an exhaust,
the improvement comprising:
feeding the waste gas from said first dust collector to a metallic rotary heat exchanger and then feeding the waste gas out of the heat exchanger;
at least partially purifying the output waste gas from said heat exchanger to produce at least partially purified waste gas;
removing dust from said at least partially purified waste gas in a second wet electric dust collector to produce purified waste gas;
raising the pressure of said purified waste gas;
feeding the purified waste gas which had its pressure raised in said pressure raising step to said heat exchanger to effect a heat exchange with said waste gas received by said heat exchanger from said first dust collector;
exhausting the heat exchanged purified waste gas from said heat exchanger;
said steps of heat exchanging, purifying, second dust collecting, pressure raising and exhausting comprising a waste gas purifying stage; and
adjusting the pressure of the waste gas at the exhaust of said main blower by a pressure adjusting valve and selectively releasing gas from said waste gas purifying stage via said pressure adjusting valve.

4,187,086

PACKAGED MEMBRANE SYSTEM AND REPLENISHMENT METHOD

Gunnar E. Walmet, and Stephen L. Matson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 806,845, Jun. 13, 1977, abandoned. This application Nov. 1, 1978, Ser. No. 956,781
Int. Cl.[2] B01D *13/00, 59/12*
U.S. Cl. 55—16 **22 Claims**



10. In a method of selectively removing a gaseous component from a gaseous mixture wherein a first membrane containing an immobilized liquid of an initial composition is contacted with said mixture to effect facilitated transport of said gaseous component through said first membrane to a hydrophobic porous gas-permeable barrier; gases emerging from said first membrane are passed through said gas-permeable barrier; and a second membrane containing an immobilized liquid of said initial composition is contacted with gases emerging from said gas-permeable barrier to effect facilitated transport of said gaseous component through said second membrane, the improvement for substantially maintaining the separation efficiency of said first and second membranes, which comprises the steps of (a) introducing fresh liquid into first regions of each of said first and second membranes to effect emission of at least partially deactivated liquid from second regions of each of said first and second membranes, and (b) substantially concurrently with said introduction step removing said deactivated liquid from said second regions such that substantially no accumulation of liquid is effected in said membranes by said introduction step, said fresh liquid being of said initial composition.

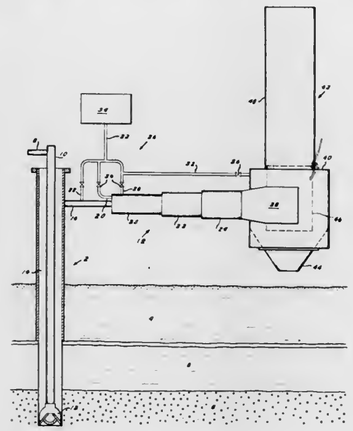
13. In a packaged membrane system having
(a) a plurality of at least partially spaced immobilized liquid membranes disposed in generally parallel surface-to-surface array to define both a first group of flow volumes and a second group of flow volumes alternating between said first flow volume group,
(b) means for spacing apart adjacent membranes disposed in each of the flow volumes of at least one of said first and second flow volume groups,
(c) means for defining the periphery of each of said flow volumes,
(d) means for providing separate access to and egress from the plurality of flow volumes in said first group and in said second group,
the improvement comprising, in combination with the above, (i) means for introducing fresh membrane liquid into first regions of said membranes and (ii) outlet means separate from said introduction means and in flow communication with second regions of said membranes for removing liquid from said second regions concurrently with the fresh liquid introduction such that substantially no accumulation of liquid is effected in said membrane by said fresh liquid introduction.

4,187,087

HANDLING FLUID DISCHARGED FROM A CONDUIT AT A HIGH VELOCITY

Olin D. Whitescarver, Santa Rosa, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Jul. 26, 1977, Ser. No. 819,177
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—43 **22 Claims**



1. An apparatus for transferring a fluid comprising a mixture of gas, liquid and particulated solids from a high pressure source to a low pressure environment at a high flow velocity comprising:
(a) a transfer conduit attached to the high pressure source for withdrawing the fluid therefrom,
(b) an expansion conduit comprising a series of axially-aligned and longitudinally-disposed connected conduit sections of increasing cross-section area, the section having the smallest cross-sectional area being connected to the transfer conduit,
(c) a vertical separator connected in sliding engagement to the section of the expansion conduit having the largest cross-sectional area, and
(d) means for injecting a treating material into the fluid flowing through said apparatus.

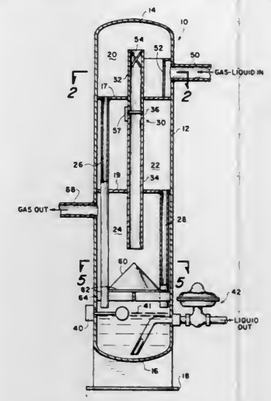
4,187,088

DOWN FLOW CENTRIFUGAL SEPARATOR

Robert A. Hodgson, Tulsa, Okla., assignor to Maloney-Crawford Corporation, Tulsa, Okla.

Filed Jan. 18, 1979, Ser. No. 4,485
Int. Cl.[2] B01D *41/12*
U.S. Cl. 55—169 **5 Claims**

1. A centrifugal separator for separating liquid from gas having
a vertically oriented cylindrical shell with a top and bottom, the shell divided by transverse walls into three chambers, a top chamber, a central chamber, and a bottom chamber,
a first downcomer pipe for separated liquids from the top chamber to the bottom chamber, a second downcomer pipe for separated liquid from the central chamber to the bottom chamber,
an axial tube extending from the top chamber to the bottom chamber, the axial tube formed of two parts, upper and lower, spaced slightly apart to form a gap which is positioned in the upper part of the central chamber, liquid level operated valve means to remove liquid from a lower part of the bottom chamber, the improvement characterized by,
means to impart circular flow of the liquid and gas mixture



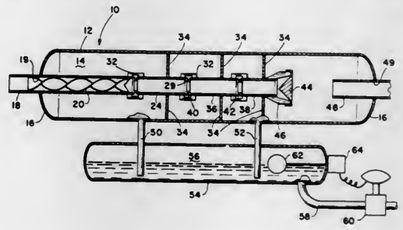
into the top chamber to create a vortex within the axial tube, means whereby liquid is first separated to the outside of the top chamber draining into the bottom chamber via the first downcomer pipe, and whereby liquid entrained in the axial tube is substantially removed via the gap, and liquid in the central chamber draining via the second downcomer pipe into the bottom chamber,
a cone-shaped baffle supported in the bottom chamber, the apex of which is axially below the lower end of the axial tube, the bottom of the cone being of less diameter than the diameter of the bottom chamber, and
a gas outlet in an upper part of the bottom chamber.

4,187,089

HORIZONTAL VAPOR-LIQUID SEPARATOR

Robert A. Hodgson, Tulsa, Okla., assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.

Continuation of Ser. No. 761,963, Jan. 24, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,121
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—219 **4 Claims**



1. A horizontal vapor-liquid separator, which comprises:
a housing providing a separation chamber;
a substantially horizontally disposed cylindrical inlet tubing extending through the housing wall to said separation

chamber and having the inner periphery of the downstream end of said tubing beveled at a given angle outwardly in a generally frusto-conical shape;

means located within said inlet tubing for imparting a helical motion to the vapor-liquid mixture introduced into said tubing;

at least three cylindrical pipes, coaxially aligned with the inlet tubing, and of the same inside and outside diameter as said inlet tubing along the entire length of said at least three pipes, each of said at least three pipes having its outer periphery upstream end beveled inwardly to form a generally frusto-conical outer facing, and the inner periphery of its downstream end thereof beveled outwardly to form a generally frusto-conical inner facing, the upstream end of one of said at least three pipes being inserted in the beveled downstream end of the inlet tubing and spaced therefrom to form an annular orifice and the other of said at least three pipes mounted in spaced sequence to define additional orifices;

the upstream end of each of said at least three pipes being swaged to define an orifice of diameter less then the diameter of said pipes, and wherein the leading edge of each of said orifices is located within the said downstream bevel of the respective adjacent upstream inlet tubing and at least three pipes;

a solid conical baffle means mounted with its apex toward the beveled end of the last of said at least three cylindrical pipes, and spaced therefrom for coalescing any liquid droplets remaining in the flow exiting from said pipe;

means for removing liquid collected in the separation chamber; and

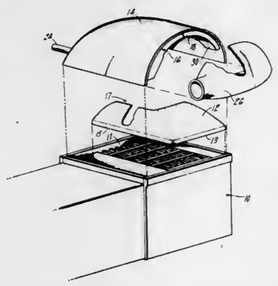
exhaust tubing extending through the housing wall into said separation chamber in substantial axial alignment with the inlet tubing.

4,187,090

HEAT EXCHANGER WATER COLLECTION SYSTEM

Peter Bizzarro, Bloomfield, and John L. Warner, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1978, Ser. No. 947,142
Int. Cl.[2] B01D *51/00*
U.S. Cl. 55—269 **10 Claims**



1. A water collection and disposal system adapted to remove moisture from an airstream emanating from a heat exchanger core or the like comprising:

baffle means connected along a substantial portion of the outside edge of said core, said baffle means extending a short distance in the direction of the outlet airstream from said core and simultaneously being contoured toward a selected side portion of said core forming thereby a gradual area restriction to the entire outlet airstream from said core for increasing the velocity thereof;

a substantially semi-hemispherical header member having one open end with the remainder of said header completely covering said core and said baffle means, said header member being contoured in the area above which said airstream passes through the area restriction in said baffle means, said contour in said header member being such as to cause the airstream to be redirected within said header member away from the area of said header member where said airstream initially impinges, the increasing velocity and changing direction of said airstream centrifuging heavy droplets of water and causing the accumulated water to flow along the inner surface of said header member in the direction of airstream flow;

water collector means attached about the inside contour of said header member at the open end thereof, said water collector means extending a short distance below the inside of said header member and including a solid wall portion for blocking the airstream flow and also including a trough member connected to said solid wall portion for collecting the water in said airflow, said trough member being extended along the length of said header member and forming a drain cavity between said extended portion of said trough member and one side of said header member for accumulating the collected water;

a drain tube connected to said header adjacent said drain cavity for draining said collected water;

air passage means in said trough member;

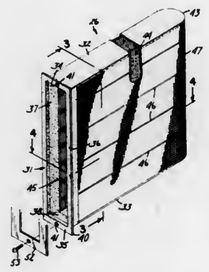
and air outlet duct means attached to the open end of said header member.

4,187,091

PLEATED PAPER FILTER CARTRIDGE

Reynold F. Durre, and Richard P. Berven, both of Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 797,317, May 16, 1977, abandoned.
This application Aug. 7, 1978, Ser. No. 931,770
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—499 **17 Claims**



9. A replacement filter for use in a filter housing having an elongated rectangular opening through which the filter is inserted, comprising:

a supporting frame of generally rectangular configuration dimensioned to overlie the rectangular housing opening and defining front and back faces, the frame comprising a first pair of elongated sides spaced apart to define an elongated opening therebetween, and a second pair of shorter sides connecting the ends of the first pair;

a filter body of pleated filter material, the body being flexible about the pleats and formed into a substantially U-shaped configuration that defines first and second adjacent ends and first and second substantially U-shaped edges, the filter body having a dimension extending in the direction of the pleats that approximates the length of the elongated frame opening and a predetermined insertion dimension;

means for sealably securing the first and second filter body ends to the first and second frame sides, respectively, so that the U-shaped filter body projects rearwardly from the back face of the supporting frame over said insertion dimension;

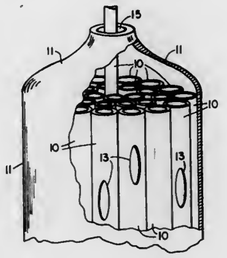
and a resiliently flexible closure member sealably secured to each of said second pair of shorter sides and to the associated U-shaped filter body edge, so that air entering the frame opening must pass through the filter body and vice versa, the filter body and closure members in their assembled state being together flexible between a first configuration in which the filter body is substantially straight over its insertion dimension and a second configuration in which the filter body is substantially curved over the insertion dimension with said pleats always remaining substantially mutually parallel, whereby the filter may be inserted through the rectangular housing opening where the available space in front of the housing is less than the insertion dimension of the filter body.

4,187,092

METHOD AND APPARATUS FOR PROVIDING INCREASED THERMAL CONDUCTIVITY AND HEAT CAPACITY TO A PRESSURE VESSEL CONTAINING A HYDRIDE-FORMING METAL MATERIAL

Ronald L. Woolley, Orem, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed May 15, 1978, Ser. No. 906,089
Int. Cl.[2] F17C *11/00*
U.S. Cl. 62—48 **7 Claims**



1. A hydrogen storage system comprising:

an elongate pressure vessel having an opening therein for charging hydrogen to the vessel and for withdrawing hydrogen from the vessel;

valve means in combination with the opening in said vessel for controlling the flow of hydrogen gas to and from said vessel;

a plurality of elongate tubes being made of a metal selected from the group consisting of aluminum, magnesium, and copper, and being positioned within said pressure vessel with the longitudinal axes of said tubes being parallel to the longitudinal axis of said vessel, each of said tubes being in firm contact along its longitudinal surface with the longitudinal surfaces of at least three other tubes to form a coherent, tightly packed tube bundle in which the outer tubes thereof also make firm contact along their longitudinal surfaces with the longitudinal inside surface of said vessel; and

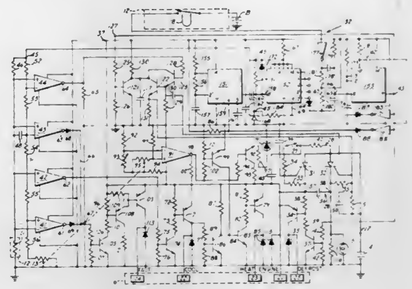
particulate, hydride-forming, metal material substantially filling the otherwise void spaces within said vessel, said metal material being capable of reacting with and absorbing hydrogen gas at a given temperature and pressure and thereafter releasing the hydrogen gas when the pressure on the hydrogen-containing material is reduced and/or the temperature of the hydrogen-containing material is increased.

4,187,093

REFRIGERATOR ELECTRONIC TEMPERATURE CONTROL AND MALFUNCTION SIGNAL APPARATUS

James P. Boratgis, Lee Hill Rd., and Earle S. Pittman, 2269 Mariposa, both of Boulder, Colo. 80302

Filed Feb. 1, 1978, Ser. No. 874,258
Int. Cl.[2] F25B *49/00*
U.S. Cl. 62—126 **17 Claims**



1. In refrigerator electronic control apparatus for controlling the temperature in and providing a malfunction signal for a refrigeration unit associated with a refrigerated chamber, the combination comprising:

temperature sensor means for said chamber;

temperature selector means for said chamber having a range of temperature settings; and

electronic circuit means including:

temperature reference means operatively associated with said temperature selector, said temperature reference means establishing a plurality of temperature reference points at selected temperature increments above and below a set point,

a comparator associated with each of said temperature reference points, each comparator responsive to an output of the associated set point and to an output of said temperature sensor means, and

control means including a plurality of solid state control elements, each control element responsive to an output of one of said comparators for alternately effecting the actuation of a heat load device in said refrigeration unit when the temperature in said chamber is a selected temperature increment below said set point and effecting the actuation of a cool load device in said refrigeration unit when the temperature in said chamber is a selected temperature increment above said set point to automatically maintain the temperature in said chamber within a selected temperature range and for also effecting the actuation of a malfunction indicator and disabling a prime mover load device to stop said refrigeration unit in the event of a malfunction in said refrigeration unit when the temperature in said chamber exceeds a selected maximum temperature reference point above said set point.

4,187,094

METHOD FOR IMPROVING THE DURABILITY OF SPONTANEOUS NAF OPAL GLASSWARE

Kun-Er Lu, and Walter H. Tarcza, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 8, 1978, Ser. No. 903,537
Int. Cl.[2] C03C *15/00*; C04B *35/00*
U.S. Cl. 65—30 R **5 Claims**

1. A method for improving the durability of a spontaneous sodium fluoride opal glass article against surface attack by water which comprises the steps of:

(a) contacting the glass article with a Na_2O-extracting medium comprising water at a temperature in the range of about 50°–100° C. for a time sufficient to deplete the Na_2O

content of the surface layer but insufficient to remove all of the extractable Na_2O therefrom; and thereafter

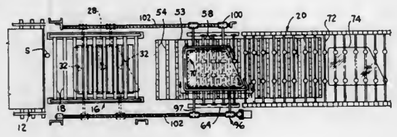
(b) heating the glass article to a temperature in the range of about 200°-500° C. for a time sufficient to consolidate the Na_2O-depleted surface layer but insufficient to permit the migration of additional Na_2O from the interior of the glass article to the surface thereof, thus to provide a surface free from microcracking and with good surface gloss.

4,187,095

METHOD AND APPARATUS FOR HANDLING GLASS SHEETS DURING SHAPING AND COOLING

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1978, Ser. No. 954,697
Int. Cl.² C03B *23/02, 27/00*
U.S. Cl. 65—104 **8 Claims**



1. In the art of handling glass sheets during thermal processing wherein a glass sheet is supported by suction against the under surface of a vacuum mold and is deposited by release of vacuum onto a ring-like member for transfer into a cooling station downstream of said vacuum mold along a path of travel, said ring-like member having a pair of upstream end stop means attached thereto on the upstream side of said path of travel,

the improvement comprising moving said ring-like member to a position where said upstream end stop means are located slightly upstream of the trailing edge of said glass sheet when said glass sheet is supported by suction against said vacuum mold,

releasing said vacuum to deposit said glass sheet onto said ring-like member with the trailing edge of said glass sheet spaced slightly downstream of said upstream end stop means, and

suddenly moving said ring-like member in a downstream direction rapidly enough to slide said glass sheet relative to said ring-like member until the trailing edge of said glass sheet is engaged by said upstream end stop means to orient and align said glass sheet in proper orientation and alignment relative to said ring-like member and to maintain said orientation and alignment while said ring-like member moves into and within said cooling station.

6. In the art of handling glass sheets during thermal processing wherein a glass sheet is supported on a ring-like member having an opening in the downstream portion thereof for transport along a path of travel in a downstream direction between a shaping station and a cooling station, is lifted at said cooling station from said ring-like member onto rolls rotating in a downstream direction to propel said glass sheet onto a downstream conveyor,

the improvement comprising starting to return said ring-like member in an upstream direction toward said shaping station before the trailing edge of said glass sheet has cleared beyond the downstream end of said ring-like member as a consequence of a downstream motion imparted to said glass sheet by said rotating rolls, thereby reducing the time needed for the ring-like member to complete a cycle of movement along said path of travel between said shaping station and said cooling station.

4,187,096

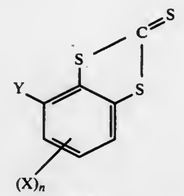
BIOCIDALLY-ACTIVE 1,3-BENZODITHIOLE-2-THIONE COMPOUNDS

Khalid Rasheed, Weslaco, and James D. Warkentin, McAllen, both of Tex., assignors to The Ansul Company, Marinette, Wis.

Continuation-in-part of Ser. No. 618,255, Sep. 30, 1975, Pat. No. 4,139,362. This application Aug. 4, 1977, Ser. No. 821,977
Int. Cl.² A01N *9/12*; A61K *31/385*; C07C *339/06*
U.S. Cl. 71—90 **40 Claims**

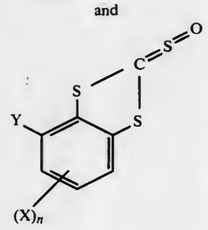
1. A compound selected from the group consisting of those of the formulae:

I



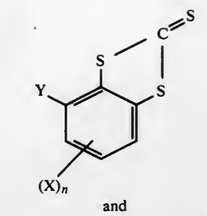
and

II

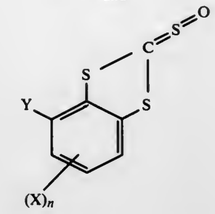


wherein Y is selected from nitro and trifluoromethyl; X is selected from alkyl and alkenyl of up to 6 carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxy, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, halogen (F, Cl, Br, I), hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms; n is an integer from 0 to 3; and salts thereof.

27. A method of treating pests associated with growing plants selected from fungi, insects and mites to beneficially enhance the growth and/or yield-potential of said growing plants which comprises treating soil, seed or said plants with a biocidally active amount of a compound selected from the group consisting of those of the formulae:



and



wherein Y is selected from hydrogen, cyano, alkylsulfonyl, nitro and trifluoromethyl; X is selected from alkyl and alkenyl of up to 6 carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethylthio, trifluoromethoxy, trifluoromethylthiothio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen (F, Cl, Br, I), hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms; n is an integer from 0 to 3; and salts thereof.

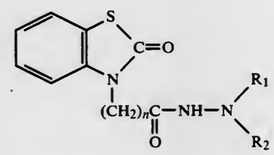
4,187,097

N-HYDRAZIDES OF 2-BENZOTHIAZOLINONE AS PLANT GROWTH REGULANTS

John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1977, Ser. No. 861,479
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.² A01N *9/12*; C07D *417/12*
U.S. Cl. 71—90 **21 Claims**

8. A method of regulating the growth of leguminous plants which comprises applying to the plant locus a plant growth regulating effective amount of a compound having the formula



wherein R_1 is hydroxy lower alkyl or 2-benzothiazolyl; R_2 is hydrogen; or R_1 and R_2 when taken together with the adjacent nitrogen form a saturated ring of 3 to 7 members and n is an integer from one to four.

4,187,098

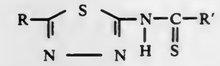
SELECTIVELY HERBICIDAL N-(5-SUBSTITUTED-2-THIADIAZOLYL)-THIOCARBOXAMIDES

Natu R. Patel, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1978, Ser. No. 963,553
Int. Cl.² A01N *9/12*
U.S. Cl. 71—90 **8 Claims**

1. The selectively herbicidal composition which comprises an effective amount of a compound which has the general structural formula

II



in which R is trifluoromethyl, N,N-dimethylsulfamyl, or N,N-diethylsulfamyl and R′ is ethyl or isopropyl in combination with an inert carrier.

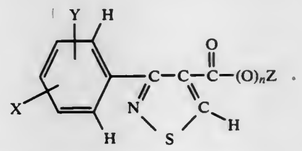
4,187,099

3-ARYL-4-ISOTHIAZOLECARBOXYLIC ACID AND 3-ARYL-4-ISOXAZOLECARBOXYLIC ACID DERIVATIVES AND THEIR USE AS HERBICIDES

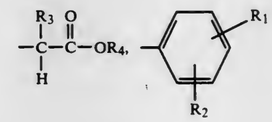
John E. Franz, Crestwood, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 16, 1977, Ser. No. 852,164
Int. Cl.² A01N *9/12*
U.S. Cl. 71—90 **7 Claims**

1. A method of inhibiting the growth of undesirable plants which comprises applying to the plant system a herbicidally effective amount of a compound having the formula



wherein X and Y are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, trifluoromethyl, halogen, cyano and nitro; n is zero or one provided that when n is zero, Z is selected from the group consisting of chloro and NR_1R_2 wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and lower alkyl; when n is one, Z is selected from the group consisting of alkyl having up to 12 carbon atoms inclusive, alkyl having up to 5 carbon atoms inclusive which have been substituted with from 1 to 3 halogen atoms, inclusive, benzyl, lower alkoxy lower alkyl, allyl, monochlorinated allyl, dichlorinated allyl,



and agriculturally acceptable cations; wherein R_1 and R_2 are as previously defined, R_3 is hydrogen or methyl and R_4 is lower alkyl.

4,187,100

4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS AND THEIR USE AS HERBICIDES

Klaus Sasse, Berg.Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

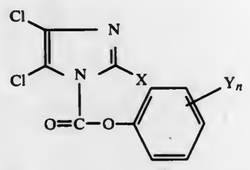
Division of Ser. No. 835,092, Sep. 21, 1977. This application Oct. 2, 1978, Ser. No. 948,185

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646143

Int. Cl.[2] C07D *233/90;* A01N *9/22*

U.S. Cl. 71—92 **11 Claims**

1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

in which

X represents trifluoromethyl or cyano,

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a



group,

in which

R^4 represents alkyl with 1 to 6 carbon atoms, and n represents 0, 1, 2, 3, 4, or 5.

8. A method of combatting a weed which comprises applying to the weed or its habitat a herbicidally effective amount of a compound according to claim 1.

4,187,101

1-ACYLOXYMETHYL-4,5-DICHLORO-IMIDAZOLE DERIVATIVES AND THEIR USE AS HERBICIDES

Florin Seng; Klaus Sasse, both of Berg.Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

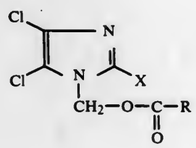
Division of Ser. No. 835,093, Sep. 21, 1977. This application Sep. 27, 1978, Ser. No. 946,252

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646142

Int. Cl.[2] C07D *233/90;* A01N *9/22*

U.S. Cl. 71—92 **10 Claims**

1. A 1-acyloxymethyl-4,5-dichloro-imidazole-2-carboxylic acid derivative of the formula



(I)

wherein

X represents trifluoromethyl or cyano and

R represents alkyl with 1 to 6 carbon atoms.

7. A method of combatting a weed which comprises applying to the weed or its habitat a herbicidally effective amount of a compound according to claim 1.

4,187,102

METHOD FOR CONTROLLING THE TEMPERATURE OF THE MELT DURING PNEUMATIC REFINING OF STEEL

Richard J. Choulet, Phoenix, Ariz., and Stewart K. Mehlman, Tarrytown, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,397

Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—60 **9 Claims**

1. A method for controlling the temperature of a melt selected from the group consisting of carbon steel and low alloy steel, during subsurface pneumatic refining thereof, comprising adding to said melt before starting the injection of refining oxygen:

(a) a fast oxidizing element characterized by having: its oxidation thermodynamically favored over carbon at steelmaking temperatures, the amount of heat released by its oxidation greater than 1100 BTU/normal ft^3 of oxygen, its oxide not strongly acidic in conventional steelmaking slags, and a vapor pressure not substantially greater than that of iron, the amount of said fast oxidizing element added being such that the total amount thereof in the melt is sufficient, when oxidized, to raise the temperature of the melt to the desired temperature before substantial decarburization begins, and

(b) a slow oxidizing element characterized: by having its oxidation thermodynamically similar to that of carbon at steelmaking temperatures and at partial pressures of carbon monoxide experienced during subsurface pneumatic refining and by having the amount of heat released by its oxidation together with that of carbon substantially equal to the steady state heat losses during decarburization, the amount of said slow oxidizing element added being such that the total amount thereof in the melt is sufficient, when oxidized, to maintain the temperature of the melt within the desired temperature range during decarburization,

whereby the temperature of the melt at the end of the refining period is at least equal to the desired tap temperature.

4,187,103

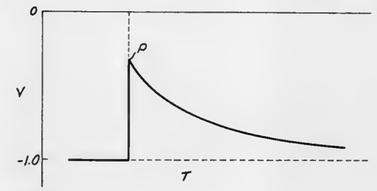
TREATED PHOTOCONDUCTIVE TITANIUM DIOXIDE SHEET

William L. Chambers, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 867,738, Oct. 20, 1969, Pat. No. 3,859,089, which is a continuation-in-part of Ser. No. 730,225, May 20, 1968, abandoned. This application Jul. 17, 1974, Ser. No. 489,448

Int. Cl.[2] G03G *5/04, 16/00, 13/24, 13/14*

U.S. Cl. 430—40 **8 Claims**



1. A photoconductive sheet comprising a base having a coating thereon comprising

(1) photoconductive titanium dioxide having a characteristic relaxation time of less than about 4 minutes and being present to the extent of about 40% to about 60% by volume of said coating;

(2) an insulating binder providing a matrix for said photoconductive titanium dioxide having an acid number below 70; and

(3) from about 0.1×10^{-6} to about 15×10^{-6} equivalents per square meter of total photoconductive titanium dioxide surface of at least one organic acid or organic acid salt decay retarder having at least 6 carbon atoms per molecule, said photoconductive sheet being capable of the electrophotographic production of more than about ten copies of substantially similar contrast per exposure to a light image.

4,187,104

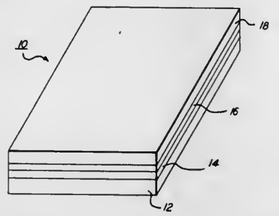
ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH COMPOSITE INTERLAYER AND METHOD OF MAKING

Simpei Tutihasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1978, Ser. No. 920,869

Int. Cl.[2] G03G *5/14, 5/082;* B05D *5/12*

U.S. Cl. 430—57 **6 Claims**



1. A method for producing an electrophotographic photoreceptor comprising:

(a) providing a substrate comprising an electrically conductive layer having arrayed on one surface thereof a layer of organic thermoplastic adhesive material having an average thickness of from about 0.5 to about 3.0 microns,

(b) vacuum evaporating a layer of amorphous arsenic triselenide having an average thickness of from about 0.1 to about 1.0 micron over said adhesive layer while maintaining the temperature of said adhesive material above its softening point but below the crystallization temperature of said arsenic triselenide; and

(c) vacuum evaporating a photoconductive layer of selenium or selenium alloy over said arsenic triselenide while maintaining the temperature of said substrate, adhesive material and arsenic triselenide layer below the softening point of said adhesive layer and below the crystallization temperature of selenium or selenium alloys.

4,187,105

PHOTOSENSITIVE IMAGE FORMING COMPOSITION CONTAINING AT LEAST ONE SUBSTITUTED BIS-DIARYL VINYLIDENE COMPOUND AND/OR AT LEAST ONE SUBSTITUTED BIS-DIARYL IMINE COMPOUND

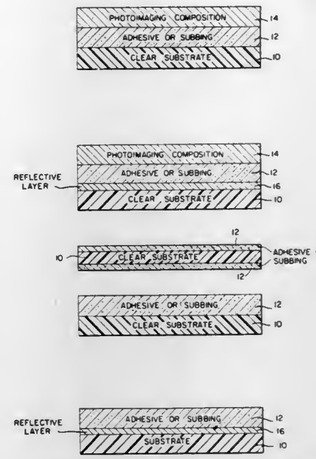
Eugene Wainer, Shaker Heights, and James M. Lewis, Aurora, both of Ohio, assignors to Horizons Research Incorporated, Cleveland, Ohio

Filed May 23, 1978, Ser. No. 908,668

Int. Cl.[2] G03C *1/52, 5/04, 5/24*

U.S. Cl. 430—336 **22 Claims**

1. In a non-silver photoimaging composition which includes at least one organic halogen compound and at least one colorless bis-aryl compound selected from the group consisting of substituted bis-aryl vinylidene compounds, substituted bis-aryl imine compounds and mixtures thereof, and wherein an image is produced as a result of the imagewise exposure of said composition to a pattern of radiation which causes said organic halogen compound to generate free radicals, the improvement which comprises providing tetraiodoethylene as an organic



halogen compound present in said composition to activate the formation of a colored image therein from the colorless bis-aryl compound.

4,187,106

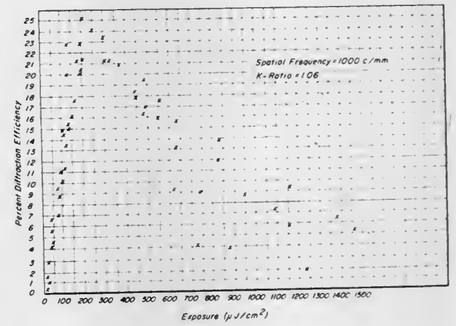
PROCESS FOR MAKING PHASE HOLOGRAMS

James W. Gladden, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1979, Ser. No. 23,217

Int. Cl.[2] G03C *5/04, 5/32*

U.S. Cl. 430—1 **5 Claims**



1. A process for the production of a phase hologram, comprising the steps of:

exposing silver halide photographic material in the exposure plane of a holographic optical system;

developing the exposed photographic material with a non-tanning developer;

bleaching the developed photographic material with a tanning bleach which removes the metallic silver of the metallic silver image areas while tanning the gelatin in the metallic silver image areas; and,

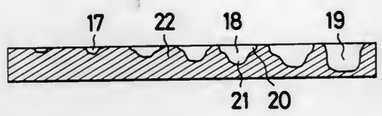
fixing the bleached photographic material with a non-tanning fixing agent to remove the silver halide from the photographic material so as to form a phase hologram of a tanned gelatin in a gelatin matrix.

4,187,107

MAKING GRAVURE PLATE WITH TINT SCREEN

Kokichi Homma, deceased, late of Wako, Japan (by Kenichiro Homma, legal representative), and Yoshio Kameyama, Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

Continuation of Ser. No. 700,319, Jun. 28, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 936,058
Claims priority, application Japan, Oct. 21, 1975, 50/126810
Int. Cl.[2] G03C *5/00;* **G03F** *5/00, 5/20, 5/24*
U.S. Cl. 430—252 **14 Claims**



1. A plate making method for gravure printing using a continuous tone positive, which method comprises the steps of:

(a) placing a gravure screen having the desired number of transparent lines on a photosensitive material and exposing to light said photosensitive material through said gravure screen so that the portions of said photosensitive material under the transparent portions of said gravure screen may be cured,

(b) placing a tint screen having transparent portions and a large number of opaque dots and also placed a continuous tone positive on said photosensitive material and again exposing said photosensitive material to light, the opaque dots of said tint screen being uniform in area, thereby said photosensitive material portions under the transparent portions of said tint screen being curved in response to the darkness of said continuous tone positive so that said curing is shallow in the shadow portions and deep in the highlight portions thereof,

(c) placing said continuous tone positive on said photosensitive material and again exposing the latter to light, thereby said entire photosensitive material being cured in response to the darkness of said continuous tone positive so the said curing is shallow in the shadow portions and deep in the highlight portions thereof, the order of said steps (a), (b), and (c) being arbitrary, and

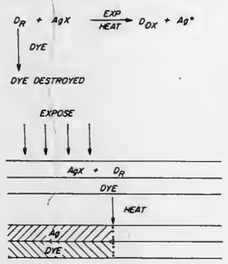
(d) treating said photosensitive material subjected to said exposure steps to make a gravure plate.

4,187,108

HEAT DEVELOPABLE MATERIAL AND PROCESS

Roland G. Willis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 766,271, Feb. 7, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,633
Int. Cl.[2] G03C *7/00, 5/30, 1/76, 1/06*
U.S. Cl. 430—203 **15 Claims**



1. A heat developable, photographic element for providing a dye enhanced, silver image comprising a support having thereon:

(A) at least one heat developable layer comprising

(i) photosensitive silver halide,

(ii) at least one active silver halide developing agent,

(iii) an activating concentration of a development activator precursor, and

(iv) a polymeric binder, and, contiguous to this layer (A),

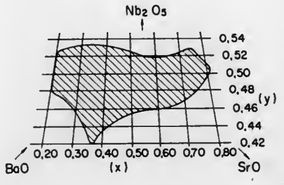
(B) at least one layer comprising an azoaniline dye that upon development of a latent image in said layer (A) by uniformly heating is bleached in the non-image areas of said element.

4,187,109

STRONTIUM BARIUM NIOBATE SINGLE CRYSTAL DOPED WITH CE

Koichi Megumi; Hirotsugu Kozuka, both of Tokyo; Masayoshi Kobayashi, Hachioji, and Yoshio Furuhata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1976, Ser. No. 652,174
Claims priority, application Japan, Jan. 27, 1975, 50-10500
Int. Cl.[2] G03C *1/76, 1/00*
U.S. Cl. 430—2 **4 Claims**



1. An optical element composed of a single crystal consisting essentially of strontium barium niobate, which is represented by the formula $(Sr_xBa_{1-x}O)_{1-y}$. $(Nb_2O_5)_y$ and doped with from 20 to 10,000 ppm of cerium based on the total number of cations of said niobate wherein the values of x and y are represented by coordinate in the hatched area in FIG. 1.

4,187,110

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara; Mitsugu Tanaka; Takeshi Hirose, and Toshiaki Aono, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 7, 1977, Ser. No. 858,225
Claims priority, application Japan, Dec. 7, 1976, 51-147027
Int. Cl.[2] G03C *1/06*
U.S. Cl. 430—544 **7 Claims**

1. A photographic light-sensitive material comprising a support thereon having at least one silver halide emulsion layer containing a coupling compound represented by the following general formula (I):

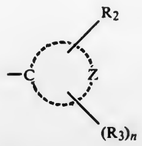


(I)

wherein X represents

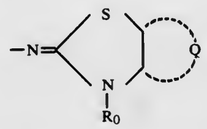


wherein R_1 represents a phenyl group which can be substituted with one or more substituents, which may be the same or different; R is an aromatic group represented by the general formula (II)



(II)

wherein Z represents an atomic group necessary to form, together with the carbon atom, an aryl group; R_2 represents a nitro group, a cyano group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkoxysulfonyl group, or an aryloxysulfonyl group; R_3 represents a hydrogen atom, a halogen atom, a nitro group, a cyano group, a thiocyano group, a hydroxy group, an alkoxy group, an aryloxy group, an alkyl group, an alkenyl group, an aryl group, an amino group, a carboxy group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, an acylamino group, a sulfo group, an alkylsulfonyl group, an arylsulfonyl group, an alkoxysulfonyl group, an aryloxysulfonyl group, a sulfamoyl group or a sulfonamido group and n represents an integer of 1 to 4; and wherein Y is a benzotriazole group which is bonded at the 1- or 2-position thereof and which is substituted by a group represented by the general formula (IIIA)



wherein R_0 represents an aliphatic group, an aralkyl group or an aryl group; and Q represents an atomic group necessary to form an aromatic ring, which can be substituted with one or more of an alkyl group, an alkoxy group and a halogen atom.

7. The photographic light-sensitive material as claimed in claim 1, wherein said photographic light-sensitive material comprises a support having thereon a blue-sensitive silver halide emulsion layer containing a yellow color forming coupler, a green-sensitive silver halide emulsion layer containing a magenta color forming coupler and a red-sensitive silver halide emulsion layer containing a cyan color forming coupler, with at least one silver halide emulsion layer of the photographic light-sensitive material containing the coupling compound represented by the general formula (I).

4,187,111

SENSITIZED POROUS BODIES USEFUL FOR PRODUCING THICK REFRACTIVE INDEX RECORDINGS

Edwin A. Chandross, Berkeley Heights, and Walter J. Tomlinson, III, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 801,783, May 31, 1977. This application May 3, 1978, Ser. No. 902,361
Int. Cl.[2] G03C *1/72, 5/04*
U.S. Cl. 430—2 **4 Claims**

1. An article produced by the process comprising the steps of impregnating a rigid porous matrix having throughout said matrix pores in the range 10 A to 400 A with a photosensitive compound having a reactive group which results in chemisorption to said porous body wherein said photosensitive compound is introduced into said rigid matrix after said rigid matrix is formed and has a sufficiently strong adhesion to said rigid matrix to prevent disengagement during a subsequent development step, permits the introduction of a composition capable of interreacting with said photosensitive compound upon exposure to electromagnetic radiation into said pores, is capable of being deactivated as a photosensitizer by exposure to electromagnetic radiation, and is capable of inducing said composition to change refractive index upon further exposure to electromagnetic radiation.

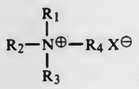
4,187,112

PHOTOSENSITIVE PLATE CONTAINING NITROGEN CONTAINING CONDENSATION TYPE POLYESTERS

Kuniomi Etoh; Masaru Nanpei, and Morio Miyagi, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 693,178, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 525,107, Nov. 19, 1974, abandoned. This application Oct. 20, 1977, Ser. No. 843,850
Claims priority, application Japan, Nov. 19, 1973, 48-130390
Int. Cl.[2] G03C *1/68, 1/78, 5/00*
U.S. Cl. 430—285 **13 Claims**

1. A water or dilute aqueous acid-developable photosensitive plate for preparation of a printing plate and containing a layer of a water-soluble photosensitive resin composition which consists essentially of a condensation type polyester having a nitrogen atom in the ammonium salt form in the main or a side chain thereof, said polyester containing at least 1×10^{-3} mole of the nitrogen atom in the ammonium salt form per 1 gram, from 5 to 150% by weight, with respect to said polyester of a photopolymerizable unsaturated monomer and from 0.01 to 5% by weight with respect to the total amount of said polyester and the photopolymerizable unsaturated monomer of a photosensitizer, said polyester having the formula:



wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, a substituted or unsubstituted hydrocarbon group or a condensation type polyester chain, at least one of R_1 to R_4 representing said condensation type polyester chain, and X is an anion paired with the ammonium ion.

4,187,113

VOIDED FILMS OF POLYESTER WITH POLYOLEFIN PARTICLES

Carl F. Mathews; Christopher Deverell, both of Hitchin; Gordon E. A. Pears, Harpenden, and Peter G. Knowles, Luton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 629,000, Nov. 5, 1975, abandoned, which is a division of Ser. No. 407,951, Oct. 19, 1973, Pat. No. 3,944,699. This application Nov. 3, 1977, Ser. No. 848,354
Int. Cl.[2] G03C *1/78*
U.S. Cl. 430—533 **7 Claims**

1. A photographic print material, which comprises a support in the form of an opaque molecularly oriented and heat set film produced from a blend of particles of a linear polyester produced by condensing at least one dicarboxylic acid, a lower alkyl diester thereof or bis-p-carboxyphenoxyethane with at least one glycol and from 3 to 27% by weight of particles of a homopolymer or copolymer of ethylene or propylene sufficient to increase the opacity of the resulting film, the homopolymer or copolymer being dispersed in the form of discrete particles throughout the oriented and heat set film, said support including voids between the regions of the linear polyester and the homopolymer or copolymer of ethylene or propylene sufficient to give said support a total luminous transmission not in excess of 20%, said support carrying a photosensitive silver halide-containing gelatinous layer.

4,187,114

HARDENING PROTEINACEOUS MATERIALS

Hendrik E. Kokelenberg, Merksem; Francis J. Sels, Kontich, and George F. Van Veelen, Mortsel, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

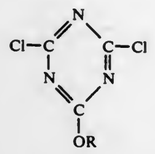
Filed May 9, 1978, Ser. No. 904,278

Claims priority, application United Kingdom, May 10, 1977, 19577/77

Int. Cl.[2] G03C *1/30*

U.S. Cl. 430—510 **8 Claims**

1. A process for hardening proteinaceous material, which comprises treating the proteinaceous material with an aqueous solution of the partial hydrolysis product of a 2,4-dichloro-6-alkoxy-s-triazine with a water-soluble tertiary phosphate and-/or a water-soluble borate, said 2,4-dichloro-6-alkoxy-s-triazine corresponding to the formula:



wherein R is a lower alkyl or alkoxyalkyl group.

4,187,115

ANORTHITE GLASS-CERAMICS

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 1, 1978, Ser. No. 938,971

Int. Cl.[2] C03C *3/22*

U.S. Cl. 106—39.8 **4 Claims**

1. A glass-ceramic article exhibiting a Log ρ at 250° C. of about 10–16, a Log ρ at 350° C. of about 9–13, a dielectric constant at 10^5 Hz of about 10–13, a dielectric constant at 10^6 Hz of about 9–13, and a coefficient of thermal expansion over the range 20°–300° C. of about $35–65\times10^{-7}$/°C. consisting essentially of a fine-grained crystal phase uniformly dispersed within a glassy matrix and constituting greater than 50% by volume of the article, said crystal phase consisting essentially of triclinic anorthite and rutile and being formed through crystallization in situ from a glass body consisting essentially, expressed in weight percent on the oxide basis, of about 10–18% CaO, 29–35% Al_2O_3, 30–39% SiO_2, and 13–20% TiO_2.

4,187,116

SILICON NITRIDE-SILICON CARBIDE COMPOSITE MATERIAL

Frederick F. Lange, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 860,403, Dec. 13, 1977, which is a continuation of Ser. No. 670,582, Mar. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 499,941, Aug. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 351,744, Apr. 16, 1973, abandoned. This application Oct. 16, 1978, Ser. No. 951,937

Int. Cl.[2] C04B *35/52, 35/58*

U.S. Cl. 106—44 **5 Claims**

1. A method of forming a composite material comprising the steps of:

(a) providing a mixture of silicon nitride powder and silicon carbide powder, the silicon carbide powder not exceeding about 40 percent by volume and having an average particle size less than about 5 microns;

(b) adding to the mixture an effective amount of a densification aid selected from the group consisting of: magnesium oxide (MgO), a member of the group of rare earth oxides, lithium oxide (LiO_2) and aluminum oxide (Al_2O_3), the mixture of silicon nitride, silicon carbide and densification aid containing less than about 200 ppm calcium; and

(c) sintering and densifying the mixture under pressure in a hot-press to provide a densified article having a silicon nitride matrix with silicon carbide particles dispersed therein.

4,187,117

TITANIUM SLAG-COKE GRANULES SUITABLE FOR FLUID BED CHLORINATION

Michel Gueguin, Tracy, Canada, assignor to Quebec Iron and Titanium Corporation - fer et Titane du Quebec, Inc., Sorel, Canada

Division of Ser. No. 811,761, Jun. 30, 1977, Pat. No. 4,117,076, which is a continuation of Ser. No. 675,954, Apr. 12, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,166

Int. Cl.[2] C04B *35/52;* **C01G** *23/02*

U.S. Cl. 106—56 **3 Claims**

1. As an article of manufacture, controllably abradable coked grains for obtaining titanium values therefrom comprising TiO_2 and a carbonaceous material in a weight ratio of from 1.5 to 2.5:1, respectively, of a hydrogen content of less than 0.2% by weight, as a binder therefor 0.25% to 1.00% per dry weight of the TiO_2 and carbonaceous material, a mesh size from 8 to 150; a crushing strength from 100 to 2000 g/mmD, and a pore size of 1 to 50 microns.

4,187,118

CONCRETE COMPOSITION FOR MAKING CONCRETE MOLDINGS AND METHOD FOR MAKING SUCH CONCRETE MOLDINGS

Koji Nakagawa, and Yoshiharu Watanabe, both of Oumi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 824,053, Aug. 12, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,108

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—89 **14 Claims**

1. A method for making concrete moldings of high strength which comprises adding, to 400–600 kg. of Portland cement per unit m^3 of concrete, 3–30% by weight of insoluble (Type II) anhydrous calcium sulfate based on the weight of said Portland cement and 0.1–3% by weight of cement dispersing agent based on the weight of the Portland cement, at a water/cement ratio of 25–35% by weight and in fine aggregate percentage of 30–50%, forming the moldings in the usual manners, subsequently subjecting the moldings thus formed to pre-steaming and thereafter effecting steam curing under atmospheric pressure.

4,187,119

GLUE FOR ARTICLES IN THE TOBACCO INDUSTRY

Jean-Claude Battard, Saran, and Jean Buisson, Orleans, both of France, assignors to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Continuation of Ser. No. 685,750, May 13, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,471

Int. Cl.[2] C09H *11/00*

U.S. Cl. 106—126 **9 Claims**

1. Glue for articles of the tobacco industry such as cigarettes, cigarillos, cigars, filter tips, coupling-sleeves, etc., characterized by the fact that at ambient temperature it is in gel form consisting essentially of water and gelatine, the gelatine concentration being in the 25–180% range in relation to the water weight, and a minor quantity of plasticizer for the gelatine in aqueous solution, selected from the group consisting of sodium alginate, carragenate, guar gum, gum arabic, pectine, galactomanne methylcellulose, sodium carboxymethylcellulose and acetylated starch, the plasticizer's concentration being within the 0,25–8% range in relation to the weight of the gelatine alone, and being adjusted so that the temperature at which the liquefied gel viscosity remains superior to 50 centipoises and becomes lower than 1000 centipoises is within the 40°–70° C. range.

4,187,120

METHOD FOR PURIFICATION OF POLYHYDRIC ALCOHOLS

Robert Kunin, Yardley, Pa., and Louis I. Blaine, Orange, N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed May 30, 1978, Ser. No. 910,628

Int. Cl.[2] C13D *3/14*

U.S. Cl. 127—46 A **12 Claims**

1. A method for purification of a polyhydric alcohol comprising:

preparing a liquid slurry mixture of filter particles, including an anion exchange resin, a cation exchange resin, and a filter aid material, said anion exchange resin particles and said cation exchange resin particles being smaller than about 37 microns;

precoating a porous support means with said slurry mixture to form a precoat layer; and

passing the polyhydric alcohol through said precoat layer and said porous support means to purify the polyhydric alcohol.

4,187,121

CLEAR-RINSE AGENT FOR MECHANICAL DISHWASHERS

Claus-Peter Herold, Mettmann; Dieter Grodau, Hilden, and Theodor Altenschopfer, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Atkien, Dusseldorf, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,751

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724350

Int. Cl.[2] B08B *7/04*

U.S. Cl. 134—26 **19 Claims**

13. In the method of washing dishes in a mechanical dishwasher comprising the steps of subjecting the soiled dishes to the forceful spraying of a cleansing liquor containing a dishwashing detergent, rinsing said dishes with a forceful spray of clear water, subjecting the cleaned and rinsed dishes to the forceful spraying of a clear rinse liquor containing an effective amount of a sheeting component, and drying said cleaned dishes, the improvement consisting essentially of employing, as said sheeting component, from 0.05 to 2.6 gm per liter of said clear rinse liquor of a reaction product obtained by reacting under acid catalysis conditions (1) an aldose selected from the group consisting of a reducing monosaccharide having 5 to 6 carbon atoms and an oligosaccharide thereof having from 2 to 4 monosaccharide units, with (2) a polyglycol ether having an average molecular weight of from 190 to 450, in a molar ratio of from 1:0.4 to 1:1.5, said reaction product having a residual quantity of free aldose of less than 4%.

4,187,122

DISHWASHING APPARATUS

Grady W. Query, P.O. Box 18452, Charlotte, N.C. 28218

Filed Nov. 7, 1978, Ser. No. 958,522

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—95 **22 Claims**

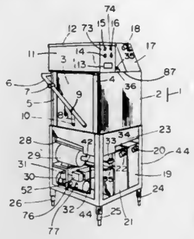
1. A dishwashing apparatus utilizing liquid treating agents in dishwashing comprising:

(a) a dishwashing compartment operative to hold objects to be washed;

(b) a plurality of storage reservoir means operative to store said liquid treating agents in bulk quantities and physically secured onto said dishwashing apparatus;

(c) an air pressure means physically secured on said dishwashing apparatus operative to maintain a constant pressure on said liquid treating agents in said plurality of storage reservoir means physically secured on said dishwashing apparatus;

(d) connecting means secured between said plurality of said storage reservoir means and said dishwashing compartment and operative to provide a means for said liquid treating agents to flow under pressure from said air pressure means into said dishwashing compartment; and



(e) flow switch means electrically controlled and operative to permit said liquid treating agents to flow under pressure from said air pressure means through said connecting means into said dishwashing compartment at pre-determined intervals.

4,187,123

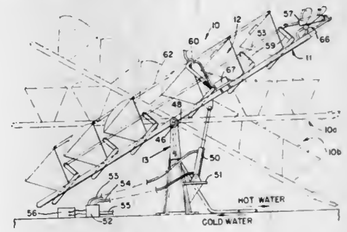
DIRECTIONALLY CONTROLLED ARRAY OF SOLAR POWER UNITS

Richard E. Diggs, 12 A Rd., Carthage, Mo. 64836

Continuation of Ser. No. 624,396, Oct. 21, 1975, abandoned. This application Nov. 15, 1977, Ser. No. 851,718

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—206 **8 Claims**



1. A directionally controlled array of solar power units, comprising: a pivotal supporting frame; a plurality of solar power units pivotally mounted on the frame for pivotal movement about two mutually perpendicular axes; conduit means on the frame for flow of cold water to and hot water from each power unit; each power unit including a solar cell for direct conversion of solar energy into electrical energy; lens means on each power unit arranged to concentrate solar energy on the solar cell of that unit; said conduit means connected for flow of cold water in heat exchange relationship with the solar cells to cool the solar cells and heat the water, said hot water thus being available for work; each power unit further comprising a base having a top surface and a bottom surface, an inlet into said base and extending through said base and exiting outwardly through the top surface of the base, a serpentine, open fluid flow troughlike passageway defined in said base top surface and extending from the inlet and a passage extending from the passageway downwardly into the base and thence outwardly through said base, said solar cell overlying the passageway closing the open side thereof to confine fluid flow through the passageway with said fluid contacting one side of said solar cell; and control means connected with the power units and the frame to pivot the power units in response to the

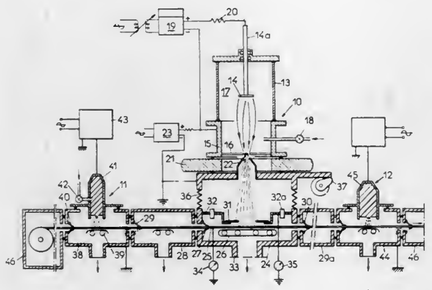
position of the sun to keep the power units pointed at the sun during hours of daylight.

4,187,124

PROCESS FOR DOPING SEMICONDUCTORS

Jean-Claude Muller; Jean-Pierre Ponpon; Joseph Kurek, and Paul Siffert, all of Strasbourg, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 15, 1978, Ser. No. 887,076
Claims priority, application France, Mar. 18, 1977, 77 08138
Int. Cl.² H01L *21/263; H01J 37/30*
U.S. Cl. 148—1.5 **12 Claims**



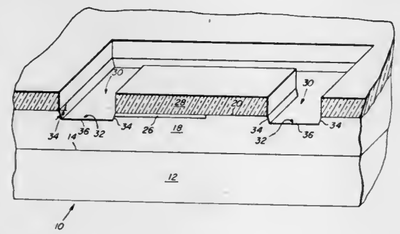
1. A process for doping a semiconductor substrate by ion implantation comprising the steps of striking an electric discharge in an atmosphere containing a gaseous compound of a dopant under a pressure between 0.1 and 10 mm of mercury for creating ions of said dopant; extracting and accelerating a beam of said ions from said atmosphere toward said substrate under a voltage selected for achieving a predetermined doping profile; and circulating said substrate transversely to said beam.

4,187,125

METHOD FOR MANUFACTURING SEMICONDUCTOR STRUCTURES BY ANISOTROPIC AND ISOTROPIC ETCHING

Wolfgang M. Feist, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 754,723, Dec. 27, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,659
Int. Cl.² H01L *29/06, 21/76, 21/302*
U.S. Cl. 148—1.5 **12 Claims**



1. The method of forming integrated circuits comprising the steps of:
(a) disposing an etch-resistant mask, having windows formed therein, over a surface of a semiconductor body;
(b) etching isolation grooves into such body by bringing an anisotropic etchant into contact with portions of the surface exposed by the windows to form grooves having side walls which intersect the surface at acute angles and bringing an isotropic etchant in contact with the walls of the etched grooves which are exposed by the windows to etch away portions of the semiconductor body under the etch-resistant mask such that the mask extends over the side walls of the resulting isolation grooves, the bottom walls of such grooves are disposed under the windows, and the side walls of the resulting isolation grooves intersect the surface at acute angles.

4,187,126

GROWTH-ORIENTATION OF CRYSTALS BY RASTER SCANNING ELECTRON BEAM

Fred J. Radd; Don H. Oertle, and Charles N. McKinney, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jul. 28, 1978, Ser. No. 929,043
Int. Cl.² H01L *21/263, 21/26*
U.S. Cl. 148—1.5 **5 Claims**

1. A method of producing a thin sheet of oriented crystal semiconductor material comprising:
(a) forming a layer of semiconductor material on a substrate;
(b) subjecting said layer to a vacuum of at least 10^{-6} torr; and
(c) applying a raster scanning electron beam to at least a portion of said layer under said vacuum to melt said portion of said layer and subsequently cause said portion of said layer to assume an oriented crystalline structure.

4,187,127

SURFACE PROCESSING SOLUTION AND SURFACE TREATMENT OF ALUMINUM OR ALUMINUM ALLOY SUBSTRATE

Kuniji Yashiro, Kanagawa; Yukihiko Ayano, Hachiohji, and Yasushi Miyazaki, Ichikawa, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,720
Int. Cl.² C23F *7/14*
U.S. Cl. 148—6.15 R **12 Claims**

1. A surface processing solution for an aluminum or aluminum alloy substrate consisting of 0.1 to 10 g/liter of one or more compounds selected from the group consisting of inositol di-~hexaphosphates and water soluble salts thereof and 0.1 to 10 g/liter as Ti of a titanium fluoride.

4,187,128

MAGNETIC DEVICES INCLUDING AMORPHOUS ALLOYS

Robert L. Billings, Andover, Mass.; Ho-Sou Chen, Warren; Ernst M. Gyorgy, Madison, and Richard C. Sherwood, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 26, 1978, Ser. No. 945,914
Int. Cl.² H01F *1/00*
U.S. Cl. 148—121 **6 Claims**

1. Method for the production of a device, said method consisting of:
a. forming a magnetic body consisting essentially of an amorphous low magnetostrictive metallic alloy by cooling said alloy from a melt or by depositing said alloy on a substrate, the composition of said alloy being represented by the formula $(Co_aFe_bT_c)_iX_j$ wherein
i. T is at least one first species selected from the group consisting of Ni, Cr, Mn, V, Ti, Mo, W, Nb, Zr, Pd, Pt, Cu, Ag, Au;
ii. X is at least one second species selected from the group consisting of a first subgroup, consisting of P, Si, B, C, As and Ge and a second subgroup consisting of Al, Ga, In, Sb, Bi and Sn;
iii. i is from 0.7 to 0.9;
iv. i+j=1;
v. a is from 0.7 to 0.97; and
vi. b is from 0.03 to 0.25 with a+b+c=1,

b. placing the body adjacent to an electrically conductive path, and
c. a characterizing additional step which is carried out either before or after placing said body adjacent to said electrically conductive path, said additional step consisting of heat treating the body by heating at heat treatment temperatures from 125 degrees Centigrade to 200 degrees Centigrade for heat treatment times from 30 minutes to two hours, which heat treatment is selected to yield a body with a temperature stabilized magnetic permeability.

4,187,129

GELLED MECHANICALLY STABLE HIGH ENERGY FUEL COMPOSITION CONTAINING METAL PLATELETS

John J. Bost, Sacramento; Jackie A. Cabeal, Citrus Heights, and Sanders D. Rosenberg, West Covina, all of Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Filed May 14, 1962, Ser. No. 195,031
Int. Cl.² C06B *45/02, 47/08*
U.S. Cl. 149—21 **13 Claims**

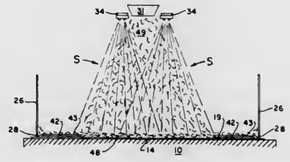
1. A gelled mechanically stable high energy fuel composition comprising a hydrazine selected from the group consisting of hydrazine, unsymmetrical dimethyl hydrazine and mixtures thereof and an amount of metal platelets effective to produce a mechanically stable gel, said platelets having a diameter of less than about 44 microns and an average diameter of about 1 micron, and said metal platelets being composed of a metal selected from the group consisting of aluminum, beryllium and aluminum-beryllium alloy.

4,187,130

METHOD FOR PRODUCING SHAPED GLASS FIBER REINFORCED GYPSUM ARTICLES

Glenn E. Kautz, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 484,304, Jun. 28, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 661,868
Int. Cl.² B32B *3/18*
U.S. Cl. 156—42 **7 Claims**



1. A method for forming glass fiber reinforced gypsum products comprising:
1. forming on a water impervious bottom membrane a ribbon comprising:
3–10 parts by weight glass fibers having an average length of ½ to 4 inches;
100 parts by weight calcium sulfate hemihydrate;
22–45 parts by weight water;
2. covering the said ribbon with a water impervious top membrane to form a sandwich consisting of two said membranes and the said ribbon;
3. removing entrapped gases from the space between the two said membranes;
4. shaping the said sandwich prior to the setting of the said ribbon;
5. setting the said ribbon prior to any deliberate water removal;
6. removing at least a portion of at least one said membrane after the ribbon has set and removing substantially all uncombined water from the said ribbon.

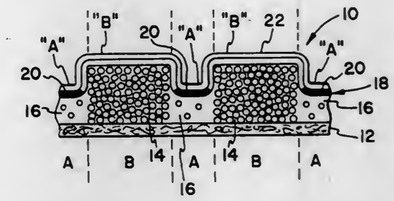
2. A method for forming glass fiber reinforced gypsum products comprising:
1. developing a spray of aqueous calcium sulfate hemihydrate slurry having a weight ratio of water to hemihydrate from 0.22 to 0.45;
2. developing a moving stream of glass fibers having an average length of 0.5 to 4.0 inches;
3. impinging said spray and said stream against each other to produce a slurry-wetted stream of glass fibers;
4. collecting said slurry-wetted stream as a ribbon on a water impervious bottom membrane;
5. covering said ribbon with a water impervious top membrane;
6. removing entrapped gases from the space between the two said membranes to produce a sandwich consisting of the two said membranes and the said ribbon;
7. shaping the said sandwich prior to setting of said ribbon;
8. setting the said ribbon prior to any deliberate water removal;
9. removing at least a portion of one said membrane after the ribbon has set and removing substantially all uncombined water from the said ribbon.

4,187,131

RESINOUS POLYMER SHEET MATERIALS HAVING SELECTIVE, SURFACE DECORATIVE EFFECTS AND METHODS OF MAKING THE SAME

Harry A. Shortway, Franklin Lakes; Alan A. Graham, Mercerville, and Charles H. Miller, Lawrenceville, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Continuation-in-part of Ser. No. 879,171, Feb. 21, 1978, abandoned, and Ser. No. 942,246, Sep. 14, 1978, abandoned. This application Jan. 22, 1979, Ser. No. 5,266
Int. Cl.² B32B *5/20, 31/22, 31/26*
U.S. Cl. 156—79 **12 Claims**



1. A method of making a resinous polymer sheet material having selectively positioned surface decorative effects comprising:
laying down or forming a base layer or substrate;
printing a pattern or design on said base layer or substrate, certain predetermined areas of said printed pattern or design containing a polymerization initiator;
applying to said printed pattern or design of said printing ink composition a resinous wear layer containing substantially uniformly therein a reactive polymerizable monomer;
mechnically embossing the surface of said resinous wear layer to provide thereon a flat, dead or dull mat texture, said mechanical embossing taking place at a sufficiently elevated temperature as to cause said polymerization initiator to (1) bring about polymerization and/or cross-linking of said reactive polymerizable monomer in those portions of said resinous wear layer lying directly over said polymerization initiator in said certain predetermined areas of said printed pattern or design and (2) to increase the melt viscosities of such portions;
and exposing said base layer or substrate and said resinous wear layer to a more elevated temperature as to cause the surfaces of said resinous wear layer to soften and melt to flow and lose their flat, dead or dull mat texture and to become sleek, smooth, glossy or lustrous, except in those

portions of said resinous wear layer containing polymerized and/or cross-linked reactive polymerizable monomers and increased melt viscosities, which portions do not soften or melt or flow but retain their flat, dead or dull mat texture to contrast with said sleek, smooth, glossy or lustrous finish portions.

9. A method of making a resinous polymer sheet material having selectively positioned surface decorative effects comprising:

laying down or forming resinous wear layer on a textured or embossed surface to create a correspondingly textured or embossed surface on said resinous wear layer thus giving the same a flat, dead or dull mat textured or embossed finish, said resinous wear layer containing substantially uniformly therein a reactive polymerizable monomer;

printed a pattern or design on said resinous wear layer, certain predetermined areas of said printed pattern or design containing a polymerization initiator capable of bring about the polymerization and/or cross-linking of said reactive polymerizable monomer;

heating said resinous wear layer and said printed pattern or design to a sufficiently elevated temperature at which said polymerization initiator brings about polymerization and/or cross-linking of said reactive polymerizable monomer in those portions of said resinous wear layer lying directly under said polymerization initiator in said certain predetermined areas of said printed pattern or design;

applying a base layer or substrate to said printed pattern or design of said printing ink composition;

removing said textured or embossed surface from said resinous wear layer; and

heating said resinous wear layer and said base layer or substrate and said printed pattern or design to a sufficiently elevated temperature to cause the surface of said resinous wear layer to soften and melt to flow into a sleek, glossy or lustrous finish only in those areas not containing any polymerized and/or cross-linked reactive polymerizable monomer, whereas those other areas containing polymerized and/or cross-linked reactive polymerizable monomers do not soften or melt or flow and retain said flat, dead or dull mat texture.

4,187,132

METHOD FOR TRANSVERSELY CUTTING AND HEMMING A WEB OF FABRIC

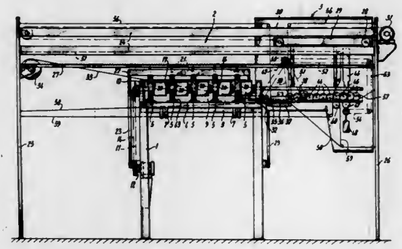
Jan A. Dijk, Winterswijk, and Everhardus J. Hegeman, Wierden, both of Netherlands, assignors to B. V. Weverij Voorheen J. H. Meijerink & Zonen, Winterswijk, Netherlands

Filed Oct. 27, 1977, Ser. No. 846,077

Claims priority, application Netherlands, Oct. 27, 1976, 7611918

Int. Cl.² B32B *31/18*; D03D *47/50*

U.S. Cl. 156—88 **3 Claims**



1. A method for transversely cutting and hemming a web of fabric including the steps of moving said web along a longitudinal direction, scanning the region where the web must be cut through with the aid of a number of scanners disposed along a line A perpendicular to the direction of movement of the web, automatically stopping said web each time each scanner interrupts the drive of the corresponding part of the width of the web, and, finally, setting the web in motion again, and said method further comprising the steps of transversely cutting and hemming said web, the improvement wherein steps of cutting and hemming said web of fabric comprises moving cutting elements and hemming elements along said line A in a transverse direction of said web during web stoppage for cutting said web and for hemming the edges being cut.

4,187,133

METHOD FOR MANUFACTURING A CLUTCH FACING

Yasunobu Yamamoto, Chiryu; Ryoichi Tomikawa; Toshiaki Sakabe, both of Toyota, and Yasuhiro Matsumoto, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 19, 1977, Ser. No. 826,132

Claims priority, application Japan, Aug. 26, 1976, 51-102054

Int. Cl.² B32B *5/00*; F16D *69/02*

U.S. Cl. 156—166 **6 Claims**

1. A method of manufacturing a clutch facing, comprising:

mixing graphite and phenolic resin to form a graphite mixture;

soaking an asbestos fiber string within said graphite mixture;

producing a soaked asbestos fiber string comprising a phenolic resin content of 14–24 weight percents and graphite content of 1–8 weight percents for every 100 weight percent of said soaked asbestos fiber string; and

bonding said soaked asbestos fiber string to said clutch facing wherein the Rockwell hardness of said clutch facing is between 20–60 on the Moh scale.

4,187,134

PROCESS FOR MAKING A GAME BALL

Věroslav Švub; Milan Burian, both of Prostějov; Vladimír Uruba, and Zdeněk Figalla, both of Gottwaldov, all of Czechoslovakia, assignors to GALA, narodni podnik, Prostejoy-Krasice,, Czechoslovakia

Filed Apr. 11, 1978, Ser. No. 895,360

Claims priority, application Czechoslovakia, Apr. 13, 1977, 2406/77; Apr. 13, 1977, 2408/77

Int. Cl.² B65H *81/00*

U.S. Cl. 156—170 **6 Claims**



1. A process for making a molded game ball which comprises,

(a) wrapping a layer of fibrous material around an inflated rubber bladder to form an inner body having a configuration corresponding to that of said bladder,

(b) applying a rubber sheet having a thickness of between 0.4 to 1.5 mm around said inner body, said rubber sheet comprising a rubber composition containing from 2.7 to 3.6 percent by weight of a first accelerating agent and from 0.2 to 0.4 percent by weight of isobutylidene-bis-4,6-dimethylphenol, said weight percentages based on the weight of the rubber composition,

(c) imprinting the applied rubber sheet with a pattern to serve as a guide for subsequent application of outer cover segments,

(d) subsequently applying a plurality of discrete cover segments to said rubber sheet conforming to said pattern, the peripheral edges of all of said cover segments being slightly spaced one from another, thereby forming a series of grooves on the semi-finished game ball,

(e) pressing the semi-finished game ball in a smooth mold for a period of from 1.5 to 10 minutes at temperatures ranging between 90° and 150° C., vulcanizing, plasticizing, and causing a portion of said rubber composition to flow into and substantially fill said series of grooves and to affect additional binding of said cover segments, and

(f) thereafter cooling the game ball so produced.

4,187,135

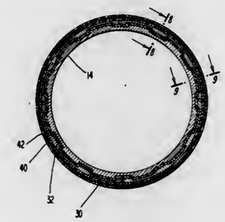
FIBER REINFORCED COMPOSITE SHAFT WITH METALLIC CONNECTOR SLEEVES MOUNTED BY LONGITUDINAL GROOVE INTERLOCK

Derek N. Yates, Los Gatos, and John C. Presta, San Jose, both of Calif., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,231

Int. Cl.² B31C *13/00*

U.S. Cl. 156—187 **12 Claims**



1. A method of forming a tubular fiber reinforced composite shaft comprising the steps of:

positioning a metal sleeve having circumferentially spaced recesses upon the outer periphery thereof upon a segment of a mandrel, said recesses each having a dimension in the longitudinal direction;

applying fibrous material bearing a non-solidified resinous material upon said mandrel and over said recesses in said sleeve;

arranging a plurality of pressing members in radially inwardly pressing relationship with said previously applied fibrous material and in overlying relationship with said recesses to press portions of said previously applied fibrous material into said recesses while bearing said non-solidified resinous material thereon;

applying additional fibrous material bearing said non-solidified resinous material to said previously applied fibrous material and around said pressing members;

solidifying said resinous material with the pressed portions of said previously applied fibrous material being positioned in said recesses to create a torsion-transmitting connection with said metal sleeve; and

removing said mandrel.

4,187,136

METHOD OF MAKING A GRADUATED DENSITY LIQUID FILTER ELEMENT

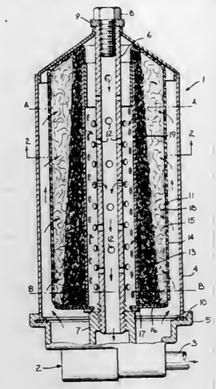
William G. Nostrand, Stoughton, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Apr. 14, 1978, Ser. No. 896,182

Int. Cl.² B31C *13/00*; B65H *81/08*

U.S. Cl. 156—192 **4 Claims**

1. A method of producing a liquid filter element, comprising the steps of forming a layer of first filtering media having a pair of longitudinal side edges and a pair of ends, forming a layer of second filtering media having different filtering characteristics than said first filtering media, disposing said second filtering media in at least partially overlapping relation with said first filtering media, said second filtering media having an edge bordering said overlapped area and disposed in non-perpendicular relation to the longitudinal side edges of the first filtering media, and winding the overlapped first and second filtering media into a coil in a manner such that said side edges are



disposed at the ends of said coil to provide a generally cylindrical filter element, whereby the cylindrical filter element has a progressively graduated density along at least a portion of its axial length.

4,187,137

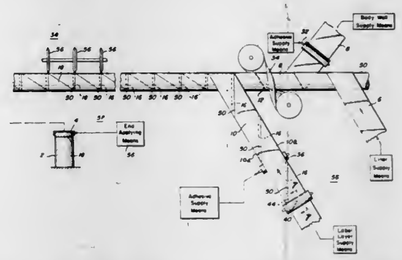
METHOD FOR FORMING A COMPOSITE CONTAINER INCLUDING A PERFORATED LABEL LAYER

Ronald A. Beauchamp, Creve Coeur, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Division of Ser. No. 789,084, Apr. 20, 1977. This application Mar. 21, 1978, Ser. No. 888,783

Int. Cl.² B65H *8/00*

U.S. Cl. 156—195 **2 Claims**



1. The method of manufacturing a composite container for dough products and the like, comprising the steps of

(a) helically winding on a mandrel an impervious inner liner layer strip (**6**);

(b) helically winding a fibrous body wall layer strip (**8**) in the same sense as, and in adhesively bonded relation on the external surface of, said helically-wound inner liner layer, said body wall layer being wound to define a helical unbonded butt joint (**12**), and said liner layer including a helically extending folded expansible portion (**6***a*, **6***b*) bonded to said body wall layer on both sides of, and extending in straddling relation across, said body wall helical butt joint, one edge portion (**6***a*) of said liner layer terminating adjacent a first side of said body wall helical butt joint, the other edge portion of said liner layer having a first portion (**6***b*) which extends from the other side of said butt joint across and beyond said butt joint, and a reversely folded second portion (**6***c*) which extends between said one edge portion and said

first portion back toward said butt joint, the length of said second portion extending substantially the length of said first portion and terminating adjacent the edge of said one edge portion, the fold line (**6***d*) between said first and second liner portions extending helically the length of the laminate section, the outer surface of said reversely folded second liner portion (**6***c*) being secured to the inner surface of said liner layer one edge portion to permit relative expansion of said first and second liner portions;

(c) forming a succession of longitudinally-spaced generally transversely extending lines of perforations (**16**) in a label layer strip (**10**), each of said lines of perforations extending from one longitudinal edge (**10***a*) of the label layer strip and terminating adjacent the other longitudinal edge (**10***b*) of the label layer strip, each of said lines of perforations being discontinuous to define in said label layer an imperforate portion (**10***e*);

(d) helically winding the label layer strip in the same sense as, and in adhesively-bonded relation on the external surface of, said body wall layer, thereby to form a tubular laminate, said label layer being wound in edge-overlapping relation with said one edge portion (**10***a*) being exposed, said imperforate portions extending in straddling relation across said body wall layer butt joint;

(e) transversely cutting the tubular laminate along longitudinally spaced lines of circumferential end cuts (**50**) contained in planes normal to the longitudinal axis of the tubular laminate, thereby to define a plurality of cylindrical laminate sections, each of said lines of perforations being adjacent, spaced from and generally parallel with the associated circumferential end cut; and

(f) fastening to the end of the laminate section adjacent the line of perforations a metal end closure member (**4**), whereby the label may be torn from the container assembly along a circumferential perforated tear line adjacent the metal end closure member, and further whereby upon removal of said label layer from the container, the butt joint is expanded by the pressurized packaged product to automatically open the liner layer by shearing or tearing.

4,187,138

SLICING WEB MATERIAL

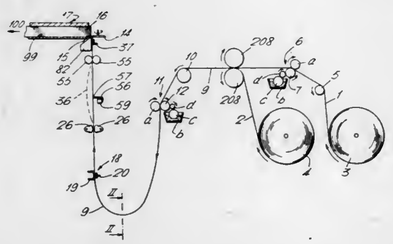
Peter J. Thwaites, Eltisley, and John N. Thornton, Abbotsley, both of England, assignors to Dufaylite Developments Ltd., Cambridgeshire, England

Filed Nov. 16, 1977, Ser. No. 851,907

Claims priority, application United Kingdom, Nov. 16, 1976, 47627/76

Int. Cl.[2] **B32B** *31/00;* **B65C** *11/04*

U.S. Cl. 156—512 **26 Claims**



1. Apparatus for producing structural honeycomb material from web material provided in the form of a plurality of superposed webs by cutting sections from the web material by transverse cutting and joining the sections together, which apparatus comprises a blade formed with a linear cutting edge, releasable clamping means for clamping the sections in turn so that they project in turn beyond said edge, a linear guide parallel with the edge, a mounting movable to and fro along the linear guide, a blade carried by the mounting and formed with a circular peripheral cutting edge positioned to overlap the linear cutting edge, in web-material cutting association therewith, a drive for moving the mounting to and fro along the guide in a continuous cyclic movement in which the mounting is moved in a first direction to a first reversal position, reversed in its motion, moved in the opposite direction to a second reversal position and again reversed in its motion for further movement in said first direction, said blades cooperating to cut the web material transversely when the mounting is moving to or fro over an intermediate part of its cyclic movement between the reversal positions to cut off the then projecting section of the web material and leave the remainder of the web material with a cut-edge at the position of the linear cutting edge, advancing means arranged to advance a section of the web material towards said clamping means whilst the mounting is moving over said intermediate part of its motion actuating means operable to release the clamping means temporarily whilst the mounting is travelling outside said intermediate part of its motion and thereby permit said section of the web material to project in its turn beyond said edge, supply means for providing the superposed webs by bringing a plurality of separate webs into face to face relationship, said supply means having adhesive applicators for securing the webs together by longitudinally extending bands of adhesive, and means for applying adhesive to the web material to join the cut sections together in face to face relationship.

4,187,139

GROWTH OF SINGLE CRYSTAL BISMUTH SILICON OXIDE

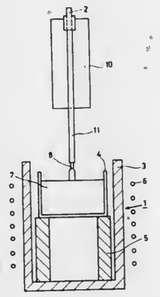
John C. Brice; Owen F. Hill, and Ronald G. Pratt, all of Salfords near Redill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 673,406, Apr. 5, 1976, abandoned, which is a continuation of Ser. No. 441,585, Feb. 11, 1974, abandoned. This application Jun. 10, 1977, Ser. No. 805,539

Claims priority, application United Kingdom, Feb. 14, 1973, 7224/73

Int. Cl.[2] **B01J** *17/18;* **C01G** *29/00*

U.S. Cl. 156—600 **2 Claims**



1. In the method of growing a single crystal of bismuth silicon oxide of constant composition by crystalization from a melt of bismuth silicon oxide the improvement wherein the crystallization is carried out in an oxygen containing atmosphere from a melt of $Bi_xSiO_{1.5x+2}$ wherein at the start of the crystallization x has a value of 11.55 to 11.82 or of 12.35 to 14.00 such that the value of x does not have a spread of more than 0.025 throughout the crystal.

4,187,140

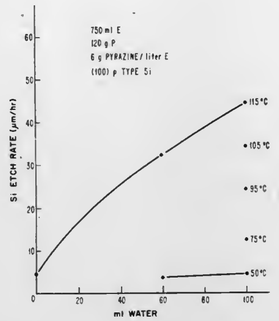
METHOD FOR ETCHING SILICON AND A RESIDUE AND OXIDATION RESISTANT ETCHANT THEREFOR

Melvin Berkenblit, and Arnold Reisman, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,340

Int. Cl.[2] **C09K** *13/00*

U.S. Cl. 156—662 **21 Claims**



6. A method for the controlled etching of thin silicon films including the steps of:

(a) Preparing an etch solution comprising from about 700 ml to about 800 ml ethylenediamine, from about 110 g to about 130 g pyrocatechol, from about 40 ml to about 100 ml of water and a diazine or a derivative thereof in the amount of about the molar equivalent of from about 5 g pyrazine/l to about 10 g pyrazine/l ethylene diamine

(b) applying said etch solution to said silicon at a temperature range of from about 20° C. to about 119° C. and for a time sufficient to effect the desired etch pattern, and thereafter

(c) quenching the etching of said silicon by the addition of water.

17. A method for rapidly etching silicon films including the steps of:

(a) preparing an etchant solution comprising from about 700 ml to about 800 ml ethylenediamine, from about 200 g to about 250 g pyrocatechol, from about 200 ml to about 250 ml of water and a diazine or a derivative thereof in the amount of about the molar equivalent of from about 5 g pyrazine/l to about 10 g pyrazine/l ethylenediamine

(b) applying said etch solution to said silicon at a temperature range of from about 100° C. to about 119° C. and for a time sufficient to etch the desired amount of silicon

(c) quenching the etching of said silicon by the addition of water.

4,187,141

METHOD OF PRODUCING BLEACHED MECHANICAL PULP

Bo Ahrel, Montreal, Canada, assignor to ALF Societe Anonyme, Fribourg, Switzerland

Continuation of Ser. No. 659,377, Feb. 19, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,515

Claims priority, application Sweden, Feb. 24, 1975, 7502060

Int. Cl.[2] **D21B** *1/02, 1/04, 1/16*

U.S. Cl. 162—23 **3 Claims**

1. In the method of producing wood pulp in a defibrating apparatus in which wood chips, impregnated with an aqueous solution of a peroxide-containing bleaching composition and compressed to a predetermined dry content with consequent removal of bleaching solution, are introduced into a pressure vessel under superatmospheric pressure and then ground between a pair of discs which rotate relative to one another in a pressure sealed defibrating zone connected to said pressure vessel, the improvement. for minimizing the consumption of peroxide, comprising:

(a) impregnating the wood chips with an aqueous solution of alkali, selected from the group consisting of sodium hydroxide, alkali silicate, alkali carbonate and alkali bicarbonate, and peroxide at a temperature ranging between 50° C. and 80° C. and for a correlated period of time ranging between 10 minutes and 2 hours to ensure presence of peroxide in the wood chips upon introduction thereof into the pressure vessel;

(b) dewatering the thus impregnated wood chips by mechanical compression to a dry content between 35% and 50%;

(c) introducing the thus impregnated and dewatered wood chips into said pressure vessel; and

(d) introducing compressed air into said pressure vessel in an amount sufficient to maintain the impregnated and dewatered wood chips at a temperature below 90° C. and the pressure vessel at superatmospheric pressure while said impregnated and dewatered wood chips are being passed into said defibrating zone to ensure retention of peroxide during the defibration.

4,187,142

METHOD FOR FORMING HIGH STRENGTH COMPOSITES

Dale M. Pickelman, Auburn; William A. Foster, and Ritchie A. Wessling, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1977, Ser. No. 825,323

Int. Cl.[2] **D21H** *3/38*

U.S. Cl. 162—146 **15 Claims**

1. A method for preparing high strength composites comprising

(a) mixing an aqueous slurry of a negatively charged, water-insoluble natural or synthetic fiber or a blend of such fibers with a latex containing a cationic water insoluble copolymer as particles having pH independent bound charges at or near the particle surface in an amount from about 0.07 milliequivalent to about 0.6 milliequivalent per gram of copolymer and a co-additive which is a water-soluble anionic polymer having a degree of polymerization above about 3000, having an available charge of from about 0.3 milliequivalent to about 8 milliequivalents per gram of polymer, having an acyclic carbon-carbon chain backbone and having the capability of retaining its solubility in the presence of polyvalent metal ions at a pH from about 4 to about 7 to form an aqueous suspension of components; the amount of said latex being more than the amount required to cause charge reversal on the fiber but less than the amount which would exceed the capacity of the fiber to hold a wet mat together during processing; and the amount of said co-additive being greater than that required to cause essentially complete retention of the latex on the fiber but less than the amount which would be effective to start redispersion of the components of the aqueous suspension;

(b) removing water from the aqueous suspension to form a wet mat;

(c) drying the mat by heating; said copolymer particles of the latex being deformable at the temperature used in heating the mat.

4,187,143
MANUFACTURE OF FIBRIDS FROM POLY(AMIDE-IMIDE) RESINS

Bruno Sander, Ludwigshafen; Kurt Scherling, Hemsbach; Rolf Steinberger, Schifferstadt, and Eckhard Ropte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft

Division of Ser. No. 727,585, Sep. 28, 1976, Pat. No. 4,091,058. This application Sep. 9, 1977, Ser. No. 831,749

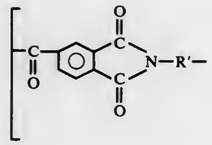
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543824

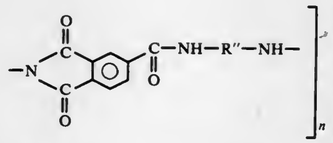
The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.[2] D21F *11/00*

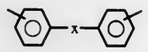
U.S. Cl. 162—157 R **2 Claims**

1. Fibrids consisting essentially of water and poly(amide-imide) resins having the formula





where n is an integer, R′ and R″ are the same or different and respectively are m-phenylene, p-phenylene or



and x is CH_2, O, S, CO or SO_2, said polymer optionally containing additional amide linkages of the formula

—OC—R′—CONH—R″—NH—

in which R′ and R″ have the meanings given above, produced by the process of dissolving a poly(amide-imide) resin in an organic solvent, selected from the group consisting of 1-methyl-2-pyrrolidone, N,N-dimethylformamide and N,N-dimethylacetamide, mixing the solution of the poly(amide-imide) resin in said organic solvent with a liquid in a volume ratio of said solvent to said liquid of from 1:1.5 to 1:5, said liquid being selected from the group consisting of tetrahydrofuran and 1,4-dioxane and said liquid being a non-solvent for said resin but being homogeneously miscible in all portions with water and with the organic solvent, and introducing the resultant solution of said resin, said solvent and said liquid into water while at the same time exposing it to shearing forces which forces are created by mechanically rotated elements at given energy densities in the range of 20 to 80 watt. sec/cm^3 to form fibrids having a length of from 0.1 to 5 mm, a thickness of from 5 to 200 μm, a Schopper-Riegler freeness of from 20° to 90° SR and a specific surface area of from 1 to 80 m^2/g.

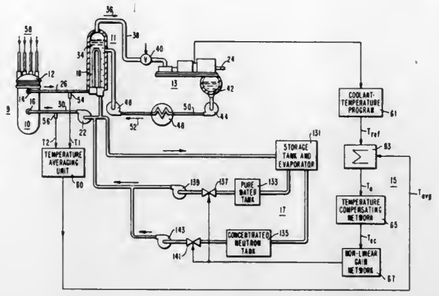
4,187,144
NUCLEAR REACTOR POWER SUPPLY

Norman P. Mueller, Trafford, and Boris A. Mutafelija, Allison Park, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 23, 1977, Ser. No. 799,632

Int. Cl.[2] G21C *7/00, 15/00*

U.S. Cl. 176—24 **11 Claims**



1. Power supply apparatus including a nuclear reactor having a fuel core to be cooled by a coolant in heat-interchange relationship with said core, said coolant to be heated by said core, conductors, connected to said reactor, for conducting said coolant from said reactor and for returning said coolant to said reactor, a turbine, connected to said conductors, to derive energy from the coolant in said conductors, means, connected to said turbine, for varying the power delivered by said turbine, means, connected to said reactor, for adjusting the chemical shim in said coolant, means, connected to said reactor, for deriving the average temperature of said coolant, means, connected to said turbine, for deriving therefrom a programmed reference temperature dependent on the power delivered by said turbine, the said reference temperature correlating said power to corresponding desired coolant temperatures, comparison means, connected to said coolant-temperature deriving means and to said reference-temperature deriving means, for deriving a compensated temperature error, and means connected to said comparison means and to said chemical-shim-adjusting means for changing the chemical shin in said coolant in dependence upon said temperature error in a sense to reduce said compensated temperature error.

4,187,145
HYDRAULIC LATCH SCRAM RELEASE MECHANISM

Richard C. Noyes, New Britain, and Shakir U. Zaman, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 25, 1977, Ser. No. 818,370

Int. Cl.[2] G21C *7/08*

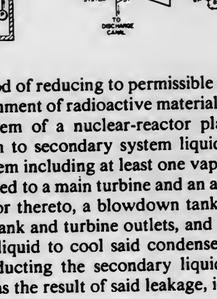
U.S. Cl. 176—36 R **6 Claims**

1. In a nuclear reactor scram device for rapidly inserting a control rod bundle downward into the reactor core including a safety duct having a liquid metal coolant flowing upward therethrough, baffle means attached to the duct above the reactor core, the fixed baffle means having one or more recesses on its lower side, a moveable latch plug disposed below the baffle means having an upper surface adapted to enclose the recess and a lower surface in fluid communication with coolant at high pressure, means for supplying low-pressure coolant to the recess, and means for transmitting the pressure of the high-pressure coolant to the recess when a scram is required, wherein the improvement comprises:

said latch plug being connected above and in spaced relation to the control rods of the control rod bundle; and

said means for transmitting pressure are contained within said plug and actuated from below said plug, said means for transmitting pressure including

a. first conduit means in fluid communication with the recess when the plug is held against the baffle means;



b. a second conduit means in fluid communication with the high-pressure coolant; and

c. valve means disposed between and fluidly separating said first conduit means and said second conduit means.

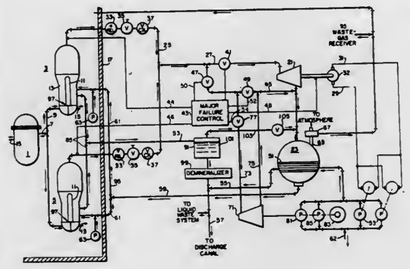
4,187,146
REDUCTION OF RADIOACTIVE EMISSIONS FROM NUCLEAR-REACTOR PLANT

Ti-Ke Shen, Monroeville, Pa., and John R. Coombe, Marblehead, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 592,858, Jul. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 378,287, Jul. 11, 1973, abandoned. This application Oct. 13, 1977, Ser. No. 841,772

Int. Cl.[2] G21C *19/30, 15/00*

U.S. Cl. 176—37 **2 Claims**



1. The method of reducing to permissible limits the rejection into the environment of radioactive materials from liquid in the secondary system of a nuclear-reactor plant resulting from primary system to secondary system liquid leakage, the said secondary system including at least one vapor generator cooperatively coupled to a main turbine and an auxiliary turbine for supplying vapor thereto, a blowdown tank, a condenser connected to the tank and turbine outlets, and means for circulating a cooling liquid to cool said condenser, the said method including conducting the secondary liquid contaminated by radioactivity, as the result of said leakage, into said blowdown tank;

conducting the vapor generated by the liquid in said blowdown tank to said condenser;

venting fluid from said condenser;

sensing the existence of radioactive gases in said fluid and selectively discharging said radioactive gases to a waste gas receiver, and after it is filled, discharging said gases into a containment enclosing the reactor in said plant;

discharging the contaminated liquid from said blowdown tank into a demineralizer;

removing radioactive materials from said contaminated liquid in the demineralizer; and,

discharging the resulting non-contaminated liquid to a discharge receiver;

diverting vapor from the main turbine in part through the auxiliary turbine and in part through said consensor to enable the auxiliary turbine;

causing the auxiliary turbine while so enabled to circulate cooling fluid through the condenser;

discharging fluid from the auxiliary turbine to the condenser; and,

transmitting the condensed liquid from the condenser to the vapor generator.

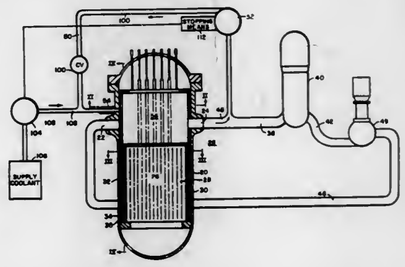
4,187,147
RECIRCULATION SYSTEM FOR NUCLEAR REACTORS

Howard E. Braun, Pittsburgh; Walter J. Dollard, Churchill, and Stephen N. Tower, Franklin Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 20, 1976, Ser. No. 659,867

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **17 Claims**



1. A recirculation system for nuclear reactor systems including a closed cylindrical nuclear reactor pressure vessel having vessel coolant inlet means and vessel coolant outlet means, a heat exchanger, piping interconnecting said heat exchanger, said vessel coolant inlet means, and said vessel coolant outlet means, a main coolant pump positioned in said piping, and a reactor coolant flowing throughout said nuclear reactor system, said recirculation system comprising:

a cylindrical core barrel positioned in and secured to said pressure vessel, said core barrel and said pressure vessel forming an annular outer space therebetween;

a lower core plate secured to the bottom of said core barrel, said lower core plate having openings therein through which reactor coolant passes;

a core baffle positioned in and secured to said core barrel, said core baffle being secured to said core plate, said core baffle having openings therein adjacent said lower core plate, said core baffle and said core barrel forming an inner space therebetween;

a nuclear core comprising a plurality of fuel assemblies, said core being positioned in said core barrel above said lower core plate;

means for extracting a portion of reactor coolant from said vessel coolant outlet means; and

means for supplying said portion of reactor coolant extracted from said vessel coolant outlet means to said inner space comprising:

a recirculation coolant inlet through said pressure vessel, said recirculation coolant inlet being in fluid communication with said inner space;

recirculation piping interconnecting said recirculation coolant inlet and said means for extracting a portion of said reactor coolant from said vessel coolant outlet means; and

a recirculation pump positioned in said recirculation piping.

4,187,148

PROCEDURE FOR SEPARATING AND RECOVERING MARSH GAS

Veli E. Reijonen, Helsinki, Finland, assignor to VYR-Metoder AB, Taby, Sweden

Continuation of Ser. No. 590,702, Jun. 26, 1975, abandoned. This application Oct. 26, 1977, Ser. No. 845,623

Int. Cl.[2] C12D *3/10*

U.S. Cl. 48—197 R **2 Claims**

1. A process for producing and recovering marsh gas generated from mud in a bog through bacterial activity comprising the steps of adding to the bog an adjusting chemical to adjust the pH value of the bog mud to be in the range from 5 to 8; adding to the bog a nutrient substance needed by methane bacteria, said substance being selected from the group consisting of phosphorus, potassium and nitrogen fertilizers; adding to the bog a trace element substance needed by methane bacteria, said substance being selected from the group consisting of iron, manganese, magnesium, calcium, nickel, cobalt, copper, zinc and molybdenum; conducting the mud from a depth having a hydrostatic pressure of several atmospheres into a separating space having subatmospheric pressure to separate the gas from the mud; conducting the gas to a place of storage or of use; and conducting the mud from the separating space back to the bog thus accomplishing a cyclic process where said adjusting chemical and said nutrient and trace element substances are added to the bog by means of adding them to the mud that is conducted back into the bog.

4,187,149

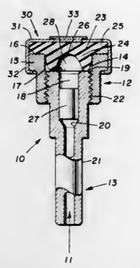
CELL CULTURE SAMPLING SYSTEM

William R. Tolbert, Manchester, and Joseph Feder, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 27, 1978, Ser. No. 881,458

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—104 **9 Claims**



1. A cell culture sampling device for withdrawing samples therethrough which comprises a double septum holder having an axial bore therethrough, an upper septum retaining member and a lower septum retaining member, said upper retaining member having lip means to retain immobilized an external septum and said lower retaining member having shoulder means to retain immobilized an internal septum, said lip and shoulder means being spaced apart to therby define a fixed chamber between said immobilized septa.

4,187,150

DISTILLED WATER APPARATUS

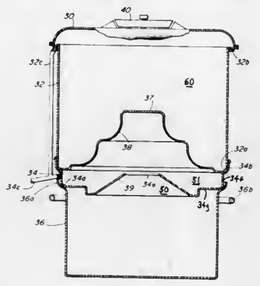
Jay Rich, 8114 NW. 91st Ave., Tamarac, Fla. 33321

Continuation of Ser. No. 675,543, Apr. 9, 1976. This application Apr. 21, 1978, Ser. No. 898,786

Int. Cl.[2] B01D *3/00;* **A47J** *31/04*

U.S. Cl. 202—182 **6 Claims**

1. An apparatus for providing a distilled water infusion beverage, comprising in vapor-sealed arrangement and readily dissemblable a bottom tank in which raw water is placed and which is adapted to be heated, a storage tank nested on but unattached to said bottom tank, and a condensing tank nested on but unattached to said storage tank; said storage tank having an outer side wall, a bottom wall and an inner side wall; said bottom wall and inner wall forming a closed surface; a tubular vapor passageway being formed by said inner side wall and extending upwardly from said bottom wall; said outer and inner side walls forming a storage compartment with said bottom wall; the bottom wall of said condensing tank acting to



seal off rising water vapor and forming an upper compartment for cooling water; said apparatus being so arranged that water vapor rising through said vapor passageway is condensed on said bottom wall of said condensing tank and drips down into said storage compartment; and a perforate infusion chamber positioned across the top portion of said storage tank extending from said outer wall to said inner wall of said storage tank for holding ground coffee or a similar infusion material, whereby said water that drips down from said bottom wall of said condensing tank passes through said infusion chamber on entering said storage tank.

4,187,151

APPARATUS FOR PRODUCING SWEET WATER

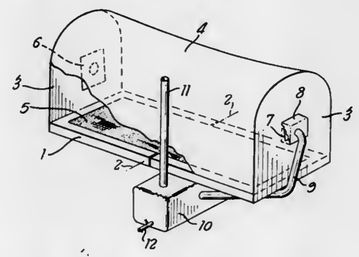
Bernard W. Hanning, 50 Firs Dr., Cranford, Middlesex, England

Filed Feb. 24, 1977, Ser. No. 771,664

Claims priority, application United Kingdom, Feb. 24, 1976, 7238/76

Int. Cl.[2] B01N *3/06*

U.S. Cl. 202—185 R **11 Claims**



1. Desalination apparatus comprising, in combination,

(a) a variable volume chamber adapted to float on the surface of a body of water and enclose air above the water surface, said chamber having

walls that move in response to wave action to alternately expand and contract the chamber and thereby effect a corresponding alternate decrease and increase in the pressure of the enclosed air,

an air inlet valve connecting the atmosphere with said enclosed air so that atmospheric pressure forces air to enter said chamber when wave action causes a decrease in pressure of the enclosed air,

an air outlet valve through which enclosed air is forced to leave said chamber when wave action causes an increase in pressure of the enclosed air; and

(b) a water collection and condensation tank having

an air inlet connected to the air outlet of said chamber so that air forced to leave said chamber is forced into said tank, and

an air outlet communicating the air in said tank to the atmosphere so that the air forced into said tank passes through and out of the tank, said tank being postionable beneath the water surface so that air forced from said chamber is cooled as it passes into and through said tank, whereby water vapor in the air condenses and collects in the tank as the air passes through said tank.

4,187,152

EXTRACTIVE DISTILLATION FOR SEPARATING KETONES AND/OR ALCOHOLS FROM PHENOL AND/OR CRESOL

David W. H. Roth, Jr., Convent Station, and David Zudkevitch, Denville, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 29, 1978, Ser. No. 974,457

Int. Cl.[2] B01D *3/40;* **C07C** *37/22, 45/24, 29/30*

U.S. Cl. 203—62 **12 Claims**

1. A process for the separation by extractive distillation of one or more alkanols, alkanones, cycloalkanols and/or cycloalkanones from mixtures with phenol and/or cresol which comprises subjecting the mixture to extractive distillation conditions in the presence of an extractive solvent comprising one or more alkylated, unmodified cycloalkyl or aryl derivatives of cyclohexanone or cyclohexanol having up to about 22 carbon atoms.

4,187,153

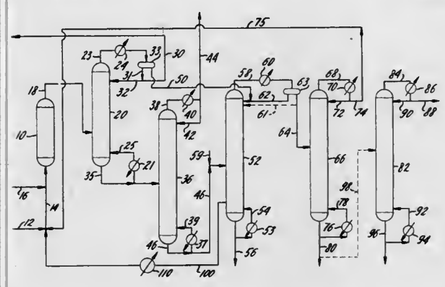
PRODUCTION OF ALKYLENE GLYCOLS

Alan Peltzman, New York, N.Y., and Charles C. Yang, Crosby, Tex., assignors to Halcon Research & Development Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,025

Int. Cl.[2] B01D *3/36*

U.S. Cl. 203—81 **16 Claims**



1. In a process for removing glycolazeotroping agent from an impure liquid containing the same, said impure liquid also containing ethylene glycol or propylene glycol, lower carboxylate esters of the glycol, carboxylic acid and water wherein said impure liquid is subjected to distillation in a distillation zone to produce an overhead product containing water and glycol-azeotropic agent and a bottoms product containing said glycol, esters and carboxylic acid, the improvement which comprises producing a bottoms product which is substantially free of said glycol-azeotropic agent, by conducting said distillation under conditions sufficient to maintain in said bottoms product a water concentration of at least about 1 weight percent.

4,187,154

METHOD FOR MANUFACTURING SUBSTANTIALLY FLAT DIES

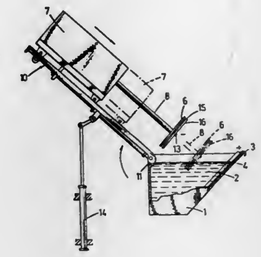
Léon Dewallens, Louvain, Belgium, assignor to Fabrication Belge de Disques "Fabeldis", Molenbeek-Saint-Jean, Belgium

Division of Ser. No. 831,351, Sep. 7, 1977, Pat. No. 4,120,771. This application Aug. 2, 1978, Ser. No. 930,660

Claims priority, application Belgium, Sep. 10, 1976, 170518

Int. Cl.[2] C25D *1/00, 1/10*

U.S. Cl. 204—5 **6 Claims**



1. Method for manufacturing substantially flat dies or similar, particularly a die or counterpart for gramophone records, which are essentially comprised of a part made from a low electric conductivity material which has been previously metallized, including introducing said part into a metal salt-based electrolyte in such a way that said part forms the cathode, the feeding of a relatively low electric current through said electrolyte between said cathode and an anode mounted inside said electrolyte some distance away from the cathode, the adjusting of the current to form by electroplating a deposit with a suitable thickness from said metal which is contained in said electrolyte, on said part, in which said electric current strength is adjusted by varying the spacing between the cathode and the anode inside the electrolyte proper, in which the spacing between the cathode-forming part and the anode is decreased continuously without influencing the electric voltage at the anode and cathode terminals during said closing operation, and maintaining the faces of the substrate and the anode substantially parallel to each other.

4,187,155

MOLTEN SALT ELECTROLYSIS

Vittorio de Nora, Nassau, The Bahamas; Placido M. Spaziante, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Continuation of Ser. No. 774,102, Mar. 7, 1977, Pat. No. 4,146,438, which is a continuation-in-part of Ser. No. 672,279, Mar. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 673,460, Apr. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 681,279, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 686,943, May 17, 1976, abandoned. This application Sep. 7, 1978, Ser. No. 940,277

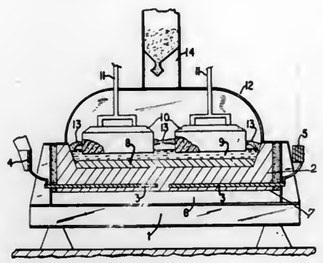
The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.

Int. Cl.[2] C25B *11/04;* **C25C** *3/06*

U.S. Cl. 204—67 **25 Claims**

1. In a method of molten salt electrolysis between an anode and a cathode wherein the salt is selected from the group consisting of metal halides and cryolite, the improvement comprising using as the anode and electrode comprised of a self-sustaining matrix of sintered powders of at least one oxycompound of at least one metal selected from the group consisting of lanthanum, terbium, erbium, ytterbium, thorium,

titanium, zirconium, hafnium, chromium, niobium and tantalum and at least one electroconductive agent, the said anode



being provided over at least a portion of its surface with at least one electrocatalyst.

4,187,156

PREPARATION OF DIHYDROAROMATIC HYDROCARBONS

James P. Coleman, Maryland Heights, and John H. Wagenknecht, Kirchwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1977, Ser. No. 862,719
Int. Cl.² C25B *3/04*
U.S. Cl. 204—73 R **10 Claims**

1. A process for the preparation of dihydroaromatic hydrocarbons which comprises electrolytic reduction at the cathode in an undivided electrolytic cell by passing a direct electric current through a basic aqueous emulsive electrolysis medium comprising an aromatic hydrocarbon selected from the group consisting of benzene, biphenyl, naphthalene, and alkyl derivatives thereof having 1 to 4 carbon atoms and an aqueous solution of a quaternary ammonium hydroxide to yield the dihydroaromatic hydrocarbon, wherein the electrolytic reduction is conducted in the substantial absence of amine salts.

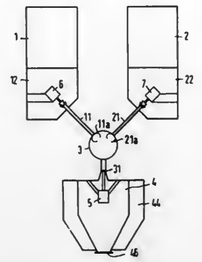
4,187,157

METHOD AND APPARATUS FOR ISOTOPE CONCENTRATION

Heinz Stehle, Marloffstein, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Aug. 28, 1975, Ser. No. 608,703
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1974, 2443216
Int. Cl.² B01J *1/10*; B01K *1/00*
U.S. Cl. 204—157.1 R **4 Claims**

1. An isotope concentration method wherein one isotope is separated from a mixture including that one isotope and at least one other isotope, by subjecting the mixture to irradiation with laser radiation exciting at least mainly only said one isotope and while the mixture is mixed with a chemical partner which chemically reacts with said one isotope when it is thus excited, said other isotope being chemically reactive with said partner when sufficiently thermally activated; wherein the improvement comprises limiting the duration of said irradiation to a time period short enough to prevent thermal activation of said mixture to a degree causing said other isotope to chemically react with said partner but long enough to excite said one isotope to a degree causing it to react with said partner, said mixture and said partner being mixed and irradiated while in a reaction vessel, and immediately after the reaction between said one isotope and the chemical partner and before any substantial thermal activation of said mixture the contents of



the vessel being emptied adiabatically into an evacuated chamber.

4,187,158

RAPID PHASE TRANSFORMATION FOR POLYBUTENE-1

Mark P. Mack, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Apr. 6, 1978, Ser. No. 893,855
Int. Cl.² C08F *6/00*
U.S. Cl. 204—159.2 **5 Claims**

1. A method for accelerating polybutene phase transformation from type II to type I, the method comprising applying a solvent selected from the group consisting of alkane isomers, cycloalkane isomers, and ethers to polybutene in type II form, said solvent evaporating and causing an immediate phase change to type I form in the area contacted thereby accelerating phase transformation to a stable polybutene type I form throughout the polybutene.

4,187,159

PROCESS FOR FORMING A CROSSLINKED POLYVINYL CHLORIDE FOAM AND PRODUCT THEREOF BY MEANS OF RADIATION CROSSLINKING

Jagadish C. Goswami, New City, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 538,623, Jan. 6, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,563
Int. Cl.² C08F *8/00*
U.S. Cl. 204—159.17 **10 Claims**

1. A process for forming a crosslinked polyvinyl chloride foam which comprises:

(a) expanding a plastisol composition which consists essentially of polyvinyl chloride, a blowing agent, and a reactive plasticizer which contains at least two ethylenically unsaturated bonds, to form a foamed composition; and

(b) exposing said foamed composition to radiation of from 50,000 to 20,000,000 electron volts until a dosage of from about 0.5 to about 3 megarads is applied to crosslink the foamed composition and form a dimensionally stable foamed product.

4,187,160

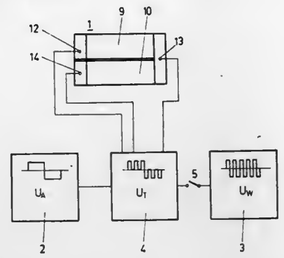
METHOD AND APPARATUS FOR OPERATING AN ELECTROPHORETIC INDICATING ELEMENT

Andreas Zimmermann, Emmenbrücke, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jul. 18, 1978, Ser. No. 925,763
Claims priority, application Switzerland, Nov. 11, 1977, 13774/77
Int. Cl.² C25D *13/18*; G02F *1/40*
U.S. Cl. 204—180 R **7 Claims**

1. A method of operating an electrophoretic indicating

element having a suspension containing a pigment which exhibits a switching time, in which said element is driven by a drive signal, comprising:



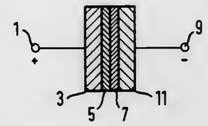
superimposing an alternating voltage signal directly on said drive signal.

4,187,161

ELECTRICAL ELEMENT OF CONSTRUCTION

Wulf Fischer, Iserlohn, Fed. Rep. of Germany, assignor to Garching Instrumente, Munich, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,435
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1978, 2806464
Int. Cl.² G01N *27/58*; H01M *8/10, 8/12*; H01L *29/66*
U.S. Cl. 204—195 S **12 Claims**



1. An electrical component having a circuit comprising between at least two points thereof, a solid ionic conductor so that the current between the two points is substantially an ionic current and means for suppressing the electron flow through the ionic conductor without substantially hindering the ion flow therethrough including at least one pn junction formed across the direction of ion flow in or adjoining the ionic conductor and which is capable of being reversed biased relative to the electron flow and wherein the p-conductive and n-conductive zones of the p-n junction comprise material conductive of the same ions as the ionic conductor.

11. An energy cell comprising the component according to claim 1.

12. A measuring probe for the conversion of chemical characteristics which determine ion current to electrical signals comprising the component according to claim 1.

4,187,162

ELECTROCHEMICAL CELL

Allen F. Dageforde, Orange, Calif., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jun. 26, 1978, Ser. No. 918,856
Int. Cl.² G01N *27/40*
U.S. Cl. 204—195 P **5 Claims**

1. A cell for electrochemical analysis of a constituent in a sample comprising:

an electrically nonconductive body having an electrolytic reservoir therein, said electrolytic reservoir containing an electrolyte;

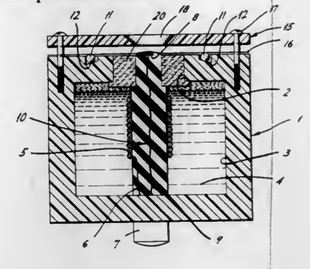
a pair of spaced electrodes, a first of said electrodes being positioned within said reservoir in contact with the electrolyte filling said reservoir;

an opening defined in said body to provide a passageway between said reservoir and the exterior of said body;

means closing said opening including a porous material in contact with the electrolyte in the reservoir and providing a path for electrolyte diffusion therethrough;

said porous material comprising the sole path for transfer of electrolyte from the reservoir to the exterior of the body;

means mounting a second of said electrodes on the exterior of the reservoir within the perimeter of said opening adjacent said porous material and being electrically coupled with the first electrode through electrolyte carried through the porous material;



a thin, flexible polymeric membrane permeable to both said constituent and said electrolyte overlying said porous material and said second electrode; and

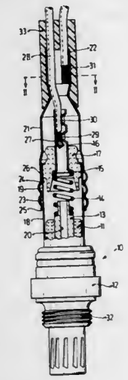
cover means overlying said membrane and providing an opening through which the constituent contacts the membrane, the interchange of the constituent and the electrolyte thereby being restricted by said porous material.

4,187,163

ELECTROCHEMICAL EXHAUST GAS OXYGEN SENSOR CONSTRUCTION

Leo Steinke, Waiblingen, and Helmut Weyl, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,612
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702578
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **10 Claims**



1. Electrochemical sensor for exposure to the exhaust gases of an internal combustion engine to determine the oxygen content therein having

a socket (12);

a solid electrolyte tubular body (11) located in the socket (12);

electrical connection means (14, 15, 16, 27) electrically connected to an electrode on the inside of the tubular body (11);

said socket including a tubular portion (18) extending in the direction of the open end of the tubular body (11) and

being formed with at least one opening (19) in gas communication with ambient air to permit penetration of ambient air to reach the interior of said tubular body (11) and provide a reference oxygen level in the interior of the tubular body; and

a cap (21) extending axially over said tubular portion (18) to protect the interior thereof against ingress of contamination,

wherein, in accordance with the invention,

said cap (21) fits snugly about the outer surface of the tubular portion (18) of the socket (12) and extends over said at least one opening (19) and is formed at its interior surface facing the tubular portion with a continuous recess extending in a labyrinthine or tortuous path formed between the outside of the tubular portion (18) of the socket (12) and the interior surface of the cap (21) and in gas communication with ambient air and with said at least one opening (19) to permit entry of air into the interior of the socket only through said labyrinthine or tortuous path between said cap and the socket while excluding contamination from the interior of the socket.

4,187,164

ANODE

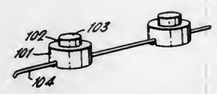
Michael A. Warne, Brewood, England, assignor to Marston Excelsior Limited, Wolverhampton, England

Filed Jun. 29, 1978, Ser. No. 920,539

Claims priority, application United Kingdom, Jul. 8, 1977, 28774/77

Int. Cl.² C23F *13/00*

U.S. Cl. 204—196 **21 Claims**



1. An anode component for use in cathodic protection comprising a strip of metal selected from the group consisting of titanium, niobium, hafnium, tantalum and alloys of one or more thereof having anodic properties comparable thereto, said strip having marginal regions and a substantially central longitudinal portion between said marginal regions, said central portion of the strip having a longitudinally extending spine upstanding from the marginal regions of the strip and the spine having a layer of anodically active material thereon.

4,187,165

BIPOLAR ELECTRODE FOR AN ELECTROLYSER

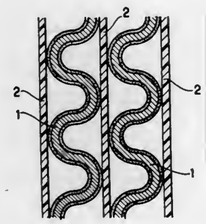
Anthony J. Appleby, Boulogne, and Gilles Crépy, Evry, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Feb. 1, 1979, Ser. No. 8,444

Claims priority, application France, Feb. 28, 1978, 78 05661

Int. Cl.² C25B *11/03, 11/06, 13/04*

U.S. Cl. 204—254 **11 Claims**



1. A bipolar electrode for an electrolyser having a basic electrolyte, said bipolar electrode including anode and cathode surfaces, the improvement wherein the anode surface and the cathode surface of said electrode both comprise a porous conductive material which includes sintered nickel previously impregnated with nickel molybdate.

4,187,166

METHOD OF REMOVING COPPER IONS FROM A BATH CONTAINING SAME

Wayne A. Kruper, Willowick, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 22, 1979, Ser. No. 5,602

Int. Cl.² C25C *1/12*

U.S. Cl. 204—43 S **8 Claims**

1. A process for electrodepositing a covering layer of lead-tin on the surface of a bearing structure formed by co-electrodepositing lead, copper and tin which process comprises

providing a metallic substrate;

placing said metallic substrate in an electroplating bath containing lead ions, tin ions and copper ions,

passing electrical current through said bath to deposit a layer of lead-tin-copper on the surface of said substrate;

removing said so-plated substrate from said bath;

subjecting said so-plated substrate to an aqueous rinsing media to remove electrolyte drag-out from said plating bath from the said plated substrate;

bring said aqueous rinse media into contact with a metal selected from the group consisting of lead, tin and alloys thereof for a period of time sufficient to cause copper ions in said media to be replaced by ions of said metal and said copper ions to deposit on the remained of said metal;

placing said rinsed plated substrate in an electroplating bath which is essentially devoid of copper ions and which contain both lead ions and tin ions; and

passing electrical current through said electroplating bath to deposit a layer of lead-tin on the surface of said substrate.

4,187,167

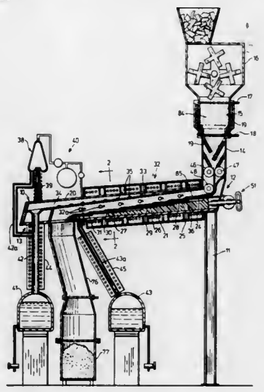
METHOD AND APPARATUS FOR THE EXTRACTION AND RECOVERY OF HYDROCARBONS FROM PETROLEUM BEARING MATERIALS

Jaroslav Havlik, 695 Bishop St., Cambridge, Ontario, Canada (N3H 4V2), and William E. Hodges, 100 Front St. West, Toronto, Ontario, Canada

Filed May 12, 1978, Ser. No. 905,233

Int. Cl.² C10B *1/08;* C10G *1/02*

U.S. Cl. 208—8 R **15 Claims**



1. The method of recovering hydrocarbons from solid materials bearing petroleum, comprising the steps of:

(a) depositing the material as a finely divided particulate homogeneous mass on linearly spaced flat reciprocating transporters housed within a vaporizing chamber having an inlet at one end and a discharge outlet at the other, including the step of metering the material as it is deposited on the transporter;

(b) transporting the deposited material through the vaporizing chamber from the inlet end to the outlet end in direct contact with the reciprocating transporters made from magnetic-electrically susceptible material able to absorb energy from the magnetic component of an electro-magnetic field through the phenomena of electric induction and transform thereby such energy to thermal heat to heat the transporters and thereby heat the said thin layer of material in direct physical contact with the surface of the said transporter to the vaporizing temperature;

(c) heating the transporters by electrical energy to thereby effectively uniformly heat the thin layer of material to the vaporizing temperature of the hydrocarbons during the transportation of the materials therethrough;

(d) controlling the temperature of the transporters the speed of travel of the said material through the vaporizing chamber to vaporize substantially all of the desired hydrocarbons; and

(e) recovering the vaporized hydrocarbons.

4,187,168

HYDROCARBON CONVERSION PROCESSES UTILIZING SUPPORTED HETERONUCLEAR CLUSTER COMPLEX CATALYSTS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 13, 1978, Ser. No. 924,198

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **12 Claims**

1. In a hydrocarbon conversion process wherein a selected hydrocarbon feedstream is contacted with a mixed noble metal catalyst under suitable conditions thereby effecting the desired change in the hydrocarbon, the improvement comprising using as the heteronuclear noble metal catalyst a supported heteronuclear noble metal cluster catalyst prepared by the reduction of supported heteronuclear noble metal cluster complexes which heteronuclear noble metal cluster complexes are selected from the group consisting of:

$(pyridine)_2\ Pt[Ir_6(CO)_{15}]$,

$(pyridine)_2\ Pt[Ir_2(CO)_7]$,

$((C_6H_5)_3P)_2\ Pt[Ir(CO)_3P(C_6H_5)_3]_2$,

$(pyridine)_3\ Pt[Ru_3(CO)_{12}]$,

$((C_6H_5)_3P)_2\ Rh(CO)[Ir(CO)_4]$, and

$(pyridine)_2\ Pt[Rh(CO)_2\ (P(C_6H_5)_3)_2]_2$

and wherein the supports are selected from the group consisting of anhydrous refractory inorganic metal oxides and carbon.

4,187,169

PROCESS AND APPARATUS FOR EFFECTING THREE-PHASE CATALYTIC REACTIONS

Jean-Paul Euzen, Ecully; Daniel Vuillemot, Millery, and Claude Dujardin, Chuzelles, all of France, assignors to Institut Francais du Petrol, Ruell-Malmaison, France

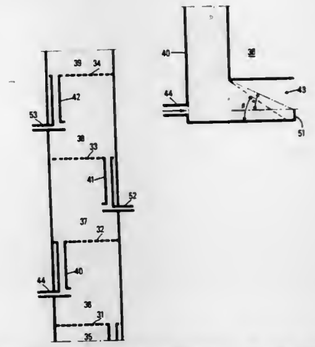
Filed Mar. 10, 1978, Ser. No. 885,222

Claims priority, application France, Mar. 10, 1977, 77 07445; Nov. 4, 1977, 77 33492

Int. Cl.² C07C *27/22;* C10G *13/16;* B01J *8/22*

U.S. Cl. 208—157 **12 Claims**

1. A process for reacting a gas with a liquid in the presence of a dispersed solid catalyst, wherein a mixture of said liquid and said gas is circulated upwardly at reaction conditions of said gas with said liquid in general counter-current to the dispersed catalyst throughout a reaction zone comprising a plurality of superposed chambers separated by common walls, each chamber containing a catalyst at least partially dispersed in the circulated liquid, each chamber also communicating with the next upper or lower chamber or both through a number of low section openings giving passage to the liquid and the gas and not to the catalyst under operation conditions, said openings being arranged in the concerned common wall and located on the direct path of the liquid and the gas, and through at least one catalyst transfer duct external to said direct path, the lower portion of the transfer duct forming a relatively quiet zone where the catalyst may accumulate, the liquid and the gas are circulated upwardly in sequence throughout the superposed chambers and the low section openings of the corresponding common walls, fresh catalyst is fed to the upper chamber of the reaction zone, the catalyst particles are moved downwardly from one chamber to a lower chamber through said duct external to the direct path of the



liquid and the gas, catalyst is discharged from the lower chamber of the reaction zone and the liquid reaction product and the residual gas are discharged from the upper chamber, so characterized that the rate of flow of the catalyst from a chamber to the immediately lower chamber is controlled by sweeping along the catalyst accumulated at the bottom of a transfer duct towards said immediately lower chamber by means of an adjustable secondary liquid and/or gas stream injected into said transfer duct, said secondary stream of liquid and/or gas being delivered in the vicinity of the opening at the lower portion of the catalyst transfer duct within said lower chamber, in the direction of said opening.

4,187,170

MAGNETIC TECHNIQUES FOR SEPARATING NON-MAGNETIC MATERIALS

Vernon C. Westcott, Lincoln, and John P. Bowen, South Hamilton, both of Mass., assignors to Foxboro/Trans-Sonics, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 762,981, Jan. 27, 1977, abandoned. This application Jan. 17, 1978, Ser. No. 870,206

Int. Cl.² B03B *1/00;* B03C *1/00*

U.S. Cl. 209—1 **16 Claims**

1. A process for separating a material of interest from a background substance by exposing a mixture thereof to a magnetic field, and wherein said material of interest is essentially non-magnetic and thus by itself not sufficiently responsive to the magnetic field to effect separation from said background substance, the method comprising the steps of:

combining said material with a solution of magnetic atoms to form a composite sample solution; and

transporting said composite sample solution through a magnetic field to develop a force on said material through magnetic influence on the atoms of said solution, said force serving to move said material to a region where it is recoverable from said background substance.

4,187,171

SIFTING MACHINE

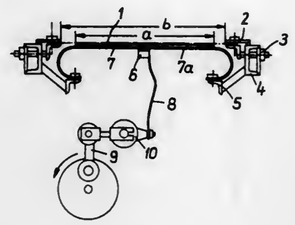
Reinhard Hoffmann; Jurgen Hoffmann, and Norbert Hoffmann, all of Plockhorst, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 26, 1975, Ser. No. 607,959

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1974, 2441859

Int. Cl.² B07B *1/34, 1/54*

U.S. Cl. 209—383 **6 Claims**



1. In a sifting machine including a screen having a length dimension; a plurality of spaced leaf springs supported below the screen and extending transversely to the length dimension of the screen; drive means connected to the leaf springs for causing each leaf spring to periodically bend away from the screen and subsequently move rapidly towards the screen to intermittently beat the latter, the improvement wherein the active beating length of each leaf spring is somewhat less than the effective width of said screen; further comprising downwardly resiliently yielding support means for opposite ends of said active beating length of each said leaf spring; said drive means including flexible cables, one associated with each said leaf spring, each cable having a first end attached to the mid portion of the associated leaf spring; and a pulling device attached to a second end of the associated cable for periodically pulling said leaf springs away from said screen for tensioning and then abruptly releasing them for causing them to move, driven solely by their own resiliency, towards and beat against said screen.

4,187,172

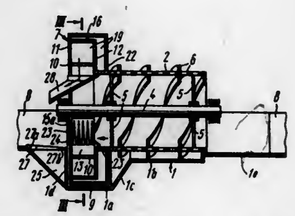
APPARATUS FOR THE SEPARATION OF TRASH FROM LESS HEAVY FIRM ARTICLES IN A FLOW OF LIQUID

Nikolai M. Datsenko, ulitsa Frunze 131, kv. 16; Nikolai N. Pushanko, ulitsa Uritskogo 9, kv. 137, and Vladimir G. Yarmilko, ulitsa Zatonskogo, kv. 78, all of Kiev, U.S.S.R.

Filed Aug. 30, 1978, Ser. No. 937,933

Int. Cl.² B07C *3/04*

U.S. Cl. 209—44.3 **6 Claims**



1. An apparatus for the separation of trash from less heavy firm articles in a flow of liquid comprising: a trough-shaped casing; a source of liquid communicating with said trough-shaped casing; a revolving screen located essentially horizontally in said trough-shaped casing; a drive of said revolving screen to actuate said screen; members to impart motion to trash mounted on said screen; a contrivance for the separation, feeding and discharging of trash located in said trough-shaped casing and attached to said revolving screen at an end where the flow of liquid carrying the uncleaned articles enters said screen and, comprising: an outward cylinder; an inward cylinder of a diameter which is somewhat greater than the diameter of said revolving screen; at least one additional cylinder interposed coaxially between said outward and inward cylinders, ports being provided in said outward cylinder for feeding the outflow of liquid with relatively small trash from said revolving screen into said contrivance, ports being provided in said inward cylinder for feeding the relatively big trash and discharging all the trash separated, ports being provided in said additional cylinder; and partitions along the longitudinal axis of said contrivance between said inward and additional cylinders so that said ports of the inward cylinder and said ports of said additional cylinders are next to each said partition on either side thereof, said partitions serving to accumulate trash thereon; wherein at least three passages are defined between said inward, outward and additional cylinders, said passages extending transversely with respect to the longitudinal axis of said contrivance, each of said passages being provided with a first length defined by the side surfaces of the outward and said additional cylinders and with a second length defined by the side surfaces of said additional cylinder and the inward cylinder, said first length communicating with said second length by a corresponding port of said additional cylinder, each of said passages opening into a corresponding port of said inward cylinder with one of its ends and into a corresponding port of said outward cylinder with another end, each of said passages being of essentially constant cross-sectional area along the entire length, and each of said passages having a length essentially equal to half the circumference of the outward cylinder.

4,187,173

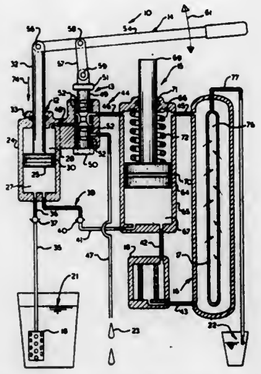
REVERSE OSMOSIS METHOD AND APPARATUS

Bowie G. Keefer, 4324 W. 11th Ave., Vancouver, B. C., Canada (V6R 2M1)

Continuation-in-part of Ser. No. 782,540, Mar. 28, 1977, abandoned. This application Mar. 14, 1978, Ser. No. 886,429

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 H **19 Claims**



1. A method of membrane separation of a feed fluid into permeate fluid and concentrate fluid fractions which respectively are permeated and rejected by selective membrane means, the membrane means being exposed to pressurized feed fluid supplied by a reciprocating pump means having a cylinder and piston means and cooperating with valve means in conduit means, the piston means dividing the cylinder into a pumping chamber in which feed fluid is pressurized and an expansion chamber in which the concentrate fluid is depressurized; the method being characterized by steps of:

(a) inducting feed fluid into the pumping chamber by an induction stroke of the piston and simultaneously exhausting concentrate fluid from the expansion chamber,

(b) reversing direction of force applied to the pump means and simultaneously hydraulically biasing the piston means against movement due to reversal of force so that reaction to reversal of force is transmitted to the valve means causing the valve means to shift in preference to relative piston means movement so as to mechanically shift the valve means to direct fluid flow between the pump means and the membrane means, the transfer of reaction forces causing a dwell period so that the valve means shifts across a closed intermediate position thereof during an interval of substantially zero fluid transfer in the expansion chamber thus incurring timely valve shifting,

(c) pressurizing the feed fluid in the pumping chamber by a compression stroke of the piston means which forces pressurized feed fluid to the membranes, and admitting the concentrate fluid fraction from the membrane means into the expansion chamber to supplement energy supplied to the piston in the compression stroke by using pressure of the concentrate fluid,

(d) separating the feed fluid into a permeate fluid fraction which passes through the membranes, and a concentrate fluid fraction which is returned from the membranes to the expansion chamber to recover some fluid pressure for pressurizing the feed fluid.

4,187,174

DIATOMACEOUS EARTH FILTERAID AND METHOD FOR ITS MANUFACTURE

Richard B. Nielsen, Irvine, and Charles J. Vogelsang, Cerritos, both of Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Continuation of Ser. No. 849,873, Nov. 9, 1977, Pat. No. 4,142,968. This application Dec. 27, 1978, Ser. No. 973,566

The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.

Int. Cl.² B01D *15/06*

U.S. Cl. 210—32 **22 Claims**

1. A process for producing diatomaceous earth filteraids of reduced beer-soluble iron content comprising the steps of mixing diatomaceous earth filteraids having a beer-soluble iron content of less than about 0.01% with an amount of aqueous acid solution less than about 15% by weight, based on the weight of the dry filteraids, and sufficient, but not in excess, to wet said diatomaceous earth filteraids uniformly, said acid being one which is capable of reducing said beer-soluble iron content within seven days when applied as a 3.0 normal aqueous solution to a diatomaceous earth filteraid in an amount of 15 % by weight based on the weight of the dry filteraid; and maintaining the acid solution in contact with the filteraids for a period of time sufficient to reduce the beer-soluble iron content of said filteraids by at least about 30%.

15. A process for producing diatomaceous earth filteraids of reduced beer-soluble iron content comprising the steps of mixing calcined diatomaceous earth filteraids having a beer-soluble iron content of less than about 0.01% with an aqueous acid solution of a strong or moderately strong inorganic acid of concentration of at least 4 gram equivalents of acid per ton of diatomaceous earth filteraid, said aqueous acid solution comprising less than about 15% by weight, based on the weight of the dry filteraids, and in an amount sufficient, but not in excess, to wet said diatomaceous earth filteraids uniformly; and maintaining the acid solution in contact with the filteraids for a period of time sufficient to reduce the beer-soluble iron content of said filteraids by at least about 30%.

4,187,175

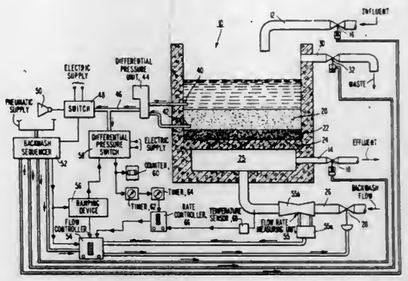
TREATMENT FACILITY WITH BACKWASH CONTROL SYSTEM

Charles V. Roberts, Drexel Hill, Pa.; William F. Sarra, Bridgewater, N.J., and Peter J. Neuspiel, Media, Pa., assignors to Robert Filter Manufacturing Company, Darby, Pa.

Filed Jun. 23, 1978, Ser. No. 918,593

Int. Cl.² B01D *23/24*

U.S. Cl. 210—80 **23 Claims**



4. A method of backwashing a treatment facility of the type having a granular media bed for use in treating liquid mixtures, such as industrial and municipal water and wastewater, said method including the steps of:

(a) establishing a first predetermined backwash liquid flow rate responsive to a predetermine pressure condition across the media bed for scouring the bed to release suspended solids or other impurities therefrom, and thereafter;

(b) establishing a second and greater backwash liquid flow rate in response to the temperature of the backwash liquid for removing the released impurities from the facility.

4,187,176

HEAVY METAL SEPARATION FROM WASTES EMPLOYING IRRADIATION

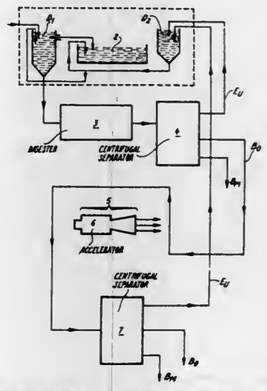
Claude Levaillant, Buc, France, assignor to C.G.R. - MeV, Buc, France

Filed Jun. 30, 1978, Ser. No. 921,111

Claims priority, application France, Jul. 5, 1977, 77 20659

Int. Cl.² C02C *1/24*

U.S. Cl. 210—151 **6 Claims**



1. A treatment plant for treating waters and sludges and using a beam of ionising radiation, comprising:

a system for decanting the primary waters and sludges;

a first centrifugal separating system for separating the waters and sludges left after decantation into clarified waters, the sludges formed by organic compounds not containing and

containing heavy metals, and the sludges formed by mineral compounds;

an irradiation apparatus supplying a beam of ionising radiation for irradiating the sludges formed by organic compounds, said organic compounds containing heavy metals being converted by means of said irradiation beam into mineral compounds of greater density;

a second centrifugal separator adapted to receive the irradiated sludges and to separate them according to their density into clarified waters, sludges formed by organic compounds, and sludges formed by mineral compounds.

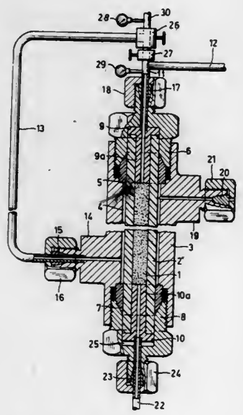
3. A treatment plant for treating waters and sludges as claimed in claim 1, wherein said irradiation apparatus comprises at least a particle accelerator supplying a beam of accelerated electrons.

4,187,177

COLUMN FOR HIGH PRESSURE LIQUID CHROMATOGRAPHY

Kurt-Wilhelm Stahl, Bischofsholer Damm 116, 3000 Hanover 1, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,517
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **13 Claims**



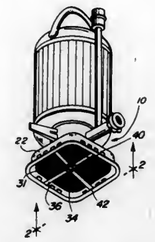
1. A column for high pressure liquid chromatography (HPLC), having a feed line for a solvent medium, a tube filled with sorbent for the passage of said solvent medium and samples to be analysed, said tube comprising an inlet and an outlet end each closed by a perforated stopper, and being concentrically surrounded by a pressure jacket so that an annular interspace between said tube and said pressure jacket is provided, one end of said interspace being connected through a separate line with the feed line through which said solvent is fed under pressure through an inlet capillary to the internal tube so that the pressure in the interspace can be equal to the pressure at the inlet end of said internal tube, both ends of said interspace being sealed by means of packings surrounding said internal tube, venting means connected to the other end of the interspace, and means for adjusting the flow resistance in the inlet capillary of said internal tube, said adjusting means being arranged upstream of the inlet end of said internal tube and downstream of where said separate line connects said interspace with said feed line.

4,187,178

HOLDER FOR FILTER SCREENS

David S. Brown, 3957 W. Lawrence Ave., Chicago, Ill. 60625

Filed Sep. 18, 1978, Ser. No. 942,986
Int. Cl.[2] B01D *29/00*
U.S. Cl. 210—232 **1 Claim**



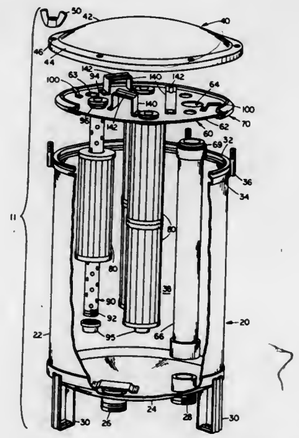
1. A device for removing and replacing a thin filter screen positioned in the lower end of a whirlpool bath apparatus, said apparatus comprising a skirt on its lower end, said skirt having spaced perforations therein, a hollow hub in the lower end of said apparatus, a filter screen, a stem having an enlarged head on one end forming a handle and the other end provided with an enlarged head for seating on said hub, said filter screen supported on said stem between the ends thereof, and ribs anchored to said screen and extending outwardly radially with the ends thereof seated in said perforations.

4,187,179

ELECTRICALLY GROUNDED FILTER PLATE

John F. Harms, 705 Waterway Dr., North Palm Beach, Fla. 33403

Filed Aug. 14, 1978, Ser. No. 933,189
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—238 **14 Claims**



1. In a filter having a closed chamber with a removable end wall and a plurality of electrically insulated electrically conductive metal parts relatively movable with respect to each other, wherein one of said metal parts is a removable support for the filter cartridges in said chamber, the improvement comprising: at least one resilient electrically conducting bridging contact means fixedly connected to one of said parts and scratchingly connected to another of said parts, which parts are otherwise electrically insulated with respect to each other, whereby said bridging contact is established when the filter is assembled and said contact is maintained regardless of any

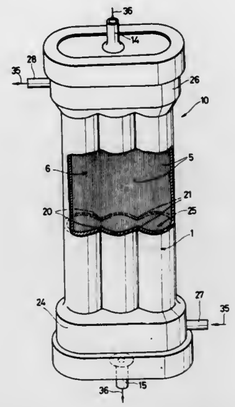
flexing of the parts relative to each other due to positive and negative pressures applied in the chamber during its operation and non-operation.

4,187,180

HOLLOW-FIBER PERMEABILITY APPARATUS

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Oct. 7, 1977, Ser. No. 840,303
Claims priority, application Japan, Oct. 18, 1976, 51-124658
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 R **13 Claims**



1. In a hollow-fiber permeability apparatus in which a permeating region of a housing comprises one compartment containing a bundle of hollow fibers, and wherein materials selectively permeate through the membranes formed by the permeable walls of said hollow fibers with a first fluid flowing along the exteriors of said hollow fibers and a second fluid flowing along the interiors of said hollow fibers, said apparatus comprising means for fixing both end portions of said hollow fibers to said housing, the walls of the housing extending parallel with said fibers between said end portions, and separate inlet and outlet means for introducing and discharging said first and second fluids, the improvement wherein:

(a) at least one housing wall includes at least one portion formed inwardly toward an opposing housing wall to define at least one inwardly formed constriction, the constriction extending in the longitudinal direction of said hollow fibers and extending substantially over the whole length of said permeating region; and

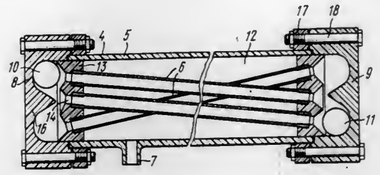
(b) said constriction extending inwardly for a distance short of said opposing housing wall whereby said constriction divides said compartment comprising said permeating region into a plurality of sub-regions with each sub-region communicating with an adjacent sub-region, said permeating region being substantially and uniformly filled with said hollow fibers, the communication of the respective sub-regions resulting in contact between the fibers in one sub-region with the fibers of an adjacent sub-region, said first fluid being adapted to flow freely between sub-regions whereby said constriction operates to divert said first fluid into contact with fibers in the central interior portions of the bundle.

4,187,181

APPARATUS FOR CLASSIFYING LIQUID MIXTURE IN ACCORDANCE WITH MOLECULAR WEIGHT

Anatoly A. Kornilov, ulitsa Moskovskoe shosse, 45, kv. 78, Dolgoprudny; Viktor D. Petrushkin, 3 Novo-Ostankinskaya ulitsa, 23, kv. 49, Moscow; Viktor N. Stetsko, Stremyanny pereulok, 35, kv. 46, Moscow, and Viktor M. Fridman, Karetny ryad, 5/10, kv. 180, Moscow, all of U.S.S.R.

Filed Dec. 28, 1978, Ser. No. 973,870
Int. Cl.[2] B01D *29/30*
U.S. Cl. 210—332 **2 Claims**



1. An apparatus for classifying liquid mixture in accordance with molecular weight, comprising:

a plurality of tubular classifiers connected in series to one another and into a plurality of sections and each said section being parallel connected to a manifold to form a unit of said apparatus; each of said tubular classifiers having a hollow casing;

end plates, each secured to a respective end of the hollow casing of each of said tubular classifiers;

vertically extending transverse partitions, each arranged in the hollow casing of each of said tubular classifiers at the end portions thereof adjacent to said end plates; pipes for admission of liquid mixture, each pipe being tangentially connected to one of the end plates of a respective tubular classifier; pipes for removal of concentrate, each pipe being tangentially connected to the other end plate of said respective tubular classifier; said vertically extending transverse partitions having through holes arranged along a spiral line conjugated with the longitudinal axis of a respective tangentially connected pipe; tubular filtering elements, each having its ends secured in the through holes located at different levels in said vertically extending transverse partitions so that each tubular filtering element is arranged at an angle to the longitudinal axis of said tubular classifier and at an angle to said vertically extending transverse partitions; pipes for removal of filtrate and each pipe being connected to a hollow casing of a respective tubular classifier.

4,187,182

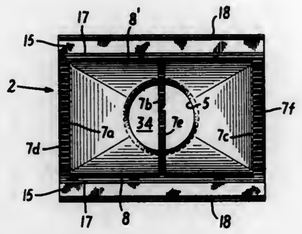
BOX FILTER

David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,767
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—445 **16 Claims**

1. A disposable filter assembly comprising, in combination, a housing in two mating housing portions of a generally box-like configuration having two ends and at least four opposed sides defining therebetween a fluid chamber and at least two fluid ports; having outer side walls along the ends and two opposed sides, and having two sides open, at least two inner side walls spaced from the outer side walls and extending along said opposed sides; a filter element in corrugated sheet form extending across the fluid chamber across the line of fluid flow between the fluid ports and held in a fluid-tight seal extending the length of the inner side walls at opposed side portions of the filter element between an edge of the inner side walls and another portion of the housing; and side caps bonded in a fluid-tight seal to the sides of the filter element extending along

said sides; at least three spaced comb means integral with each housing portion and extending outwardly therefrom, the three comb means being evenly spaced with one comb means at each end and one approximately equidistant from each end of each housing portion, and interdigitatedly inserted between corrugation folds and between each other and having tynes of a width substantially equal to the spacing between corrugation folds, and a length substantially equal to one-half the depth of



the corrugation folds; the comb means, the side caps, and inner side walls and housing portions together holding the sides and corrugation folds of the filter element and positioning the filter element across the fluid chamber, the comb means being so spaced as to support the folds against displacement in any direction, all the side edges of the filter element being sealed to the side caps and inner side walls of the housing, so that the fluid flow between the fluid ports must pass through the filter element.

4,187,183

MIXED-FORM POLYHALIDE RESINS FOR DISINFECTING WATER

Gary L. Hatch, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation of Ser. No. 656,416, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 563,068, Mar. 28, 1975, abandoned. This application Jun. 29, 1978, Ser. No. 920,260

Int. Cl.² C02B *3/06*

U.S. Cl. 210—501 **3 Claims**

1. A mixed-form polyhalide bactericidal resin comprising a strong base anion-exchange resin having anion exchange sites and having attached to a predominant number of such sites polyhalide anions of the following formulas:

$a(I_3^-)$ and $b(I_5^-)$;

wherein:

a=0.4 to 0.8 of the exchange sites;

b=0.1–0.3 of the exchange sites;

$a+b$=a predominant number of the anion sites available for exchange; and

$a+2(b)$ equals or exceeds 1.0.

4,187,184

SOFTENING COMPOSITION

Gert Becker, Weinheim, Fed. Rep. of Germany; Ulrich Schilp, Vlaardingen, Netherlands, and Hans F. Barth, Wiesloch, Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

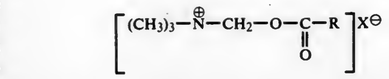
Filed Nov. 16, 1978, Ser. No. 961,273

Claims priority, application United Kingdom, Nov. 16, 1977, 47691/77

Int. Cl.² D06M *13/36*

U.S. Cl. 252—8.8 **4 Claims**

1. Fabric-softening agent on the basis of quaternary ammonium compounds, characterized in that it has further a content of choline ester salts of the following formula:



in which R is an alkyl group with 6–24 C atoms and X is a monovalent anion.

4,187,185

OIL RECOVERY PROCESS USING OXYALKYLATED ADDITIVES

Jack H. Park, and Walter D. Hunter, both of Houston, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,152

Int. Cl.² E21B *43/24, 43/22;* C11D *3/34*

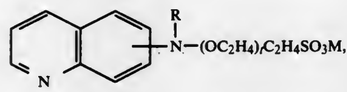
U.S. Cl. 252—8.55 D **9 Claims**

1. A method for recovering hydrocarbons from an underground formation penetrated by an injection well and a production well which comprises:

(a) injecting into the said formation via said injection well an aqueous drive fluid having dissolved therein about 0.05 to about 5.0 weight percent of a sulfonated interfacial tension reducer,

(b) forcing the said fluid through the formation to displace hydrocarbons in said formation, and

(c) recovering the displaced hydrocarbons via said production well, and wherein the said sulfonated interfacial tension reducer has the formula:



wherein t is an integer of from 3 to about 40, and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium, R is selected from the group consisting of hydrogen and $-(OC_2H_4)_sC_2H_4SO_3M$, where s is an integer of from 3 to about 40 and M has the same meaning as previously described.

4,187,186

LUBRICANT COMPOSITIONS CONTAINING ESTERS OF BENZOTRIAZOLECARBOXYLIC ACID

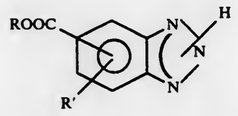
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,677

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 R **7 Claims**

1. A lubricant composition which comprises an oleagineous material, and, in an amount effective to impart antiwear, antioxidant and copper corrosion prevention properties thereto, an ester of benzotriazolecarboxylic acid having the formula;



where R is selected from the group consisting of alkyl containing from 1 to 12 carbon atoms, aralkyl containing from 7 to 12 carbon atoms and cycloalkyl and alkyl-substituted cycloalkyl containing from 5 to about 12 carbon atoms; and R′ is hydrogen or an alkyl group containing from 1 to 8 carbon atoms.

4,187,187

METHOD AND APPARATUS FOR POLLUTANT SPILL CONTROL

Joseph E. Turbeville, 4303 Jetton, Tampa, Fla. 33609

Division of Ser. No. 792,583, May 2, 1977. This application Nov. 6, 1978, Ser. No. 958,160

Int. Cl.² H01F *1/00;* B01J *31/02;* C02B *1/14*

U.S. Cl. 252—62.54 **10 Claims**



1. In a sorbent for the collection of liquid hydrocarbon pollutants having a partially reticulated, buoyant polymeric plastic substrate, a plurality of non-abrasive, magnetically susceptible particles inbedded in, and substantially evenly distributed throughout said substrate, said particles having a size of from about 100 microns to about 1500 microns, said particles present in an amount sufficient to impart to said sorbent a magnetic force to weight ratio of not less than about 2.0.

4,187,188

ELECTRICAL DEVICE CONTAINING A HALOGENATED ALKANOATE DIELECTRIC FLUID

Dennis P. Miller, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1978, Ser. No. 960,332

Int. Cl.² H01B *3/24*

U.S. Cl. 252—65 **6 Claims**

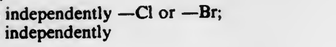
1. In an electrical device containing a dielectric fluid, the improvement which comprises employing as the dielectric fluid a compound of the formula:

(I)

where:

X is independently —Cl or —Br;

Z is independently



R and R′ are independently $(CH_2)_nCH_3$; and

n is an integer of 0 to 10.

4,187,189

PHASE CHANGE THERMAL STORAGE MATERIALS WITH CRUST FORMING STABILIZERS

Maria Telkes, Killeen, Tex., assignor to American Technological University, Killeen, Tex.

Filed May 2, 1978, Ser. No. 902,239

Int. Cl.² C09K *5/06;* F24H *7/00*

U.S. Cl. 252—70 **37 Claims**

1. A body for the storage and release of thermal effects, utilizing the heat of fusion of a material forming the body, consisting of

a mass of separate crystalline particles of a salt-hydrate;

a rigid, integral support structure for said mass of particles, formed by a water-insoluble solid filling the voids between said particles and enclosing each particle; said support structure consisting of a crust structure formed by a chemical reaction of a crust-forming compound with the surfaces of said crystalline particles;

said particles and said support structure defining a rigid, self-supporting conglomerate structure; said conglomerate structure remaining rigid and self-supporting for both the solid phase and the liquid phase of said salt-hydrate;

and means providing a water impermeable outer skin for said conglomerate structure.

16. A method for fabricating a heat exchange body, including a heat of fusion material, comprising the steps

preparing a mass of crystalline particles of a salt-hydrate to a generally uniform size;

preparing a crust forming compound, chosen to react chemically with said crystalline particles to form a water insoluble crust surrounding each particle;

thoroughly mixing said salt-hydrate particles and said crust forming compound to form a homogenous mixture;

pouring said mixture into a suitable form;

allowing said mixture to set in said form, whereby said crust forming compound reacts chemically with the surfaces of said particles to form an integral, rigid, water insoluble crust structure surrounding each of said particles and defining an integral, cellular, support structure for said particles;

and forming a moisture impermeable outer skin for said body.

4,187,190

LOW PHOSPHATE CONTENT DISHWASHING DETERGENT

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 737,588, Nov. 1, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,761

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **13 Claims**

1. A dry powder, low-phosphate machine dishwashing composition which consists essentially of:

about 10 to about 20 weight percent of a phosphorus-containing compound selected from the group consisting of an alkali metal tripolyphosphate and an alkali metal hexametaphosphate;

at least 8 weight percent of carbonate compounds selected from the group consisting of alkali metal carbonate, bicarbonate or sesquicarbonate, providing a carbonate-to-phosphate weight ratio of about 0.8:1 to about 1.3:1;

a water-soluble alkali metal silicate powder in an amount providing at least about 2.8 weight percent of said composition of soluble SiO_2, the weight ratio of SiO_2/alkali metal oxide in said silicate powder being about 1.8:1 to about 2.6:1; and

at least about 1 up to about 10 weight percent of said composition of a water-soluble high-foaming nonionic surfactant which is an ethoxylated monohydric compound containing at least about 7 moles of ethylene oxide per mol of monohydric compound, and a foam reducing agent therefor.

4,187,191

PHOTORESIST STRIPPER WITH DODECYLSULFONIC ACID AND CHLORINATED SOLVENTS

George W. Simpson, Jr., Cicero, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1978, Ser. No. 928,094

Int. Cl.² C23G *5/02;* B08B *3/08*

U.S. Cl. 252—143 **5 Claims**

1. A low cost and readily disposable liquid composition for removing an organic solvent strippable polymer and/or colloid photoresist mask from a face on a silicon wafer substantially at room temperature and pressure, said composition including, by volume, about 15–50% dodecylsulfonic acid, and about 25–42% of each of tetrachloroethylene and orthodichlorobenzene in generally equal stripper proportions.

4,187,192

TALC DISPERSIONS

Geoffrey P. Sheridan, Manchester, Urmston, England, assignor to Lankro Chemicals Ltd., Manchester, England

Filed Feb. 8, 1978, Ser. No. 876,172

Claims priority, application United Kingdom, Feb. 14, 1977, 6084/77

Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—313 R **20 Claims**

1. A stable aqueous talc dispersion containing

(a) at least 60 wt %, based on the total composition, of finely divided talc; and

(b) as a dispersing and wetting agent, at least 0.5 part by weight of one or more sulphated ethoxylated phenol, or alkylated phenol, salt per hundred parts by weight talc, the phenol, or alkylated phenol, salt containing at least 48 wt % ethylene oxide (based on the unsulphated, unsalified phenol, or alkylated phenol, itself), and when alkylated the alkyl group(s) totalling up to 12 carbon atoms.

18. A method for preparing an aqueous talc dispersion which is stable and has a viscosity enabling it to be pumped relatively easily and including at least 60 wt %, based on the total weight of the composition, of finely divided talc comprising: combining said talc, water, and dispersing agent in an amount of at least 0.5 part by weight per hundred parts by weight talc, said amount being sufficient to render said talc dispersed in said water in stable form, said dispersing agent being one or more sulphated ethoxylated phenol, or alkylated phenol, salt containing at least 48 wt % ethylene oxide (based on the unsulphated, unsalified phenol, or alkylated phenol, itself), and when alkylated the alkyl group(s) totaling up to 12 carbon atoms.

4,187,193

MICRO-CAPSULES CONTAINING UREIDO FLUORAN CHROMOGENIC COMPOUNDS

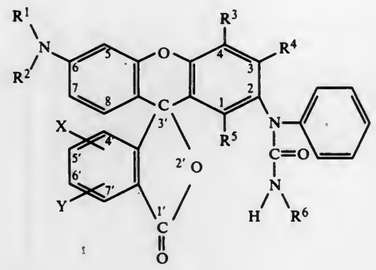
David N. Vincent, San Diego, Calif., and Cheng-Hsiung Chang, Naperville, Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 611,205, Sep. 8, 1975, Pat. No. 4,104,437, and a continuation-in-part of Ser. No. 508,834, Sep. 24, 1974, abandoned. This application May 5, 1978, Ser. No. 903,134

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **11 Claims**

1. Pressure-rupturable microcapsules containing a chromogenic compound having the structural formula



wherein

R^1 and R^2 each represent an alkyl group;

R^3 and R^4 each represent a hydrogen atom; a halogen atom, an alkyl group, a nitro group, an amino group, an acyl group, or a carboalkoxy group;

R^5 represents a hydrogen atom or an alkyl group, with the proviso that R^5 represents an alkyl group only when R^4 represents a hydrogen atom;

R^6 represents an alkyl group, an aryl group or an aralkyl group; and

X and Y each represent a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, an aryl group, an alkoxy group, or a carboalkoxy group.

4,187,194

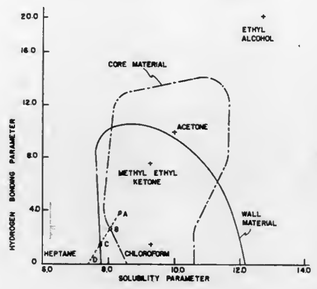
ENCAPSULATION PROCESS

Russel E. Wellman, Pittsford, and Robert W. Brown, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 214,744, Jan. 3, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,637

Int. Cl.[2] B01J *13/02;* **B05D** *7/00;* **B29C** *13/00*

U.S. Cl. 252—316 **18 Claims**



1. Process for forming capsules comprising

(i) forming a solution of wall material and core material in a solvent;

(ii) admixing said solution with an immiscible liquid to form a dispersion wherein said solution is the dispersed phase and the immiscible liquid is the continuous phase;

(iii) altering the solubility characteristics of the solvent for said solution to effect sequential phase separation of said core and wall materials, respectively, thereby forming capsules of core material encapsulated with wall materials; and

(iv) recovering said capsules.

18. Process for forming capsules as defined in claim 1 wherein the capsule exhibits an average particle size ranging from 1 to about 100 microns.

4,187,195

METHOD FOR REACTIVATING CARBON

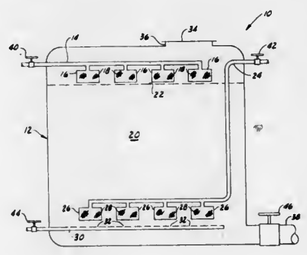
Sterling R. Kennedy, 3460 Hollenberg Dr., Bridgeton, Mo. 63044

Continuation-in-part of Ser. No. 509,353, Sep. 25, 1974, Pat. No. 3,965,037. This application Mar. 17, 1976, Ser. No. 667,481

The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.

Int. Cl.[2] B01J *21/20;* **B01D** *15/06*

U.S. Cl. 252—412 **6 Claims**



1. The method of reactivating in place carbon in a carbon bed which has been used in filtering water reclaimed from industrial wastes and is contaminated with industrial waste components which consists in removing from the carbon excess water but discontinuing such removal before the water level reaches the level of the bed, adding a hydroxide of an alkali metal to said carbon, mixing the water remaining with the hydroxide to thoroughly mix the hydroxide with the carbon, wherein high pressure air is periodically blown into the hydroxide and water to thoroughly mix the hydroxide with the carbon, periodically repeating said mixing while retaining the mixture of hydroxide and water with the carbon for sufficient time to reactivate the carbon, and then removing the hydroxide and water from the carbon.

4,187,196

PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF ALPHA-OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, all of Milan, and Romano Mazzocchi, Pernate, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 795,363, May 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 503,766, Sep. 6, 1974, abandoned, which is a continuation of Ser. No. 265,455, Jun. 23, 1972, abandoned. This application Oct. 30, 1978, Ser. No. 955,762

Claims priority, application Italy, Jun. 25, 1971, 26275 A/71

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 252—429 B **9 Claims**

1. Process for preparing a component of catalysts for the stereoregular polymerization of alpha-olefins of the formula $CH_2{=}CHR$ in which R is an alkyl radical having from 1 to 6 carbon atoms, which process comprises contacting a halogenated bi-, tri-, or tetra-valent Ti compound, or a complex of said Ti compounds and an electron-donor compound, with a support formed of or comprising an anhydrous Mg or Mn dihalide obtained by reacting, with a trialkyl Al compound, a complex of the Mg or Mn dihalide and an electron-donor compound, selected from the group consisting of esters of oxygenated organic or inorganic acids, the Al trialkyl/ester molar ratio being higher than 1.0.

4,187,197

CATALYST FOR THE DIMERIZATION OF OLEFINS

Viktor A. Kabanov, Lomonosovsky prospect, 14, kv. 108; Marina A. Martynova, ulitsa Stasovoi, 4, kv. 34; Stanislav K. Pluzhnov, pereulok Yazykovsky, 5, kv. 104, and Vladimir I. Smetanjuk, ulitsa Stasovoi, 4, kv. 34, all of Moscow, U.S.S.R.

Division of Ser. No. 779,263, Mar. 18, 1977, Pat. No. 4,118,432. This application Apr. 11, 1978, Ser. No. 895,341

Int. Cl.[2] B01J *31/22, 31/24*

U.S. Cl. 252—431 P **3 Claims**

1. In a dimerization catalyst consisting of a complex of a nickel salt with a compound selected from the group consisting of tertiary phosphines and tertiary phosphites in combination with an organoaluminum compound wherein the improvement comprises using as the organoaluminum compound a rubber selected from the group consisting of natural and synthetic carbo-chain rubber with a content of 2 to 50 mol% of AlRX units, wherein R is an alkyl with at most 8 carbon atoms, X is a halogen; the atomic ratio of Al/Ni being varied within the range of from 1:1 to 100:1.

4,187,198

NOVEL PRECIOUS METAL SENSITIZING SOLUTIONS

Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Kollmorgen Technologies Corp., Dallas, Tex.

Continuation of Ser. No. 869,237, Jan. 13, 1978, which is a continuation of Ser. No. 639,440, Dec. 10, 1975, abandoned, which is a continuation of Ser. No. 531,724, Dec. 11, 1974, Pat. No. 3,960,573, which is a continuation of Ser. No. 278,429, Aug. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 9,060, Feb. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 801,167, Feb. 20, 1969, Pat. No. 3,672,938, which is a continuation-in-part of Ser. No. 712,575, Mar. 12, 1968, abandoned, which is a continuation of Ser. No. 551,249, May 19, 1966, abandoned, which is a continuation of Ser. No. 285,889, Jun. 6, 1963, abandoned, which is a continuation of Ser. No. 53,352, Sep. 1, 1960, abandoned. This application Apr. 24, 1978, Ser. No. 898,805

The portion of the term of this patent subsequent to Jun. 27, 1989, has been disclaimed.

Int. Cl.[2] B01J *27/08, 27/10*

U.S. Cl. 252—434 **10 Claims**

1. A process for the formation of an essentially dry composition which, upon admixture with an aqueous solution containing about 12 to 18.5% hydrochloric acid, forms a stable catalyst solution for catalyzing a substrate prior to deposition of an electroless metal, said process comprising the steps of providing a liquid catalyst solution that is the product of admixture in hydrochloric acid of a catalytic metal halide with a stannous halide in molar excess of the catalytic metal halide, said liquid catalyst composition comprising acid in an amount sufficient to prevent hydrolysis; drying said liquid catalyst composition; and mixing stannous halide with the product obtained by drying said liquid catalyst composition to protect against the effects of atmospheric oxidation, said stannous halide being added in excess.

4,187,199

HYDROCARBON CONVERSION CATALYST

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 772,170, Feb. 25, 1977, Pat. No. 4,137,151. This application Sep. 5, 1978, Ser. No. 939,578

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **5 Claims**

1. A catalyst composition comprising 1 to 80 weight percent of a zeolitic crystalline aluminosilicate, 0.05 to 10 weight percent lanthanum, calculated as the elemental metal and excluding lanthanum in the crystal structure of said aluminosilicate, and 0.05 to 10 weight percent iron, calculated as the elemental metal and excluding iron in the crystal structure of said zeolite, said lanthanum, iron and aluminosilicate being dispersed in a porous, refractory matrix.

4,187,200

METHOD OF MAKING A SUPPORTED POROUS METAL CATALYST

William C. Jenkin, 382 Dorchester Rd., Akron, Ohio 44320

Filed Jun. 20, 1978, Ser. No. 917,278

Int. Cl.[2] B01J *23/74, 35/00*

U.S. Cl. 252—472 **10 Claims**

1. The method of making a highly active metal catalyst, which method comprises producing a coating of an alloy on a supporting surface, the alloy containing a first metal having catalytic properties, and a second metal capable of forming a volatile compound, reacting the coating with a material forming a volatile compound with the second metal, and removing the compound by volatilization.

4,187,201

THICK FILM CONDUCTORS

David G. Hilson, Norwalk, Conn., and Peter A. Tulipan, Irvington, N.Y., assignors to Electro Materials Corporation of America, Mamaroneck, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,945
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—512 **15 Claims**

1. A conductor paste comprising: a conductive metal consisting essentially of one member of the group consisting of Cu, Au, Au combined with Pt and Pd, Ag combined with Pd, and Ag combined with Pd and Pt; a vehicle; and a flux, said flux including ZnO in an amount equal to about 1% to 3% by weight of the total.

4,187,202

PROCESS FOR PREPARING POLYMER RESINS OF HIGH IMPACT RESISTANCE

Masatsune Kondo, and Akira Tanoue, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Osaka, Japan

Filed Jul. 28, 1976, Ser. No. 709,515
Claims priority, application Japan, Jul. 30, 1975, 50-93577
Int. Cl.[2] C08F *253/00*; C08C *1/14*; C08F *255/00*
U.S. Cl. 260—4 R **6 Claims**

1. A process for preparing polymer resins of high impact resistance which comprises coagulating a latex of a rubbery polymer selected from the group consisting of natural rubber, butadiene rubber, styrene-butadiene copolymer, acrylonitrile-butadiene copolymer, isoprene rubber, chloroprene rubber, acrylic rubber, ethylene-propylene-diene terpolymer and ethylene-vinyl acetate copolymer, said rubbery polymer being grafted or not with at least one ethylenic monomer in the presence of a suspension stabilizer and a coagulating agent to make a stable aqueous suspension of coagulated particles of said rubbery polymer, adding at least one ethylenic monomer to the aqueous suspension and subjecting the resultant mixture to suspension polymerization, said resins having a rubbery polymer content of 3 to 60% by weight.

4,187,203

POLYAMINE-CHROMIC ACID IONIC POLYMERS AND AQUEOUS CATIONIC ELECTROCOAT SYSTEMS CONTAINING THE SAME

Edward J. Murphy, Mt. Prospect, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 14, 1978, Ser. No. 924,569
Int. Cl.[2] C09D *5/08, 5/40*
U.S. Cl. 260—18 N **8 Claims**

1. An aqueous cationic electrocoating bath adapted to electrodeposit films at the cathode which cure to provide enhanced corrosion protection, comprising an aqueous bath having an amine-functional resin dispersed therein with the aid of a solubilizing acid, and a polyamine-chromic acid ionic polymer formed by mixing a water insoluble polyamine with from about 50 to about 95 equivalent percent of aqueous chromic acid, said ionic polymer providing from about 25 to about 1000 parts of chromate per million of said bath.

4,187,204

WATER-RESTRICTED, WATER-SOLUBLE PAINT

Jerald D. Howard, Upland, Calif., assignor to Pactra Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 807,109, Jun. 16, 1977, Pat. No. 4,125,499. This application May 16, 1978, Ser. No. 906,386
Int. Cl.[2] C09D *3/58, 3/64, 3/74, 5/02*
U.S. Cl. 260—22 CB **22 Claims**

1. A water soluble paint composition capable of direct application to a surface for forming a dried coating of paint, comprising:

from 5 to 60 weight percent of a water soluble, neutralized resin film former obtained by reaction of (a) resin containing sufficient carboxyl groups to be water solubilized by reaction with a basic neutralizer to form a salt thereof, said resin being selected from maleinized oils, oil modified alkyds, copolymer alkyds, oil free alkyds, acrylic solutions, copolymer oils, epoxy esters and urethane polymers, and (b) an amine or ammonia as said basic neutralizer for forming said salt with said resin, the amount of said neutralizer reacted with said resin to water-solubilize said resin being equal to at least 60% of the theoretical neutralization requirement of said resin; and

from 35 to 95 weight percent of a solvent for said neutralized resin comprising a water-soluble solvent;

said paint composition having a maximum of 8 weight percent water.

4,187,205

RADIATION-SENSITIVE COMPOSITION

Yoshio Hatano, Hachioji; Saburo Nonogaki, Tokyo; Shinkichi Horigome, Tachikawa, and Shungo Sugawara, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Feb. 15, 1978, Ser. No. 877,866
Claims priority, application Japan, Feb. 18, 1977, 52/16232
Int. Cl.[2] 260 *45.9 D*; C08K *5/34, 5/13, 5/08*
U.S. Cl. 260—30.4 A **4 Claims**

1. A radiation-sensitive composition comprising a radiation-sensitive polymer which contains a plurality of epoxy groups and a plurality of bromine atoms in one molecule thereof and which comprises at least one polymeric material selected from the group consisting of brominated and epoxidized homopolymers of butadiene, brominated and epoxidized copolymers of butadiene, brominated and epoxidized homopolymers of isoprene, brominated and epoxidized copolymers of isoprene, brominated products of copolymers of butadiene with addition-polymerizable compounds containing an epoxy group, brominated products of copolymers of isoprene with addition-polymerizable compounds containing an epoxy group and epoxidized products of copolymers of one of butadiene and isoprene with addition-polymerizable compounds containing a bromine atom, and at least one stabilizer which is selected from the group consisting of compounds having stable free radicals selected from the group consisting of 2,2-diphenyl-1-picrylhydrazyl and α,γ-bisdiphenylene-β-phenylallyl, polymerization inhibitors selected from the group consisting of hydroquinone monomethyl ether, benzoquinone, methylquinone, 2,5-dimethylquinone, thymoquinone, trimethylquinone, tetramethylquinone, chloranil, 1,4-naphthoquinone, phenanthraquinone, chrysenequinone, 2-methoxyquinone, 2-chlorobenzoquinone, dichlorobenzoquinone, methylnaphthoquinone, dichloronaphthoquinone, anthraquinone, and 2-tert-butylanthraquinone, ketone-amine reaction products selected from the group consisting of polymerization products of 2,2,4-trimethyl-1,2-dihydroquinoline, 6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline and 6-dodecyl-2,2,4-trimethyl-1,2-dihydroquinoline and phenol derivatives selected from the group consisting of 4,4'-dioxydiphenyl, dioxydiphenyl methane derivatives, and 1,1-bis-(4-hydroxyphenyl)-cyclohexane.

4. A radiation-sensitive composition according to claim 1, further comprising a solvent in which the radiation-sensitive polymer is dissolved in the non-crosslinked or non-irradiated state.

4,187,206

BLEND COMPOSITION OF AN OIL AND A NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,774
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.5 A **26 Claims**

1. An elastomeric blend composition which is injection moldable or extrudable comprising:

(a) a neutralized sulfonated elastomeric polymer having about 15 to about 50 meq. of metal sulfonate groups per 100 grams of said neutralized sulfonated elastomeric polymer, said metal sulfonate containing an ammonium or metal counterion; and

(b) about 10 to about 200 parts by weight of a non-polar process oil per 100 parts of said neutralized sulfonated elastomeric polymer, said non-polar process oil having less than 0.75 wt.% polar type compounds as measured by molecular type clay gel analysis and less than 10 wt.% aromatic constituents.

4,187,207

FLAMEPROOFED POLYAMIDE CONTAINING RED PHOSPHOROUS

Jacqueline Cerny, Lyons, and Robert Troncy, Oullins, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 11, 1977, Ser. No. 840,634
Claims priority, application France, Oct. 11, 1976, 76 31308
Int. Cl.[2] C08K *3/40*
U.S. Cl. 260—37 N **6 Claims**

1. A composition of matter comprising a polyamide, an amount of red phosphorous sufficient to flameproof said polyamide and an amount of cadmium oxide sufficient to retard the liberation of phosphine during heating of said polyamide.

4,187,208

COLORED ORGANOSILOXANE ELASTOMERS WITH IMPROVED FLAME RETARDANCY

Hewart W. Winnan, South Glamorgan, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Mar. 30, 1978, Ser. No. 891,588
Claims priority, application United Kingdom, Mar. 31, 1977, 13595/77
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **5 Claims**

1. A method for improving the flame resistance of a colored organosiloxane elastomer containing a platinum flame retarding agent wherein the elastomer is a composition vulcanizable to a silicone rubber containing:

(A) a polydiorganosiloxane convertible to the solid elastic state, wherein the organic substituents are selected from monovalent hydrocarbon groups and monovalent fluorinated hydrocarbon groups, at least 40 percent of the total substituents being methyl groups, any groups having aliphatic unsaturation being present in a proportion of not greater than 2 percent, the ratio of organic substituents to silicon atoms in the polydiorganosiloxane being in the range from 1.98 to 2.02,

(B) a reinforcing silica filler

(C) an organic peroxide vulcanising agent and

(D) from 2 to 150 parts by weight of platinum per million parts by weight of (A), the improvement consisting essentially of the addition of from 0.01 to 10 parts by weight per 100 weight of (A) of a pyrazolone pigment to the elastomer composition.

4,187,209

BRAKE BLOCK MATERIAL

William H. Searfoss, and Gerald P. Jones, both of Ridgway, Pa., assignors to Molded Materials Company, Div. Carlisle Corporation, Ridgway, Pa.

Continuation-in-part of Ser. No. 904,613, May 10, 1978. This application Nov. 6, 1978, Ser. No. 957,864
The portion of the term of this patent subsequent to Apr. 17, 1979, has been disclaimed.
Int. Cl.[2] C08K *3/22, 3/30, 3/32*
U.S. Cl. 260—38 **6 Claims**

1. An improved heat and wear resistant friction material comprising in approximate percent by weight:

Spun blast furnace slag fibers: 20%–75%
Phenolic Resin and Modifier: 13%–33%
Barytes: 10%–35%.

4,187,210

HOMOGENEOUS, HIGHLY-FILLED, POLYOLEFIN COMPOSITES

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 573,598, Apr. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 424,820, Dec. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 424,821, Dec. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 424,822, Dec. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 444,295, Feb. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 529,006, Dec. 2, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 699,942
Int. Cl.[2] C08K *9/00*
U.S. Cl. 260—42.14 **66 Claims**

1. A solid, homogeneous, particulate, highly-filled, polyolefin composite which comprises

(a) 10–75% by weight of polyolefin having an inherent viscosity of at least 2 selected from the group consisting of polyethylene and copolymers of ethylene containing up to 15% by weight of units derived from one or more 1-alkenes of 3 to 10 carbon atoms, and

(b) 25–90% by weight of finely-divided, inorganic filler compound having a neutral-to-acidic surface and a weight-average average equivalent spherical particle diameter of 0.1 to less than 50μ, and having interacted at its surface sufficient catalytically-active transition metal compound which contains substantially no halogen bonded to the transition metal to provide 0.000001–1.7 milligram-atom of transition metal per gram of filler,

said polyolefin being polymerized onto the surface of said filler, and said composite being substantially free of polymer-free filler and filler-free polymer, being a free-flowing powder, having particle sizes in the range of 0.1μ to 5 mm, and having a 10-second micronization homogeneity of at least 50% and a micronization homogeneity index of at least 20.

4,187,211

FORMULATION AND MANUFACTURE OF ANTIFOULING COMPOSITIONS

Alan V. Robinson, and John Chapman, both of Tyne and Wear, England, assignors to Camrex Research and Development, Ltd., Sunderland, England

Filed Mar. 20, 1978, Ser. No. 888,592
Claims priority, application United Kingdom, Mar. 21, 1977, 11900/77
Int. Cl.[2] C08K *5/57*
U.S. Cl. 260—42.44 **11 Claims**

1. In an antifouling marine coating composition comprising a cuprous oxide pigment and a triorganotin compound selected from the group consisting of triorganotin carboxylate homopolymers and triorganotin carboxylate copolymers, the cuprous oxide pigment and the triorganotin compound co-acting to provide an extremely effective coating toxic to marine life, the improvement comprising the presence of a desiccant for increasing the storage life of the composition, the desiccants being relatively inert and of low water solubility and capable of taking up water either physically or chemically, the desiccant being present in the coating composition in an amount sufficient to keep the cuprous oxide pigment and triorganotin compound relatively free of moisture.

4,187,212

STABILIZATION SYSTEMS FROM TRIARYLPHOSPHITES AND PHENOLS

Horst Zinke, Ernsthofen; Hans J. Lorenz, Bensheim-Auerbach, both of Fed. Rep. of Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 658,312, Feb. 17, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,921

Claims priority, application Switzerland, Feb. 20, 1975, 2155/75; Sep. 19, 1975, 12231/75

Int. Cl.[2] C08K *5/52*

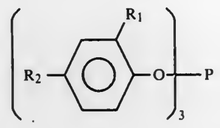
U.S. Cl. 260—45.8 NT **20 Claims**

1. A stabilized composition consisting essentially of

(a) a polymer that is derived from a singly unsaturated acyclic hydrocarbon, or mixtures or copolymers thereof and

(b) from 0.005 to 5% of a mixture of

(1) a triarylphosphite of the general formula



wherein

R_1 represents tert-butyl, or 1,1-dimethylpropyl,

R_2 represents methyl, tert-butyl, or 1,1-dimethylpropyl, and

(2) a hindered phenolic antioxidant selected from the group consisting of 1,3,5-tris-(3',5'-di-t.butyl-4-hydroxybenzyl)-isocyanurate, 1,3,5-tris-(3,5-di-t.butyl-4-hydroxybenzyl)-2,4,6-trimethylbenzene, ethyleneglycol-bis(3,3-bis-3'-t.butyl-4'-hydroxyphenyl)-butyrate, pentaerylthrit-tetra-[3-(3,5-di-t.butyl-4-hydroxyphenyl)-propionate], thiobisethyleneglycol-bis-[3-(3,5-di-t.butyl-4-hydroxyphenyl)-propionate], hexamethylene-1,6-di-[3-(3,5-di-t.butyl-4-hydroxyphenyl)-propionate] and β-(3,5-di-t.butyl-4-hydroxyphenyl)-propionic acid-n-octadecyl ester, the ratio of the phosphite to the antioxidant being from 10:1 to 1:5.

4,187,213

MULTIHETEROCYCLIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr.; James C. Ownby, and Richard H. S. Wang, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

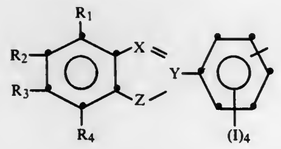
Filed Jan. 9, 1978, Ser. No. 868,087

Int. Cl.[2] C07D *213/28, 213/36, 213/89;* **C08K** *5/35*

U.S. Cl. 252—402 **26 Claims**

14. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one novel multiheterocyclic compound having the formula:

wherein A is a group having the structure



wherein

X is a carbon atom or a nitrogen atom;

Y is a carbon atom;

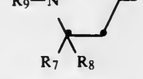
Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or an alkyl group having 1 to 12 carbon atoms or an aryl or substituted aryl group having 6 to 18 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, hydroxyl, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, amino, substituted amino, cyano or carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to Y and the carbon atom attached to the B group connecting the heterocyclic A group with the C group, said B connecting group being attached to the benzenoid ring in the ortho, meta or para positions from the carbon atom connected to Y, said I substituents can all be the same substituent listed above or different listed substituents;

wherein B is a linking group connecting A and C and can be alkylene, arylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinylidioxy, oxy(alkoxy)phosphinooxy, alkyloxyphosphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a group having the formula



R_5 and R_6 are each alkyl having 1–6 carbons; R_7 and R_8 are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R_9 is hydrogen, oxy, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl.

4,187,214

FIRE RETARDANT ADHESIVE POLYOLEFIN COMPOSITIONS

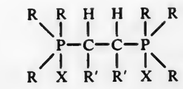
Donald G. Needham, and Ray D. Griffin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 412,282, Nov. 2, 1973, Pat. No. 3,940,547. This application Dec. 12, 1975, Ser. No. 640,087

Int. Cl.[2] C08K *5/16*

U.S. Cl. 260—45.9 KA **9 Claims**

1. A fire retardant composition having improved adhesion to aluminum, said composition comprising a normally solid, thermoplastic polyolefin; a crosslinking agent; a halogenated phosphorus-nitrogen compound having the formula



wherein R' is H or an alkyl radical having from 1 to 3 carbon atoms, R is a cyano alkyl radical having from 2 to 6 carbon atoms and X is chlorine, bromine, or iodine; ammonium polyphosphate having at least 45 percent of the phosphate in the form of polyphosphates; and a dimer of hexachlorocyclopentadiene wherein the concentrations of each of said halogenated phosphorus-nitrogen compound and said ammonium polyphosphate are in the range of about 2 percent to about 7.5 percent based on the weight of said polyolefin, and wherein the concentration of hexachlorocyclopentadiene dimer is within the range of about 5 percent to about 20 percent by weight based on the weight of said polyolefin.

4,187,215

POLYMERIC ISOCYANATE-HYDROXY TERMINATED POLYBUTADIENE COMPOSITIONS

John M. Wrightson, Carmichael, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Sep. 25, 1972, Ser. No. 292,195

Int. Cl.[2] C08F *18/24*

U.S. Cl. 528—51 **12 Claims**

1. A composition comprising in combination:

organic compounds containing a plurality of hydroxyl groups capable of reacting with an isocyanato group;

polyisocyanate of the general formula $R(NCO)_m$ in which R is a di-or polyvalent organic radical containing from 2–30 carbon atoms and m is 2,3, or 4;

homopolymerizable polyisocyanate in excess of the stoichiometric amount necessary to form said polyurethane; and

a catalyst in an amount effective for said homopolymerization.

4,187,216

DIPEPTIDE DERIVATIVES

Cedric H. Hassall, Welwyn; William H. Johnson, Hitchin, and Noel A. Roberts, Welwyn Garden City, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

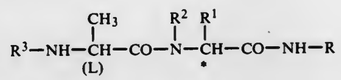
Filed Jun. 8, 1977, Ser. No. 804,680

Claims priority, application United Kingdom, Jun. 25, 1976, 26662/76; Aug. 6, 1976, 32847/76; Mar. 14, 1977, 10657/77

Int. Cl.[2] C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **34 Claims**

1. Dipeptide derivatives of the formula



(I)

wherein R is phenyl, substituted phenyl, lower cycloalkyl or n-(C_4-C_6)-alkyl; R^1 and R^2 each is hydrogen or methyl, with the proviso that R^1 and R^2 are not simultaneously hydrogen, or R^1 and R^2 together are trimethylene; R^3 is alkanoyl, haloalkanoyl, nitro-alkanoyl, cyano-alkanoyl, cycloalkylcarbonyl, cycloalkyl-alkanoyl, aroyl, aryl-alkanoyl, alkoxycarbonyl, aryloxycarbonyl, arylsulfonyl, alkylsulfonyl, cyclo-alkylsulfonyl, cycloalkylsulfinyl, cycloalkyl-alkylsulfonyl or cycloalkyl-alkylsulfinyl and the asterisk denotes that the configuration at the carbon atom so-marked is L when R^1 is other than hydrogen.

4,187,217

BRADYKININ CYCLIC ANALOG-CYCLO-[(N^{ϵ}-1-L-LYSINE, 6-GLYCINE)-BRADYKININ]

Gunar I. Chipens, ulitsa Lenina, 84, kv. 5; Felix K. Mutulis, ulitsa Bikrnieku, 77, kv. 52, and Inta P. Misinya, ulitsa St. Mangali, 7, kv. 1, all of Riga, U.S.S.R.

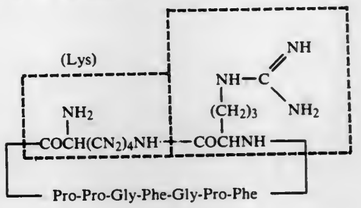
Filed Dec. 8, 1978, Ser. No. 967,609

Claims priority, application U.S.S.R., Dec. 14, 1977, 2555261

Int. Cl.[2] C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **1 Claim**

1. Cyclic analog of bradykinin - cyclo[(N^{-68} -1-L-lysine, 6-glycine)-bradykinin] where N-terminal bradykinin arginine is substituted by L-lysine, and serine in position 6 of bradykinin is substituted by glycine, the cycle is closed with peptide bond formed by arginine carbonyl group and ϵ-amino group of lysine of the formula



where Lys -L-lysine residue, Pro -L-proline residue, Gly -glycine residue, Phe -L-phenylalanine residue, Arg - L-arginine residue.

4,187,218

WATER-SOLUBLE ACID AZO DYE

Fabrizio Merlo, Saronno; Giorgio Bornengo, Novara, and Camillo Paffoni, Pogno, all of Italy, assignors to Montedison S.p.A., Milan, Italy

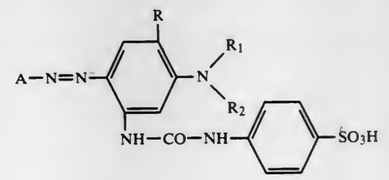
Filed Mar. 15, 1978, Ser. No. 886,943

Claims priority, application Italy, Mar. 17, 1977, 21341 A/77

Int. Cl.[2] C09B *29/36, 29/06*

U.S. Cl. 260—158 **1 Claim**

1. A water-soluble acid azo dye having the formula:



wherein:

A is a residue of a diazotizable aromatic or heterocyclic amine, optionally substituted;

R is selected from the group consisting of H, CH_3, OCH_3 and OC_2H_5;

R_1 is selected from the group consisting of CH_3 and C_2H_5; and

R_2 is selected from the group consisting of CH_3 and C_2H_5.

4,187,219

STARCH COATING PIGMENT FOR PAPER

Thomas K. Maher, LaGrange Park, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 15, 1977, Ser. No. 861,069

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.4 ST **16 Claims**

1. A process for the production of a pigment coating compo-

sition for paper containing an improved cooked starch product which comprises the steps of:

(a) cooking in water a substantially non-birefringent, cold-water swelling, granular starch product characterized prior to cooking as having less than 10% solubles and a swelling power such that each 5 g. when dispersed in water and held for about 16 hours at 25° C. has a swollen volume of from about 20-ml. to about 35-ml.; and

(b) mixing the cooked starch product characterized as having from greater than 10% solubles to about 40% solubles by weight in water at 25° C. into the clay slip to obtain a pigment coating composition for paper.

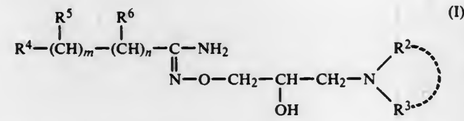
4,187,220

NEW O-(3-AMINO-2-HYDROXY-PROPYL)-AMIDOXIME DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Kalman Takacs; Peter N. Literati; Ilona Kiss, nee Ajzert; Antal Simay; Matyas Szentivanyi; Sandor Virag, and Katalin Farago, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Aug. 30, 1977, Ser. No. 829,148
Int. Cl.[2] C07D *295/14, 401/12, 403/12*
U.S. Cl. 260—239 B **13 Claims**

1. A compound of the formula I or a pharmaceutically acceptable acid addition salt thereof



(I)

wherein

R^2 and R^3 are polymethylene which together form a five- to eight-membered ring;

R^4 is unsubstituted or halogen-, C_1 to C_4 alkoxy or C_1 to C_4 alkyl mono- or di-substituted phenyl, naphthyl, quinolyl, isoquinolyl, pyridyl, or pyrazolyl;

R^5 is hydrogen or alkyl having one to four carbon atoms, cycloalkyl or phenyl which can be mono- or di-substituted with halogen, alkoxy having one to four carbon atoms or alkyl having one to four carbon atoms;

R^6 is hydrogen, alkyl having one to four carbon atoms or phenyl;

m—0,1 or 2; and

n—0,1 or 2.

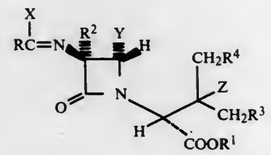
4,187,221

PROCESS FOR PREPARING AZETIDINONES

Ronald G. Micetich; Robert A. Fortier, both of Sherwood Park; Chia C. Shaw, Edmonton, and Werner O. Merlo, Devon, all of Canada, assignors to Connlab Holdings Limited, Quebec, Canada

Filed Dec. 27, 1977, Ser. No. 864,705
Int. Cl.[2] C07D *205/08, 403/04*
U.S. Cl. 260—239 A **11 Claims**

1. A compound of formula 1



1

wherein R is an amino-protecting group commonly used in penicillin chemistry derivatives selected from the group consisting of H, C_1–C_6 alkyl, phenyl (optionally substituted in the o—, m—, or p- positions by CH_3, F, Cl, OCH_3, or a nitro group), benzyl, 2-thienylmethyl, tetrazol (1-, 2-, or 5-)yl-methyl, 2-phenyl-5-methylisoxazol-4-yl, phenoxymethyl, and R^5O— and R^5S, wherein R^5 stands for C_1–C_6 alkyl, phenyl, benzyl or trichloroethyl; X is OH, and RCX=N may also represent the phthalimido, succinimido-, or tritylamino- group; R^1 is a carboxy-protecting group commonly used in penicillin chemistry selected from the group consisting of hydrogen, a cleavable acid protective group selected from C_1–C_6 alkyl, methoxymethyl, phenoxymethyl, benzyloxymethyl, trichloroethyl, benzyl, p-halobenzyl, p-nitrobenzyl, p-methoxybenzyl, benzhydryl and trimethylsilyl; R^2 is selected from hydrogen and methoxy; R^3 and R^4 are selected from the group consisting of H, Cl, Br, I, OCHO, $OCOCH_3$, SCl, and SBr with the proviso that one and only one of R^3 or R^4 must be H, Y is selected from Cl and Br, Z is selected from Cl, Br, I, SCl, and SBr and one of R^3, R^4 and Z must be SCl or SBr.

4,187,222

PROCESS FOR THE PREPARATION OF CYCLOPENTADECANOLIDE

Kurt Bauer, and Alfred Körber, both of Holzminden, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 921,158
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731543
Int. Cl.[2] C07D *313/00*
U.S. Cl. 260—343 **2 Claims**

1. In a process for the preparation of cyclopentadecanolide from 13-oxa-bicyclo[10.4.0]-hexadecane-[1(12)] by oxidizing the starting material to the 12-keto-cyclopentadecanolide and converting the keto-lactone to cyclopentadecanolide, the improvement which comprises converting the 12-keto-cyclopentadecanolide or its oxime to the cyclopentadecanolide by reduction with hydrazine in the presence of an alkaline catalyst to form the linear hydroxyacid and thereafter closing the ring.

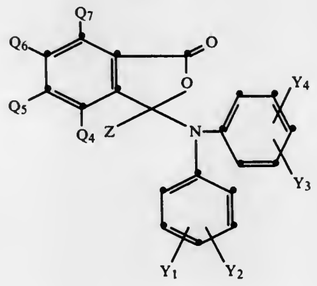
4,187,223

3-[4-(DISUBSTITUTED-AMINO)PHENYL]-3-(DI-PHENYLAMINO)PHTHALIDES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 821,927, Aug. 4, 1977, which is a continuation-in-part of Ser. No. 755,183, Dec. 29, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 942,996
Int. Cl.[2] C07D *307/83*
U.S. Cl. 260—343.3 R **18 Claims**

1. A compound having the formula



wherein:

Q_4 is hydrogen or halo;

Q_5 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_6 and Q_7 are each hydrogen;

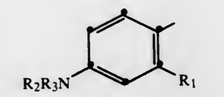
Q_6 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_5 and Q_7 are each hydrogen;

Q_7 is the same as Q_4;

X is hydroxy, benzyloxy, alkoxy having from 1 to 18 carbon atoms or OM where M is an alkali metal cation, an ammonium cation or a mono-, di- or trialkylammonium cation having from 1 to 18 carbon atoms;

Y_1, Y_2, Y_3 and Y_4 are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, lower-alkoxy, alkyl having from 1 to 9 carbon atoms, phenyl-lower-alkyl, $COOR_4$ and NR_5R_6 where R_4 and R_5 are hydrogen or lower-alkyl and R_6 is hydrogen, lower alkyl, cycloalkyl having from 5 to 7 carbon atoms, lower-alkanoyl, phenylsulfonyl or lower-alkyl-substituted phenylsulfonyl;

Z is a radical having the formula



in which:

R_1 is selected from the group consisting of hydrogen, halo, lower-alkyl, lower-alkoxy and di-lower-alkylamino;

R_2 is lower-alkyl; and

R_3 is selected from the group consisting of lower-alkyl, benzyl, phenyl, and phenyl substituted with a lower-alkyl or lower-alkoxy group.

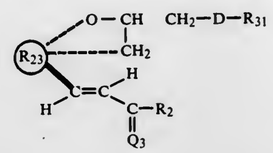
4,187,224

2-DECARBOXY-2-HYDROXYMETHYL-5,6-DIHYDRO-PROSLACYLIN ANALOGS

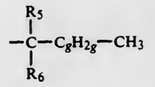
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 857,236, Dec. 5, 1977, Pat. No. 4,125,712, which is a continuation-in-part of Ser. No. 788,146, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,400, Jun. 1, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,634
Int. Cl.[2] C07D *307/93*
U.S. Cl. 260—346.22 **28 Claims**

1. A cyclic ether of the formula

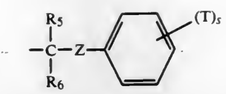


wherein D is (1) a valence bond; (2) $—(CH_2)_d—$ where d is one, 2, 3, 4, or 5; (3) —CH=CH—A— where A is a valence bond or $—(CH_2)_h—$ where h is one, 2, or 3; or (4) $—CH_2—O—CH_2—Y—$ where Y is a valence bond or $—(CH_2)_k—$ where k is one or 2; wherein R_2 is



(1)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; or



(2)

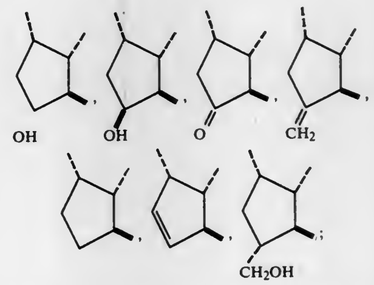
wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $—CR_5R_6—$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;

wherein Q_3 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_{23} is



wherein R_{31} is $—CH_2OH$ with the proviso that R_{31} is not $—CH_2OH$ when D is a valence band,

and wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,187,225

NOVEL SYNTHESIS OF BIS PYRAZOLONE OXONOL DYES

Henry Bader, Newton Center, and Michael H. Feingold, Randolph, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1978, Ser. No. 883,182
Int. Cl.[2] C07D *23/42;* **C09B** *23/02*
U.S. Cl. 260—239.9 **33 Claims**

1. A method of preparing a bis-pyrazolone oxonol compound which comprises:

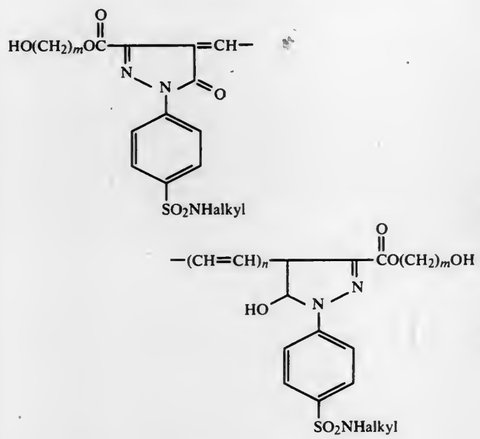
(1) reacting (a) a p-N-alkylsulfonamidophenylhydrazine or its hydrochloride with (b) about a 10 to 20% molar excess of sodium diethyl oxalacetate in an inert, alkali-stable organic solvent at a temperature between about 50° and 100° C. to yield a 3-carbethoxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one;

(2) hydrolyzing said 3-carbethoxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one in situ with aqueous alkali at room temperature to give the corresponding 3-carboxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one;

(3) removing substantially all of the impurities from said 3-carboxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one;

(4) reacting said purified 3-carboxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one with a five to twenty-fold amount of a glycol having the formula $HO(CH_2)_mOH$ wherein m is 2 or 3 in the presence of boron trifluoride-etherate at a temperature between about 50° and 100° C. to yield the corresponding 3-carb(β-hydroxy)alkoxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one; and

(5) reacting said 3-carb(β-hydroxy)alkoxy-1-(p-N-alkylsulfonamidophenyl)-2-pyrazolin-5-one with a stoichiometric amount of glutaconaldehyde dianil hydrochloride or malonaldehyde dianil hydrochloride at a temperature between about −20° and 25° C. in an inert organic solvent in the presence of a condensing agent to yield a bis-pyrazolone oxonol compound having the formula



wherein m is an integer 2 or 3 and n is an integer 1 or 2.

4,187,226

PYRAZOLINE COMPOUNDS

Manfred Patsch, and Albert Hettche, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

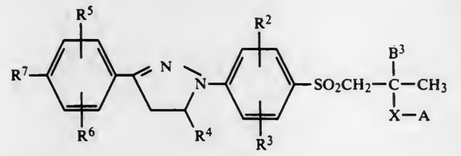
Division of Ser. No. 702,975, Jul. 6, 1976, Pat. No. 4,129,563. This application Apr. 21, 1978, Ser. No. 898,630

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534180; Aug. 6, 1975, 2535095; Nov. 11, 1975, 2550548

Int. Cl.² C07D *401/12, 231/06*

U.S. Cl. 260—239.8 **3 Claims**

1. A compound of the formula



in which

B^3 is hydrogen or C_1 to C_4 alkyl,

R^2, R^3, R^5, R^6 and R^7 are independently hydrogen, chlorine, bromine, fluorine, methyl, ethyl, methoxy or ethoxy,

R^4 is hydrogen, C_1 to C_4 alkyl, benzyl, phenylethyl, phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, cyano or hydroxysulfonyl,

X is —O—,

R^8 is hydrogen, C_1 to C_4 alkyl or C_2 or C_3 alkyl substituted by hydroxy or C_1 to C_4 alkyl and

A is C_2 or C_3 alkyl substituted by C_1 to C_4 dialkylamino, piperidino, pyrrolidino or hexamethyleneimino.

4,187,227

MANUFACTURE OF 2,4-DIOXO-OXAZOLIDINES

Norbert Goetz, Worms; Dietrich Mangold, Neckargemuend, and Bernd Zeeh, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

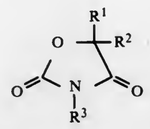
Filed Feb. 21, 1978, Ser. No. 879,724

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711659

Int. Cl.² C07D *263/44*

U.S. Cl. 548—226 **2 Claims**

1. A process for the manufacture of a 2,4-dioxooxazolidine of the formula I

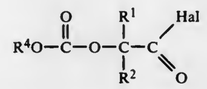


I

where R^1 and R^2 are identical or different and each is a saturated or a mono-olefinically unsaturated aliphatic hydrocarbon radical of 1 to 4 carbon atoms and R^3 is 3,5-dichlorophenyl, wherein an aniline compound of the formula III

$$R^3—NH_2 \qquad \text{III}$$

where R^3 has the above meaning, is reacted with an α-hydroxycarboxylic acid derivative of the formula II



II

where R^1 and R^2 have the above meanings, Hal is halogen and R^4 is alkyl of 1 to 4 carbon atoms, in the presence of tertiary amine at 20° to 120° C.

4,187,228

ANTIBACTERIAL AGENTS 5R, 2S-HYDROXYMETHYL-3Z (2-HYDROXY- OR 2-ALKOXYETHYLIDENE-1-AZA-4-OXABICYCLO[3,2,0-]HEPTANONE

Kong Luk, Cranleigh, England, assignor to Beecham Group Limited, England

Filed Feb. 24, 1978, Ser. No. 880,949

Claims priority, application United Kingdom, Mar. 4, 1977, 9128/77

Int. Cl.² C07D *263/14;* **A61K** *31/42*

U.S. Cl. 260—245.3 **1 Claim**

1. 5R,2S-Hydroxymethyl-3Z-(2-hydroxyethylidene)-1-aza-4-oxa-bicyclo[3.2.0]heptan-7-one.

4,187,229

BIS-BENZOTRIAZOLE COMPOUNDS

Gether Irick, Jr.; Charles A. Kelly, and James C. Martin, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 715,013, Aug. 16, 1976, Pat. No. 4,085,089. This application Feb. 3, 1978, Ser. No. 875,029

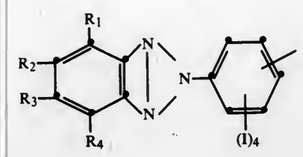
Int. Cl.² C07D *249/20*

U.S. Cl. 548—260 **52 Claims**

1. A compound having the formula:

A—B—C

wherein A is a group having the structure



(I)4

wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy, carboalkoxy;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is oxy, carbonyloxy, oxycarbonylalkyleneoxy, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenephenylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, carbonylamino, N-alkylcarbonylamino, N-phenylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-phenylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-alkylamino, N-phenylamino, N-alkylaminoalkyleneoxy, N-phenylaminoalkyleneoxy, oxyalkyleneoxy, oxyphenyleneoxy, and

wherein C is a group having the formula

(I)3 (I)4

where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,187,230

PREPARATION OF 5-AROYL-PYRROLE COMPOUNDS

Karl E. Wiegand; James T. F. Kao, and Michael J. Dagani, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 580,761, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 480,009, Jun. 17, 1974, abandoned. This application Nov. 7, 1977, Ser. No. 848,936

Int. Cl.² C07D *207/32, 409/06*

U.S. Cl. 260—326.47 **23 Claims**

1. A process for the preparation of 5-aroyl-pyrrole-2-acetic acid compounds, comprising the steps of mixing an aroyl halide selected from tolyoyl, benzoyl, p-chlorobenzoyl, thienoyl halide and such aroyl halides having the aromatic nucleus mono-, di-, or tri-substituted with groups selected from lower alkyl, halo, cyano, nitro, amino, lower alkoxy, methylthio and trifluoromethyl groups with a pyrrole compound having a group selected from cyano, carboxy, lower alkyl carboxylic acid ester, amide, lower alkyl substituted amide and dilower alkyl substituted amide groups attached in the 2-position to the pyrrole ring structure via a methylene group and adding a lower alkyl aluminum halide while maintaining the resultant mixture at a temperature of about 0° to about 40° C. whereby a 5-aroyl-pyrrole-2-acetic acid compound is produced.

4,187,231

CYANIDE-CATALYZED ISOMERIZATION AND DEUTERIUM EXCHANGE WITH ALPHA- AND BETA-SULFOLENES

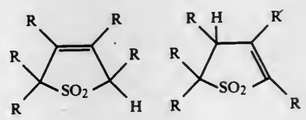
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1977, Ser. No. 852,138

Int. Cl.² C07D *333/48*

U.S. Cl. 260—332.1 **7 Claims**

1. The deuterating of an alpha- and/or beta-sulfolene at a temperature in the approximate range −10° C. to 95° C. which comprises bringing together at least one of alpha- and beta-sulfolene, which can be represented by the following formula:



I (Beta) II (Alpha)

wherein each R is selected from hydrogen, alkyl radicals having 1 to 6 carbon atoms, aryl or substituted aryl radicals of 6 to 10 carbon atoms, or aralkyl radicals of 7 to 12 carbon atoms and wherein the R in formula II in the 2-position is hydrogen, cyanide ion, and a conventional deuterating agent.

4,187,232

ACYLAMINO DERIVATIVES

Delme Evans, Chalfont St. Peter; Michael R. J. Jolley, Camberley; William J. Ross, Lightwater, and Brian P. Swann, Camberley, all of England, assignors to Lilly Industries Limited, London, England

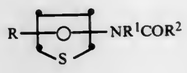
Division of Ser. No. 691,961, Jun. 1, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,960

Claims priority, application United Kingdom, Jun. 5, 1975, 24223/75

Int. Cl.² C07D *333/24*

U.S. Cl. 549—69 **4 Claims**

1. A compound of the formula:



wherein

R is hydrogen, C_1–C_4 alkyl or phenyl optionally substituted by halogen, trifluoromethyl or C_1–C_3 alkoxy;

R^1 is C_3–C_6 alkenyl, C_3–C_6 alkynyl, or benzyl optionally substituted by halogen or nitro; and

R^2 is C_1–C_7 alkyl, C_3–C_{10} cycloalkyl, phenyl or benzyl; provided that, when R is hydrogen or C_1–C_4 alkyl and R^1 is C_3–C_6 alkenyl or C_3–C_6 alkynyl, R^2 cannot be C_3–C_{10} cycloalkyl.

4,187,233

PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL AND NOVEL 2,2-DIARYLCHROMENO COMPOUNDS USED THEREIN

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

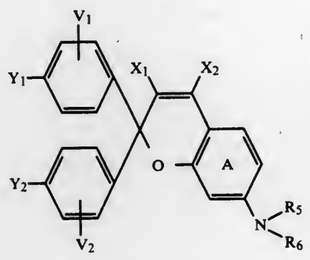
Filed Jan. 30, 1978, Ser. No. 873,582

Claims priority, application Switzerland, Feb. 4, 1977, 1379/77

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **5 Claims**

1. A 2,2-diarylchromeno compound of the formula



wherein

V_1 and V_2, each represent hydrogen, chlorine, lower alkyl or lower alkoxy,

Y_1 and Y_2, each represent hydrogen, -O-R_1 or



X_1 and X_2, each independently of the other, represent hydrogen, alkyl of up to 12 carbon atoms which is unsubstituted, or represent benzyl, phenyl, or benzyl or phenyl which is substituted by chlorine, nitro, lower alkyl, lower alkoxy or the amino group



and

R_1, R_2, R_3, R_4, R_5 and R_6, each independently of the other, represent alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by cyano or lower alkoxy, or represents cycloalkyl, phenyl, benzyl, or phenyl or benzyl which is substituted by chlorine, nitro, lower alkyl or lower alkoxy.

4,187,234

ALKANECARBOXYLIC ACID COMPOUNDS WHICH HAVE BENZOFURANYL OR BENZOTHIENYL SUBSTITUENTS

Raymond Bernasconi, Oberwil, and Pier G. Ferrini, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

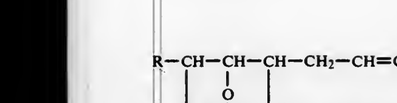
Continuation of Ser. No. 798,272, May 19, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,055

Claims priority, application Switzerland, May 31, 1976, 6783/76

Int. Cl.² C07D *307/80*

U.S. Cl. 260—346.22 **12 Claims**

1. An alkanecarboxylic acid compound of the formula



(I)

in which one of X and X_1 represents oxygen or sulphur, and the other represents 1,2-phenylene or 1,2-phenylene substituted by one to four identical or different members selected from the group consisting of lower alkyl, lower alkoxy, halogen and trifluoromethyl, R_1 represents the radical of the formula



(Ia)

in which Ph represents 1,3- or 1,4-phenylene or such phenylene substituted as said 1,2-phenylene moiety X or X_1,X_2 represents oxygen or sulphur, R_3 and R_4 independently of one another denote hydrogen or alkyl with up to 12 carbon atoms and R_5 represents hydroxyl, amino, lower alkoxy, hydroxy-lower alkoxy, phenyl-lower alkoxy, pyridyl-lower alkoxy, lower alkylamino, di-lower alkylamino or hydroxylamino, and R_2 denotes hydrogen, lower alkyl or said radical of the formula Ia; or a pharmaceutically usable salt of said acids with R_5 being hydroxyl.

4,187,235

METHOD FOR PREPARING MALEIC ANHYDRIDE

Kiyoshi Katsumoto, El Cerrito, and David M. Marquis, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 729,920, Oct. 6, 1976, Pat. No. 4,132,670, which is a continuation of Ser. No. 521,604, Nov. 6, 1974, abandoned, which is a continuation of Ser. No. 290,049, Sep. 18, 1972, abandoned. This application Sep. 22, 1978, Ser. No. 944,951

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **3 Claims**

1. A process for oxidizing a feed hydrocarbon to maleic anhydride which comprises contacting the hydrocarbon under conditions sufficient to convert the hydrocarbon feed to maleic anhydride with a catalyst having an intrinsic surface area of at least 10 m^2/g prepared by a process comprising the steps of:

(a) heating vanadium pentoxide with a substantially anhydrous primary or secondary alcohol liquid reducing agent to reduce the vanadium of the vanadium pentoxide to a valence between 4.0 and 4.6 and thereby obtain a vanadium-containing feed,

(b) contacting on orthophosphoric acid with the vanadium-containing feed to form a heterogeneous reaction mixture of suspended vanadium (IV) phosphate,

(c) removing liquid from the heterogeneous mixture to obtain the vanadium (IV) phosphate compound, and

(d) calcining the vanadium (IV) phosphate compound to obtain said catalyst.

4,187,236

7-OXABICYCLOHEPTANE COMPOUNDS

Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 848,543, Nov. 4, 1977, Pat. No. 4,143,054. This application Nov. 6, 1978, Ser. No. 958,330

Int. Cl.² C07D *307/16*

U.S. Cl. 260—346.22 **7 Claims**

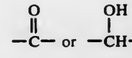
1. A compound having the structural formula

and stereoisomers thereof, wherein

each R is independently hydrogen or hydroxy, provided at least one R is hydroxy;

R^1 is hydrogen or lower alkyl; and

R^3 is



4,187,237

PROCESS FOR THE MANUFACTURE OF A FURANCARBOXYLIC ACID ANILIDE

Wolfgang Deinhammer; Rudolf Kaufmann, both of Burghausen; Hermann Braunling, and Norman Haberle, both of Munich, all of Fed. Rep. of Germany, assignors to Consortium for Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

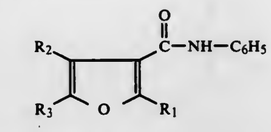
Filed Jan. 2, 1979, Ser. No. 480

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800504

Int. Cl.² C07D *307/68*

U.S. Cl. 260—347.3 **5 Claims**

1. A process for the manufacture of furancarboxylic acid anilides of the general formula



in which R_1 represents an aryl group or an alkyl group, R_2 and R_3 each represent an alkyl group or hydrogen, by a ring-closure reaction of a β-ketoester with an α-haloaldehyde or alpha-haloketone, in the presence of a stoichiometric amount of a halide-binding substance, to form a furancarboxylic acid ester and by subsequent anilidation, the reaction being performed in two stages, the ring-closure reaction being carried out in the presence of a mixture of alkaline earth metal carbonates and pyridine in a ratio of from 1000 to 5:1 Val, based on the hydrohalic acid liberated, at temperatures between 50° and 100° C.; and, after separation in said second stage, the furancarboxylic ester is reacted while stirring with aniline in up to 20 times molecular excess, in the presence of equimolar amounts based on the furancarboxylic acid, of a member of the group consisting of magnesium dianilide, aluminum trianilide, and a mixture of both, in liquid phase or in suspension at temperatures between 20° and 180° C., under normal pressure.

4,187,238

ANTHRAQUINONE DISPERSE DYES

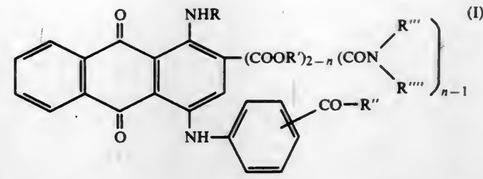
Urs Karlen, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 842,188, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 705,850, Jul. 16, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,394

Int. Cl.² C07C *49/68*

U.S. Cl. 260—376 **8 Claims**

1. Disperse dyes of the formula (I)



(I),

wherein R represents substituted or unsubstituted alkyl, cycloalkyl or hydrogen, R′ represents substituted or unsubstituted alkyl, cycloalkyl, aralkyl or phenyl, and R″ represents a radical of the formula —OX, wherein X represents substituted or unsubstituted alkyl, cycloalkyl, aralkyl or phenyl and n is 1.

4,187,239

METHOD FOR PREPARING ORGANOTIN COMPOUNDS

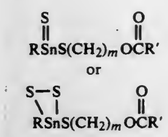
Robert D. Dworkin, Old Bridge, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 738,132, Nov. 2, 1976. This application Jul. 20, 1978, Ser. No. 926,516

Int. Cl.² C07F *7/22*

U.S. Cl. 260—410.6 **11 Claims**

1. A method for preparing an organotin compound of the general formula



wherein R and R′ are individually selected from the group consisting of alkyl containing from 1 to 20 carbon atoms, cycloalkyl, aralkyl, aryl and alkaryl and m is 2 or 3, said method consisting essentially of the following sequence of steps:

(1) reacting a monoorganotin trihalide of the formula $RSnX_3$ wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine, with an aqueous solution containing a stoichiometric amount of a base selected from the group consisting of ammonium hydroxide, alkali metal hydroxides and alkaline earth metal hydroxides, wherein the ratio of the number of equivalent weights of base to the number of moles of monoorganotin trihalide is 1:1;

(2) adding an equimolar amount, based on said monoorganotin trihalide, of 2 mercaptoethanol or 3-mercaptopropanol to the resultant mixture;

(3) adding to the reaction product of step 2 an alkali metal sulfide or an alkali metal disulfide, the numbger of moles of sulfide or disulfide being equal to the number of moles of tin present in said reaction product;

(4) separating an aqueous phase from the reaction mixture;

(5) reacting the product obtained thereby with an equimolar amount, based on said monoorganotin trihalide, of a carboxylic acid, R′COOH, or an ester R′COOR″ wherein R″ is alkyl and contains from 1 to 20 carbon atoms, while removing any by-product water from the reaction mixture; and

(6) isolating said organotin compound in the form of the liquid residue remaining following removal of said by-product water.

4,187,240
PROCESS FOR PREPARING TELLURIUM(II) MATERIALS

Sylvia A. Gardner, and Henry J. Gysling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 841,857, Oct. 13, 1977. This application Aug. 28, 1978, Ser. No. 937,286
Int. Cl.[2] C07F *7/30, 7/22, 7/24*
U.S. Cl. 260—429 R **5 Claims**

1. A method of preparing a Te(II) complex represented by the formula:

$$RTeM(R')_3$$

wherein M is Pb, Sn, Ge or Si; R and R′ are each selected from the group consisting of alkyl containing 1 to 12 carbon atoms and aryl containing 6 to 12 carbon atoms, comprising the steps, in sequence, of (a) reacting an aryl or alkyl telluride containing up to 12 carbon atoms with a reducing agent and an alkali metal hydroxide to provide an alkali metal salt of said telluride, and then (b) reacting the resulting alkali metal salt from (a) with a compound represented by the formula:

$$M(R')_3Cl$$

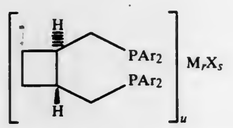
to provide said Te(II) complex.

4,187,241
METAL PHOSPHINE COMPLEX

John M. Townsend, Montclair, and Donald H. Valentine, Jr., Highland Park, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 816,235, Jul. 18, 1977, Pat. No. 4,120,870. This application May 10, 1978, Ser. No. 904,688
Int. Cl.[2] C07F *1/08*
U.S. Cl. 260—438.1 **2 Claims**

1. A compound of the formula:



wherein P is phosphorus; Ar is substituted or unsubstituted aryl; M is a Group IB or IIB metal; X is tetraphenylborate, halide, perchlorate, tetrahalogenoborate, hexahalogenophosphate or hexahalogenoantimonate, wherein said halogenates are fluorine or chlorine; u is an integer from 1–3; r and s are 1 or 2 depending on the value of M and the value of u,
the dimers and oligomers thereof.

4,187,242
CATALYTIC AROMATIC CARBONATE PROCESS

Alan J. Chalk, Kinnelon, N.J., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 731,495, Dec. 12, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,497
Int. Cl.[2] C07C *68/00*
U.S. Cl. 260—463 **22 Claims**

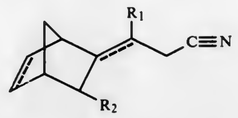
1. An aromatic carbonate process which comprises contacting a phenol, carbon monoxide, a base, the Group VIIIB element selected from ruthenium, rhodium, palladium, osmium, iridium or platinum, and an oxidant having an oxidation potential greater than that of the said selected Group VIIIB element.

4,187,243
NOVEL 2-(2-CYANOETHYLIDENE)-BICYCLO[2.2.1]HEPT-5-ENES AND HYDROGENATED DERIVATIVES THEREOF

Gary W. Shaffer, Trumbull, Conn., and Kenneth L. Purzycki, Lake Parsippany, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 860,660, Dec. 15, 1977, Pat. No. 4,132,677. This application Jul. 25, 1978, Ser. No. 927,788
Int. Cl.[2] C07C *121/46, 121/48*
U.S. Cl. 260—464 **11 Claims**

1. A compound of the general formula:



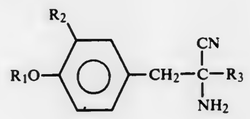
wherein: R_1 and R_2 may be alike or different and are chosen from the group consisting of hydrogen or methyl and the dotted line between two carbons indicates that the carbons are connected by either a single or a double bond.

4,187,244
PROCESS FOR THE RESOLUTION OF RACEMIC ALPHA-AMINONITRILES

Marijan Hohnjec, Zagreb, and Miha Japelj, Novo mesto, both of Yugoslavia, assignors to KRKA, Farmaceutika, Kemija, Kozmetika, zdravilisca in gostinstuo, Novo mesto, n.sd.o., Novo Mesto, Yugoslavia

Filed Mar. 30, 1978, Ser. No. 891,973
Claims priority, application Yugoslavia, Apr. 8, 1977, 937/77
Int. Cl.[2] C07C *121/66*
U.S. Cl. 260—465 E **16 Claims**

1. Process for the resolution of racemic α-aminonitriles of the general formula:



(I)

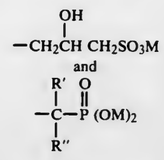
wherein
R_1 stands for a hydrogen atom or a methyl group,
R_2 stands for a hydrogen atom or a methoxy group, and
R_3 stands for a hydrogen atom or a methyl group, into optically active enantiomers, which comprises:
(A) treating said recemic α-aminonitriles with (−)-mandelic acid in an alkanol/C_{5-8} hydrocarbon mixture in order to thereby obtain a racemic mixture of diastereoisomeric D and L salts of (−)-mandelic acid;
(B) macerating said racemic mixture of diastereoisomeric D and L salts of (−)-mandelic acid with an alkanol/C_{5-8} hydrocarbon mixture to thereby obtain a salt of D- and L-aminonitrile respectively with (−)-mandelic acid;
(C) neutralizing the L-form;
(D) extracting the neutralized product obtained in step (C) above with a chlorinated aliphatic hydrocarbon; and
(E) converting said neutralized product to a hydrochloride or acetyl derivative.

4,187,245
HYDROXYPROPYLENE-AMINO-PHOSPHONIC-SULFONIC ACIDS

Derek Redmore, Ballwin, and Frederick T. Welge, Affton, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 582,862, Jun. 2, 1975, abandoned. This application Dec. 4, 1978, Ser. No. 966,249
Int. Cl.[2] C07F *9/38;* **C07D** *307/04, 233/22, 239/00*
U.S. Cl. 260—502.5 **11 Claims**

1. A compound containing one to five of each of the following amino nitrogen-bonded groups:



(I)

and

(II)

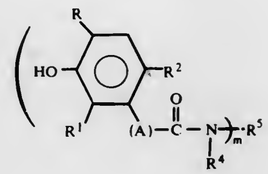
where R′ and R″ are hydrogen or alkyl and M is hydrogen or a salt ion selected from alkali metal, ammonium, alkaline earth metal and the ammonium form of triethanolamine and diethanolamine, the nitrogen to which said groups are bonded being at least one amino nitrogen of a moiety which, with hydrogen replacing said nitrogen bonded groups (I) and (II), is an amine which contains hydrogen attached to nitrogen and is selected from the group consisting of monoamines of the formula RNH_2, where R is alkyl or cycloalkyl, alkanolamines, polyamines selected from alkylene polyamines and polyalkylene polyamines and said polyamines substituted in a terminal nitrogen by alkyl, cycloalkyl, aryl or aralkyl, furfurylamine, ethylenebisoxypropylamine, and cyclic amidines having an amino side chain.

4,187,246
AMIDES OF 2,4,6-TRIALKYL-3-HYDROXYPHENYLALKANOIC ACIDS

John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 693,387, Jun. 7, 1976, Pat. No. 4,093,618, which is a division of Ser. No. 494,156, Aug. 2, 1974, Pat. No. 3,988,363, which is a continuation-in-part of Ser. No. 400,603, Sep. 25, 1973, abandoned. This application Mar. 16, 1978, Ser. No. 887,151
Int. Cl.[2] C07C *103/26, 103/78*
U.S. Cl. 260—559 R **4 Claims**

1. A compound having the formula



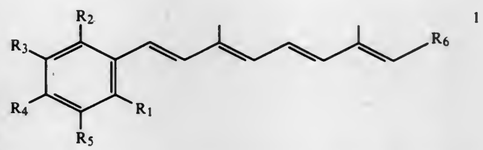
wherein
R is tert-butyl,
R^1 and R^2 are methyl,
R^4 is hydrogen or methyl,
R^5 is n-octadecyl or hexamethylene,
A is methylene, and
m is an integer of 1 to 2.

4,187,247
9-SUBSTITUTED PHENYL-3,7-DIMETHYL-NONA 2,4,6,8-TETRAENE COMPOUNDS

Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 903,639, May 8, 1978, Pat. No. 4,163,103, which is a division of Ser. No. 816,409, Jul. 18, 1977, Pat. No. 4,107,190, which is a division of Ser. No. 613,676, Sep. 15, 1975, Pat. No. 4,054,589. This application Mar. 8, 1979, Ser. No. 19,025
Claims priority, application Switzerland, Sep. 26, 1974, 13032/74; Jul. 9, 1975, 8962/75
Int. Cl.[2] C07C *47/48, 41/52, 41/00*
U.S. Cl. 260—574 **1 Claim**

1. A compound of the formula:



wherein one of R_1 and R_2 is halogen or lower alkyl, and the other is halogen or lower alkoxy; R_3 and R_5 are hydrogen, halogen or lower alkyl; with the proviso that one of R_3 and R_5 is other than halogen; R_4 is halogen, lower alkoxy, amino, mono(lower alkyl)amino or di(lower alkyl) amino; and R_6 is formyl, hydroxymethyl, or alkoxymethyl and salts thereof.

4,187,248
MAKING A NITRODIARYLAMINE BY REACTING AN ALKALI METAL SALT OF A FORMAMIDE WITH A NITROHALOARENE

Helmut L. Merten, Hudson, and Gene R. Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 23, 1977, Ser. No. 854,109
Int. Cl.[2] C07C *85/20*
U.S. Cl. 260—576 **14 Claims**

1. The process which comprises forming a nitrodiarylamine by reacting a sodium, potassium, rubidium or cesium salt of the formyl derivative of an aromatic primary amine with nitrohaloarene containing halogen reactive with such salt the reaction being promoted in the case of a sodium salt with the formyl derivative of an aromatic primary amine in an amount of at least 0.4 mole per mole of nitrohaloarene.

4,187,249
PROMOTING THE REACTION OF SODIUM SALTS OF FORMYL DERIVATIVES OF AROMATIC AMINES TO FORM NITRODIARYLAMINES

Otto W. Maender, Copley, and Gene R. Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,195
Int. Cl.[2] C07C *85/20*
U.S. Cl. 260—576 **7 Claims**

1. The process which comprises forming nitrodiarylamine by reacting in the presence of a polar solvent
(A) the sodium salt of the formyl derivative of an aromatic amine with
(B) nitrohaloarene containing reactive halogen and
(C) a reaction promoting amount of a compound of potassium, cesium or rubidium or mixture thereof effective for promoting the reaction.

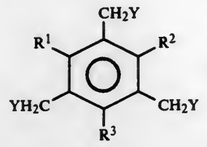
4,187,250

NOVEL TRIFUNCTIONAL AROMATIC AMINES

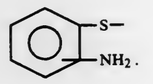
Gabriel Karoly, Springfield, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jun. 5, 1978, Ser. No. 912,229
Int. Cl.² C07C *87/50*
U.S. Cl. 260—578 **2 Claims**

1. A trifunctional amine of the general formula



wherein R^1, R^2 and R^3 are individually selected from the group consisting of alkyl containing from 1 to 3 carbon atoms and Y is



4,187,251

MALODOR COUNTERACTANTS

Alfred A. Schleppnik, No. 1 Hanley Downs, St. Louis, Mo. 63117

Continuation-in-part of Ser. No. 771,753, Dec. 16, 1976, abandoned. This application May 22, 1978, Ser. No. 908,423
Int. Cl.² C07C *49/43*
U.S. Cl. 260—586 R **2 Claims**

1. 4-ethylcyclohexyl methyl ketone.
2. 4-isopropylcyclohexyl methyl ketone.

4,187,252

TETRAMETHYLPENTANE BLOOD SUBSTITUTES

Richard J. Lagow, Austin, Tex.; Lawrence A. Shimp, Hinsdale, Ill., and Leland C. Clark, Jr., Cincinnati, Ohio, assignors to Suntech, Inc., Philadelphia, Pa. and Children's Hospital Medical Center, Cincinnati, Ohio

Division of Ser. No. 827,999, Aug. 26, 1977, Pat. No. 4,110,474. This application Apr. 3, 1978, Ser. No. 892,806
Int. Cl.² C07C *19/08*
U.S. Cl. 260—653 **2 Claims**

1. Perfluoro-2,2,4,4-tetramethylpentane.
2. 3-Hydro-nonadecafluoro-2,2,4,4-tetramethylpentane.

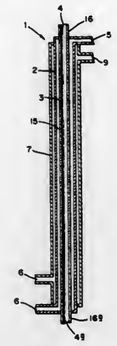
4,187,253

PROCESS AND APPARATUS FOR ISOTHERMAL CHLORINATION OF HYDROCARBONS

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Chemical Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 363,445, May 24, 1973, abandoned, which is a division of Ser. No. 167,733, Jul. 30, 1971, abandoned. This application Dec. 29, 1975, Ser. No. 644,788
Int. Cl.² C07C *17/02*
U.S. Cl. 260—662 R **7 Claims**

1. A process for isothermal chlorination of a feed stream selected from the group consisting of hydrocarbons having from 1 to 2 carbon atoms, their partially chlorinated derivatives and mixtures thereof, to form chlorinated hydrocarbons under improved temperature and distribution conditions which comprises: (a) passing said feed stream under pressure and in laminar flow into one end of a first elongated gas zone, (b) passing a gas containing chlorine into a second elongated gas zone positioned along said first gas zone, said first and second elongated gas zones being separated along the major length thereof by a porous member, (c) maintaining the pressure of the gas in said second gas zone in excess of the pressure in said first gas zone for diffusion of chlorine into said first gas zone, (d) maintaining said first gas zone under conditions sufficient to effect reaction therein of at least a portion of said diffused chlorine with the feed stream for production of the desired chlorinated hydrocarbon, and (e) withdrawing the gas product containing the desired chlorinated hydrocarbon from the other end of said first gas zone.



4,187,254

GRIGNARD REAGENTS AND PROCESSES FOR MAKING THEM

Karel Bujadoux, Lens; Jean-Marie Neyer, Bethune, and Jean-Pierre Houzeaux, Noeux les Mines, all of France, assignors to Societe Chimique des Charbonnages - CdF Chimie, Bully-les-Mines, France

Filed Nov. 2, 1977, Ser. No. 847,824
Claims priority, application France, Nov. 9, 1976, 76 33757
Int. Cl.² C07F *3/02*
U.S. Cl. 260—665 G **12 Claims**

1. In a continuous process for preparing an organometallic halide having the formula:

$$(RMX)(MX_2)_a(MR_2)_b(MH_2)_c$$

wherein $a \leqq 0.45$, $b \leqq 0.15$, and $c \leqq 0.30$, X is a halogen, R is an organic radical, and M is a metal selected from the group consisting of magnesium, zinc, beryllium, and calcium by reaction between an organic monohalide RX and a metal M under an inert and dry gas atmosphere, said metal being in molar excess with respect to said monohalide, the improvement wherein said metal is in the form of convex solid grains of a size between 1 and 15 mm, the reaction temperature is lower than the temperature at which decomposition of the organometallic halide RMX begins and at least 10° C. higher than the boiling point of said organic monohalide, and the reaction is a dry process that is carried out in the absence of a liquid solvent.

4,187,255

PROCESS FOR METHYLATING NAPHTHALENE

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Aug. 21, 1978, Ser. No. 935,285
Int. Cl.² C07C *15/24*
U.S. Cl. 585—467 **11 Claims**

1. A process for preparing a mixture of 1-methylnaphthalene and 2-methylnaphthalene wherein the process comprises reacting in vapor phase from about 0.5 mole to about 6.0 moles of methanol with 1 mole of naphthalene at a temperature in the range of about 425° C. to about 700° C. and a pressure in the range of about 1 to about 70 atmospheres in the presence of an effective amount of activated alumina.

4,187,256

POLYALKYLENIMINE-ALKYLENE SULFIDE GRAFT COPOLYMER AND METHOD OF MAKING SAME

Giffin D. Jones, and Robert G. Asperger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1978, Ser. No. 948,464
Int. Cl.² C08L *61/20, 79/04, 81/04*
U.S. Cl. 525—471 **9 Claims**

1. A graft copolymer consisting essentially of (1) a reaction product of a lower aliphatic ketone and a poly(alkylenimine), said polyalkylenimine having a molecular weight of from about 300 to about 10,000, and (2) ethylene sulfide in a weight ratio of 1 of (1) to 0.5 to 1.5 of (2).

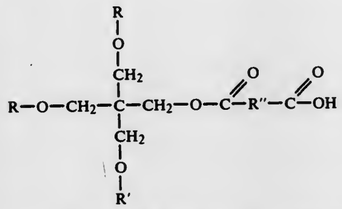
4,187,257

RADIATION CURABLE VINYL ESTER RESIN

Robert C. Nielsen, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 18, 1978, Ser. No. 897,311
Int. Cl.² C08L *63/00*
U.S. Cl. 525—445 **8 Claims**

1. A radiation curable composition comprising the terminally unsaturated ester of (1) a polyepoxide or a hydroxyl terminated polyester and (2) a monoester of a substituted pentaerythritol and a dicarboxylic acid, said monoester having the formula



wherein R is individually acrylyl or methacrylyl, R' is acrylyloxy, methacrylyloxy, hydrogen, a saturated aliphatic group, an unsaturated aliphatic group, or an aromatic group, and R'' is a divalent saturated aliphatic group, a divalent arylene group or an unsaturated aliphatic group of the formula



wherein X is a halogen or an aromatic group.

4,187,258

SEALERLESS PRIMERS

Martin J. Simon, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 156,923, Jun. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 887,333, Dec. 22, 1969, abandoned. This application Apr. 6, 1973, Ser. No. 348,771
Int. Cl.² C08L *61/20, 67/00*
U.S. Cl. 525—157 **6 Claims**

1. A primer composition comprising:

a. an aminoplast curing agent produced from the condensation products of amines or amides with an aldehyde;
b. a saturated resin which is curable with said aminoplast curing agent to form a thermoset polymer and which is a saturated polyester having hydroxyl functionality, a saturated polyether having hydroxyl functionality or a saturated polyurethane having hydroxyl functionality; and
c. a thermoplastic acrylic polymer which
(1) is selected from the group consisting of addition polymers of esters of alpha, beta ethylenically unsaturated acids and interpolymers of esters of alpha, beta ethylenically unsaturated acids with other ethylenically unsaturated compounds,
(2) is essentially non-curable with said aminoplast curing agent, and
(3) after curing of the primer composition, is soluble in solvents in which it was soluble before said curing.

4,187,259

POLYMER BLENDS WITH IMPROVED HYDROLYTIC STABILITY COMPRISING A LINEAR AROMATIC POLYESTER AND A METHACRYLATE CROSS-LINKED ACRYLATE COPOLYMER

Gideon Salee, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,891
Int. Cl.² C08L *67/06*
U.S. Cl. 525—219 **32 Claims**

1. A thermoplastic polymeric composition comprising in admixture; (a) a linear aromatic polyester of a bisphenol and a dicarboxylic acid and (b) the methacrylate-crosslinked acrylate copolymer recovered from the polymerization process which comprises emulsion-polymerizing a monomer reactant which is predominantly a lower alkyl acrylate monomer in the presence of a small effective amount of a diethylenically unsaturated cross-linking monomer to form a latex of a soft crosslinked lower alkyl acrylate polymer, adding to said latex a monomer reactant which is predominantly a lower alkyl methacrylate monomer and emulsion-polymerizing said lower alkyl methacrylate monomer to form a hard lower alkyl methacrylate polymer, said crosslinked lower alkyl acrylate polymer and said hard lower alkyl methacrylate polymer being produced from the same polymerization reaction mixture micelles.

4,187,260

MASS POLYMERIZATION PROCESS FOR POLYBLENDS

Robert L. Kruse, Springfield, and Gene E. DeJackome, Orange, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 23, 1976, Ser. No. 716,605
Int. Cl.² C08F *279/02*
U.S. Cl. 525—263 **2 Claims**

1. An improved process for the mass polymerizing of a solution comprising a monoalkenyl aromatic monomer having a diene rubber dissolved therein wherein the improvement comprises:

A. dissolving a minor amount of an organic diperoxide initiator in said solution,
B. mass polymerizing said solution at temperatures of from about 80°–180° C., with agitation,
C. forming polymer molecules of said monomers as a matrix phase having dispersed therein a diene rubber phase as rubber particles grafted with and having occluded at least a portion of said polymer molecules, said diperoxide compound being selected such that, during polymerization, said diperoxide compound initiates a higher molecular weight polymer fraction providing said polymer with a broader molecular weight distribution, said organic diperoxide initiator being 2,5,dimethyl-2,5-bis(t-butyl peroxy) hexyne-3.

4,187,261

VINYL AROMATIC POLYMERIZATION PROCESS

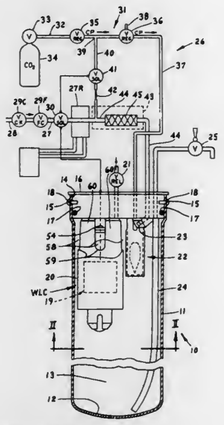
Francis J. Slama, Aurora, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1978, Ser. No. 908,839
Int. Cl.² C08F *279/02*
U.S. Cl. 525—243 **10 Claims**

1. In a three-stage, plug flow, continuous, mass polymerization process in which vinyl aromatic polymer is polymerized in

the presence of a rubber with sufficient agitation to disperse rubber particles adequately, the improvement which comprises (a) in the first stage conversion of monomer to polymer is between about 20 to about 55 percent and the temperature is about 120° C. to about 150° C.; (b) in the second stage conversion of monomer to polymer is between about 45 to about 75 percent and the temperature is about 148° C. to about 170° C.; and in the final reactor stage conversion of monomer to polymer is between about 50 to about 89 percent and the temperature is about 160° C. to about 225° C.

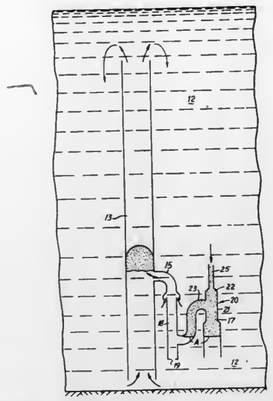
4,187,262
CARBONATOR AND LIQUID LEVEL CONTROL
Herman S. Fessler, Coon Rapids, Minn., and Gene A. Tracy, Amery, Wis., assignors to The Cornelius Company, Anoka, Minn.
Filed Apr. 26, 1978, Ser. No. 900,177
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—50 B **39 Claims**



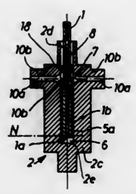
1. A carbonator, comprising
(a) a pressure vessel for containing therein water and carbon dioxide under pressure;
(b) means for introducing water into said vessel;
(c) means for introducing carbon dioxide into said vessel;
(d) means for controlling the level of water in said pressure vessel, said control means comprising
(1) means for sensing the level of water within the vessel, and
(2) means operative by said sensing means for controlling introduction of water into the vessel; and
(e) a housing within the pressure vessel and enclosing said level sensing means, said housing having
(1) a water chamber within which is said sensing means
(2) a water inlet port to said water chamber, said port being substantially at the level of a desired maximum water level within said vessel,
(3) a water outlet port from said water chamber, said outlet port being substantially below said inlet port, and
(4) means in said outlet port for checking against flow of water into the water chamber through the outlet port.

4,187,263
LIQUID CIRCULATING DEVICE
Peter Lipert, Dollard des Ormeaux, Canada, assignor to Aero-Hydraulics Corporation, Dorval, Canada
Filed Jan. 15, 1979, Ser. No. 3,707
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—77 **12 Claims**

1. A device for creating circulation within a body of liquid, the device comprising a substantially vertically extending stackpipe means designed to be wholly submerged within the liquid, the stackpipe having an upper discharge opening and a lower inlet opening; a large-bubble generator means located adjacent the stackpipe and comprising a gas-accumulator chamber having a peripheral wall, a top wall, and an opening at the chamber bottom; a substantially vertically extending standpipe adjacent the accumulator chamber and the stackpipe; an inverted siphon defining fluid flow connecting means between the upper portion of the accumulator chamber and the standpipe; means for delivering gas under pressure into the accumulator chamber; transverse gas flow conduit means between the upper end of the standpipe and the stackpipe, the transverse conduit connecting through the peripheral wall of the stackpipe; and secondary liquid inlet means into the transverse conduit between the standpipe and the stackpipe.

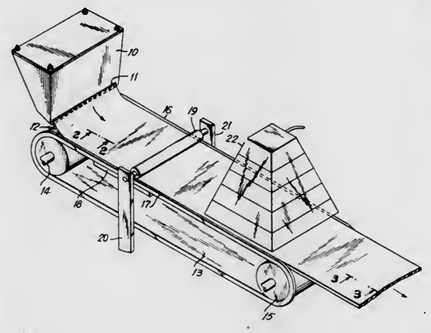


4,187,264
CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE
Rudolf Diener, Seefeldstrasse 253, Zürich, Switzerland
Continuation of Ser. No. 680,387, Apr. 26, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,277
Claims priority, application Switzerland, May 9, 1975, 6017/75; Jul. 28, 1975, 9835/75
Int. Cl.[2] F02M *29/02*
U.S. Cl. 261—84 **22 Claims**



1. A carburetor for an internal combustion engine, comprising means defining a fuel chamber, a fuel-infeed conduit cooperating with the fuel chamber, an impeller wheel for rotating the fuel chamber about a lower end of the fuel-infeed conduit, the fuel chamber possessing at least one lateral nozzle for the delivery of fuel into a mixing compartment, a substantially ring-shaped gap provided in the fuel chamber between its inner wall and the fuel-infeed conduit, the fuel chamber including a lower fuel compartment and an upper fuel compartment, said nozzle being disposed in the upper fuel compartment, the fuel-infeed conduit opening into the lower fuel compartment, the ring-shaped gap flow communicating the lower fuel compartment with the upper fuel compartment, the upper fuel compartment having a ring-shaped air inlet opening which is substantially coaxially arranged with respect to the fuel-infeed conduit, wherein the fuel-infeed conduit has an outlet opening, the ring-shaped gap between the lower fuel compartment and the upper fuel compartment possesses a length amounting to a multiple of its diameters and a gap width which is smaller than the diameter of the outlet opening of the fuel-infeed conduit, and wherein from the upper fuel compartment there leads a respective substantially radial bore to each said lateral fuel-delivery nozzle, and the diameter of the bore is greater than the width of the ring-shaped gap.

4,187,265
METHOD OF MAKING ORNAMENTAL PLASTIC PRODUCT
Daniel A. Fischler, Dix Hills, N.Y., assignor to Emsig Manufacturing Corp., New York, N.Y.
Continuation of Ser. No. 184,594, Sep. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 849,429, Aug. 12, 1969, abandoned. This application May 14, 1975, Ser. No. 577,240
Int. Cl.[2] B29D *3/02*
U.S. Cl. 264—22 **2 Claims**



1. The method of manufacturing a formed plastic article having oriented laminar, non-magnetic filler material disposed therein from a batch of liquid resinous material of a type which exhibits an exothermic reaction upon polymerization and which is subject to polymerization responsive to a high speed electron beam, which comprises the steps of introducing said filler material into said resin batch, subjecting said filled resin batch to orienting influences to cause said filler to assume a desired orientation within said batch, terminating application of said influence, and thereafter, while said filler remains oriented, subjecting said batch to a source of high speed electrons in dosage sufficient partially to polymerize the treated portions of said batch throughout the thickness thereof substantially to the "B" stage, thereby to fix the position of said filler in said desired orientation relative to said polymerized material, thereafter forming said material while in the "B" stage, and thereafter completing the cure of the formed material.

4,187,266
PROCESS FOR MAKING A CERAMIC ARTICLE HAVING A DENSE INTEGRAL OUTER BARRIER LAYER AND A HIGH DEGREE OF POROSITY AND CRUSHABILITY CHARACTERISTICS
Charles D. Greskovich, Schenectady; Frederic J. Klug, Amsterdam, and Wayne D. Pasco, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 6, 1977, Ser. No. 840,021
Int. Cl.[2] B29H *7/20*
U.S. Cl. 264—43 **8 Claims**

1. A method for increasing the porosity and crushability characteristics of cores and molds for investment casting including the process steps of
(a) preparing a material composition consisting essentially of a reactant fugitive filler material which is one selected from the group consisting of carbon, aluminum, aluminum carbide, aluminum oxycarbide, boron and boron carbide and an alumina-based ceramic compound material having the general formula $MO.NAl_2O_3$ wherein
M is Na_2, Ca, Sr, or Ba
N is from 9 to 11 when M is Na_2, and
N is 6 when M is Ca, Sr, or Ba;
(b) working a portion of the material composition to produce a preform of a predetermined shape;
(c) sintering the preform in a controlled furnace atmosphere to cause a reaction between at least the alumina-based compound material and the reactant fugitive filler material to produce at least one or more suboxides of alumina to produce an alumina ceramic article having a predetermined continuous porosity content and crushability characteristics, and
(d) oxidizing at least a portion of the suboxides of alumina to form a dense integral barrier layer of alumina at the surface.

4,187,267
LASER SAFETY SYSTEM
Philip H. Fisher, Lambertville, Mich., and Lawrence D. Ninneman, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed May 22, 1978, Ser. No. 908,171
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—40.1 **2 Claims**

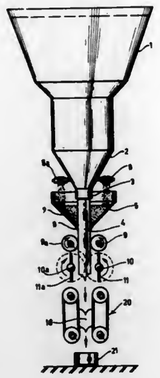


1. In a method of making plastic articles by sequentially and repeatedly injection molding the articles about a series of core pins aligned on a linear path and then stripping the articles from the pins, the article being hollow and having a closed end and an open finish end, the steps of:
(a) scanning the core pins, after stripping the plastic articles therefrom, with two laser devices to scan the core pins aligned on the linear path to detect the presence of any plastic residue on any of the core pins, one laser device aligned with the finish end forming portions of the core pins and the other laser device aligned with the closed end forming portions of the core pins;
(b) interrupting the laser beam by the presence of any plastic article residue on any of said pins; and
(c) halting the operation of the method in the event that the laser beam is so interrupted.

4,187,268
METHOD OF MANUFACTURING MOLDED ARTICLES FROM A KNEADABLE MATERIAL, E.G., CLAY
Hendrik Sinnema, Sneek, Netherlands, assignor to Machinefabriek W. Hubert & Co. B.V., Sneek, Netherlands
Filed Jan. 14, 1975, Ser. No. 541,035
Int. Cl.[2] B29C *17/14*
U.S. Cl. 264—151 **5 Claims**

1. A method of making molded articles comprising the steps of:
(a) continuously producing a vertical strand of plastic material, the strand moving continuously along a vertical path,
(b) severing the moving strand at regular intervals to produce a succession of individual pieces of plastic material,

(c) delivering each individual piece to a guide means arranged along said vertical path, and



(d) operating the guide means to throw each individual piece along said vertical path into a mold with sufficient kinetic energy that the piece plastically deforms and fills the mold.

4,187,269

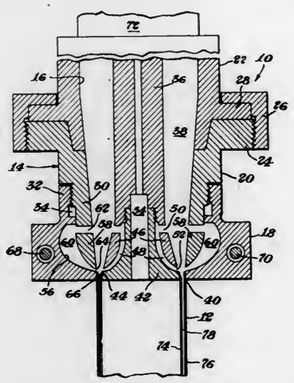
EXTRUSION PROCESS FOR REDUCING MELT FRACTURE

Loyd B. Hutchinson, Denham Springs, and Robert R. Blanchard, Port Allen, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 632,539, Nov. 17, 1975, Pat. No. 4,080,138. This application Dec. 5, 1977, Ser. No. 857,499

Int. Cl.² B29F *3/10*

U.S. Cl. 264—171 **8 Claims**



1. In a process for preparing extruded articles with substantially reduced melt fracture and improved surface smoothness by flowing a heat plastified stream of an extrudable synthetic resinous thermoplastic material through an extrusion orifice, the steps performed prior thereto of:

(a) physically separating the stream into a central core stream and first and second boundary streams on each side of the core stream;

(b) while maintaining physical separation of the core and boundary streams, selectively heating the boundary streams to a temperature substantially hotter than the material in the core stream;

(c) thereafter, recombining the streams prior to expelling the material out the extrusion orifice, said boundary streams being applied as relatively thin hot layers generally uniformly onto the opposite surfaces, respectively, of the core stream.

4,187,270

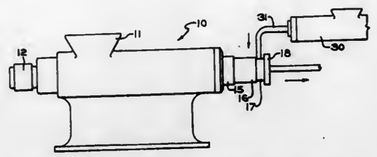
EXTRUSION APPARATUS

David E. Bartrum, Bay Village, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 818,175, Jul. 22, 1977, Pat. No. 4,118,166. This application May 15, 1978, Ser. No. 905,901

Int. Cl.² B29F *3/10*

U.S. Cl. 264—171 **4 Claims**



1. A method of forming a composite multilayer sheet of plastic material comprising the steps of, providing a first plasticized extrudate that is cylindrical in cross-sectional shape, forming said first extrudate into a generally laterally extending elongated cross-sectional configuration, shaping and laterally expanding said extrudate into a generally elongate oblong L-shaped configuration, directing a second extrudate toward said first extrudate, shaping and laterally expanding said second extrudate to the full width of said first elongate L-shaped oblong extrudate, reducing said second laterally expanded extrudate into an elongate thin film substantially along and adjacent to the full width of said first generally elongate L-shaped oblong extrudate, merging said first elongate extrudate with said elongate thin film to form a composite extrudate, and reducing the thickness of the composite extrudate by passing said laterally extending composite extrudate through an extrusion die orifice having a narrow die opening to form an article of substantially the same width as said elongate extrudate of said first extrudate but of reduced thickness.

4,187,271

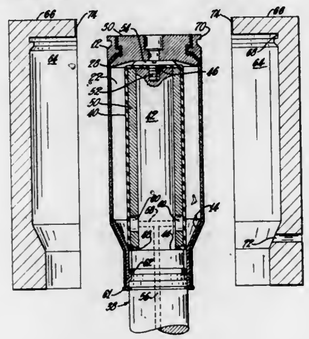
METHOD OF MAKING SAME

J. Albert Rolston, Newark, and Thomas E. Philipps, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 788,166, Apr. 18, 1977, abandoned. This application Nov. 2, 1978, Ser. No. 957,259

Int. Cl.² B29D *3/02, 23/00*

U.S. Cl. 264—258 **9 Claims**



1. A method for making a casing comprising:

(a) inserting a fibrous preform into a first end of a fibrous sleeve, said preform being configured to interlock said sleeve with an encircling preformed ring and without said ring form a head for said casing;

(b) expanding an expandible core within said fibrous preform and said sleeve to expand said preform and said sleeve into said ring within a mold;

(c) introducing hardenable resin between said expandible core and inner walls of said mold to impregnate said fibrous sleeve and said fibrous preform;

(d) hardening said resin to form said casing; and removing said casing from said mold.

4,187,272

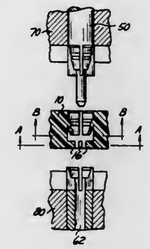
METHOD OF MAKING MOLDED ELECTRICAL CONNECTOR INSERT

Normand C. Bourdon, and Richard Sanford, both of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 728,821, Oct. 1, 1976. This application Dec. 7, 1977, Ser. No. 858,306

Int. Cl.² B29F *1/00*; B29G *3/00*

U.S. Cl. 264—318 **1 Claim**



1. A method of molding a one-piece unitary insert for an electrical connector having front and rear faces with internal passages extending therethrough between said front and rear faces, the steps of said method comprising:

positioning a mold to form a substantially enclosed cavity in a shape related to the desired shape of the insert, said mold including members for defining the front and rear connector faces and means for receiving core structures;

locating a plurality of core structures within the cavity of the mold and coupled to the receiving means, each of said core structures having a generally cylindrical body in the shape related to the shape of the passages, said body including cut out portions tapering axially and radially inward at an angle with respect to the axis of the body, said portions shaped to form inwardly tapering fingers within the passages facing in one direction in the molded inert and cut out portions shaped to form shoulders, within the passage upon molding, spaced axially from and radially adjacent to the fingers facing in an opposite direction, each core structure including first and second members with the first element having an axial projection assembled in a central aperture of the second member;

filling the cavity with a material selected from thermo-plastic resins and thermo-setting materials in the liquid state to form a one-piece electrical connector insert having passages with integral fingers and shoulders located within the passages;

cooling the material to its solid state to form an electrical connector insert; and

non-destructively removing the mold and core structures from the insert by displacing the mold and core structures away from the insert in a direction along the axis of the core structures, whereby a one-piece, unitary electrical connector insert having passages extending therethrough with integral fingers and shoulders located within the passage is formed.

4,187,273

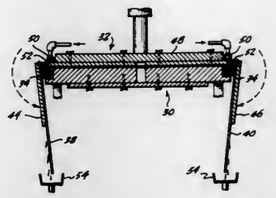
METHOD OF PREFORMING A ONE-PIECE WALL COVERING

Melvin A. Stratis, 138 Beach Dr., Edmonds, Wash. 98020

Division of Ser. No. 698,951, Jun. 23, 1976, Pat. No. 4,052,835. This application Aug. 4, 1977, Ser. No. 821,635

Int. Cl.² B29C *17/02, 3/00*

U.S. Cl. 264—322 **2 Claims**



1. A method of preforming a wall covering for three adjacent walls of a bathtub recess by bending a single sheet of standard grade heat softenable plastic laminate material which has a decorative layer on one side and a backing layer on the opposite side, to form two end walls connected to a side wall by two corner regions, including forming each said corner region by:

placing a substantially rectangular suitably sized sheet of said heat softenable plastic laminate material onto a support with a portion thereof which will become an end wall extending outwardly beyond an elongated forming tube which extends along a side of said support and has an outer forming surface of a predetermined radius, and with said decorative layer facing towards and contacting said support and said elongated forming tube;

applying pressure against said sheet of material to press it against said support and said forming tube while simultaneously heating said forming tube so that it will in turn preheat the portion of the plastic laminate material which is in contact with the forming tube only to a preheat temperature below the temperature at which the material becomes soft and can be bent;

then gradually increasing the temperature of the tube from within so that it in turn gradually increases the temperature of the material above said preheat temperature;

applying a steady pressure on the outwardly extending end wall portion of the material as the temperature is rising above said preheat temperature, so that such material will bend about the forming tube as soon as it becomes soft enough to bend, and continuing said bending until the end wall extends at a desired interior angle from the side wall, then discontinuing heating of the material so that the decorative face of the material will not be scorched; and

applying moisture to the formed corner region while said formed corner region is still hot, for the purpose of tempering said formed corner region and substantially setting the shape of said formed corner region.

4,187,274

METHOD FOR FORMING SHEETS HAVING REDUCED SURFACE IMPERFECTIONS

Sigurdur I. Arnason, Fenwick, Mich., assignor to The General Tire & Rubber Company, Akron, Ohio

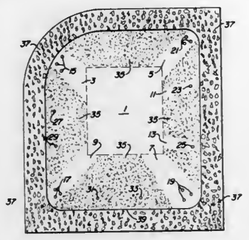
Continuation of Ser. No. 801,709, May 31, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,930

Int. Cl.² B29G *1/00*

U.S. Cl. 264—325 **1 Claim**

1. In a method for molding a thermosetting liquid having an initial viscosity of from 1,000 to 7×10^7 centipoises at room temperature filled with chopped glass fibers, into a cured sheet of material, which sheet in its final form has one visible surface and one surface which is less visible by:

(a) placing the glass fiber filled thermosetting liquid between two heated dies; and
(b) bringing the heated dies toward each other to cause the glass fiber filled thermosetting liquid to flow and fill the cavity formed by the dies and then set, wherein the improvement comprises:
a rougher surface on the die forming the less visible surface of the sheet than the surface of the die forming the more visible surface, wherein the rougher surface is rough



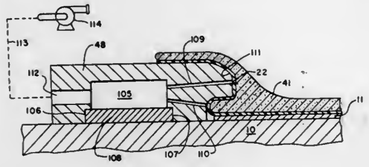
enough to retard the flow of the compound more than the flow is retarded on the corresponding die surface forming the more visible surface, the rougher surface being rough enough to improve the paintability of the sheet produced but not so rough so as to impart a rough finish to the sheet after painting, the rougher surface being formed by the initial casting of the die surface or subsequent removal of material from the die surface by abrasion, etching, electric arc or plasma treatment.

4,187,275

METHOD AND APPARATUS FOR PRODUCING SHAPED GLASS FIBER REINFORCED CEMENTITIOUS ARTICLES

Albert J. Bracalielly, Mars; Glenn E. Kautz; Robert G. Lindner, both of Sewickley, all of Pa., and Bernard H. Davis, Stoney Creek, Canada, assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jun. 14, 1974, Ser. No. 479,428
Int. Cl.[2] B32B *13/08, 13/12*
U.S. Cl. 264—511 **11 Claims**



1. A method for continuously forming glass fiber reinforced gypsum products comprising:
(1) shaping a continuous water impervious formable sheet to a pre-selected trough-like profile and delivering the said formable sheet in the said pre-selected trough-like profile into a slurry deposition station;
(2) depositing on the said formable sheet in the said slurry deposition station a ribbon comprising
2 to 8 parts by weight of glass fibers having an average length in the range of 0.5 to 4.0 inches;
100 parts by weight gypsum hemi-hydrate;
22 to 45 parts by weight water;
(3) delivering the said formable sheet with the said ribbon thereupon from the said slurry deposition station and into a ribbon compaction station;
(4) compacting the said ribbon against the said formable sheet in the said compaction station while maintaining the said formable sheet in a pre-established trough-like profile;
(5) delivering the compacted ribbon and formable sheet to a setting station and maintaining the said formable sheet in the said pre-established trough-like profile until the said ribbon has hardened;
(6) thereafter cutting the said hardened ribbon transversely into lengthwise segments having the said pre-established trough-like profile;
(7) carrying out steps (2) through (6) without deliberately removing liquid water from the said ribbon.

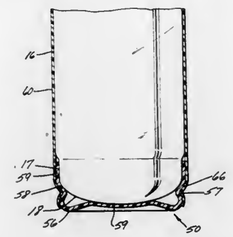
7. The method for forming glass fiber reinforced gypsum articles which comprises:
(1) depositing on a water impervious formable sheet a layer of aqueous slurry of gypsum hemi-hydrate;
(2) thereafter depositing on the said layer a mixture of (a) glass fibers having a random orientation and an average length in the range of 0.5 to 4.0 inches, and (b) aqueous slurry of gypsum hemi-hydrate;
(3) wherein the said mixture constitutes a ribbon containing 2 to 8 parts by weight of glass fibers 100 parts by weight gypsum hemi-hydrate and 22 to 45 parts by weight water;
(4) compacting the said ribbon and recovering a hardened article;
(5) carrying out steps (1) through (4) without deliberately removing liquid water from the said ribbon.

4,187,276

METHOD OF MAKING A PLASTIC PACKAGE

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 705,868, Jul. 16, 1976, abandoned. This application May 15, 1978, Ser. No. 905,686
Int. Cl.[2] B29C *27/24*
U.S. Cl. 264—515 **6 Claims**



1. A method of producing a package having a bottle substantially solely securely attached to a bottle supporting base with a heat shrunk label, said method comprising:
(a) extruding a tube of plastic, stretching said tube both radially and longitudinally to biaxially orient the tube, the extent of stretch and the degree of orientation being greater longitudinally than radially, forming a decorated sleeve blank from the tube, fabricating the blank into a tubular sleeve label in which that portion of the original stretched tube which was stretched longitudinally extends circumferentially of the tubular sleeve label,
(b) loosely positioning an uprightly unstable bottle having a vertical axis and a continuously arcuate bottom on a bottle supporting base having a flat support bottom,
(c) encircling externally exposed peripheral surfaces only of said bottle and base including the peripheral line of juncture therebetween within the heat shrinkable predecorated tubular sleeve label, said sleeve label having a high heat shrinkage in the circumferential direction of said label and a low heat shrinkage in the axial direction of said label,
(d) securely and integrally attaching said base to said loosely positioned bottle with said sleeve label by heating said sleeve label for a time and at a temperature sufficient to peripherally shrink said sleeve label into snug, encircling engagement with said external peripheral surfaces and

insufficient to axially shrink the label beyond the confines of said base so as to produce said package, said heating being insufficient to cause any substantial deformation of said bottle, while effecting minimal distortion of said tubular sleeve label axially of said bottle, so that the package is supported on a horizontal surface by the uncovered base support bottom depending beneath said label.

4,187,277

PROCESS OF INHIBITING CORROSION WITH QUATERNARIES OF HALOGEN DERIVATIVES OF ALKYNOXYMETHYL AMINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 556,331, Mar. 7, 1975, abandoned. This application Nov. 3, 1978, Ser. No. 957,616
Int. Cl.[2] C23F *11/04, 11/08, 11/14;* **C23G** *1/06*
U.S. Cl. 422—16 **8 Claims**

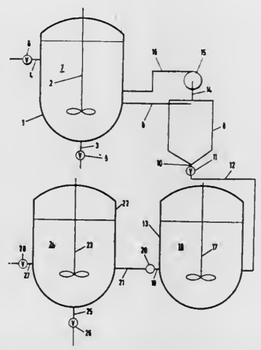
1. A process of inhibiting corrosion of metals and alloys in an aqueous system which comprises adding to such system a corrosion inhibiting amount of a quaternary selected from quaternaries of halo alkynoxymethyl amines having one to two quaternary nitrogen atoms to each of which are attached up to two halogen derivatives of alkynoxymethyl moieties of the formula $XC{\equiv}CR''OCH_2$—where R'' is alkylidene and X is halogen, the groups directly attached to the quaternary nitrogen atoms in the said quaternary amines being said halo alkynoxymethyl groups and being R and R' groups when there is but one quaternary nitrogen atom present per molecule and being said halo alkynoxymethyl groups and being R and Z groups when there are two quaternary nitrogen atoms present per molecule, the Z groups constituting bridging groups linking the two quaternary nitrogen atoms, the R groups being monovalent hydrocarbon, hydroxy substituted alkyl or furfuryl groups, the R' groups being monovalent hydrocarbon of up to 30 carbon atoms and the Z groups being divalent alkylene, alkenylene, alkynylene, alkaralkylene, or alkylenether groups, the counter anions balancing the positive charge on the quaternary nitrogen being halide anions.

4,187,278

POLYMERIZATION PROCESS

Michael L. Clifford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 12, 1976, Ser. No. 676,342
Claims priority, application United Kingdom, Apr. 18, 1975, 16064/75
Int. Cl.[2] B01J *1/00;* **C08L** *23/00*
U.S. Cl. 422—132 **5 Claims**



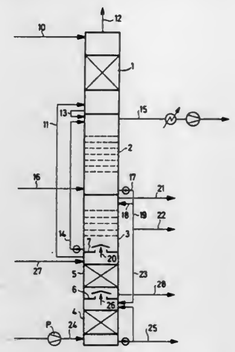
1. A polymerisation apparatus comprising a first polymerisation vessel, a separation vessel, a second polymerisation vessel, outlet means in said first polymerisation vessel, inlet means in said separation vessel, connecting means from said outlet means to the inlet means of said separation vessel, the inlet means of said separation vessel being connected only to said connecting means whereby a liquid phase consisting essentially of a solid olefine polymer and a liquid olefine monomeric phase is withdrawn from the first polymerisation vessel and this liquid phase is the only material passed into the separation vessel, means adjusted to withdraw, from the separation vessel, a concentrated mixture of solid olefine polymer and the liquid olefine monomeric phase, said concentrated mixture having an increased content of solid olefine polymer compared to the liquid phase introduced into the separation vessel, means for passing the concentrated mixture to the second polymerisation vessel and means adjusted to maintain the second polymerisation vessel under conditions of temperature and pressure such that the olefine monomer forming the liquid olefine monomeric phase in the first polymerisation vessel, is in the gaseous phase.

4,187,279

DEVICE FOR RECOVERING SODIUM CHEMICALS FROM GREEN LIQUOR AND FLUE GASES

Pertti K. Rimpi, Tampere, Finland, assignor to OY Tampella AB, Tampere, Finland

Filed Sep. 1, 1978, Ser. No. 938,944
Claims priority, application Finland, Sep. 5, 1977, 772626
Int. Cl.[2] B01J *10/00;* **C01B** *17/16;* **D21C** *11/06, 11/12*
U.S. Cl. 422—185 **3 Claims**



1. In a device for recovering chemicals from flue gases and water solution of a smelt obtained from burning waste liquor of sodium based pulping processes, which device comprises: a precarbonation reactor; a H_2S stripping column; a carbonation reactor; a washing tower for flue gases, a cooling tower for washed flue gases; means for feeding flue gases into the washing tower, from the washing tower into the cooling tower, and from the cooling tower into the carbonation reactor and the precarbonation reactor, and for feeding flue gases out of the precarbonation reactor and the carbonation reactor; means for feeding green liquor into the precarbonation reactor, for leading solution containing sodium bisulfide from the precarbonation reactor into the stripping column, and for discharging a solution containing sodium carbonate and sodium bicarbonate from the stripping column; means for feeding transfer gas into the stripping column and for discharging gaseous hydrogen sulphide from the stripping column; means for feeding cooling water into the cooling tower and for discharging warm water therefrom; means for feeding the solution containing sodium carbonate and sodium bicarbonate into the carbonation reactor and thereafter into the stripping column; means for feeding the solution containing sodium carbonate and sodium bicarbonate discharged from said stripping column into the washing tower and for discharging a sodium sulfite solution therefrom; the improvement: that at least the carbonation reactor, the cooling tower and the washing tower are arranged on top of each other

in the same column which is provided with trays so that the means for feeding flue gases from the washing tower into the cooling tower and further into the carbonation reactor are openings made in the trays to allow the washed flue gases to rise from the washing tower into the cooling tower above it and further into the carbonation reactor above the cooling tower; that the means for feeding flue gases into the washing tower comprise a common blower for blowing flue gases through washing tower, cooling tower, carbonation reactor, and precarbonation reactor, and that the means for discharging the solution containing sodium carbonate and sodium bicarbonate from the stripping column are connected with means for feeding this solution directly into the carbonation reactor and the washing tower.

4,187,280

PROCESS FOR RECOVERING USEABLE PRODUCTS FROM BY-PRODUCT AMMONIUM NITRATE FORMED IN THE MANUFACTURE OF NUCLEAR REACTOR FUELS OR BREEDER MATERIALS

Paul Morschl, and Erich Zimmer, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,151

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2617968

Int. Cl.[2] C01F *15/00*; C01G *56/00*

U.S. Cl. 423—15 **4 Claims**

1. A method for the treatment of by-product ammonium nitrate produced in the production of nuclear fuels and breeder materials enabling recovery and recycling of nitrogen in usable form derived both from the ammonia component and from the nitrate component of the ammonium nitrate and thereby usefully recovering substantially all the nitrogen thereof, comprising the steps of:

a. heating an aqueous solution containing said by-product ammonium nitrate to a temperature between 90° C. and 110° C.;

b. adding an oxide or hydroxide of an alkali or alkaline earth metal to said heated aqueous solution to initiate one of the following reactions:

$$2NH_4NO_3+Me(OH)_2\rightarrow Me(NO_3)_2+2NH_3+2H_2O,$$

$$2NH_4NO_3+MeO\rightarrow Me(NO_3)_2+2NH_3+H_2O,$$

$$NH_4NO_3+Me(OH)\rightarrow MeNO_3+NH_3+H_2O,$$

$$2NH_4NO_3+Me_2O\rightarrow 2MeNO_3+2NH_3+2H_2O,$$

where Me represents the alkali or alkaline earth metal;

c. recovering the ammonia gas vaporized during the above reactions;

d. drying the metal nitrate solution obtained in step b to recover the metal nitrate in solid form;

e. heating the metal nitrate to decompose the compound into the respective metal oxides and oxides of nitrogen according to the equations:

$$Me(NO_3)_2\rightarrow MeO+2NO_2+\tfrac{1}{2}O_2,$$

$$2MeNO_3\rightarrow Me_2O+2NO_2+\tfrac{1}{2}O_2,$$

$$\tfrac{1}{2}O_2+2NO_2\rightarrow N_2O_5;$$

f. treating the oxides of nitrogen to produce nitric acid;

g. utilizing the metal oxides formed in step e as an oxide additive in step b to form metal nitrate and ammonia;

h. dissolving the ammonia recovered in step c in water to form ammonia hydroxide solution;

i. adding a compound selected from $UO_2(NO_3)_2$ and $Th(NO_3)_4$ to the solution formed in step h to produce $(NH_4)_2U_2O_7$ and $Th(OH_4)$, respectively, according to the following reactions:

$$2UO_2(NO_3)_2+6NH_4OH\rightarrow(NH_4)_2U_2O_7+4NH_4NO_3+3H_2O,$$

$$Th(NO_3)_4+4NH_4OH\rightarrow Th(OH)_4+4NH_4NO_3;$$

j. utilizing the nitric acid formed in step f for dissolving an oxide of a fissionable metal from irradiated nuclear fuel.

4,187,281

HYDROMETALLURGICAL RECOVERY OF COBALT AND NICKEL

John C. Stauter, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 7, 1978, Ser. No. 931,804

Int. Cl.[2] C22B *23/00*

U.S. Cl. 423—150 **11 Claims**

1. In a hydrometallurgical process for the recovery of nickel and cobalt metal values from a source containing the same which comprises:

(a) roasting said source in a reducing atmosphere at a temperature in the range of from about 550° to about 900° C. in contact with a roast additive selected from the group consisting of solid sulfur in the concentration of about 0.01 to about 5% by weight of said source, gaseous sulfur compounds in the concentration of about 0.01 to about 10% by weight of said source, hydrogen halide in the concentration of about 0.01 to about 10% by weight of said source, and combinations thereof;

(b) cooling said roasted material in the absence of air until said reduced source obtains a temperature below about 95° C. and extracting the same below about 95° C. in the presence of an oxygen-containing gas with a basic leaching agent at a pH sufficiently high to prevent dissolution of high amounts of iron from said source; and

(c) recovering said desired nickel and cobalt metal values, the improvement which comprises utilizing ammoniacal ammonium chloride as said basic leaching agent of step (b).

4,187,282

PROCESS FOR TREATING A WASTE GAS CONTAINING SULFUR OXIDES

Shimpei Matsuda; Akira Kato; Shigeo Uno, and Fumito Nakajima, all of Hitachi, Japan, assignors to Babcock-Hitachi K.K. and Hitachi, Ltd., both of, Japan

Filed Feb. 11, 1977, Ser. No. 767,962

Claims priority, application Japan, Feb. 12, 1976, 51-13174; Jun. 16, 1976, 51-69760

Int. Cl.[2] C01B *17/00*; B01J *8/00*; C01B *21/00, 17/02*

U.S. Cl. 423—244 **18 Claims**

1. A process for treating a gas containing sulfur oxides comprising the steps of contacting the gas with an adsorbent catalyst to remove the sulfur oxides by adsorbing the sulfur oxides on the adsorbent catalyst and then desorbing the sulfur oxides from the adsorbent catalyst, wherein the adsorbent catalyst consists essentially of at least 50 atomic percent of titanium oxide, from 2 to 50 atomic percent of at least one of iron oxide and copper oxide and up to 10 atomic percent of oxides of molybdenum, tungsten, vanadium, cobalt and nickel, said adsorbent catalyst being free of aluminum oxide, said adsorbent catalyst being prepared by molding a coprecipitate of titanium hydroxide and at least one of iron hydroxide and copper hydroxide and calcining the moldings at a temperature below 600° C. under an oxidizing atmosphere.

4,187,283

METHOD FOR IMPROVING ORGANIC CATION-CONTAINING ZEOLITES

George T. Kokotailo, and Stephen Sawruk, both of Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,326

Int. Cl.[2] C01B *33/28*; B01J *29/06*

U.S. Cl. 423—328 **13 Claims**

1. A method for improving the adsorptive properties of an organic cation-containing crystalline zeolite which comprises (1) heating said zeolite at a temperature within the approximate range of 150° to 600° C. for a period of time sufficient to decompose organic material contained in the zeolite without effecting coking thereof, (2) contacting the resulting product with an aqueous solution of a monovalent metal salt at a temperature between about 50° and about 120° C. for a period of time sufficient to expel at least a major portion of the decomposition products of said organic material and (3) calcining the product so obtained at a temperature of at least about 500° C. but below a temperature at which crystallinity of said zeolite is adversely affected.

4,187,284

SKELETAL IMAGING KIT UTILIZING TRIETHYLENE TETRAMINE HEXA (METHYLENE PHOSPHONIC ACID)

Richard E. Rolleston, Dollard des Ormeaux, and Jacques A. Nadeau, Ville St. Laurent, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1977, Ser. No. 838,709

Int. Cl.[2] A61K *43/00*

U.S. Cl. 424—1 **5 Claims**

1. A kit for the preparation of an injectable solution incorporating Technetium 99m which comprises in a single sterile container a freeze-dried mixture of triethylene tetramine hexa (methylene phosphonic acid) or a water-soluble salt thereof and a water-soluble tin salt.

5. The lead salt of triethylene tetramine hexa (methylene phosphonic acid).

4,187,285

MICROAGGREGATED ALBUMIN

Marion Meeks, East Windsor, and R. K. Narra, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 16, 1977, Ser. No. 861,231

Int. Cl.[2] A61K *29/00, 43/00*; G01N *33/16*

U.S. Cl. 424—1 **6 Claims**

1. A composition comprising microaggregated denatured albumin having stannous ions bound thereto, having a particle size in the range of about 0.1 to 3 microns, said composition being substantially free of buffer.

4,187,286

CONTRACEPTIVE SUPPOSITORY

Bertram J. Marcus, Freehold, N.J., assignor to G&W Laboratories, Inc., South Plainfield, N.J.

Filed Jan. 2, 1979, Ser. No. 960,077

Int. Cl.[2] A61K *9/02, 9/46*

U.S. Cl. 424—44 **10 Claims**

1. A suppository consisting essentially of polyethylene glycol, a thickening agent, alginic acid, an effervescent agent and a medicinally active ingredient, the polyethylene glycol being present in a proportion of about 61.2–74.8 percent by weight, the thickening agent being present in a proportion of about 0.9–1.1 percent by weight, the effervescent agent being present in a proportion of about 10.8–13.2 percent by weight, the alginic acid being present in a proportion of about 13.5–16.5 percent by weight, and the medicinally active ingredients being present in a proportion of about 3.6–4.4 percent by weight.

4,187,287

WARM TWO TONE FLAVORED DENTIFRICE

Ronald S. Schreiber, Highland Park, and Joseph R. Principe, East Brunswick, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 827,295, Aug. 24, 1977, Pat. No. 4,132,771. This application Sep. 29, 1978, Ser. No. 947,305

The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **9 Claims**

1. An anhydrous heat releasing dentifrice which generates heat in the mouth and effects a two tone flavor change in the oral cavity comprising an abrasive system consisting essentially of a finely divided anhydrous synthetic zeolite having an appreciable heat of hydration and capable of being reversibly dehydrated in amounts of about 10–50% by weight, and about 5–20% of a finely divided anhydrous dental abrasive to decrease the abrasivity and regulate the degree of heat generated by said dentifrice, about 0.1 to 5% by weight of at least one flavoring agent, and about 20 to 75% of an anhydrous liquid vehicle.

4,187,288

MODIFIED ABRASIVE SYSTEM FOR DENTIFRICES

Martin Cordon, Highland Park, and James Norfleet, Plainfield, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 759,617, Jan. 17, 1977, which is a continuation-in-part of Ser. No. 544,618, Jan. 28, 1975, abandoned. This application Oct. 4, 1978, Ser. No. 948,606

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **8 Claims**

1. A toothpaste or dental cream of superior cleaning and polishing characteristics comprising an aqueous humectant containing dental vehicle and an abrasive system having at least one hard abrasive having a particle size of about 1 to 15 microns in diameter selected from the group consisting of calcined alumina, zirconium silicate, feldspar, pumice, and ZrO_2, and in an amount to provide a radioactive enamel abrasion value to the dentifrice of above about 400 and present in an amount of at least 7.5% and up to 20% by weight of the dentifrice, and including an additional softer dental abrasive having a particle size of 2–40 microns and in an amount of about 10–50% by weight, said dental vehicle containing a non-toxic zinc compound in an amount to provide at least about 0.0065% zinc to the dentifrice, said zinc compound selected from the group consisting of zinc chloride, zinc sulfate, zinc acetate, zinc nitrate, and zinc oxide in an amount of about 0.01–2.0% by weight of the dentifrice, so as to reduce the enamel abrasion of the dentifrice.

4,187,289

SOFTENING AGENTS CONTAINING DIESTER/AMINE ADDUCTS AND QUATERNARY AMMONIUM SALTS, VALUABLE FOR USE AS AFTER-RINSE SOFTENERS AND AFTER-SHAMPOO HAIR CONDITIONERS

Claude Eckhardt, Riedisheim, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

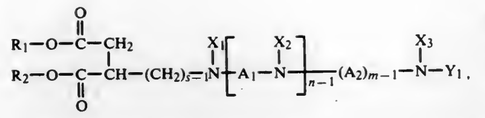
Filed Nov. 21, 1977, Ser. No. 853,067

Claims priority, application Switzerland, Dec. 3, 1976, 15255/76

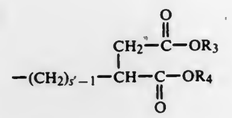
Int. Cl.[2] A61K *7/06, 7/08*

U.S. Cl. 424—70 **16 Claims**

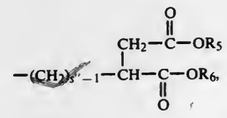
1. A softening agent which contains (a) a diester/amine adduct of the formula



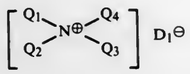
in which R_1 and R_2 each are alkyl or alkenyl of 12 to 22 carbon atoms, m and s each are 1 or 2 and n is 1, 2, 3 or 4, A_1 and A_2 each are alkylene of 2 or 3 carbon atoms or 2-nydroxy-n-propylene, X_1, X_2 and X_3 each are hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyalkyl or hydroxy-halogenalkyl of 2 to 4 carbon atoms or are a radical of the formula



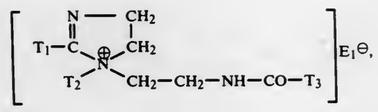
in which R_3 and R_4 each are alkyl or alkenyl of 12 to 22 carbon atoms and s' is 1 or 2, with the proviso that, if n is 3 or 4, the individual radicals X_2 are the same or different, and Y_1 is hydrogen, alkyl of 1 to 4 carbon atoms or a radical of the formula



in which R_5 and R_6 each are alkyl or alkenyl of 12 to 22 carbon atoms and s'' is 1 or 2, and the ratio of the diester groups to the nitrogen atoms is 1:1 and the adduct of the indicated formula is in the form of the free base, acid salt or quaternary ammonium salt; and (b) a quaternary ammonium salt selected from the group consisting of the formula



and of the formula



in which Q_1 and T_2 each are hydrogen, alkyl or alkenyl of at most 8 carbon atoms, Q_2 is alkyl or alkenyl of at most 8 carbon atoms, Q_3, T_1 and T_3 each are alkyl or alkenyl or alkenyl of 8 to 30 carbon atoms, Q_4 is alkyl or alkenyl of at most 30 carbon atoms, and $D_1\ominus$ and $E_1\ominus$ each are anion which imparts water-solubility or water-dispersibility to the ammonium salts, the weight ratio of diester/amine adduct to ammonium salts being 9.5:0.5 to 1:9.

16. A method of conditioning human hair which comprises treating hair with an after-shampoo hair conditioner containing a softening agent according to claim **1**.

4,187,290

CARRIER AND DISPERSAL MECHANISM FOR A MICROORGANIC LARVICIDE

Leonard J. Goldberg, Albany, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 888,083, Mar. 20, 1978. This application Apr. 18, 1979, Ser. No. 30,961

Int. Cl.[2] A01N *15/00*

U.S. Cl. 424—93 **6 Claims**

1. A carrier for dispersing spores of a microbial entomotoxin employed as an oral bacterial larvicide comprising:

(a) dioxane;

(b) oleaginous liquid, said liquid being dissolved in said dioxane;

(c) microbial entomotoxin admixed with said solution of dioxane and said oleaginous liquid such that said oleaginous liquid nucleates about said spores upon introduction of water to admixture.

4,187,291

COSMETIC COMPOSITION FOR THE SKIN

Janine Marissal, Monte Carlo, Monaco, assignor to Biotherm, Monte Carlo, Monaco

Filed May 6, 1977, Ser. No. 794,646

Claims priority, application Luxembourg, May 7, 1976, 74900

Int. Cl.[2] A61K *37/48, 35/78*

U.S. Cl. 424—94 **11 Claims**

1. A composition for treating cellulitis or folds of fat comprising in a cosmetically acceptable vehicle, as active components (i)–(iii) wherein

(i) is an iodinated vegetable oil containing about 37 to 42 percent combined iodine,

(ii) is a mucopolysaccharidase selected from the group consisting of thiomucase and hyaluronidase, and

(iii) is escine.

4,187,292

ANTIBIOTICS PRODUCED FROM THE MICROORGANISM NOCARDICE

Eiji Higashide, Takarazuka; Mitsuko Asai, Osaka, and Toru Hasegawa, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1977, Ser. No. 815,050

Claims priority, application Japan, Mar. 31, 1977, 52-37168; Apr. 1, 1977, 52-37884

Int. Cl.[2] H01K *35/00*

U.S. Cl. 424—122 **2 Claims**

1. Antibiotics selected from C-14919 E-1 or E-2, which have the following properties:

(a) Antibiotic C-14919 E-1

(i) m.p. 187° C. (decomp.)

(ii) Appearance: yellow crystals (needles or prisms)

(iii) Solubility: Insoluble in: petroleum ether, hexane, water Sparingly soluble in: diethyl ether, benzene Soluble in: ethyl acetate, chloroform, butanol, methyl isobutyl ketone, ethanol, acetone, methanol Readily soluble in: dimethylsulfoxide

(iv) Acid, neutral or basic: a neutral substance

(v) Elemental analysis: C, 65.31; 65.05; 64.85 (%) H, 7.71; 7.58; 7.62 N, 5.01; 4.95; 5.01 O, 21.37; 22.83; 22.45

(vi) Empirical formula: $C_{30\text{-}32}H_{42\text{-}48}N_2O_{8\text{-}9}$

(vii) Ultraviolet absorption spectrum: λ_{max}^{MeOH}: N-HCl(9:1)(nm)($E_1^{1\%}$ cm): 274(455), 240(sh.), 397(43) λ_{max}^{MeOH}(nm)($E_1^{1\%}$ cm): 274(455), 240(sh.), 397(43) λ_{max}^{MeOH}: N-NAOH(9:1)(nm)($E_1^{1\%}$ cm): 236(585), 265(500), 550(56)

(viii) Infrared absorption spectrum (KBr): Dominant peaks (cm^{-1}) at: 3430, 3340, 2950, 2910, 1740, 1692, 1660, 1645, 1605, 1500, 1375, 1315, 1120, 1100, 1085, 1060, 1025

(ix) Specific rotation: $[\alpha]_D^{25°} + 350° \pm 10°$ (c=0.5, methanol)

(x) Color reactions Negative ninhydrin, Erhlich, peptide and 1% iron chloride-1% ferricyanide (1:1) reactions

(b) Antibiotic C-14919 E-2

(i) m.p. 148° C. (decomp.)

(ii) Appearance: Pale yellow crystals (needles or prisms)

(iii) Solubility: Insoluble in: petroleum ether, hexane Sparingly soluble in: diethyl ether, benzene, chloroform, water Soluble in: ethyl acetate, butanol, methyl isobutyl ketone, ethanol, acetone, methanol Readily soluble: dimethylsulfoxide

(iv) Acid, neutral or basic: a neutral substance

(v) Elemental analysis: C, 62.32; 62.07 (%) H, 8.58; 8.43 N, 4.82; 4.78 O, 20.81: 20.81

(vi) Empirical formula: $C_{30\text{-}32}H_{44\text{-}50}N_2O_{8\text{-}9}.xH_2O$

(vii) Ultraviolet absorption spectrum: λ_{max}^{MeOH}: N-HCl(9:1)(nm)($E_1^{1\%}$ cm): 225(295), 308(sh.) λ_{max}^{MeOH}(nm)($E_1^{1\%}$ cm): 238(550), 255(290), 308(sh.) λ_{max}^{MeOH}: N-NaOH(nm)($E_1^{1\%}$ cm): 236(505), 265(420), 550(50)

(viii) Infrared absorption spectrum (KBr): Dominant peaks (cm^{-1}) at: 3480, 3250, 2980, 1685, 1625, 1598, 1472, 1390, 1370, 1315, 1207, 1090, 1065, 1042, 1030

(ix) Specific rotation: $[\alpha]_D^{25°} + 62° \pm 4°$ (c=0.5, methanol)

(x) Color reactions Negative ninhydrin, Erhlich and peptide reactions; Positive 1% iron chloride-1% ferricyanide (1:1) reaction (blue).

4,187,293

STABILIZATION OF SOLUTIONS CONTAINING ACTIVE CHLORINE

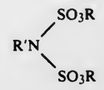
G. Douglas Nelson, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 25, 1978, Ser. No. 954,700

Int. Cl.[2] A01N *11/02*

U.S. Cl. 424—149 **9 Claims**

1. A method of stabilizing an aqueous solution containing active chlorine as a sanitizing agent against the loss of active chlorine upon exosure to ultraviolet light or by contact with aluminum, copper or iron which comprises adding to the solution a stabilizing amount of a compound represented by the structure



wherein each R is individually hydrogen, an alkali metal or alkaline earth metal and R' is hydrogen, chlorine, an alkali metal or alkaline earth metal.

4,187,294

METHOD FOR PRODUCING EGGS CONTAINING A HIGH AMOUNT OF IODINATED AMINO ACIDS

Tadashi Ishikawa, Sagamihara, and Hiroshi Kamimae, Yokohama, both of Japan, assignors to Nihon Nousan Kougyou Co., Ltd., Yokohama, Japan

Filed Jul. 6, 1978, Ser. No. 922,581

Int. Cl.[2] A61K *33/18*

U.S. Cl. 424—150 **1 Claim**

1. A method for increasing the iodine content of the eggs of egg-laying birds in the form of iodinated amino acids in an amount of 7 ppm or more, said eggs being useful in treating hypercholesterolemia, which comprises providing a feed composition containing calcium iodate in the amount of 230–2000 mg per kg of feed, and feeding said feed composition to egg-laying birds.

4,187,295

ORGANIC COMPOUNDS

Janos Pless, Basel, and Edmond Sandrin, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sep. 6, 1978, Ser. No. 940,051

Claims priority, application Switzerland, Sep. 7, 1977, 10939/77; Nov. 17, 1977, 14058/77; May 19, 1978, 5468/77

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **35 Claims**

1. A compound of the formula

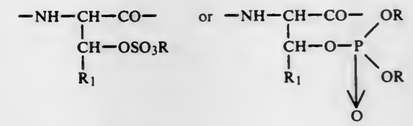
A—B—C—D—E I

wherein

A is H—Trp, H—MeTrp, H—Trp(5—OH) or H—MeTrp-(5—OH),

B is Ala,

C is Ser, Thr, Ala, Gly, Val, a residue of formula



wherein

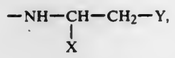
R is hydrogen, alkyl of 1 to 4 carbon atoms, or an alkali metal or an alkaline earth metal

and

R_1 is hydrogen or methyl,

D is Gly or Sar,

E is a residue



wherein

X and Y independently signify COZ or CH_2OH,

Z is OH, OR_2, NH_2, NHR_3 or NR_3R_4, and

each of

R_2, R_3 and R_4 independently signifies alkyl of 1 to 4 carbon atoms

whereby the residues A, B, C and E can have the L-, D- or D, L configuration, or a pharmaceutically acceptable salt or complex form thereof.

4,187,296

2-N-ACYL AND ALKYL 6-EPI-FORTIMICIN B AND DERIVATIVES

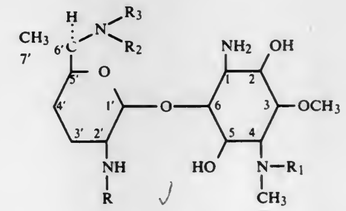
John S. Tadanier, and Jerry R. Martin, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,007

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **10 Claims**

1. 2'-N-substituted, 6'-epi fortimicins B represented by the formula:



wherein: R is acyl, hydroxyacyl, aminoacyl, N-monoloweralk-

ylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, or N,N-diloweralkylaminohydroxyloweralkyl; and R_1 is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, hydroxyacyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl or hydrogen R_2 is lower alkyl; R_3 is hydrogen or lower alkyl and wherein acyl is represented by the formula



wherein Y is loweralkyl; and the pharmaceutically acceptable salts thereof.

10. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

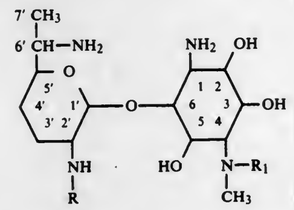
4,187,297

3-DE-O-METHYL-2-N-ACYL AND ALKYL FORTIMICINS A AND B

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,014
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **10 Claims**

1. A compound of the formula:



wherein; R is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralylaminoacyl, hydroxy-substituted aminoacyl, a chiral amino acid residue, loweralkyl, aminoloweralkyl, hydroxyacyl, an alkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, or N,N-diloweralkylaminohydroxyloweralkyl; and R_1 is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, hydroxyacyl, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralllkylaminohydroxyloweralkyl or hydrogen wherein acyl is



Y being loweralkyl; and the pharmaceutically acceptable salts thereof.

10. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

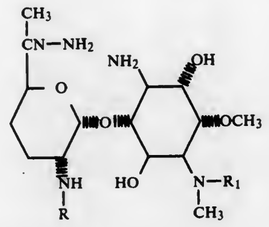
4,187,298

2'N-ACYL AND ALKYL FORTIMICIN B AND DERIVATIVES, 4,2'-N,N'DIACYL AND DIALKYL FORTIMICIN B DERIVATIVES 4-N-ACYL-2'-N-ALKYL AND 4-N-ALKYL-2'-N-ACYL FORTIMICIN B DERIVATIVES

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,012
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **21 Claims**

1. A fortimicin B derivative selected from the group consisting of 2'N-acyl and alkyl fortimicin B and fortimicin B derivatives, 4,2'-N,N'-diacyl and dialkyl derivatives, 4-N-acyl-2'-N-alkyl and 4-N-alkyl-2'-N-acyl fortimicin B derivatives represented by the formula:



wherein: R is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, hydroxyacyl, an amino acid residue selected from the group consisting of L, D or DL glycyl, alanyl, sarcosyl, tyrosyl, phenylalanyl, methionyl, seryl, lysyl, asparginyl, isoleucyl, leucyl, histidyl, threonyl, aspartyl, asparaginyl, valyl, prolyl, glutaminyl, tryptophanyl, and glutamyl, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, or N,N-diloweralkylaminohydroxyloweralkyl; and R_1 is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, hydroxyacyl an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl or hydrogen; with the limitation that R_1 cannot be hydrogen when R is glycyl and the pharmaceutically acceptable salts thereof, and wherein acyl is

R_4 being loweralkyl.

21. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

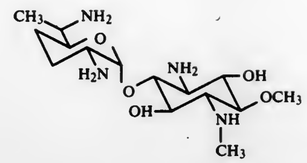
4,187,299

FORTIMICIN E

Gerald G. Post, Kenosha, Wis., assignor to Abbott Laboratories, Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,016
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—181 **3 Claims**

1. Fortimicin E, represented by the formula



or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition comprising a therapeutically effective amount of fortimicin E or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or diluent.

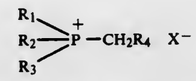
4,187,300

USE OF PHOSPHONIUM SALTS IN TREATMENT OF AFRICAN TRYPANOSOMIASIS

Keaneth E. Kinnamon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1978, Ser. No. 971,124
Int. Cl.[2] A61K *31/66*
U.S. Cl. 424—198 **7 Claims**

1. A method for treating African trypanosomiasis which comprises administering, either parenterally or perorally and using a pharmaceutically acceptable vehicle, a therapeutically effective amount of a phosphonium compound of the formula:



wherein R_1 through R_4 each represent phenyl or substituted phenyl and X represents halogen; and wherein the phosphonium compound is administered to a subject infected with a trypanosomal parasite.

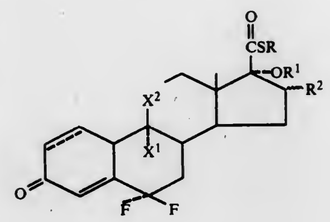
4,187,301

17 BETA-THIOCARBOXYLIC ACID ESTERS OF 6 ALPHA, 6 BETA-DIFLUORO-3-OXOANDROST-4-ENES

John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,389
Int. Cl.[2] A61K *31/58;* **C07J** *71/00*
U.S. Cl. 424—241 **21 Claims**

1. A compund chosen from those represented by the formula



(I)

wherein
X^1 is hydrogen, fluoro, chloro or bromo;
X^2 is =C=O or



or is



when X^1 is chloro;
R is alkyl of 1 through 6 carbon atoms or phenyl or benzyl optionally substituted with one substituent on the phenyl ring chosen from the group consisting of alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms and halo;
R^1 is hydrogen or alkanoyl of 2 through 6 carbon atoms when R^2 is hydrogen, alpha-methyl or beta-methyl;
OR^1 and R^2 together are 16 alpha,17 alpha-isopropylidenedioxy; and
the broken line between C-1 and C-2 represents a double or a single bond.

12. An anti-inflammatory pharmaceutical composition which comprises about 0.001% by weight to about 10% by weight of a compound of claim 1 in combination with about 90% by weight to about 99.999% by weight of suitable pharmaceutical excipients.

4,187,302

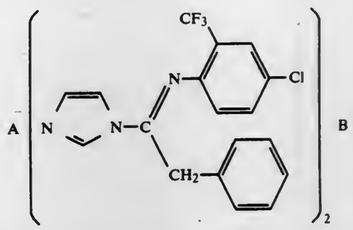
1-[N-(4-CHLORO-2-TRIFLUOROMETHYLPHENYL)-PHENYLACETIMIDOYL]IMIDAZOLE, METAL COMPLEXES THEREOF, AND FUNGICIDAL COMPOSITIONS

Katsuyata Ikura, Ninomiya; Kiyoshi Katsuura, and Masaaki Kataoka, both of Ohiso, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,358
Claims priority, application Japan, Mar. 31, 1977, 52-35236
Int. Cl.[2] A01N *9/22, 11/04;* **C07D** *233/56*
U.S. Cl. 424—245 **12 Claims**

1. 1-[N-(4-chloro-2-trifluoromethylphenyl)-phenylacetimidoyl]imidazole

2. A metal complex of the formula



wherein A is Cu(II) or Zn(II) and B is cl_2 or $(CH_3COO)_2$.

9. A method for the control of fungi comprising applying to the locus to be protected an effective amount of the compound of claim 1.

4,187,303

THIAZINE DERIVATIVES

Otto Hromatka; Dieter Binder, both of Vienna, Austria; Paul Zeller, Allschwil, and Rudolf Pfister, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

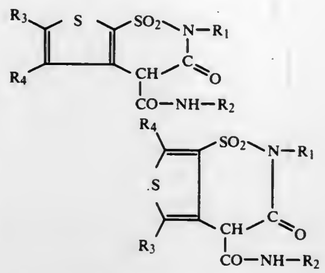
Filed Aug. 15, 1978, Ser. No. 933,682

Claims priority, application Luxembourg, Aug. 22, 1977, 78009

Int. Cl.[2] C07D *279/02;* **A61K** *31/54*

U.S. Cl. 424—246 **12 Claims**

1. A compound of the formula

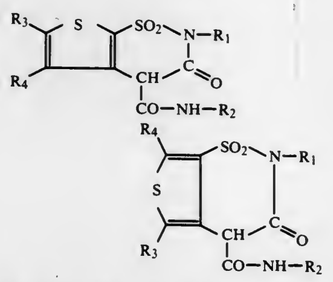


I'

I''

wherein R_1 is lower alkyl, R_2 is an unsubstituted aromatic heterocyclic radical selected from the group consisting of 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazin-2-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6,-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl or 1,2,3,4-tetrazol-5-yl; a phenyl radical, or a phenyl or benzyl group optionally substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy, and R_3 and R_4, individually, are hydrogen or lower alkyl, its tautomer, a salt thereof with a pharmaceutically acceptable base and, when R_2 is the residue of a basic heterocycle, a salt thereof with a pharmaceutically accetpable strong acid.

12. A pharmaceutical preparation comprising a compound of the formula



I'

I''

wherein R_1 is lower alkyl, R_2 is an unsubstituted aromatic heterocyclic radical selected from the group consisting of 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazin-2-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6,-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl or 1,2,3,4-tetrazol-5-yl; a phenyl radical, or a phenyl or benzyl group optionally substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy, and R_3 and R_4, individually, are hydrogen or lower alkyl, its tautomer, a salt thereof with a pharmaceutically acceptable base and, when R_2 is the residue of a basic heterocycle, a salt thereof with a pharmaceutically acceptable strong acid, in association with a compatible pharmaceutical carrier material.

4,187,304

PROCEDURE FOR TREATING MAMMALS TO CONTROL PARASITIC DIPTERA LARVAE

Rolf Immler, Arisdorf, and Hans Bouvard, Ollon, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

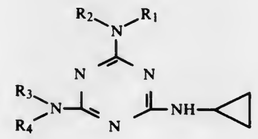
Filed Feb. 7, 1979, Ser. No. 10,277

Claims priority, application Switzerland, Feb. 17, 1978, 1761/78

Int. Cl.[2] A61K *31/53*

U.S. Cl. 424—249 **4 Claims**

1. A procedure for treating domestic animals and productive livestock belonging to the class of Mammalia for systemic control of tissue-parasitic insect larvae of the order of Diptera, which comprises parenteral or transcutaneous administration, to the animals to be treated, of an effective dose of an active substance of the general formula I



(I)

in which R_1 is hydrogen, methyl, ethyl or cyclopropyl, R_2 is hydrogen or methyl, R_3 is hydrogen, methyl or cyclopropyl and R_4 is hydrogen or methyl, or of an acid addition salt thereof which is non-toxic to mammals or of a composition which contains the active substance or an acid addition salt thereof which is non-toxic to mammals.

4,187,305

PROCEDURE FOR TREATING MAMMALS TO CONTROL PARASITIC DIPTERA LARVAE

Rolf Immler, Arisdorf, and Hans Bouvard, Ollon, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

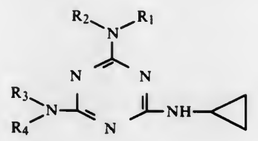
Filed Feb. 7, 1979, Ser. No. 10,279

Claims priority, application Switzerland, Feb. 17, 1978, 1762/78

Int. Cl.[2] A61K *31/53*

U.S. Cl. 424—249 **5 Claims**

1. A procedure for treating domestic animals and productive livestock belonging to the class of Mammalia for systemic control of tissue-parasitic insect larvae of the order of Diptera, which comprises peroral administration, to the aminals to be treated, of an effective dose of an active substance of the general formula I



(I)

in which R_1 is hydrogen, methyl, ethyl or cyclopropyl, R_2 is hydrogen or methyl, R_3 is hydrogen, methyl or cyclopropyl and R_4 is hydrogen or methyl, or of an acid addition salt thereof which is non-toxic to mammals or of a composition which contains the active substance or an acid addition salt thereof which is non-toxic to mammals.

4,187,306

BENZODIAZEPINE-DIONES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS MEDICAMENTS

Karl H. Mayer; Helmut Heitzer, both of Leverkusen; Friedrich Hoffmeister, Wuppertal; Arend Heise, Wuppertal, and Stanislav Kazda, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

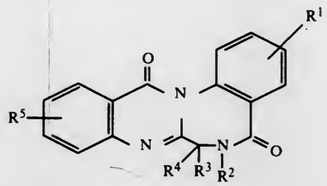
Filed Jul. 6, 1978, Ser. No. 922,419

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733681; Dec. 30, 1977, 2758875

Int. Cl.[2] C07D *471/04*

U.S. Cl. 424—251 **21 Claims**

1. A compound which is a 6,7-Dihydro-5H, 13H-quinazolin [3,2-a][1,4]benzodiazepine-5,13-dione of the formula (I) or its pharmacologically acceptable acid-addition salts:



(I)

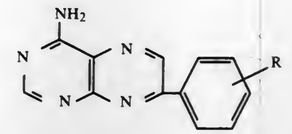
in which

R^1 and R^5 are the same or different and each represents 0, 1, 2, 3 or 4 substituents which are the same or different and each of which is alkyl, hydroxyl, acyloxy, alkoxy, nitro, amino, alkylamino, dialkylamino, acylamino, acylalkylamino, alkoxycarbonylamino, halogen, trifluoromethyl, cyano, carboxyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, aminosulphonyl, alkylaminosulphonyl, dialkylaminosulphonyl, alkylaminocarbonylamino or dialkylaminocarbonylamino, each of said alkyl, alkoxy and acyl radicals having 1 to 4 carbon atoms

R^2 is hydrogen, alkyl having from 1 to 6 carbon atoms and optionally substituted by phenyl, pyridyl, halogen, alkoxy or dialkylamino, each of the alkyl and alkoxy moieties containing from 1 to 4 carbon atoms, or an alkoxycarbonyl group having from 1 to 4 carbon atoms in the alkoxy moiety and

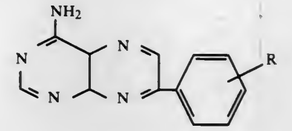
R^3 and R^4 are the same or different and each is hydrogen, alkyl having from 1 to 4 carbon atoms or phenyl.

18. A method of treating the central nervous system in warm-blooded animals which comprises administering to the said animals an amount effective for providing central nervous system action of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.



wherein R is hydrogen, dimethylamino, m-methyl or p-methyl.

15. A medicinal composition for increasing urine excretion from a warm-blooded animal containing a diuretically effective amount of a compound of the formula



wherein R is H, Me_2N, m-Me or p-Me together with a pharmaceutically acceptable diluent or carrier.

4,187,307

DIURETICS

Gerard Y. Paris, Duvernay; Denis G. Cimon, Montreal-Nord; Dilbagh S. Bariana, Pointe-Claire, and Anthony Fung, Pierrefonds, all of Canada, assignors to Abbott Laboratories, Chicago, Ill.

Filed Oct. 16, 1978, Ser. No. 951,935

Int. Cl.[2] A61K *31/505;* **C07D** *475/06*

U.S. Cl. 424—251 **21 Claims**

1. A compound of the formula

4,187,308

PHARMACEUTICAL COMPOSITION WITH ANTI-BRONCHOSPASMODIC AND ANTI-TUSSIVE ACTIVITY

Jose S. Franzone, and Teresio Tamietto, both of Turin, Italy, assignors to Istituto Biologico Chemioterapico "ABC" S.p.A., Torino, Italy

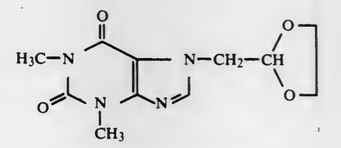
Filed Oct. 12, 1978, Ser. No. 950,749

Claims priority, application Italy, Apr. 6, 1978, 22019 A/78

Int. Cl.[2] A61K *31/52*

U.S. Cl. 424—253 **7 Claims**

1. A pharmaceutical composition with anti-bronchospasmodic and anti-tussive activity in the form of an aerosol for pulmonary administration containing an effective amount of the compound of formula I



(I)

together with at least one pharmaceutically acceptable carrier or diluent.

4,187,309

4-HYDROXY-2-QUINOLINONE-3-CARBOXYLIC ACIDS AND SALTS THEREOF

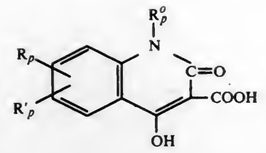
Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Jun. 20, 1977, Ser. No. 807,914

Int. Cl.[2] A61K *31/47*

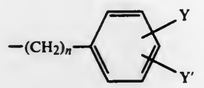
U.S. Cl. 424—258 **64 Claims**

1. The method of treating allergic conditions due to histamine release comprising administering to a mammal in need of such treatment an allergy treating effective amount of a compound having in free acid form the formula:



wherein

R_p^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms, or



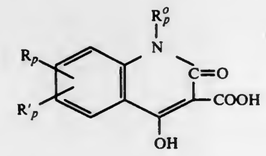
n—is 0 or 1,

Y and Y'—are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

R_p and R_p'—are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl,

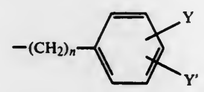
with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom; or a mono- or di-salt form thereof in which the salt forming cation is a pharmaceutically acceptable cation.

33. A pharmaceutical composition comprising in unit dosage form a pharmaceutically acceptable carrier and an amount effective to relieve allergic conditions due to histamine release of a compound having in free acid form the formula:



wherein

R_p^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms, or



n—is 0 to 1,

Y and Y'—are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

R_p and R_p'—are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl, with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom; or a mono- or di-salt form thereof in which the salt forming cation is a pharmaceutically acceptable cation.

4,187,310

1,2-DIHYDRO-2-OXOQUINOL-4-YLACETIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

David R. Brittain; Edward D. Brown; Walter Hepworth, all of Macclesfield, and Gilbert J. Stacey, Cheadle, all of England, assignors to Imperial Chemical Industries Limited, London, England

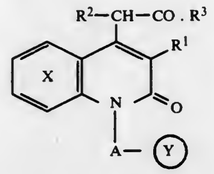
Division of Ser. No. 832,613, Sep. 12, 1977, U.S. Pat. No. 4,138,490, which is a continuation-in-part of Ser. No. 662,685, Mar. 1, 1976, Pat. No. 4,066,651. This application Sep. 25, 1978, Ser. No. 945,596

Claims priority, application United Kingdom, Mar. 20, 1975, 11644/75; Oct. 14, 1975, 4204375

Int. Cl.[2] A61K *31/545;* **C07D** *215/22*

U.S. Cl. 424—258 **8 Claims**

1. A quinolone alkanoic acid of the formula:



wherein A is a direct bond, or a C_{1-4}-alkylene or C_{2-4}-alkenylene group; R^1 is hydrogen or a halogen atom or a C_{1-4}-alkyl group; R^2 is hydrogen; R^3 is a hydroxy, amino, hydroxylamino, C_{1-6}-alkoxy or phenoxy group; and wherein the benzene ring X may be unsubstituted or substituted by 1 or 2 substituents selected from halogen atoms, C_{1-6}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkylthio, trifluoromethyl, C_{1-3}-alkylenedioxy, nitro, amino, C_{1-4}-alkylamino, di-(C_{1-4}-alkyl)amino, C_{2-4}-alkanoylamino, benzyloxy and hallogenobenzyloxy groups; and wherein the ring Y is an unsubstituted phenyl group or a phenyl group substituted by 1, 2 or 3 substituents selected from halogen atoms, C_{1-6}-alkyl, C_{1-4}-alkoxy, C_{1-4}-allkylthio, C_{1-4}-alkylamino, di-(C_{1-4}-alkyl)amino, nitro, cyano, trifluoromethyl, C_{2-8}-alkoxyalkyl, phenyl and halogenophenyl groups; or wherein the ring Y is a naphthyl, halogenonaphthyl, furyl, pyridyl, or thienyl group; or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical aldose reductase inhibiting composition which comprises a compound of formula I or a pharmaceutically acceptable salt thereof as claimed in claim 1 in pharmaceutically-acceptable form.

6. A method of inhibiting the enzyme aldose reductase in a warm-blooded animal requiring such treatment which comprises internally administering to the said animal an effective amount of a compound of formula I or a pharmaceutically acceptable salt thereof as claimed in claim 1.

4,187,311

3-ARYLOXY-1-CARBOALKOXYETHYLPYRIDINIUM COMPOUNDS AND COMPOSITIONS

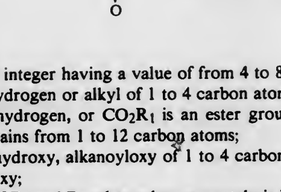
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1978, Ser. No. 960,251

Int. Cl.[2] C07D *213/65;* **A61K** *31/44*

U.S. Cl. 424—263 **9 Claims**

1. A compound of the formula



where R is hydrogen, fluorine or chlorine; R^1 is hydrogen or lower alkyl, R^2 is lower alkyl and $X^\ominus$ is a pharmaceutically-acceptable anion.

8. A pharmaceutical composition comprising an antisenility or induced amnesia reversing effective amount of a compound of claim 1 and a pharmaceutical carrier.

4,187,312

3-HYDROXY-4,4-DIMETHYL-5-PYRROLIDONE DERIVATIVES

Frederick Cassidy, Harlow, and Antony W. Lake, Saffron Walden, both of England, assignors to Beecham Group Limited, England

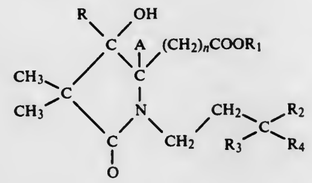
Division of Ser. No. 732,989, Oct. 15, 1976, Pat. No. 4,136,190. This application Oct. 24, 1978, Ser. No. 954,188

Claims priority, application United Kingdom, Oct. 25, 1975, 43989/75; May 22, 1976, 21279/76

Int. Cl.[2] C07D *207/26;* **A61K** *31/40*

U.S. Cl. 424—274 **33 Claims**

1. A compound of the formula



wherein

n is an integer having a value of from 4 to 8;

R is hydrogen or alkyl of 1 to 4 carbon atoms;

R_1 is hydrogen, or CO_2R_1 is an ester group in which R_1 contains from 1 to 12 carbon atoms;

R_3 is hydroxy, alkanoyloxy of 1 to 4 carbon atoms or benzyloxy;

each of R_2 and R_4 when taken separately is hydrogen, alkyl of 1 to 9 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, cycloalkylalkyl of 5 to 8 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety, phenyl, phenylalkyl of 1 to 6 carbon atoms in the alkyl moiety, naphthyl, naphthylalkyl of 1 to 6 carbon atoms in the alkyl moiety, said phenyl and naphthyl groups being unsubstituted or substituted by one or more members selected from the group consisting of halo, trifluoromethyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and nitro; or R_2 and R_4 when taken with the carbon atom to which they are joined are cycloalkyl of 5 to 8 carbon atoms;

A is hydrogen or methyl; or an alkali metal, alkaline earth metal, ammonium or substituted ammonium salt of said compound in which R_1 is hydrogen.

32. A pharmaceutical composition having antigastric secretion activity, anti-hypertensive activity, bronchodilator activity, and platelet aggregation inhibition activity comprising an effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,187,313

2-AMINOETHYL-1,4-BENZODIOXANS

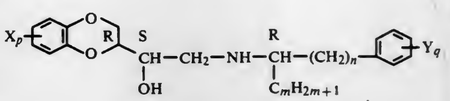
Heinz W. Gschwend, New Providence, and Charles F. Huebner, Chatam, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 873,457, Jan. 30, 1978, abandoned. This application Oct. 10, 1978, Ser. No. 949,583

Int. Cl.[2] A61K *31/335;* **C07D** *319/08*

U.S. Cl. 424—278 **7 Claims**

1. Specific stereoisomers of erythro-2-(2-aralkylamino-1-hydroxyethyl)-1,4-benzodioxans corresponding to Formula I



(I)

wherein each of X and Y are hydrogen, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, halogen or trifluoromethyl; each of p and q is the integer 1 or 2 and each of m and n is an integer from 1 to 4; or pharmaceutically acceptable acid addition salts thereof.

6. An antihypertensive pharmaceutical composition comprising a hypotensively effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

7. A method of treating hypertension and cardiac conditions in mammals, which comprises administering to them enterally or parenterally a composition as claimed in claim 6.

4,187,314

SUBSTITUTED FURYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS AND PHARMACEUTICAL USE

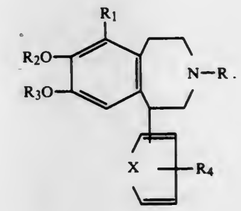
Kenneth G. Holden, Haddonfield, N.J., and Nelson C. Yim, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 764,672, Feb. 2, 1977, Pat. No. 4,111,957. This application May 24, 1978, Ser. No. 909,073

Int. Cl.[2] A61K *31/55;* **C07D** *405/04*

U.S. Cl. 424—282 **7 Claims**

1. A compound of the formula:



in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of 1–5 carbons, lower alkyl of 1–5 carbons, hydroxyethyl or lower alkenyl of 3–5 carbons;

R_1 is hydrogen, halo, trifluoromethyl, methylthio, trifluoromethylthio, methyl or methoxy;

R_2 and R_3 are hydrogen;

R_4 is hydrogen, halo, cyanomethyl or methyl; and

X is —O—; and the pharmaceutically acceptable nontoxic salts thereof.

7. A pharmaceutical composition having dopaminergic activity comprising an effective therefor and nontoxic quantity of a compound of claim 1 and a dosage unit carrier therefor.

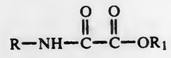
4,187,315

N-ALKYL(AND CYCLOALKYL)OXAMIC ACID AND DERIVATIVES AS INHIBITORS OF GLYCOLIC ACID OXIDASE

Edward J. Cragoe, Jr., Lansdale; Frederick C. Novello, Berwyn, and Walfred S. Saari, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 11, 1978, Ser. No. 950,510
Int. Cl.[2] A61K *31/215, 31/195*
U.S. Cl. 424—305 **2 Claims**

1. A method of treating or preventing the formation of calcium oxalate kidney or bladder stones, which comprises administering to a patient with, or prone to this disease, an effective amount of a compound of the formula



wherein R is alkyl or from 6–12 carbon atoms or cycloalkyl of from 6–12 carbon atoms, R_1 is hydrogen or lower alkyl from 1–6 carbon atoms or a pharmaceutically acceptable salt thereof.

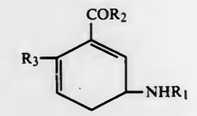
4,187,316

SUBSTITUTED 1,5-CYCLOHEXADIENE CARBOXYLIC ACID DERIVATIVES

Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jan. 12, 1978, Ser. No. 868,860
Int. Cl.[2] A61K *31/215;* **C07C** *61/22*
U.S. Cl. 424—305 **9 Claims**

1. A compound of the formula



wherein R_1 is hydrogen; R_2 is hydroxy, or a straight or branched alkoxy group of from 1 to 8 carbon atoms; R_3 is hydrogen or bromine; and pharmaceutically acceptable salts and individual optical isomers thereof.

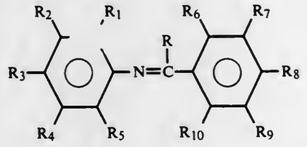
4,187,317

SUNSCREEN AND ERYTHEMA TREATING WITH N-BENZYLIDENE ANILENES

George W. Nuss, Jr., Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 839,960, Oct. 6, 1977. This application Sep. 15, 1978, Ser. No. 942,868
Int. Cl.[2] A61K *31/24, 31/135, 31/195*
U.S. Cl. 424—309 **31 Claims**

1. A method of protecting human skin from erythema caused by ultraviolet and visible light radiation and for inhibiting the formation of prostaglandins in humans resulting from the radiation which comprise applying to the skin an effective amount of a compound of the formula:



(I)

where:
R is hydrogen or alkyl;
R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} may be the same or different and are
hydrogen,
alkyl,
nitro,
amino,
haloloweralkoxy,
haloloweralkyl,
halo,
loweralkoxy,
hydroxy,
carboxy and
carbalkoxy; and
R_3 and R_8 may also be cycloalkyl, cycloalkenyl and aryl.

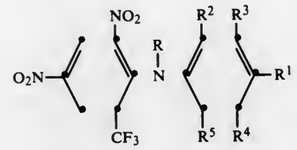
4,187,318

RODENTICIDAL N-ALKYLDIPHENYLAMINES

Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 706,022, Jul. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 617,115, Sep. 26, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,492
Int. Cl.[2] A01N *9/20;* **C07C** *87/54*
U.S. Cl. 424—330 **79 Claims**

1. A compound of the formula:



wherein
R represents methyl, ethyl or propyl;
R^1 represents hydrogen, fluoro, chloro, bromo, iodo, cyano, methyl, nitro or trifluoromethyl;
R^2 and R^5 independently represent hydrogen, fluoro, chloro, bromo, nitro, methyl or trifluoromethyl, provided that no more than one of R^2 and R^5 represents nitro;
R^3 and R^4 independently represent hydrogen, methyl, fluoro, chloro, bromo or trifluoromethyl;
provided that
(a) no more than one of R^1, R^2, R^3, R^4 and R^5 represents methyl, except that R^3 and R^4 may both represent methyl;
(b) when R^1, R^2, R^3, R^4 or R^5 represents methyl or fluoro, two or three of R^1, R^2 and R^5 represent chloro or bromo;
(c) no more than one of R^1, R^2, R^3, R^4 and R^5 represents trifluoromethyl, except that R^3 and R^4 may both represent trifluoromethyl;
(d) when R^2 or R^5 represents trifluoromethyl, R^1 represents chloro or bromo;
(e) when one and only one of R^3 and R^4 represents trifluoromethyl, two or three of R^1, R^2 and R^5 represent chloro or bromo;
(f) no more than four of R^1, R^2, R^3, R^4 and R^5 represent hydrogen;
(g) two fluorine atoms are not adjacent to each other;
(h) when R^2 or R^5 represents nitro, R^1 represents chloro, bromo or nitro;
(i) when one of R^1, R^2, R^3, R^4 and R^5 represents trifluoromethyl, none of R^1, R^2, R^3, R^4 and R^5 represents fluoro or methyl.

48. A method of reducing a population of rats or mice which comprises supplying to a locus frequented by the rats or mice a rodenticidally-effective amount of a rodenticidal composition comprising an inert carrier and a rodenticidally-effective concentration of a compound of claim **1**.

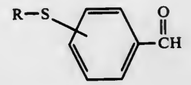
4,187,319

SUBSTITUTED BENZALDEHYDE HYPOLIPIDEMIC AGENTS

Thomas R. Blohm, Maderia; J. Martin Grisar, and Roger A. Parker, both of Cincinnati, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

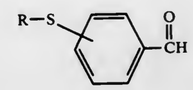
Continuation of Ser. No. 619,304, Oct. 3, 1975, Pat. No. 4,066,788. This application Jun. 2, 1977, Ser. No. 802,853
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.[2] A61K *31/11;* **C07C** *47/48*
U.S. Cl. 424—333 **5 Claims**

1. A pharmaceutical composition in unit dosage form containing about 50 milligrams to 1 gram of a compound of the formula:



wherein R is a straight saturated hydrocarbon chain having from 13 to 20 carbon atoms or a straight unsaturated hydrocarbon chain having from 13 to 20 carbon atoms and from 1 to 4 double bonds and a significant amount of a pharmaceutical carrier.

3. A compound of the formula:



wherein R is a straight saturated hydrocarbon chain having from 13 to 20 carbon atoms or a straight unsaturated hydrocarbon chain having from 13 to 20 carbon atoms and from 1 to 4 double bonds.

4,187,320

PROCESS FOR PREPARING CHEWING GUM BASE USING SOLID ELASTOMER

Edwin R. Koch, Garden City; Leonard P. Abbazia, Brooklyn, and Wayne J. Puglia, Bellerose Village, all of N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 1, 1978, Ser. No. 901,371
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—3 **40 Claims**

1. A two-stage process for preparing a chewing gum base using solid elastomer which comprises:
A. a first stage wherein solid elastomer, an elastomer solvent and an oleaginous plasticizer are subjected to high intensity mixing under high shear conditions until a molten, uniform mass is obtained; said solid elastomer being initially subjected to high intensity mixing to masticate said solid elastomer until a uniform, lump-free mass is obtained, followed by the step-wise addition of said elastomer solvent with continuous high intensity mixing, followed by the step-wise addition of said oleaginous plasticizer with continuous high intensity mixing; and
B. a second stage wherein a hydrophobic plasticizer, an oleaginous plasticizer, a non-toxic vinyl polymer and an emulsifier are added to the molten, uniform mass of A, said second stage ingredients being added step-wise to the molten, uniform mass of A, with continuous high intensity mixing under high shear conditions; said high intensity mixing being continued until a uniform blend of ingredients is obtained.

4,187,321

METHOD FOR PRODUCING FOODS AND DRINKS CONTAINING BIFIDOBACTERIA

Masahiko Mutai, Higashi Yamato; Mitsuo Mada, Kodaira, and Kiyohiro Shimada, Kunitachi, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 861,002
Claims priority, application Japan, Mar. 31, 1977, 52-37008
Int. Cl.[2] A23C *9/12*
U.S. Cl. 426—43 **2 Claims**

1. A method for producing foods and drinks containing at least two kinds of viable bifidobacteria, which comprises adding to a milk medium a bifidobacteria mixture containing at least one oxygen-resistant mutant strain of Bifidobacterium selected form the group consisting of *Bifodobacterium bifidum* YIt-4002, Deposit No. FERM-P 3371, *Bifidobacterium bifidum* YIT-4005, Deposit No. FERM-P 3372 and *Bifidobacterium breve* YIT-4006, Deposit No. FERM-P 3906, and at least one strain of obligatory anaerobic Bifidobacterium selected from the group consisting of *Bifidobacterium longum, Bifidobacterium breve, Bifidobacterium adolescentis, Bifidobacterium infantis* and *Bifidobacterium bifidum,* and growing the bifidobacteria mixture in the milk medium under aerobic conditions in the absence of added growth promoting substances normally necessary for the obligatory anaerobic Bifidobacterium alone to grow under aerobic conditions in a pure milk medium.

4,187,322

POWDER COMPOSITIONS CONTAINING VITAMIN C ACTIVE COMPONENT

Rene Josse, Rixheim, France, and Heinrich Klaui, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 8, 1976, Ser. No. 739,879
Claims priority, application Switzerland, Nov. 30, 1975, 15466/75
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—72 **17 Claims**

14. A stable, vitamin C fortified animal feedstuff which comprises an admixture of (a) an animal feedstuff and (b) a dry, stable, free-flowing powder composition which comprises pre-swollen cereal grain having absorbed therein from about 15% to about 45% by weight, based on the total weight of the powder composition, of a vitamin C active component selected from the group consisting of ascorbic acid, an alkali metal salt thereof and an alkaline earth metal salt thereof and wherein said vitamin C active component is obtained from an aqueous solution of said acid or said salts.

4,187,323

COLORED WHEY

Rolf G. Gidlow, 4473 Olson Lake Trail, Lake Elmo, Minn. 55042

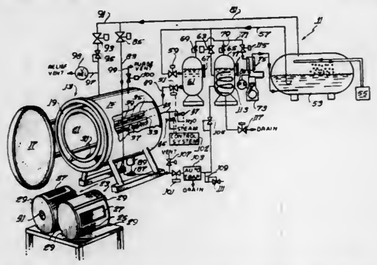
Filed Aug. 16, 1976, Ser. No. 714,311
Int. Cl.[2] A23C *21/00*
U.S. Cl. 426—250 **12 Claims**

1. A product comprising homogeneously mixed whey particles and first particulate material,
said first particulate material consisting principally of flour particles,
said whey particles incorporating a color additive and having the color of said additive,
said first particulate material having a color different from said color additive,
said product appearing to have the color of said color additive, and getting said appearance of said color additive from said colored whey particles in their solid state.

4,187,324
SOYBEAN BEVERAGE
Darrell B. Shirbroun, Box 225, Callender, Iowa 50523
Filed May 12, 1977, Ser. No. 796,148
Int. Cl.[2] A23F *1/14*
U.S. Cl. 426—460 **5 Claims**

1. A process of preparing a coffee substitute soybean beverage, consisting essentially of, presoaking green soybeans in water to soften said beans, crushing said soaked beans to expel the oil therefrom and to
disrupt at least some of the bean cell walls, separating soybean oil from the crushed green bean, to provide
a soybean oil content of crushed green bean of about 0.5% or less by weight, pre-drying said crushed bean until it feels substantially dry, grinding the cell wall crushed green beans to conventional roast and ground coffee particle size, and
slow roasting said ground bean at a temperature of from about 350° F. to about 425° F. until the roasted ground beans have a conventional roast color appearance of roasted and ground coffee.

4,187,325
STEAM COOKING WITH DIRECT CONTACT CO_2 COOLING
Lewis Tyree, Jr., 145 Briarwood Ave., N., Oak Brook, Ill. 60521
Division of Ser. No. 831,227, Sep. 7, 1977, Pat. No. 4,137,723.
This application Feb. 2, 1979, Ser. No. 8,862
Int. Cl.[2] A47J *27/092*
U.S. Cl. 426—510 **11 Claims**



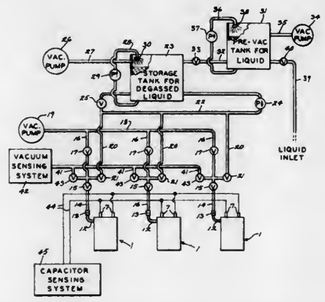
1. A method of preparing food which comprises supplying liquid CO_2 from a high pressure storage vessel system to a holding tank and creating a coolant reservoir therein containing solid CO_2 at a pressure not greater than 60 psig,
compressing the CO_2 vapor created by said solid CO_2 formation and returning said vapor to said storage vessel,
disposing food to be cooked in a chamber,
pressuring said chamber to superatmospheric pressure with carbon dioxide vapor,
cooking said food by injection of steam into said chamber while said superatmospheric pressure is maintained,
freezing said cooked food by injecting liquid CO_2 into said chamber whereby CO_2 vapor is generated, and
recovering said CO_2 vapor generated in said chamber by condensing said vapor by melting said solid CO_2 in said reservoir.

7. Apparatus for preparing food, which apparatus comprises
a liquid carbon dioxide storage vessel system,
a holding tank,
means for supplying liquid CO_2 from said storage vessel system to said holding tank and for lowering the pressure therein below 60 psig to create a coolant reservoir including solid CO_2,
means for compressing CO_2 vapor from said holding tank and returning said compressed vapor to said storage vessel system,
a cooker including a chamber for receiving food,
means for pressuring said chamber to superatmospheric pressure with CO_2 vapor from said storage vessel system,
means for injecting steam into said chamber to cook said food while under said superatmospheric pressure,
means for injecting liquid CO_2 into said chamber to freeze said cooked food,
outlet means disposed in a bottom portion of said chamber,
conduit means connecting said outlet means with said holding tank,
said conduit means including a device for draining liquids therefrom while permitting the flow of vapor therethrough, and
pressure regulator means in said conduit means for maintaining a pressure of at least about 65 psig therein
whereby water resulting from condensation of steam drains from said conduit means via said device and whereby the CO_2 vapor generated in said chamber flows to said holding tank where it is condensed by melting said solid CO_2 in said reservoir.

4,187,326
DRY BEVERAGE MIX CONTAINING A CLOUDING AGENT
James M. Serafino, Stamford, Conn.; Slawko Yadlowsky, Manville, and John S. Witzeman, Rivervale, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.
Filed Oct. 25, 1977, Ser. No. 844,686
Int. Cl.[2] A23L *2/00*
U.S. Cl. 426—590 **9 Claims**

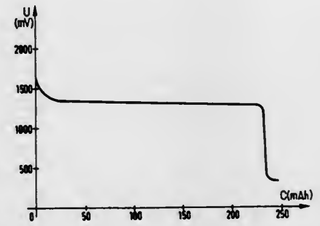
1. A fruit flavored dry beverage mix which comprises sugar, food acid, flavor and color wherein the improvement comprises a dry clouding agent which is obtained by co-drying an aqueous dispersion comprised of, on a dry basis, a major amount of solubilized malto dextrin and a minor amount of xanthan gum and titanium dioxide whereby the total dry beverage mix is storage stable and the reconstituted beverage obtained from the total dry mix has properties resembling the opacity and mouth-feel of a natural fruit juice and retains said opacity and mouth-feel for at least 24 hours when held at 50° F.

4,187,327
METHOD OF PROCESSING AN ELECTRICAL APPARATUS
John Lapp, Franklin, Wis., and John R. Willy, Greenwood, S.C., assignors to McGraw-Edison Company, Elgin, Ill.
Continuation of Ser. No. 612,028, Sep. 10, 1975, abandoned. This application May 31, 1977, Ser. No. 801,637
Int. Cl.[2] H01G *13/04;* B05D *5/12*
U.S. Cl. 427—8 **3 Claims**



1. A method of processing an electrical capacitor having an outer casing containing a polymeric dielectric material and electrically conductive layers, comprising the steps of degassing a dielectric liquid to remove gas therefrom by subjecting the liquid to a sub-atmospheric pressure, subjecting the interior of the casing to sub-atmospheric pressure to evacuate the same, introducing the degassed dielectric liquid into the casing while maintaining a sub-atmospheric pressure on the interior of the casing and on said liquid, applying a super-atmospheric pressure to the degassed liquid disposed within the casing to impregnate the dielectric material, maintaining the dielectric material at a temperature below 60° C. during the steps of evacuating the casing and impregnating the dielectric material, and thereafter sealing the casing while maintaining the super-atmospheric pressure on the liquid.

4,187,328
METHOD OF PREPARING POSITIVE ACTIVE MATERIAL FOR ELECTRIC PRIMARY CELLS
Yves Jumel, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France
Division of Ser. No. 865,517, Dec. 29, 1977, Pat. No. 4,125,689.
This application Jun. 16, 1978, Ser. No. 915,986
Claims priority, application France, Dec. 30, 1976, 76 39572
Int. Cl.[2] H01M *4/54, 6/04*
U.S. Cl. 427—8 **3 Claims**

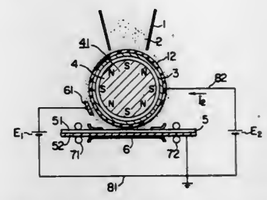


1. A method of preparing a positive active material for primary electric cells, the method comprising:
adding a predetermined quantity of a reducing agent to a selected amount of silver peroxide powder sufficient to reduce an outer layer of each grain of said powder until a layer of metallic silver is formed on the surface of each of the powder grains;
reducing said powder with said reducing agent;
measuring the resistance of said powder; and terminating said reducing step as soon as the resistivity of said powder significantly decreases, thereby indicating the formation of a thin surface layer of metallic silver on the grains of said powder.

4,187,329
ELECTROPHOTOGRAPHIC DEVELOPING PROCESS AND COMPOSITIONS FOR USE THEREIN
Walter Crooks, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 809,966, Mar. 24, 1969, abandoned. This application Feb. 3, 1971, Ser. No. 112,393
Int. Cl.[2] G03G *13/08, 9/08*
U.S. Cl. 430—110 **15 Claims**

1. In an electrophotographic process wherein an electrostatic image is made visible by contacting the surface bearing said image with a developer comprising finely divided toner particles of thermoplastic resin binder containing coloring pigment, the improvement according to which toner filming of the image bearing surface is reduced by incorporating in the developer in an amount up to 10% by weight of the toner and in particle size smaller than the toner, a particulate pigment-free organic polymer additive selected from the group consisting of polytetrafluoroethylene, polyvinylfluoride, polyvinylidenefluoride, polyethylene, polyhexafluoropropylene, copolymers of tetrafluoroethylene with tetrafluoropropylene, and copolymers of tetrafluoroethylene with hexafluoropropylene.

4,187,330
ELECTROSTATIC DEVELOPING METHOD AND APPARATUS USING CONDUCTIVE MAGNETIC TONER
Hideki Harada, Urawa, and Keitarou Yamashita, Kamisatomachi, both of Japan, assignors to Hitachi Metals, Ltd., Japan
Filed Jan. 25, 1977, Ser. No. 762,268
Claims priority, application Japan, Jan. 30, 1976, 51-8430; Feb. 4, 1976, 51-10405
Int. Cl.[2] G03G *15/09*
U.S. Cl. 430—103 **14 Claims**



1. An electrostatic developing method comprising the steps of:
(a) attracting magnetic and inductively chargeable electroconductive toner particles which have a volume resistance ranging between 10^2 and $10^5\Omega$-cm in a D.C. electric-field of 100 V/cm, on an insulating carrier by a magnetic force of a permanent magnet means,
(b) carrying the toner particles in brush form on said insulating carrier close to an electrostatic latent image on an electrostatic latent image bearing medium,
(c) oppositely charging inductively the tips of the toner particles adjacent to the electrostatic latent image to that of the latent image, an electrode being provided to electrically contact the toner particles and being electrically connected with the image bearing medium, and
(d) attracting a part of the toner particles adjacent to the electrostatic latent image by means of an electric attraction force between the toner particles and the latent image.

2. An electrostatic developing method according to claim 1, wherein the permanent magnet means and the insulating carrier are rotated relative to each other for carrying the toner particles.

4,187,331
FLUORINE PLASMA RESIST IMAGE HARDENING
William Hsioh-Lien Ma, Wappingers Falls, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Aug. 24, 1978, Ser. No. 936,425
Int. Cl.[2] B05D *3/06*
U.S. Cl. 430—328 **10 Claims**

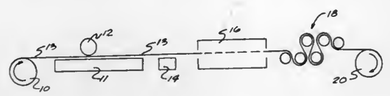
1. A process for stabilizing an organic polymer resist image layer formed on a substrate comprising placing the image layer bearing substrate in an electrodeless glow discharge in a low pressure fluorine containing atmosphere so as to harden the exposed surface of said layer and then heating said layer.

4,187,332
PROCESS FOR PRODUCING LIGHT-REFLECTIVE FABRICS
Glynn E. Fouche, Jr., Spartanburg, S.C., assignor to M. Lowenstein & Sons, Inc., New York, N.Y.
Filed Oct. 19, 1978, Ser. No. 952,781
Int. Cl.[2] G02B *5/12;* D06C *29/00;* B29D *9/08;* B32B *17/12*
U.S. Cl. 427—47 **11 Claims**

1. A method of producing light-reflective fabrics comprising the steps of:
(a) providing a textile fabric constructed of differentially dyed or dyeable yarns or fibers;
(b) applying to a surface of said fabric a liquid paste composi-

tion comprising an aqueous dispersion of reflex-reflective glass bead particles having a substantially hemispheric coating of a magnetizable component in an activatable binder, said paste composition including a carboxyvinyl polymeric thickner to provide a viscosity of the composition of between about 3,000 to 17,000 centipoise;

(c) applying a directional magnetic force field to the composition containing fabric to magnetically orient the reflex-



reflective glass bead particles in said paste composition and dispose their reflex-reflective surfaces of the bead particles outwardly of the surface of the fabric;

(d) activating the binder of the particles to adhesively secure them to said fabric surface; and

(e) subsequently treating the fabric with a textile finishing composition to increase the durability and resistance of the glass bead particles thereon to removal by washing.

4,187,333

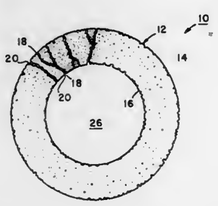
ION-EXCHANGE HOLLOW FIBERS

Alan Rembaum; Shiao-Ping S. Yen, both of Altadena, Calif., and Elias Klein, New Orleans, La., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 363,130, May 23, 1973, Pat. No. 3,944,485. This application Mar. 5, 1975, Ser. No. 555,526

Int. Cl.[2] C08J *5/20, 5/24*

U.S. Cl. 427—230 **8 Claims**



1. A method of forming an ion-exchange medium comprising the steps of:

introducing into one end of the central channel of a hollow, thin-wall, microporous fiber of a synthetic organic resin having pores which join to form a path across the wall of the fiber a mixture of liquid reactive monomers until the mixture appears at the second end thereof and exudes through the wall of the fiber to the outside surface thereof; and

reacting the monomers within the pores to form solid, insoluble ion-exchange resin particles having a diameter smaller than the pore diameter, and having an even distribution of fixed charge; said particles being embedded and constrained within said pores without blocking said pores or said path.

4,187,334

PROCESS AND MATERIAL FOR TREATING STEEL WALLS AND FANS IN ELECTRICAL PRECIPITATION INSTALLATIONS WITH MICRON COLLOIDAL GRAPHITE PARTICLES

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Nov. 1, 1978, Ser. No. 956,497

Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—236 **4 Claims**

1. A process of treating the inner steel walls and fluid handling and moving devices in electrical precipitation installations that consists essentially of the steps of cleaning said steel walls and devices, penetrating a liquid suspension of micron colloidal particles of graphite into said cleaned steel walls and devices so as to build up a smooth covering coating on said steel walls and devices, said micron colloidal suspension including more than about 15% by weight micron colloidal particles of graphite and less than about 75% by weight micron colloidal particles of graphite, between about 15% to 75% by weight water, between about 15% to 75% by weight alcohol and substantially about 1% to 2% by weight liquid soap, and drying said coating to form a slick, smooth surface.

4,187,335

PROCESS FOR TREATING COKE OVEN DOORS AND JAMBS TO PREVENT THE BUILD UP OF TAR THEREON

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation of Ser. No. 905,513, May 15, 1978. This application Oct. 5, 1978, Ser. No. 948,886

Int. Cl.[2] B08B *17/02*

U.S. Cl. 427—318 **6 Claims**

1. A process of treating the engaging portions of steel coke oven doors and jambs that comprises cleaning said portions to the bare metals, applying at least one penetrating coating of a liquid suspension of micron colloidal particles of graphite to said cleaned steel portions so as to build up a smooth convering coating on said steel portions, and drying said coating to form a slick smooth surface.

4,187,336

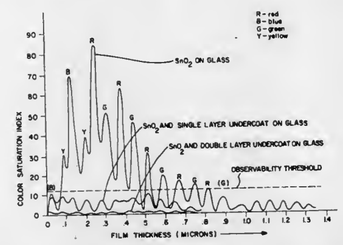
NON-IRIDESCENT GLASS STRUCTURES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed Apr. 4, 1977, Ser. No. 784,542

Int. Cl.[2] B32B *15/00, 9/00, 9/04*

U.S. Cl. 428—34 **104 Claims**



1. In a structure formed of at least one transparent glass sheet and comprising thereon a first inorganic coating of an infra-red reflective material which material is of the type that is a transparent semiconductor and normally exhibits iridescent colors in daylight illumination, the improvement wherein

a second coating, is between said glass and said first coating, and said second coating

forms means to substantially diminish iridescent colors of said first coating by providing at least two interfaces which form means, together with the mass of said second coating, to reflect and refract light such that the observability, in daylight illumination, of said iridescent colors is substantially reduced; and

wherein said second coating has a refractive index defined as about the square root of the multiple of the refractive indices of said glass and said first coating, and

wherein said second coating has a thickness of about ¼ wavelength of light having a vacuum wavelength of about 500 nanometers.

4,187,337

ANTI-SLIP UNDERLAY

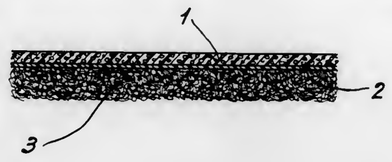
Roland H. Romageon, 165 boulevard Bineau, Neuilly sur Seine, France

Filed Dec. 28, 1977, Ser. No. 865,249

Claims priority, application France, Jan. 6, 1977, 77 0023

Int. Cl.[2] B32B *5/06*

U.S. Cl. 428—95 **3 Claims**



1. An underlay for carpets, rugs and the like, comprising:

a first layer which is of resilient material selected from the group comprising resilient synthetic foam material and rubber;

a second layer of non-woven fibrous material which is secured to one face of said first layer without substantial penetration of its fibers into said first layer; and

a third layer of non-woven fibrous material which is connected by inerlocking with the fibers of said second layer, said second layer of non-woven fibrous material being needle-felted to cause compaction and interlocking of the fibers of said second layer thereby causing said second layer to have a density greater than the third layer;

whereby the outer face of the first layer provides a non-skid surface and an outer face of the third layer provides a relatively rought, fibrous surface.

4,187,338

METHOD FOR PRODUCING A FOAMED BODY HAVING CHEMICALLY EMBOSSED PATTERNS

Nobuo Miura, Kashiwa, Japan, assignor to Lonseal Corporation, Tokyo, Japan

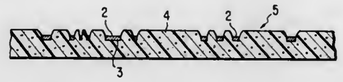
Continuation-in-part of Ser. No. 659,104, Feb. 18, 1976, Pat. No. 4,082,876. This application Jan. 5, 1978, Ser. No. 867,033

Claims priority, application Japan, Feb. 20, 1975, 50-21655

The portion of the term of this patent subsequent to Apr. 4, 1978, has been disclaimed.

Int. Cl.[2] B29D *27/00*

U.S. Cl. 28—159 **25 Claims**



1. A method for producing a foamed body having a chemically embossed pattern, which comprises:

forming a composition containing a plasticized vinyl chloride resin, a synthetic rubber material capable of being vulcanized, a blowing agent, a vulcanizing agent and a vulcanization promotor into a sheet;

printing an ink containing a vulcanizing accelerator onto said sheet in a desired configuration;

drying and curing the printed sheet by heating said printed sheet to a temperature of up to 100° C.; and

heating said dried sheet to a temperature of 150°–250° C. to cause foaming of said sheet thereby generating a sheet having said chemically embossed patterns therein.

24. An embossed foamed body prepared by the method of claim 1.

4,187,339

PRINTED CIRCUITS

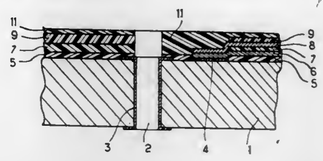
Pierre-Henri Cayrol, 20, Avenue Beauséjour, 77500 Chelles, France

Filed Aug. 30, 1978, Ser. No. 938,104

Claims priority, application France, Aug. 31, 1977, 77 27152

Int. Cl.[2] H05K *1/00;* **B32B** *5/16*

U.S. Cl. 428—208 **4 Claims**



1. A method of making a printed circuit which comprises the steps of:

(a) applying to an electrically insulating substrate formed with metallized holes and conductive zones upon a surface of the substrate a first insulation layer through which portions of said zones are exposed;

(b) applying over said first insulating layer beads of electrically conductive hardenable synthetic-resin material bridging at least some of said zones to electrically interconnect the same;

(c) hardening said beads of synthetic-resin material;

(d) applying over the hardened beads while leaving at least some of said holes exposed, a second layer of electrically insulating material; and

(e) mounting circuit board components above said second layer with leads extending into and soldered to said holes.

3. A printed circuit assembly comprising:

(a) an electrically insulating board formed with metallized holes and electrically conductive zones upon a surface of said board;

(b) a first layer of insulating material overlying the surface of said board provided with said zones and leaving at least some of said zones exposed;

(c) a plurality of beads of hardened conductive synthetic resin overlying said first layer and electrically interconnecting at least some of the zones left exposed by said first layer;

(d) a second electrically insulating layer overlying said beads and said first layer; and

(e) circuit components mounted above said second layer and having leads extending into and soldered to said holes.

4,187,340

METHOD OF FORMING PATTERNED TRANSPARENT ELECTRO-CONDUCTIVE FILM ON THE SUBSTRATE OF LIQUID CRYSTAL DISPLAY

Rokuji Oishi; Yasuharu Okajima; Satoshi Noguchi, all of Yokohama, and Kazuyuki Akeyoshi, Yamato, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 359,641, May 14, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,000

Int. Cl.[2] B32B *3/10, 17/06*

U.S. Cl. 428—210 **3 Claims**

1. A glass substrate having a patterned transparent electroconductive film formed thereon, which coated substrate is used as the electrode plates for liquid crystal display cells, and is prepared by the process, which comprises the steps of:

printing a paste containing a vehicle which easily decomposes at a temperature of 350°–550° C. on a predetermined portion of said glass substrate and drying said paste;

coating said substrate with a low valence metal oxide mixture comprising 85–70 wt. % of In_2O_3 and 15–30 wt. % of SnO_2 by deposition on said printed substrate in a vacuum to form a transparent electroconductive metal oxide coating; and

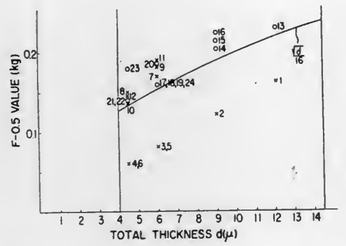
simultaneously decomposing said vehicle of said paste and oxidizing said low valence metal oxide by heating in the range of 300°-600° C. said coated substrate in an atmosphere containing oxygen.

4,187,341

MAGNETIC RECORDING TAPE

Masaaki Suzuki; Osamu Suzuki, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 17, 1977, Ser. No. 852,574
Claims priority, application Japan, Nov. 26, 1976, 51-141323
Int. Cl.[2] B32B *7/02, 5/16*
U.S. Cl. 428—213 **10 Claims**



1. A magnetic recording tape comprising a base layer and a magnetic layer, said tape having a total thickness of 4.0 to 14.5μ, a base to magnetic layer thickness ratio of 2:3 to 3:2, a base to magnetic layer Young's modulus ratio of 1:2 to 2:1 and a tensile strength at 0.5% elongation of at least $\sqrt{d}/16$ (Kg), where d is the total thickness (in microns) of the tape.

4,187,342

BONDED FIBER WEB, WHICH IS CAPABLE OF ABSORBING WATER VAPOR COMPRISING A SWELLABLE CELLULOSE ETHER IN FIBER FORM

Arno Holst; Helmut Lask, both of Wiesbaden; Ehrenfried Nischwitz, Schmitten-Oberreifenbg., and Wilhelm Fischer, Pirmasens, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,326
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710874
Int. Cl.[2] D04H *1/42, 1/64;* **D06M** *15/52;* **D06N** *3/00*
U.S. Cl. 428—283 **8 Claims**

1. In a bonded fiber web capable of absorbing water vapor and composed of synthetic, natural or regenerated fibers with an uniformly incorporated additive of at least one polymer,

the improvement comprising about 3 to 70% by weight, relative to the total fiber proportion, of said additive which comprises fibrous particles of at least one swellable cellulose ether, which has been modified by crosslinking, effected by means of heat energy, radiation, or an additional chemical compound and which is insoluble in water to the extent of at least about 30% by weight.

5. In the process for the manufacture of a bonded fiber web capable of absorbing water vapor and composed of synthetic, natural or regenerated fibers with an uniformly incorporated additive of at least one polymer,

the improvement comprising (a) adding to the synthetic, natural or regenerated fibers, before or during the manufacture of the web, about 3 to 70% by weight, relative to the total fiber proportion, of fibrous particles of at least one swellable cellulose ether, which has been modified by crosslinking, effected by means of heat energy, radiation, or an additional chemical compound and which is insoluble in water to the extent of at least about 30% by weight, (b) incorporating said fibrous particles uniformly therein, (c) bonding the fiber web, and (d) drying it after bonding.

4,187,343

PROCESS FOR PRODUCING NON-WOVEN FABRIC

Takashi Akiyama; Akinori Tanji, and Selichi Asano, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Oct. 8, 1976, Ser. No. 730,983
Claims priority, application Japan, Oct. 8, 1975, 50-122259
Int. Cl.[2] B67D *5/60*
U.S. Cl. 428—288 **5 Claims**

1. A process for producing a non-woven fabric, which comprises drawing uniaxially or biaxially a non-woven sheet material comprising not less than 90% by weight of semi-drawn aromatic polyester fibers produced by melt spinning the polyester obtained from an aromatic dicarboxylic acid and an alkaline glycol wherein not less than 80% by mol of the component unit of the polyester is an ethylene terephthalate chain, said fibers having a breaking elongation of 80 to 150% wherein the fibers are crossed and intertwined with each other and are partially bonded at the crossing points, said drawing being carried out until the bonding of the fibers is partially broken or the fibers are partially cut.

4,187,344

PROTECTIVE SILICON NITRIDE OR SILICON OXYNITRIDE COATING FOR POROUS REFRACTORIES

John I. Fredriksson, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Filed Sep. 27, 1978, Ser. No. 946,337
Int. Cl.[2] B32B *9/04*
U.S. Cl. 428—304 **6 Claims**

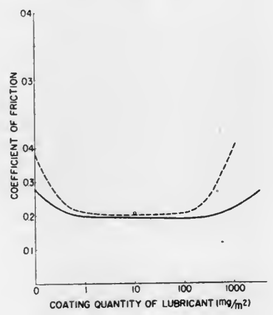
1. A porous refractory article including a protective coating thereon, said coating being a material selected from the group consisting of silicon nitride, silicon oxynitride, and mixtures thereof, and wherein said coating has penetrated the porous refractory article to a depth greater than the depth of the surface pores therein.

4,187,345

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Masaaki Fujiyama, and Satoru Takayama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 836,709, Sep. 26, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,123
Claims priority, application Japan, Sep. 26, 1976, 51-116025
Int. Cl.[2] H01F *10/00*
U.S. Cl. 428—337 **9 Claims**



1. A magnetic recording medium which comprises a support having a surface roughness of at most 0.35 micron, a magnetic recording layer on one side of the support and a lubricant layer on the other side of the support, the lubricant layer being a lubricant represented by the following general formula:

$$R-O-(CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-O)_x-(CH_2-CH_2-O)_yH$$

in which $R=C_nH_{2n+1}$, n=12−18, x=0−8 and y=1−50, which is coated on the support in a mean coating quantity of 1 to 200 mg/m² and which is applied to the support in the form of a solution in an organic solvent.

4,187,346

CONTROLLED PERMEATION PROCESS FOR FIREPROOFING WOOD

George W. Jarrett, Jackson, Miss., assignor to Shelby-Williams Industries, Inc., Morristown, Tenn.

Filed Aug. 22, 1978, Ser. No. 935,861
Int. Cl.[2] B05D *3/00, 3/02, 1/18;* **B32B** *21/04*
U.S. Cl. 428—342 **33 Claims**

1. A process for fireproofing and strengthening wood by employing controlled permeation of a fire retardant compound in the cellular structure of a wood comprising:

(a) evacuating and expanding the cellular structure of a wood by utilizing a sufficient amount of dry heat, vacuum or a combination thereof to activate the cellular structure of said wood for receiving a fire retardant solution to a depth of about 1% to 40% of the thickness of the treated wood;

(b) immersing said evacuated and expanded cellular structure of said wood in a fire retardant solution composed of a combination of a halide salt of a Group I or Group II metal and an ammonium salt to provide a reaction between said halide salt and said ammonium salt and deposit a reaction product in said cellular structure of said wood;

(c) dissipating said dry heat, vacuum or combination thereof after said evacuated and expanded cellular structure of said wood is immersed in said fire retardant solution to draw said fire retardant solution into said wood and deposit said reaction product; and

(d) drying said wood by exposing said wood to the atmosphere or drying in a kiln for about 15 minutes to 72 hours at a temperature of from about 100° F. to 175° F. or a combination of said atmospheric and kiln drying.

18. The product produced by the process of claim 1.

4,187,347

ENCAPSULATED IMPREGNATED ROVINGS

Richard L. Brook, Mount Prospect, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 557,656, Mar. 12, 1975. This application Apr. 5, 1976, Ser. No. 673,724
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—375 **6 Claims**

1. A solid impregnated roving comprising a fibrous roving impregnated with a thermosetting epoxy resin composition in uncured semi-solid form, said impregnated roving being encapsulated within a thin membrane coating of a solid phenolformaldehyde novolac.

4,187,348

THERMOSET IMIDAZOLE CURED EPOXY-POLYSULFIDE RUBBER AUTOMOTIVE BODY SOLDER

Thomas J. Dearlove, Troy; Richard K. Gray, Warren, and Richard P. Atkins, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1978, Ser. No. 917,670
Int. Cl.[2] C08L *63/02*
U.S. Cl. 428—418 **5 Claims**

1. A spreadable thermosetting automotive body solder composition comprised in parts by weight of

100 parts of an epoxy resin adduct of epichlorohydrin and bisphenol A, said adduct having epoxy equivalent weight in the range of from about 180 to 200;

from about 25 to 40 parts of a liquid polysulfide polymer having a number average molecular weight of about 1,000;

from about 0.02 to 0.06 moles imidazole curing agent, said imidazole being substituted in the 2-position with a hydrocarbon group;

and a filler system consisting essentially of

from about 5 to 20 parts aluminum powder;

from about 10 to 20 parts ion-exchanged clay;

from about 3 to 6 parts of a wetting agent for said clay; and

from about 70 to 130 parts talc having particles substantially in the shape of short fibers or platelets with an average particle size of about 3 microns or less,

wherein said filler system provides said body solder with thixotropic properties in the uncured state and sag resistance in the cured and uncured states at temperatures of up to about 200° C.

4,187,349

BONDING OF RUBBER TO REINFORCING ELEMENTS

Heimo J. Langer, Columbus, Ohio, and William J. McKillip, Crystal Lake, Ill., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 26, 1975, Ser. No. 562,072
Int. Cl.[2] B32B *27/34;* **D02G** *3/00*
U.S. Cl. 428—395 **4 Claims**

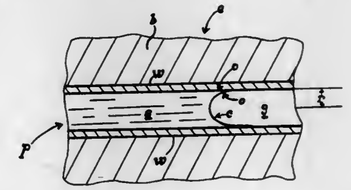
1. A rubber-reinforcing element in the form of a filamentary substrate of polyester having a heat-cured first coating comprising the reaction product of a polyepoxide and an addition polymerization product consisting essentially of a copolymer of N-vinylpyrrolidone and an aminimide selected from the group consisting of dimethyl-(2-hydroxypropyl)amine methacrylimide and trimethyl amine methacrylimide, and a heat-cured second coating of a RFL adhesive.

4,187,350

POROUS CATALYZED ELECTRODE PROVISION AND TECHNIQUE

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,594
Int. Cl.[2] H01M *4/90;* **C25B** *11/03*
U.S. Cl. 429—45 **22 Claims**



12. A catalyzed porous electrode body having a structure comprising:

an electroconductive material of construction shaped into electrode body form;

said electrode body form containing a great multiplicity of fine pores traversing said body that have an average nominal diameter size or equivalent measure of between about 0.1 and 12 microns;

said electrode body form also having a porosity of between about 30 and about 90 volume percent, based on the volume of porulous void space in the total volume of the electrode body;

said body being further characterizable as the physically compressed and densified remains of a porous pre-form of a preliminary body of the same material of construction copiously laced with interstitial passageways that were precursors of said fine pores and which had an average nominal diameter or equivalent measure in excess of about 12 microns.

4,187,351

IMVIC TEST METHOD

Edmund M. Powers, Saxonville, Mass., assignor to The United States of America as represented by the secretary of the Army, Washington, D.C.

Filed Nov. 25, 1977, Ser. No. 855,101

Int. Cl.[2] C12Q *1/10*

U.S. Cl. 435—38 **10 Claims**

1. An improved IMViC test method suitable for confirming the presence of *Escherichia coli,* for differentiating between bacteria of the genera Escherichia and Enterobacter and for distinguishing members of the family Enterobacteriaceae which comprises:

obtaining a suitable culture of said bacteria;

inoculating a test plate with an isolated colony of said bacteria from said suitable culture, said test plate containing test media for (a) indole, (b) methyl red, (c) Voges-Proskauer and (d) citrate tests in separate compartments wherein each of said test media is a solid agar medium and wherein the test medium for the methyl red and Voges-Proskauer tests is an unbuffered glucose peptone medium in which sodium chloride is substituted for dipotassium phosphate;

incubating said inoculated test plate to enable said bacteria to grow on said test plate; and,

determining the results of said tests.

4,187,352

METHOD AND APPARATUS FOR PRODUCING SYNTHETIC PLASTICS PRODUCTS, AND PRODUCT PRODUCED THEREBY

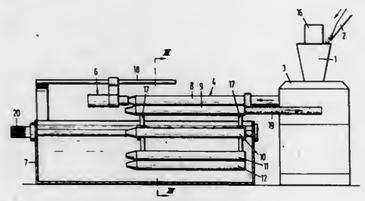
Eduard J. G. Klobbie, Sneek, Netherlands, assignor to Lankhorst Touwfabrieken B.V., Sneek, Netherlands

Filed Mar. 7, 1978, Ser. No. 884,271

Claims priority, application Netherlands, Apr. 19, 1977, 7704265

Int. Cl.[2] B29D *27/00*

U.S. Cl. 521—79 **6 Claims**



1. A method of molding articles from thermoplastic synthetic material, which comprises the steps of

(a) simultaneously introducing into an extruder apparatus having no screen member and no extrusion nozzle a quantity of a blowing agent and a mass of material at least 75% of which comprises a thermoplastic synthetic resin material;

(b) heating and mixing the components in the extruder apparatus to cause the synthetic resin material to be in a fluid condition at atmospheric pressure;

(c) introducing the mixture at atmospheric pressure into one end of an open ended mold; and

(d) cooling and removing the mixture from the mold.

5. An article produced by the method of claim 1.

4,187,353

FOAMABLE POLYMER MATERIAL

Güenter Schröeder, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 912,962

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726260

Int. Cl.[2] C08V *9/12, 9/14*

U.S. Cl. 521—149 **8 Claims**

1. A foamable polymer composition comprising

(A) a copolymer of 20–99.99 percent by weight of a member selected from the group consisting of acrylic acid and methacrylic acid, 0–79.99 percent by weight of a further ethylenically unsaturated monomer copolymerizable therewith, and 0.01–5 percent by weight of a member selected from the group consisting of metal salts of acrylic acid and methacrylic acid, and

(B) a foaming agent compatible with said copolymer.

4,187,354

PROCESS FOR LOWERING THE VISCOSITY OF FORMOSE OR MIXTURES OF FORMOSE IN MONO- AND/OR DI-SACCHARIDES, PRODUCTS PRODUCED THEREBY, AND THE USE THEREOF IN PRODUCING POLYURETHANE RESINS

Kuno Wagner, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 829,173, Aug. 30, 1977.

This application Aug. 17, 1978, Ser. No. 934,577

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738513

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—158 **11 Claims**

1. A process for lowering the viscosity of formose or mixtures of formose and mono- and/or di-saccharides by the addition of a viscosity reducing agent wherein dialkylphosphites comprise the viscosity reducing agents.

4,187,355

PRODUCTION OF POLYALKYLENE GLYCOL ETHERS FROM FORMOSE AND USE THEREOF IN THE PREPARATION OF POLYURETHANE RESINS

Kuno Wagner, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 829,173, Aug. 30, 1977.

This application Aug. 17, 1978, Ser. No. 934,578

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737951

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—158 **11 Claims**

1. A process for the production of polyether polyols having an average molecular weight of from 200 to 10,000 and an average hydroxyl functionality of from 2.0 to 7.0, comprising reacting one or more cyclic ethers, optionally successively, with a starter comprising:

(A) formose which is optionally α-aldolized; or

(B) liquid mixtures of:

(a) high molecular weight and/or low molecular weight polyhydroxyl compounds and/or mono- or di-saccharides and/or natural or synthetic invert sugars; and

(b) formose which is optionally α-aldolized

in the presence of an acid catalyst.

4,187,356

CONDENSATION OF FORMALDEHYDE HYDRATE TO FORM MIXTURES WHICH, TOGETHER WITH MONOMERS CAPABLE OF AMINOPLAST FORMATION ARE USEFUL IN THE PREPARATION OF POLYURETHANE FOAMS

Kuno Wagner, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 829,173, Aug. 30, 1977.

This application Aug. 17, 1978, Ser. No. 934,649

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738532

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—158 **24 Claims**

1. Isocyanate reactive mixtures comprising

(a) 10–95% by weight (based on a+b+c) of a mixture of polyhydric alcohols, hydroxyaldehydes and hydroxyketones obtained by the condensation of formaldehyde hydrate,

(b) 5–80% by weight (based on a+b+c) of monomers capable of aminoplast formation or their N-methylolation products and

(c) 0–80% by weight (based on a+b+c) of water.

4,187,357

PROCESS FOR THE PREPARATION OF POLYURETHANE FOAMS

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 590,332, Jun. 25, 1975, Pat. No. 4,097,399, which is a division of Ser. No. 425,524, Dec. 17, 1978, Pat. No. 3,957,922. This application Apr. 13, 1978, Ser. No. 895,989

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—159 **6 Claims**

1. A polyurethane foam composition comprising, based on the total weight of ingredients, a foamed mixture containing

(A) 20 to about 100 parts of an oxyalkylation polyol prepared by

(1) providing a mixture containing

(a) a phenol, at least in an amount sufficient to form a complex with an aluminum or iron substance in the mixture;

(b) a non-phenolic active hydrogen compound having 2 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000;

(c) a substance containing aluminum or iron which will form a complex with phenol, and

(d) an organic acid anhydride, at least one of which components (a), (b), and (d) is halogenated.

(2) heating the mixture to a temperature in the range of from about 80° C. to about 250° C.; and

(3) oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product.

(B) 40 to about 60 parts of a polyarylpolyalkylene polyisocyanate having a functionality of about 2.2 to 3.3 or of an isocyanate terminated prepolymer derived from the reaction of a stoichiometric excess of said polyarylpolyalkyleneisocyanate with said oxyalkylation polyol; and

(C) 0.2 to about 2 parts of a wetting agent, and

(D) 5 to about 30 parts of a blowing agent.

4,187,358

RESIN COMPOSITION

Kayomon Kyo, Kyoto; Yasuhiko Asai, Uji; Sadao Kato, Uji; Tadashi Ishikura, Uji, and Hiroshi Sugawara, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Dec. 28, 1978, Ser. No. 974,210

Claims priority, application Japan, Dec. 29, 1977, 52/160047

Int. Cl.[2] C08L *77/00*

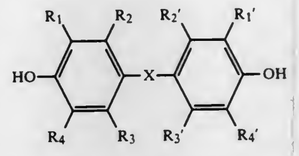
U.S. Cl. 525—132 **20 Claims**

1. A resin composition comprising

(A) about 5 to about 94.9% by weight of an aromatic copolyester comprising the reaction product in about equimolar amounts of

(1) a mixture of terephthalic acid and isophthalic acid and/or the functional derivatives thereof with the terephthalic acid unit to the isophthalic acid unit molar ratio being about 9:1 to about 1:9 and

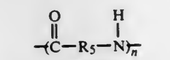
(2) a bisphenol of the general formula [I]



[I]

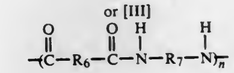
wherein —X— represents a member selected from the group consisting of —O—, —S—, —SO_2—, —SO—, —CO—, an alkylene group containing 1 to 5 carbon atoms and an alkylidene group containing 1 to 5 carbon atoms, and R_1, R_2, R_3, R_4, R_1', R_2', R_3' and R_4', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 5 carbon atoms, and/or a derivative thereof;

(B) about 5 to about 94.9% by weight of a polyamide containing therein a repeating unit of the following general formula [II]:



[II]

or [III]



[III]

wherein R_5, R_6 and R_7, which may be the same or different, each represents an alkylene group containing 4 to 11 carbon atoms and n is an integer from 30 to 500, and

(C) about 0.1 to about 90% by weight of an ionomer.

4,187,359

ACETYLENE-TERMINATED POLYIMIDE COMPOSITIONS

Lewellyn G. Picklesimer, 3765 Winthrop Dr., Dayton, Ohio 45431; Michael A. Lucarelli, 175 Old Dayton Yellow Springs Rd., Fairborn, Ohio 45324, and Theodore J. Reinhart, Jr., 345 Forrer Blvd., Dayton, Ohio 45419

Filed Dec. 6, 1978, Ser. No. 967,049

Int. Cl.[2] C08L *77/10*

U.S. Cl. 525—6 **3 Claims**

1. A composition of matter comprising a major amount of an acetylene-terminated polyimide oligomer and a minor amount of trinitriloacetonitrile.

4,187,360

HEAT-SHRINKABLE OR HEAT-EXPANDABLE PRODUCTS FROM HYDROGENATED POLYBUTADIENE

Thomas A. Peters, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 18, 1975, Ser. No. 597,262
Int. Cl.[2] B29H *5/01*
U.S. Cl. 525—339 **10 Claims**

1. A process for producing a dimensionally heatunstable article which comprises:
(a) hydrogenating to 0.01 to about 10 percent residual unsaturation a polybutadiene which, prior to hydrogenation, contains from about 15 to about 55 percent trans 1,4-addition and from about 15 to about 40 percent cis 1,4-addition, and thereafter recovering the resulting hydrogenated polybutadiene;
(b) shaping and vulcanizing said hydrogenated polybutadiene, and thereafter recovering the resulting shaped, vulcanized article; and
(c) subjecting said shaped, vulcanized article to a force sufficient to alter its dimensions at a temperature between room temperature and 150° C., said force being maintained for a time sufficient to allow the resulting shape-altered article to cool to room temperature, and thereafter recovering the resulting dimensionally heat-unstable article.

4,187,361

METHOD FOR PREPARING POLYPHENYLENE OXIDES WITH MANGANESE-VINYL RESIN COMPLEXES

Eugene G. Banucci, Scotia, and Walter K. Olander, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 753,562, Dec. 21, 1976, Pat. No. 4,110,312. This application Jun. 22, 1978, Ser. No. 917,795
Int. Cl.[2] C08F *8/42*
U.S. Cl. 525—4 **12 Claims**

1. A heterogeneous polymer-bound catalyst for the oxidative coupling of phenolic monomers, said catalyst comprising a manganese (II) complex that is formed from a manganese (II) compound and a crosslinked vinyl resin having units that contain a benzoin oxime group.

4,187,362

SYNTHETIC RESINS DERIVED FROM PETROLEUM

Paul Hepworth, and Ian S. Ripley, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 2, 1976, Ser. No. 673,055
Claims priority, application United Kingdom, Apr. 16, 1976, 15642/75
Int. Cl.[2] C08F *240/00*
U.S. Cl. 526—73 **9 Claims**

1. A process for the production of a synthetic resin which comprises preheating to a temperature of at least 160° C. for a period of not more than 5 hours a C_5 stream boiling in the range 10° to 80° C. and which is derived from a thermally or steam cracked naphtha or gas oil and which contains 1 to 50% by weight butadiene and then polymerising the stream by treatment with a Friedel-Crafts catalyst.

4,187,363

VINYL CHLORIDE POLYMERIZATION METHOD

Richard A. Marshall, Akron; Edwin S. Smith, Cuyahoga Falls, and Frank A. Cich, Norton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 24, 1978, Ser. No. 909,221
Int. Cl.[2] C08F *114/06*
U.S. Cl. 526—208 **2 Claims**

1. A method of achieving chain transfer in a suspension polymerization of a vinyl chloride monomer to a polyvinyl chloride product comprising polymerizing said monomer in the presence of a peroxide catalyst and aldehydes of 3 to 6 carbon atoms as the chain transfer agent and treating product with an alkali bisulfite solution after the vinyl chloride monomer has been removed to obtain the polyvinyl chloride.

4,187,364

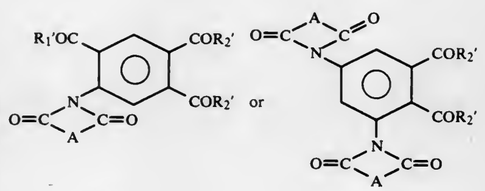
CROSSLINKABLE POLYMERS OF UNSATURATED IMIDES

Roland Darms; Josef Pfeifer, both of Therwil, and Vratislav Kvita, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 696,350, Jun. 15, 1976, Pat. No. 4,115,359. This application Jul. 6, 1978, Ser. No. 922,268
Claims priority, application Switzerland, Jun. 18, 1975, 7955/75
Int. Cl.[2] C08G *73/12, 73/14, 73/16*
U.S. Cl. 526—259 **14 Claims**

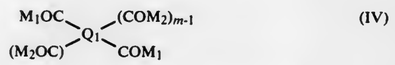
1. A crosslinkable polymer which has an average molecular weight of at least 1,200, or the corresponding cyclized imide derivative, which is manufactured by reacting at a temperature between about −50° and 300° C. in the melt or in an inert organic solvent or solvent mixture

0.5 to 100 mol% of a compound of the formula Ib or IIb



(Ib) (IIb)

and 0 to 99.5 mol% of a compound of the formula IV

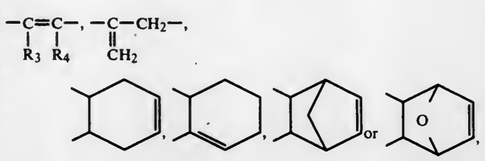


(IV)

with substantially stoichiometric amounts of a compound of the formula V

HY—Q—XH

in which formulae m and n independently of one another represent the number 1 or 2, A represents a radical of the formula



R_2' represents phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy with 1 to 18 carbon atoms or the two R_2's conjointly represent the —O— grouping,

R'_1 represents a chlorine atom, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; or alkoxy of 1 to 18 carbon atoms,

R_3 and R_4 independently of one another represent hydrogen, chlorine or bromine,

X and Y represent —O— or one of X and Y represents —O— and the other denotes



where R_5 represents hydrogen, alkyl with 1-4 carbon atoms or phenyl,

Q represents an aliphatic radical with at least 2 carbon atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, and

Q_1 represents an aliphatic radical or a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carbonyl and carboxyl groups are bonded to different carbon atoms and the carboxyl groups are each in the ortho-position relative to a carbonyl group,

M_1 represents a chlorine atom, a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; or alkoxy with 1 to 18 carbon atoms, or when m or n is 2, M_1, conjointly with M_2, forms the —O— grouping and

the groups $—COM_1$ and $—COM_2$ are bonded to different carbon atoms and the $—COM_1$ groups are each in the ortho-position relative to a $—COM_2$ group.

4,187,365

PROCESS FOR THE PRODUCTION OF POLYCONDENSATE CONTAINING CYCLIC IMIDE GROUPS

Wilfried Zecher; Werner Clarenz; Willi Dunwald, and Rudolf Merten, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 788,112, Apr. 18, 1977, abandoned, which is a continuation of Ser. No. 610,989, Sep. 8, 1975, abandoned. This application May 15, 1978, Ser. No. 906,259
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1974, 2443576; Sep. 12, 1974, 2443575
Int. Cl.[2] C08G *18/00, 73/10*
U.S. Cl. 528—45 **2 Claims**

1. A process for the production of polycondensates linked by cyclic imide groups and especially capable of lacquering metals, wherein at least one organic polyisocyanate or masked isocyanate, formic acid and at least one cyclic dicarboxylic acid anhydride compound which, in addition to the cyclic anhydride group, is substituted at least once by another cyclic anhydride, carboxyl, carbalkoxy carbaroxy or SO_3H group, are polycondensed at temperatures in the range from 0° to 450° C., said polycondensation being carried out with 0.1 to 40 mol % of formic acid based on the isocyanate compound employed and in the presence of at least one solvent selected from the group consisting of N-methyl pyrrolidone and dimethyl acetamide.

4,187,366

AMIDE-MODIFIED URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS DERIVED FROM CONDENSATION REACTION PRODUCTS OF CARBOXYL AND ISOCYANATO GROUPS

Charles B. Friedlander, Glenshaw, and John C. McMullen, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,426
Int. Cl.[2] C08G *18/34, 18/32, 18/62*
U.S. Cl. 528—75 **27 Claims**

1. Addition polymerizable compound comprising the reaction product of

(a) carboxylic acid containing at least one carboxyl functional group;
(b) polyisocyanate; and
(c) polyfunctional compound containing at least one hydroxyl group which is reactive with an isocyanato group of said polyisocyanate and which polyfunctional compound provides at least one ethylenic functional group in said reaction product; wherein said addition polymerizable compound contains
(d) at least one amide group formed by reaction of a carboxyl group of said carboxylic acid with an isocyanato group of said polyisocyanate; and
(e) at least one urethane group formed by reaction of a hydroxyl group of said polyfunctional compound with an isocyanate group of said polyisocyanate.

4,187,367

EPOXY RESINS WITH IMPROVED ADHESION AND PEEL STRENGTH

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,749
Int. Cl.[2] C08G *59/56, 59/60*
U.S. Cl. 528—94 **24 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:
a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule;
a polyether diureide having a molecular weight of about 2000 to 3000 and
an aminopropyl derivative of a polyoxyalkylenepolyamine.

4,187,368

PROCESS FOR PRODUCING POWER-LIKE FURAN RESIN

Ildgam A. Bekbulatov, ulitsa Kashkarskaya, 215; Juldash Mamatov, ulitsa Pushkina, 50, kv. 60; Gennady D. Varlamov, ulitsa Jubileinaya, 5, kv. 13; Shavkat Madaliev, ulitsa Yarmazar, 361, and Valery M. Gaibov, ulitsa Turgeneva, 19, kv. 44, all of Fergana, U.S.S.R.

Filed Jun. 26, 1978, Ser. No. 919,279
Claims priority, application U.S.S.R., Jun. 29, 1977, 2513610; Aug. 2, 1977, 2517037; Apr. 5, 1978, 2593551
Int. Cl.[2] C08G *8/02, 8/06, 8/28*
U.S. Cl. 525—503 **10 Claims**

1. A process for producing a powder-like furan resin comprising heating of the starting components, viz. a ketone of the furan series and phenolformaldehyde resin taken in amounts ensuring a weight ratio therebetween of 10:3-15 respectively, to a temperature within the range of from 130° to 200° C.

4,187,369

PROCESS FOR PRODUCING HYDROCARBON-PHENOL-FORMALDEHYDE RESIN

Rudolf Z. Pavlikov, Nizhny Tagil; Natalya V. Shorygiña, Moscow; Vladimir A. Strupinsky, Nizhny Tagil; Anatoly A. Kruglikov, Nizhny Tagil; Jury G. Farbshtein, Nizhny Tagil, and Iosif L. Klipinitser, Moscow, all of U.S.S.R.

Continuation of Ser. No. 813,769, Jul. 7, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 940,641
Int. Cl.[2] C08G *14/14*
U.S. Cl. 528—137 **3 Claims**

1. A process for producing a hydrocarbon-phenol-formaldehyde resin comprising a continuous polycondensation of the anthracene fraction of coal tar boiling at a temperature within the range of from 270° to 350° C., phenol and formaldehyde at a weight ratio between said components of 1:3-4:1-1.2 respectively, in the presence of 0.5 to 1.2% by weight of an acidic catalyst at a supply rate of a mixture of said components of from 500 to 550 g/hr.

4,187,370

POLYMERIZATION AND RECOVERY OF 2-PYRROLIDONE WITH ACID TREATMENT

Byron E. Anshus, Orinda; Kiyoshi Katsumoto, El Cerrito, and Ira M. Serkes, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 792,421, Apr. 29, 1977, Pat. No. 4,139,696. This application Oct. 17, 1977, Ser. No. 842,758

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—312 **12 Claims**

1. A process for the polymerization of pyrrolidone, which comprises polymerizing under substantially anhydrous conditions a mixture containing alkaline catalyst, pyrrolidone, and solvent, to form a substantially anhydrous reaction product mixture consisting essentially of particulate poly-2-pyrrolidone, alkaline catalyst and solvent and, before said poly-2-pyrrolidone can appreciably agglomerate, treating said reaction product mixture with an acid to reduce the pH of the resulting mixture to about from 5 to 8.

4,187,371

FORMATION OF TEREPHTHALAMIDE POLYMER OF 5-METHYL-1,9-NONANEDIAMINE

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 255,553, May 22, 1972, Pat. No. 3,904,677. This application Aug. 8, 1975, Ser. No. 603,220

Int. Cl.[2] C08G *69/28*

U.S. Cl. 528—340 **24 Claims**

1. A process which comprises contacting terephthalic acid and a diamine in a medium at substantially room temperature to thereby form a semi-solid slurry of the resulting salt in said medium within a few minutes, said medium consisting essentially of methanol and water wherein the volume ratio of methanol to water in said medium during the formation of said salt is in the range of about 99:1 to about 80:20; the weight ratio of the total of acid and diamine to said medium is in the range of about 1:1 to about 1:3, and utilizing the thus formed salt to produce a normally solid, moldable polyterephthalamide.

4,187,372

SELDOMYCIN FACTOR 5 DERIVATIVE

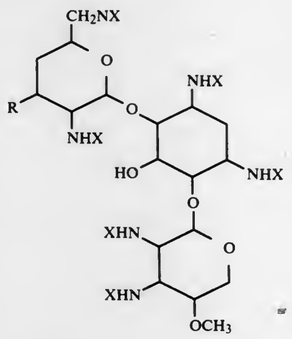
Ronald E. Carney, Gurnee; James B. McAlpine, and Thomas J. Perun, both of Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 8, 1976, Ser. No. 721,613

Int. Cl.[2] C07H *15/22*

U.S. Cl. 536—17 R **9 Claims**

1. A compound of the formula:



wherein R is a member of the group consisting of H, and



wherein Y is a member of the group consisting of lower alkyl, lower aryl, imidazolyl and wherein X is an amine protecting group and the pharmaceutically acceptable salts thereof.

4,187,373

NOVEL DIHYDROBENZANTHRACENE DERIVATIVES

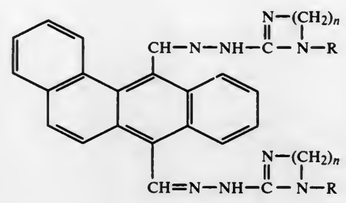
Ralph G. Child, Pearl River; Stanley A. Lang, Jr., Stony Point; Ving J. Lee, Airmont, and Yang-i Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,976

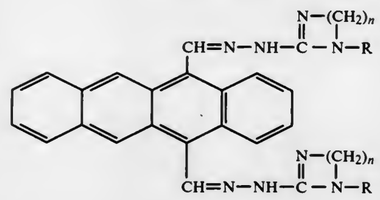
Int. Cl.[2] C07D *233/56, 239/20*

U.S. Cl. 542—402 **10 Claims**

1. A compound selected from the group consisting of those of the formulae:



(I)



(II)

wherein n is 2, 3, 4 or 5 and R is hydrogen or alkyl having from 1 to 4 carbon atoms and the pharmaceutically acceptable acid-addition and quaternary ammonium salts thereof.

4,187,374

7-(β-AMINOACYLAMINO)-3-SUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES AND PREPARATION THEREOF

Kunihiko Tanaka, Toyonaka; Masaru Kurita, Takatsuki, and Osamu Nishiwaki, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

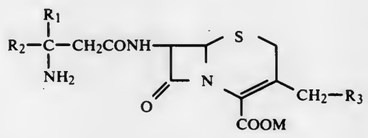
Division of Ser. No. 396,580, Sep. 12, 1973, Pat. No. 4,094,872. This application Mar. 24, 1978, Ser. No. 889,637

Claims priority, application Japan, Nov. 17, 1972, 47-115983; Feb. 14, 1973, 48-18636

Int. Cl.[2] C07D *501/36, 501/22*

U.S. Cl. 544—28 **9 Claims**

1. Compounds of the formula:



wherein

R_1 is hydrogen, lower alkyl (C_{1-6}) phenyl or a thienyl,

R_2 is hydrogen, or

R_1 and R_2 taken together with the carbon to which they are attached is a cycloalkyl (C_{5-7}) group,

R_3 is hydrogen or lower alkylthio (C_{1-6}), and

M is hydrogen or a nontoxic, pharmaceutically acceptable cation,

provided that R_3 is lower alkylthio (C_{1-6}) when R_1 is phenyl.

4,187,375

PROCESS FOR PREPARING OXAZINE RING COMPOUNDS

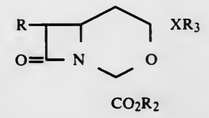
Thomas F. Buckley, Albany, Calif., and John G. Gleason, Delran, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 913,181, Jun. 6, 1978, Pat. No. 4,162,250, which is a division of Ser. No. 822,774, Aug. 8, 1977, Pat. No. 4,122,262, which is a continuation-in-part of Ser. No. 721,251, Sep. 8, 1976, Pat. No. 4,089,956. This application Oct. 27, 1978, Ser. No. 955,294

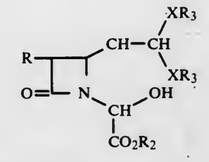
Int. Cl.[2] C07D *265/04*

U.S. Cl. 544—92 **2 Claims**

1. The method of preparing a compound of the formula:



in which R is a blocked amino, X is thio or oxy, R_2 is a carboxyl blocking group and R_3 is lower alkyl comprising reacting in an inert solvent at about room temperature with a catalytic source of protons a compound of the formula:



in which R, R_2, X and R_3 are as defined above.

4,187,376

REMOVAL OF CONTAMINANTS FROM CYANURIC ACID REACTION PRODUCT

Ronald H. Carlson, Willingboro, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 22, 1977, Ser. No. 835,653

Int. Cl.[2] C07D *251/32*

U.S. Cl. 544—192 **11 Claims**

1. In a process for producing cyanuric acid wherein a compound selected from the group consisting of urea and biuret is heated in an inert solvent to a temperature of at least about 180° C. under a subatmospheric pressure of from about 0 to about 250 mm. of Hg., wherein a reaction mixture (i) comprising cyanuric acid, from about 0.01 to about 5 percent by weight of said compound or of a mixture (ii) of urea and biuret, and inert solvent is obtained, and wherein cyanuric acid substantially free of said compound and of said mixture (ii) of urea and biuret is recovered from said reaction mixture (i), the improvement which comprises

distilling said reaction mixture (i) at a temperature of from about 150° C. to about 250° C. and at a pressure of from about 70 to about 170 mm of Hg., and collecting a distillate therefrom comprising not more than 60% by volume of said inert solvent together with said compound or a mixture of urea, biuret and cyanuric acid produced therefrom in distillation, and recovering from the remaining reaction mixture said cyanuric acid contained therein.

4,187,377

HALOGEN-CONTAINING S-TRIAZINE COMPOUND

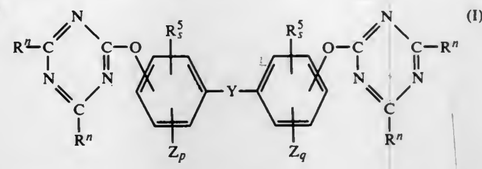
Shigeyuki Narisawa; Shohei Yoshida, and Hiroshi Kawahara, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,636

Int. Cl.[2] C07D *251/30*

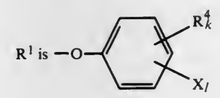
U.S. Cl. 544—219 **6 Claims**

1. A flame retardant which comprises a halogen-containing s-triazine compound having the formula



(I)

wherein R^n is OH, R^1, R^2 or R^3;



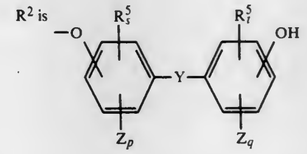
wherein:

R^4 is a lower alkyl group or a lower haloalkyl group;

X is Br or Cl

k, l=0 or an integer of 1 to 5;

$k+l \leqq 5$

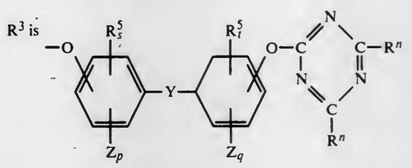


wherein

R^5 is a lower alkyl group or a lower haloalkyl group:

Z is Br or Cl

Y is a lower alkylene, a lower haloalkylene group, or $—SO_2—$, —SO—, —S—, —O—, —CO— or direct bond



wherein R^n, R^5, Z, Y, are as defined above; and throughout

p, q=0 or an integer from 1 to 4;

s, t=0 or an integer from 1 to 4;

$p+q+s+t \leqq 8$

$1+p+q \geqq 2$.

4,187,378

PREPARATION OF PYRIDYL-4-PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,537
Int. Cl.[2] C07D *213/04*
U.S. Cl. 546—21 **9 Claims**

1. A process of preparing a pyridyl-4-dihydrocarbon phosphonate unsubstituted in a 2-position which comprises reacting in an inert solvent a phosphite compound (A) which is a metallic salt of a phosphite dihydrocarbon diester or is a trialkyl phosphite with compound (B) which is an aromatic hydrocarbon N-substituted pyridinium salt unsubstituted in the 4-position and at least one of the two 2-positions, the said pyridinium salt being sterically hindered for reaction at a 2-position with said compound (A) by a sterically hindering bulky N-substituent which is a sufficiently bulky group to prevent substitution in the 2-position of the pyridine ring of compound (B).

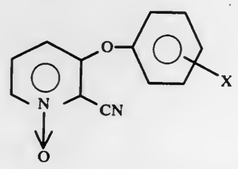
4,187,379

3-ARYLOXY-2-PYRIDINECARBONITRILE 1-OXIDE COMPOUNDS

Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1978, Ser. No. 959,802
Int. Cl.[2] C07D *213/57*
U.S. Cl. 546—288 **7 Claims**

1. A compound of the formula



where X is hydrogen, chlorine or lower alkoxy and is in the o or m positions.

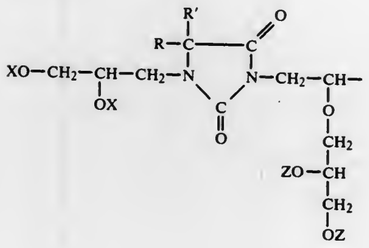
4,187,380

ESTERS OF IMIDAZOLIDINEDIONE-BASED TRIEPOXIDES

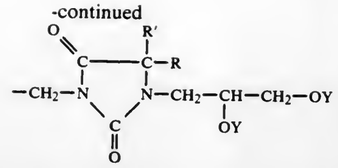
J. Alden Erikson, Gibsonia; Ronald J. Lewarchik, Natrona Heights, and William J. Birkmeyer, Oakmont, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1978, Ser. No. 950,097
Int. Cl.[2] C07D *233/72*
U.S. Cl. 548—310 **10 Claims**

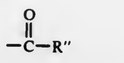
1. An ester of imidazolidinedione-based triepoxide having the formula:



-continued



wherein R and R′ are independently hydrogen or hydrocarbon groups having from 1 to 8 carbons atoms, one X is hydrogen, one Y is hydrogen, one Z is hydrogen and the other X, Y and Z are



where the R″ groups are independently hydrocarbon groups having from 1 to 17 carbon atoms.

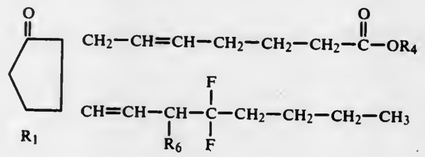
4,187,381

16-SUBSTITUTED PROSTAGLANDINS

George W. Holland, North Caldwell; Jane L. Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 745,257, Dec. 8, 1976, Pat. No. 4,112,225, which is a continuation-in-part of Ser. No. 683,576, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 480,458, Jul. 18, 1974, Pat. No. 4,052,446, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Nov. 2, 1977, Ser. No. 847,881
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **4 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen or lower alkyl; R_1 is lower alkyl; R_6 is hydroxy, lower alkanoyloxy, benzoyloxy, tetrahydropyranyloxy, benzyloxy, benzhydryloxy, trimethylsilyloxy, trityloxy or 4-methoxy-5,6-dihydro-2H-pyranyloxy;

or enantiomers or racemates thereof.

4,187,382

PROCESS FOR PRODUCING LOW COLOR RESIDUE ACRYLATE ESTER MONOMERS

Frank G. Cowherd, III, and Louis F. Theiling, Jr., both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

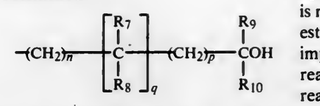
Filed Dec. 28, 1976, Ser. No. 755,062
Int. Cl.[2] C07C *69/54, 69/66*
U.S. Cl. 560—185 **14 Claims**

1. A process for producing a low color residue acrylate ester which comprises the steps of:

(a) pretreating an organic diol of the formula



-continued



wherein R_3, R_4, R_9 and R_{10} are selected from the group consisting of H, alkyl, aryl, cycloalkyl, substituted alkyl, substituted aryl and substituted cycloalkyl groups; R_5, R_6, R_7 and R_8 are selected from the group consisting of H, alkyl, aryl and cycloalkyl groups; and k, l, m, n, p and q are whole numbers having values from 0 to 5, by admixing it with from 3,000 ppm to 100,000 ppm, based on the weight of the organic diol, of triphenyl phosphite at a temperature of from 80° C. to 160° C.; then

(b) reacting said pretreated organic diol with a compound chosen from the group consisting of acrylic acid and methacrylic acid at a temperature of from 20° C. to 85° C. in contact with an esterification catalyst and from 50 ppm to 5,000 ppm, based on the weight of acrylic or methacrylic acid of a polymerization inhibitor chosen from the group consisting of monoalkyl ethers of hydroquinone having up to 10 carbon atoms in the alkyl segment and alkylated hydroxyanisoles having up to 10 carbon atoms in the alkyl segment.

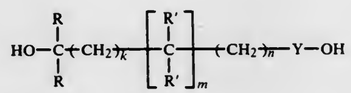
4,187,383

PROCESS FOR PRODUCING LOW COLOR RESIDUE ACRYLATE ESTERS

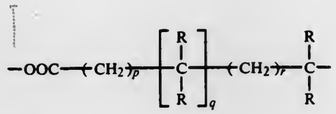
Frank G. Cowherd, III, and Louis F. Theiling, Jr., both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,046
Int. Cl.[2] C07C *69/54, 69/66*
U.S. Cl. 560—224 **8 Claims**

1. In an esterification process whereby acrylic or methacrylic acid is reacted with an organic polyol of the formula



wherein each R is hydrogen, alkyl of 1 to 8 carbon atoms, or cycloalkyl from 5 to 8 carbon atoms; each R′ is hydrogen, alkyl of 1 to 8 carbon atoms or $—CH_2OH$; K, m, and n are integers from 0 to 5; and Y is nothing or



wherein p, q, and r are integers from 0 to 5 and each R is as defined above, provided that when Y is nothing, m and n have values of at least 1 and each R′ is a substituent other than hydrogen, and provided further that when R′ is $—CH_2OH$, Y is nothing and m is 1, and wherein the acrylate or methacrylate ester product is recovered as a non-distillable residue, the improvement which comprises carrying out the esterification reaction at a temperature of from 20° C. to 80° C. with the reactants in contact with from 50 p.p.m. to 5,000 p.p.m., based on the weight of acrylic or methacrylic acid, of an alkoxy substituted phenolic or alkylated alkoxyphenolic polymerization inhibitor having up to 10 carbon atoms in the alkyl and alkoxy segments, to produce a product having a Gardner color of 4 or less.

4,187,384

PREPARATION OF MONO- AND POLY-ETHYLENE GLYCOL DIALKYL ETHERS

Rolf Platz, Mannheim; Werner Fuchs, Ludwigshafen, and Wolfgang Vodrazka, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,336
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801793
Int. Cl.[2] C07C *41/06, 41/10*
U.S. Cl. 568—618 **1 Claim**

1. A process for the preparation of mono- and polyethylene glycol dialkyl ethers of the general formula I

$$R^1—O—(—CH_2—CH_2—O—)_n—R^2 \qquad I$$

where R^1 is alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 3 to 5 carbon atoms and n is from 1 to 100, by reacting monoalkyl ethers II

$$R^1—O—(—CH_2—CH_2—O)_n—H \qquad II$$

with an olefin (III) which corresponds to the radical R^2, in the presence of an acid ion exchanger at from 1 to 200 bar and from 40° to 150° C., wherein the reaction is started at from 100° to 150° C. and the temperature is then lowered, in at least two approximately equal steps, to from 40° to 80° C., the temperature being dropped in each case to the next-lower level when the conversion per unit time no longer changes significantly.

4,187,385

PROCESS FOR THE POLYMERIZATION OF ETHYLENE OR ALPHA-OLEFINS AND CATALYST THEREFOR

Tetsuya Iwao, Zushi; Heizo Sasaki, Tokyo; Akira Ito, Yokohama, and Masahiro Kono, Manazuru, all of Japan, assignors to Mitsui Toatsu Chemical, Inc., Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,227
Claims priority, application Japan, May 17, 1976, 51-55422; May 17, 1976, 51-55423; Jun. 10, 1976, 51-67092; Jun. 10, 1976, 51-67093
Int. Cl.[2] C08F *4/66, 10/06*
U.S. Cl. 526—128 **11 Claims**

1. A process for the polymerization of ethylene and/or α-olefins to form a polymer product with a narrow particle size distribution and a reduced amount of finely powdered polymer which comprises polymerizing ethylene and/or α-olefins with use of a catalyst comprising (A) a titanium component obtained by copulverizing in the substantial absence of an inert solvent at a temperature in the range of −30° to 150° C. for from 1 to 100 hours the starting titanium component of

Ziegler solid catalysts comprising titanium trichloride, or its compositions, or titanium tetrachloride, or its compositions, supported on a solid carrier and an organoluminum compound of the formula,

$$Al\ R_m X_{3-m}$$

wherein R is alkyl or aryl, X is hydrogen or halogen and m is 1 to 3, together with ethylene or α-olefins in an amount between about 0.01 and 10% by weight of said starting titanium component, and (B) an organoaluminum component, said catalyst having a narrow particle size distribution, a reduced amount of finely powdered catalyst having a size of less than 5μ in a diameter, and high catalyst activity, wherein said copulverizing with said ethylene or said α-olefin permits the particle size of said titnaium catalyst to be controlled.

4,187,386

CYCLIZATION OF 1,5-HEXADIENE TO CYCLOHEXENE

George D. Lockyer, Jr., Snyder; Dennis E. Burd, Kenmore; Richard F. Sweeney, Elma; Bernard Sukornick, Williamsville, all of N.Y., and Harry E. Ulmer, Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 29, 1978, Ser. No. 974,397
Int. Cl.[2] C07C *13/20*
U.S. Cl. 585—367 **19 Claims**

1. The method for the production of cyclohexene which comprises contacting, 1,5-hexadiene with a mixture of a first catalyst selected from the group consisting of chromium oxides, chromium chlorides, chromium bromides, molybdenum oxides, molybdenum chlorides, molybdenum bromides, tungsten oxides, tungsten chlorides, tungsten bromides, iron oxides, cobalt oxides, nickel oxides, elemental sulfur, SiO_2, Al_2O_3, vanadium metal, vanadium oxides and VOF_3, and mixtures thereof, and a second catalyst selected from a tin (IV) halide and mixtures thereof.

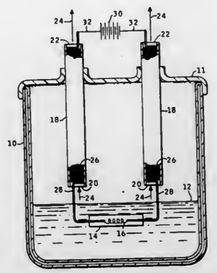
ELECTRICAL

4,187,387

ELECTRICAL LEAD FOR CRYOGENIC DEVICES

Jerome F. Parmer, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Feb. 26, 1979, Ser. No. 15,270
Int. Cl.[2] H01B *12/00*
U.S. Cl. 174—15 CA **3 Claims**



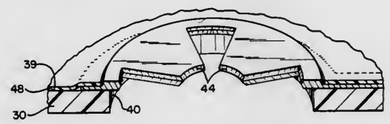
3. In a container holding a cryogenic liquid, an electrical lead for supplying current to an electrical device immersed in said cryogenic liquid comprising, a vent made of an electrical and thermal insulating material, said vent disposed above said cryogenic liquid and leading from said container, an electrical conductive ribbon folded into a plurality of folds and fitted in said vent to define a plurality of chambers within said vent, said ribbon shaped to form a plurality of holes interconnecting each of said chambers through which boil-off gas from said cryogenic liquid cascades in heat exchange relationship with said folded ribbon.

4,187,388

CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Merrimack, N.H.

Division of Ser. No. 808,808, Jun. 22, 1977, Pat. No. 4,107,836.
This application Apr. 21, 1978, Ser. No. 898,623
Int. Cl.[2] H05K *1/10*
U.S. Cl. 174—68.5 **12 Claims**



1. A circuit board assembly of the type adapted for solderless attachment thereto of components by their leads to said board, and comprising in combination:

(A) rigid, dielectric panel having at least one aperture formed between opposite surfaces thereof;

(B) at least one electrically conductive circuit formed of a resiliently flexible metal, rigidly affixed at least in part to a surface of said dielectric panel, said electrically conductive circuit having (i) at least one integral termination which essentially surrounds said at least one aperture in said panel, said termination including (ii) a plurality of spaced fingers (a) disposed inwardly for a distance from edge areas of said aperture, and (b) adapted for locking mating with said component leads; and

(C) an apertured, flexible, dielectric material fixedly attached at least in part to said surface so as also to cover said at least one conductive circuit at least in part, with its apertures positioned over said apertures in said rigid, dielectric panel;

said integral termination, and said fingers having areas of cross-sectional thickness greater than the cross-sectional thickness of said electrically conductive circuit, said termination including a peripheral shoulder area (i) of reduced cross-section thickness and (ii) a plan area greater than said apertures in (a) said rigid, dielectric panel, and (b) said flexible, dielectric material, said peripheral shoulder being fixedly attached to said dielectric panel at least in part; and

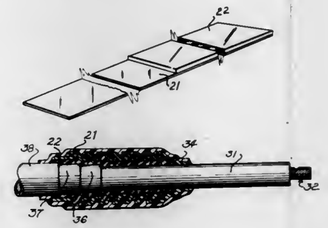
said flexible dielectric material overlaying and fixedly attached at least in part to said termination peripheral shoulder area.

4,187,389

SHIELDED ELECTRICAL CONDUCTOR TERMINATIONS AND METHODS OF MAKING SAME

George A. Foote, Kendall Park; Mason M. Lindamood, Basking Ridge, and Robert D. Fulcomer, Milford, all of N.J., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Continuation of Ser. No. 567,440, Apr. 11, 1975, abandoned.
This application Feb. 24, 1977, Ser. No. 771,658
Int. Cl.[2] H02G *15/02, 1/14;* B32B *7/00;* H01B *1/04*
U.S. Cl. 174—73 R **8 Claims**



5. Method of preventing corona-induced failure at a terminal of a high voltage shielded electrical conductor, the conductor being covered on the exterior thereof by an insulator and said insulator being covered on the exterior by a conductive shield which terminates short of the end of said insulator with a length of the surface of said insulator being exposed beyond the end of the conductive shield, comprising the step of winding a high voltage insulating tape member around the end portion of said conductive shield and around said insulator surface proximate to the end of said conductive shield, said high voltage insulting tape member being capable of applying compressive force to said terminal, said high voltage insulating tape member having a corona-resistant electrical stress-relieving elastomeric material bonded to a portion of the length of one side of said insulating tape member, said insulating tape member being wound such that said stress-relieving elastomeric material underlies said tape member in contact with said end portion of the conductive shield and in contact with said insulator surface proximate to the end of said conductive shield, said winding progressing in one direction along said end portion of said conductive shield and said insulator surface until said stress-relieving material is exhausted.

6. In a high voltage electrical terminal having an electrical conductor covered on the exterior thereof by an insulator and wherein said insulator is covered on the exterior by a conductive shield which ends short of the end of said insulator with a length of the surface of said insulator extending beyond the end of said conductive shield, a corona-resistant stress-relieving termination for said terminal comprising: a flexible high voltage insulating tape member, a layer of cold-flowable corona-resistant electrical stress-relieving elastomeric material bonded to at least a portion of one side of said tape member, said tape member being wrapped in overlapping relationship about the end portion of said conductive shield and also about the surface of said insulator beyond the end of said conductive shield with said layer of cold-flowable elastomeric material underlying said tape member in direct contact with the end portion of the conductive shield and in direct contact with the insulator

surface beyond the end of said conductive shield, said tape member after being wrapped thereon applying continuing compressive force to the underlying stress-relieving material for cold-flowing said elastomeric material about the surface of said insulator and for providing self-mending capability, and said elastomeric material containing from about 350 to about 600 parts by weight per hundred parts of elastomeric material of a semi-conductor powder in which the voltage when measured at various currents in a cylindrical column of powder 1-inch in diameter packed at a pressure of 400 pounds per square inch is in accordance with the equation: $I=kV^n$ wherein the value of "n" exceeds about 2.

4,187,390

POROUS PRODUCTS AND PROCESS THEREFOR

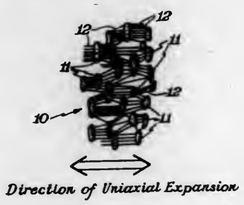
Robert W. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 637,298, Dec. 3, 1975, abandoned, which is a division of Ser. No. 376,188, Jul. 3, 1973, Pat. No. 3,953,566, which is a continuation of Ser. No. 39,753, May 21, 1970, abandoned. This application Jun. 21, 1977, Ser. No. 808,545

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.[2] H01B *7/18, 9/02*

U.S. Cl. 174—102 R **77 Claims**



Direction of Uniaxial Expansion

1. A porous material consisting essentially of highly crystalline polytetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above about 7,300 psi.

4,187,391

HIGH FREQUENCY COAXIAL CABLE AND METHOD OF PRODUCING SAME

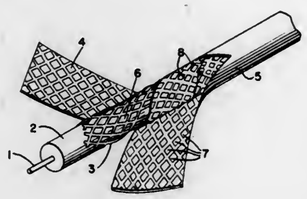
Othmar Voser, Möriken, Switzerland, assignor to Kupferdraht-Isolierwerk Ag Wildegg, Wildegg, Switzerland

Filed Jan. 10, 1978, Ser. No. 868,418

Claims priority, application Switzerland, Jan. 12, 1977, 372/77

Int. Cl.[2] H01B *11/06*

U.S. Cl. 174—106 R **13 Claims**



1. A high frequency coaxial cable for aerial and ultra-high-frequency lines, comprising a metal internal conductor, a plastic dielectric concentrically surrounding the internal conductor, an external conductor surrounding the dielectric and comprising a metal wire mesh and a plastic foil strip metallised on at least one side, and a plastic sheath enveloping the external conductor as an external protective cover, the wires of said wire mesh being arranged in netlike configuration to define an open wire mesh deposited on the dielectric and said plastic foil strip being applied on the wire mesh in helical edgewise overlapping windings with said metallised side facing the wire mesh and being pressed into each single mesh of the wire mesh in the form of a generally trough-like dent thereby short-circuiting each single mesh of the wire mesh.

12. A method of producing a high frequency coaxial cable for aerial and ultra-high-frequency lines comprising the steps of applying around a metal internal conductor a plastic dielectric concentrically surrounding the internal conductor, applying around said plastic dielectric an external conductor comprising a metal wire mesh and a plastic foil strip metallised on at least one side, said metal wire mesh being applied in form of an open wire mesh by arranging the wires thereof in netlike configuration and said plastic foil strip being applied on said mesh by winding the plastic foil strip with its metallised side facing the wire mesh in the form of helical edgewise overlapped windings on the wire mesh, and applying on said windings of the metallised plastic foil strip a plastic sheath as an external protective cover by extrusion under pressure of sufficient magnitude as to press the metallised plastic foil into each single mesh of the netlike wire mesh in the form of a generally trough-like dent and to fill these trough-like dents with material of the plastic sheath thereby providing the internal surface of the plastic sheath with generally knob-shaped projections fitting into said trough-like dents.

4,187,392

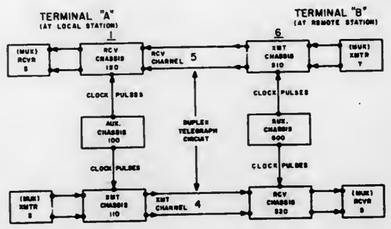
SYNCHRONOUS UNIVERSAL BINARY SCRAMBLER

Laurance F. Safford, Washington, D.C., assignor to American Standard Inc., New York, N.Y.

Filed Jun. 8, 1962, Ser. No. 200,995

Int. Cl.[2] H04L *9/02*

U.S. Cl. 178—22 **44 Claims**



1. A synchronous binary cryptographic system responsive to an input synchronous telegraph signal comprising means for generating timing pulses of substantially fixed, predetermined frequency, means for generating a synchronous binary cryptographic key in synchronism with timing pulses applied thereto by said means for generating timing pulses, switch means actuated by a predetermined input signal sequence for applying the timing pulses to said means for generating the binary cryptographic key, said cryptographic key generating means being continuously responsive to said timing pulses during operation of the system and means for combining said input signal with the cryptographic key.

4,187,393

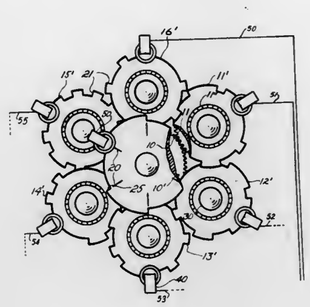
KEY GENERATOR

Eugene R. DeWeese, Jr., 1531 Queens Ct., Claremont, Calif. 91711, and Lynn W. Marsh, Jr., 1106 N. Garfield St., Boston, Mass. 02114

Filed Aug. 23, 1955, Ser. No. 530,216

Int. Cl.[2] G09C *5/00;* **H04L** *9/04*

U.S. Cl. 178—22 **3 Claims**



2. An apparatus for producing a substantially noncyclic sequence of binary electric values, including a driving gear, a plurality of driven gears associated with said driving gear, each of said driven gears having a pattern disc carried thereby, each said dics having a plurality of radial slots in its periphery, means for utilizing the slots of each said disc to produce a sequence of binary electric values, means for substantially combining pairs of sequences so produced, value by value, to produce a lesser number of new sequences of binary electric values, and means for combining said new sequences in pairs, value by value.

4,187,394

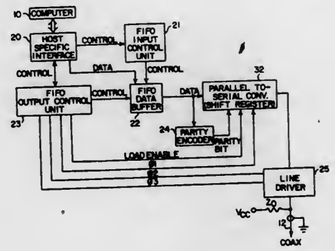
HIGH-SPEED DATA LINK FOR MODERATE DISTANCES AND NOISY ENVIRONMENTS

Michael W. Sievers, Van Nuys, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 25, 1978, Ser. No. 899,828

Int. Cl.[2] H04L *5/14;* **H04J** *6/00*

U.S. Cl. 178—58 R **10 Claims**



1. A full duplex data link for coupling a first digital system at one site to a second digital system at a remote site in noisy environments for digital communication over two channels, one channel for communication in each direction, comprising a module at each system, each module having a submodule for transmitting data and a submodule for receiving data, and means for each submodule for interfacing the submodule with the site system, each submodule of a module being connected to the site system through said interfacing means, a transmitting submodule comprising

an input control unit and an output control unit,

a first-in-first-out data buffer for receiving data from said system under control of said input control unit commanded by the site system through said transmitting submodule interfacing means, and for putting out data, one parallel n-bit word at a time, under control of an output control unit commanded by the site system through said transmitting module interfacing means,

means for converting each n-bit word into a train of n bit pulses, and

means for digital frequency modulating said train of n-bit pulses over one of said channels for transmission to a receiver submodule at the site of the other system, said digital frequency modulating means producing on said channel one clock pulse followed by a data pulse for every bit **1** of said n-bit word, and one clock pulse followed by no data pulse for every bit **0** of said n-bit word,

and a receiving submodule comprising

an input control unit and an output control unit,

means for serial-to-parallel conversion of a train of n data pulses,

a first-in, first-out data buffer for receiving data from said one of said serial to parallel conversion means, and

means for separating and delaying data clock pulses from said train of n data pulses, said clock pulses being delayed sufficiently for their use to synchronize said serial-to-parallel converting means to receive n data bits, and for every n data bits beginning with the first data bit, to enable transfer to said first-in-first-out data buffer a data word under control of said input control unit for subsequent transfer into said site system under control of said output control unit.

4,187,395

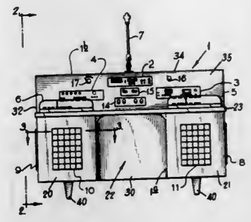
STEREO SOUND RECORDING AND REPRODUCTION APPARATUS

Robert G. Hewson, Jr., 204 Concord Dr., Harleysville, Pa. 19438

Filed May 23, 1978, Ser. No. 908,645

Int. Cl.[2] H04R *5/02*

U.S. Cl. 179—1 GA **6 Claims**



1. An integrated, self-contained stereophonic sound recording and reproduction system housed within a console, said console comprising a front desk-like component and a rear storage component, said system including

(a) a pair of stationary spaced-apart speaker cabinets, each cabinet containing a speaker mounted rotatably internally of the cabinet,

(b) a horizontal surface supported by and extending between the speaker cabinets and mounting at least one turntable,

(c) an open three dimensional space located between the two speaker cabinets and below the horizontal surface,

(d) said speaker cabinets, horizontal surface and open space constituting the desk-like component of the console,

(e) support means disposed above the horizontal surface for mounting a plurality of operably connected component parts of the sound recording and reproduction system,
(f) said component parts including
(1) a microphone,
(2) at least one record/play unit,
(3) an amplifier,
(4) a mixer and
(5) volume control means, and
(g) at least one hollow compartment constituting the rear storage component, said compartment having access means for permitting storage therein and including support means for mounting component parts of the sound recording and reproduction system.

4,187,396
VOICE DETECTOR CIRCUIT

Gabriel J. Luhowy, Lima, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Filed Jun. 9, 1977, Ser. No. 804,868
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SC **7 Claims**

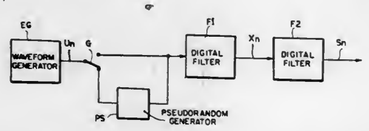


1. Apparatus for detecting the voice content of an audio signal, comprising slew-rate limited amplifier means responsive to said audio signal to provide an impulse noise limited audio signal, and having a maximum slew-rate selected such that said amplifier means is substantially transparent to the voice content of said audio signal, however, impulse noise components of said audio signal are substantially attenuated thereby, and voice detector means responsive to said impulse noise limited audio signal for determining the voice content of said signal and providing a first output indication thereof, wherein said voice detector means includes syllabic-rate means for determining the average syllabic-rate content of said impulse noise limited audio signal and for providing a first signal in accordance therewith, threshold means for supplying a threshold signal, and comparator means for comparing said first signal and said threshold signal for providing said first output indication having a value in accordance with said comparison.

4,187,397
DEVICE FOR AND METHOD OF GENERATING AN ARTIFICIAL SPEECH SIGNAL

Giulio Modena, Caselle-Torino; Stefano Sandri, Turin, and Carlo Scagliola, Caselle-Torino, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 16, 1978, Ser. No. 916,356
Claims priority, application Italy, Jun. 20, 1977, 68420 A/77
Int. Cl.[2] G10L *1/10*
U.S. Cl. 179—1 SG **8 Claims**

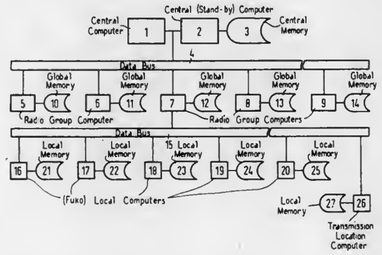


1. A method of producing a simulated voice signal for measuring the performance of voice-transmitting equipment, comprising the steps of:
generating a periodic waveform whose frequency components substantially correspond to those produced, within a predetermined frequency range, by glottal excitation of the vocal tract;
converting said periodic waveform into an intermediate signal in which the amplitudes of said frequency components are substantially equalized; and
transforming said intermediate signal into an output signal in which the amplitudes of said frequency components correspond substantially to those of the voice spectrum in said predetermined frequency range.

4,187,398
TELEPHONE AND DATA NETWORK FOR MOBILE SUBSCRIBERS

Anselm Stark, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,212
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1977, 2709855
Int. Cl.[2] H04Q *7/00*
U.S. Cl. 179—2 EB **5 Claims**



1. In a telephone and data network for mobile subscribers of the type wherein radio concentrators are locally distributed in the overall area of a radio network and can communicate by radio with mobile subscribers, and radio exchange offices are associated with one or more radio concentrators and are connected to the public communication system which may include telephone, teleprinter and data transmission networks, the improvement therein comprising:
a local memory operative to store, for interrogation, the call number and area code of the location of each mobile subscriber in a smaller area within the overall larger area; and a global memory operatively associated with a plurality of said memories and storing, for interrogation, the date on the prevailing location of each mobile subscriber in the larger overall area.

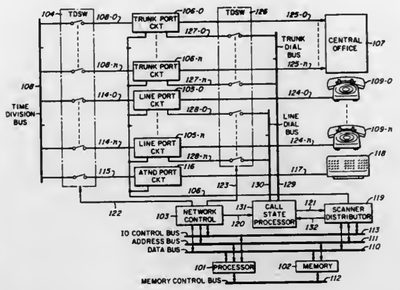
4,187,399
CALL STATE PROCESSOR FOR A TIME DIVISION SWITCHING SYSTEM

Thomas G. Maxfield, Boulder, and Ronald K. Witmore, Lafayette, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1978, Ser. No. 912,833
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 BY **23 Claims**

1. In a time division switching system in which communication signals are transmitted over a first time division bus system between port circuits connected on a call under control of a system controller, each call served by said system being assigned to a unique time slot in a series of cyclically recurring time slots, said switching system further comprising the combination of:
a second time division bus system connected to said port circuits,
means effective during each occurrence of a time slot to which a call currently being served by one of said port

circuits is assigned for applying hook state information signals from said one port circuit to said second bus system,
means responsive to the application of said hook state signals to said second bus system for generating output messages specifying call state information for the calls to which said

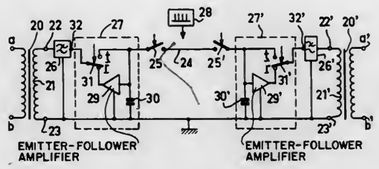


hook state signals pertain, each message being unique to a single call,
and means for transmitting each generated message to said system controller to control the serving of calls by said system, each of said messages including information specifying the identity of the time slot to which the call represented by each message is assigned.

4,187,400
TIME-DIVISION MULTIPLEX COMMUNICATION SYSTEM FOR CONNECTING TWO-WIRE LINE CIRCUITS IN TIME-DIVISION MULTIPLEX

Gilbert M. M. Ferrieu, Bievres, France, assignor to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Filed Mar. 16, 1978, Ser. No. 887,434
Claims priority, application France, Mar. 21, 1977, 77 08404
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 AA **5 Claims**

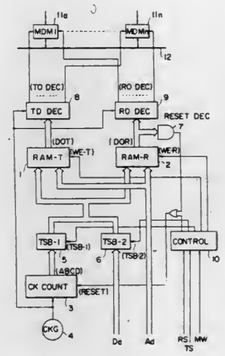


1. A time-division multiplex communication system for connecting two-wire line circuits, comprising a single wire two-way time-division multiplex bus, and connecting apparatus comprising a primary switching means for periodically connecting each line circuit to said bus during a predetermined time period of a multiplex frame, storage means responsive to said primary switching means for storing an information signal present on said bus during said predetermined time period, amplifier means connected to said storage means for providing an output signal corresponding to the stored information signal, and secondary switching means operating in sychronization with said primary switching means for disconnecting the output of said amplifier means from an output terminal of said connecting apparatus for the entire predetermined time period and for connecting the output of said amplifier to the output terminal of said connecting apparatus for the remainder of said multiplex frame.

4,187,401
METHOD OF CONTROLLING CHANNEL ASSIGNMENT IN A TIME DIVISION MULTIPLEXING NETWORK

Jun Matsumoto, Chiryu, Japan, assignor to Aiphone Co., Ltd., Nagoya, Japan

Filed May 25, 1978, Ser. No. 909,669
Claims priority, application Japan, Jun. 6, 1977, 52-66547
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 BW **1 Claim**

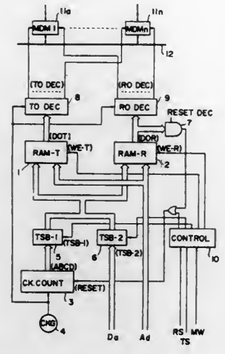


1. In a method for controlling the channel assignment of a time division multiplex network of the type that interconnects a large number of subscribers with one another through a selected smaller number of time division channels and includes a time division multiplex communication path to which the subscribers are each connected via individual modulation/demodulation circuits for modulating an analog signal to a pulse signal when transmitting the analog signal to said communication path and for demodulating the pulse signal to the analog signal when receiving the pulse signal from the communication path, the improvement comprising the steps of:
assigning each time division multiplex channel, in a sequential manner, to a particular subscriber addressor/addressee pair who presently desire to communicate or are communicating with one another along the communication path, the addressor and the addressee of each so-assigned channel each identified by subscriber address-data which corresponds to the respective modulation/demodulation circuit of the addressor or addressee;
storing, in a channel-by-channel sequence, the subscriber address-data of the addressor or the addressee of the so-assigned channels in successive addressable storage locations of a circulating read/write memory;
storing reset data in a storage location of said circulating memory following the last storage location that contains subscriber address-data;
reading-out, in sequence, the subscriber address-data from each storage location in said circulating memory and using the read-out subscriber address-data for gating the particular modulation/demodulation circuit corresponding to the read-out subscriber address-data; and
reading-out the reset data and using the reset data to repeat said reading-out of the subscriber address-data step.

4,187,402
METHOD OF CONTROLLING CHANNEL ASSIGNMENT IN A TIME DIVISION MULTIPLEXING NETWORK

Jun Matsumoto, Chiryu, Japan, assignor to Aiphone Co., Ltd., Nagoya, Japan

Filed May 25, 1978, Ser. No. 909,689
Claims priority, application Japan, Jun. 6, 1977, 52-66548; Jun. 6, 1977, 52-66549
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 BW 2 Claims



1. In a method for controlling the channel assignment of a time division multiplex network of the type that interconnects a large number of subscribers to each other through a selected smaller number of time division channels and includes a time division multiplex communication path to which the subscribers are each connected via individual modulation/demodulation circuits for modulating an analog signal to a pulse signal when transmitting the analog signal to said communication path and for demodulating the pulse signal to the analog signal when receiving the pulse signal from the communication path, the improvement comprising the steps of:

assigning each time division multiplex channel, in a sequential manner, to a particular subscriber addressor/addressee pair who presently desire to communicate or are communicating with one another along the communication path, the addressor and the addressee of each so-assigned channel each identified by subscriber address-data which corresponds to the respective modulation/demodulation circuit of the addressor or addressee;

storing, in a channel-by-channel sequence, the subscriber address-data of the addressor of each so-assigned channel in successive addressable storage locations in a transmission side read/write memory and the subscriber address-data of the addressee of each so-assigned channel in corresponding, successive storage locations in a reception side read/write memory;

storing reset data in a storage location in either said transmission side or said reception side memory following the last storage location that contains subscriber address-data;

reading-out, simultaneously and in sequence, the corresponding storage locations in said memories by addressing successive storage locations in response to a clock count;

decoding the subscriber address-data read-out from the transmission side memory and the subscriber address-data read-out from the reception side;

supplying the decoded subscriber address-data, as a sampling synchronous pulse, to the particular modulation/-demodulation circuits corresponding to the read-out subscriber address-data;

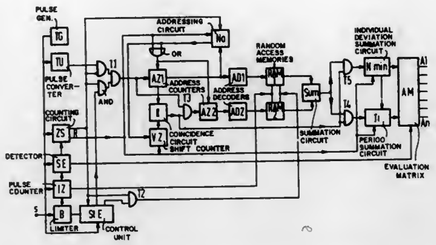
reading-out the reset data; and

resetting the clock count in response to said reset data.

4,187,403
VOICE-PROTECTED, FREQUENCY-SELECTIVE SIGNAL RECEIVER

Reinhold Ast, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,957
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712847
Int. Cl.[2] H04M *1/50*; G01R *23/14*
U.S. Cl. 179—84 VF 2 Claims



1. A voice-protected, frequency-selective signal receiver for telecommunications systems, in which the received signals comprise simultaneously occurring and beating individual frequencies forming a beat frequency analog sum signal, comprising:

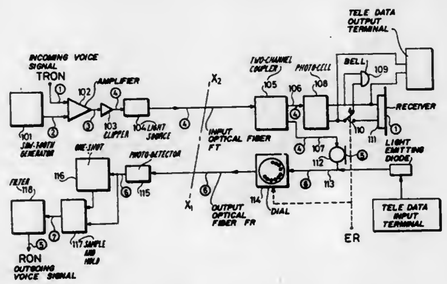
means for converting said beat frequency analog sum signal into a digital signal of positive and negative pulses of equal amplitude with the duration of the individual pulses being equal to the spacings of the respective two successive zero crossings of the beat frequency analog sum signal; and

means for determining the period duration of the pulses of the digital signal, including means for determining the time interval between two pulses of the same polarity and the same duration.

4,187,404
TELEPHONE SET FOR OPTICAL FIBERS LINES

Pierre Deman, and Luigi d'Auria, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 20, 1978, Ser. No. 926,234
Claims priority, application France, Jul. 25, 1977, 77 22757
Int. Cl.[2] H04B *9/00*
U.S. Cl. 179—100 R 7 Claims



1. A telephone set for receiving from an input optical fiber an input optical signal and for emitting on an output optical fiber an output optical signal comprising:

a two-channel coupler for dividing said input optical signal into first and a second parts;

a photovoltaic cell for converting said first part in an electrical signal;

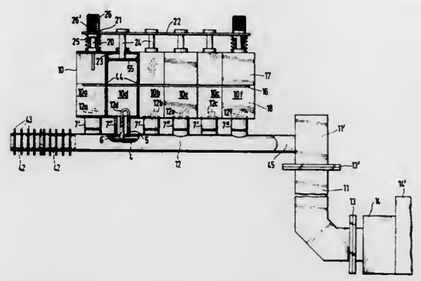
a receiver actuated by said electrical signal;

a microphone diaphragm for receiving and directly modulating with acoustic waves said second part and delivering said output optical signal.

4,187,405
DEVICE FOR FUSING AND FIXING A TONER IMAGE ON A CARRIER

Herbert A. Püschner, Schwanewede, and Helmut Lembens, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,245
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645765
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A 48 Claims



1. A device for fusing and fixing a toner image on a carrier of predetermined web width by means of an electromagnetic radiation field, comprising means for generating microwave energy; and means coupled to said generating means for radiatively transmitting said microwave energy uniformly across the web width of said carrier, said carrier being movable relative to said transmitting means, said transmitting means comprising:

a plurality of discrete transmitting elements arranged in at least two rows, one of said rows lying behind the other in the running direction of said carrier; and

a network of waveguides coupled to said generating means for distributing said microwave energy to said discrete transmitting elements.

4,187,406
MACHINE FOR WELDING SEAMS IN AUTOMOTIVE WHEEL RIM BLANKS

Vernon R. Fencl, Northbrook, and Aujit Tan, Chicago, both of Ill., assignors to Grotnes Machine Works, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 722,428, Sep. 13, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 920,075
Int. Cl.[2] B23K *11/02*
U.S. Cl. 219—59.1 16 Claims

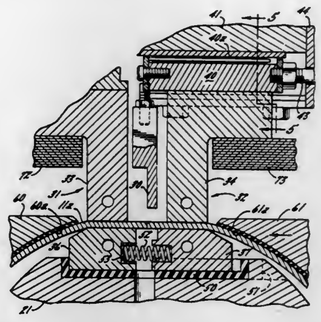
1. A welding machine for welding the longitudinal seams in wheel rim blanks which have been rolled into cylinders with the longitudinal edges of each blank forming the weld zone for said longitudinal seam, said machine comprising the combination of

a pair of clamping assemblies each including an inside member and an outside member for engaging the inner and outer surfaces, respectively, of the rim blank adjacent the longitudinal edges thereof on opposite sides of said weld zone so as to align said longitudinal edges with each other, at least one of said clamping assemblies being movable relative to the other clamping assembly in a direction transverse to said weld zone so as to permit the longitudinal edges of the rim blank to be pressed against each other while the blank is clamped on both sides of said weld zone,

means for urging said inside and outside members of said clamping assemblies against the respective inner and outer surfaces of the rim blank,

said movable clamping assembly including bearing means supporting both the inner and outer clamping members to permit sliding movement of said clamping members on said bearing means without any relative movement between said clamping members and the rim blank clamped therebetween,

means independent of said clamping assemblies for engaging the outside surface of the rim blank on opposite sides of



said weld zone and pressing the longitudinal edges of the rim blank together in the transverse direction to press said longitudinal edges of the rim blank together during the welding thereof,

and means for passing an electric welding current through said clamping assemblies and transversely through the longitudinal edges of the rim blank to effect the welding of said longitudinal edges while said edges are continuously pressed together and while the rim blank is continuously clamped on both sides of said weld zone to maintain said edges in alignment with each other.

4,187,407
WELDED LAP JOINT AND METHOD OF MAKING THE SAME

John J. Marko, Jr., Roseville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,416
Int. Cl.[2] F16B *11/00*; B23K *11/10*
U.S. Cl. 219—91.2 3 Claims



1. A method of forming a welded lap joint in sheet metal panels to form a substantially uninterrupted outer surface across the joint comprising the steps of:

positioning a metal spacer strip along the edge of a first panel on the back surface and spaced from said edge thereof,

bending the margin of the first panel from the plane of the outer panel surface back against the spacer strip to form a U-shaped section with the spacer strip crimped inside the U-shaped section,

forming the margin of the second panel in an offset substantially parallel to the outer panel surface and spaced from the plane of the second panel surface by an amount equal to the thickness of the U-shaped section of the first panel,

assembling the second panel margin to the bent back-first panel margin by overlapping the margins so that the outer surfaces of the first and second panels are substantially

coplanar and spaced by a small crevice, and joining the panels by welding the panel margins together so that the outer surface of the first panel is separated from the weld by the spacer strip and is substantially free of weld marks.

3. A welded lap joint of two sheet metal panels presenting a substantially uninterrupted surface across the joint comprising

an edge of a first panel having three layers of sheet metal including a panel margin bent back toward the under surface of the panel and a sheet metal spacer strip sandwiched between the margin and the under surface of the panel,

a second panel having an edge thereof lying flat against the bent back margin of the first panel and spot welded thereto to form a four layer assembly with the outer surface of the first panel separated from the welds by the spacer strip, the second panel having an offset adjacent the first panel to align the second panel outer surface with the first panel outer surface and to define a small crevice in the joint at the outer surface of the two panels wherein the outer surface across the joint is substantially uninterrupted.

4,187,408

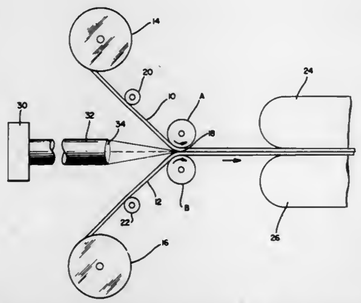
METHOD FOR LASER SEAM WELDING OF MOVING WORKPIECES

Robert F. Heile, Chappaqua, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 625,480, Oct. 24, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 788,452

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 LM **8 Claims**



1. A method for continuous seam welding of at least two thin flexible strips of sheet material composed of a highly conductive metal selected from the group consisting of aluminum, copper and brass, having a thickness in the range of from about 0.001 to about ¼ inch, while the strips are moving at a relatively high rate of speed of at least about 100 feet per minute, comprising the steps of:

(a) directing the moving strips toward one another to form a converging Vee between the moving strips;

(b) providing a pair of pressure rollers;

(c) passing the moving strips between the pair of pressure rollers;

(d) applying a force of above zero pounds against the moving strips with the pair of pressure rollers at a location contiguous to the point at which the moving strips converge such that the moving strips overlay one another in intimate contact at the point of convergence;

(e) generating a laser beam of energy;

(f) providing an optical medium for focusing said laser beam;

(g) focusing said laser beam with said optical medium to produce a converging beam of laser energy having a predetermined focal length; and

(h) directing said converging beam of laser energy into said converging Vee with its focal point located substantially about said point of convergence, the focal length of said converging beam being chosen in relation to the diameter of said pressure rollers such that when said converging beam is directed into said converging Vee said beam impinges upon the moving strips in the vicinity of the converging Vee closest to said point of convergence so as to minimize energy losses due to reflection and absorbed heat and to optimize the amount of energy that is available at said point of convergence for welding said strips together while moving at said high rate of speed.

4,187,409

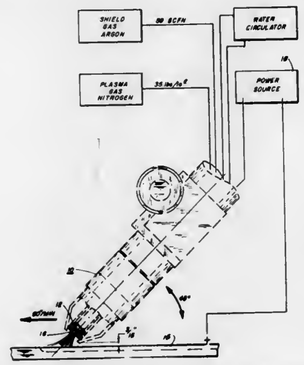
APPARATUS FOR AND METHOD OF PLASMA PRE-WELD AND POST-WELD METAL PREPARATION

Norbert G. Slater, Pascagoula, Miss., assignor to Everett Greer and John F. Bryan, III, both of Pascagoula, Miss., part interest to each

Continuation of Ser. No. 660,211, Feb. 23, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,737

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **1 Claim**



1. The method of pre-weld and post weld preparation of metal plate with plasma arc torch having a tip with cylindrical plasma passageway and comprising the steps of:

(a) flaring outwardly the tip end of said cylindrical plasma gas passageway in an axial angle of divergence of 90 degrees plus or minus 10 degrees;

(b) ionizing an inert gas in an arc stream between said tip and metal plate that responsive to said axle angle of divergence, forms a short thick plasma jet; and

(c) passing said short thick plasma jet over said metal plate in any set comprising a wide range of working parameters, ie work angle, speed of travel, standoff, power density and gas flow, for producing stabilized gouges in said metal plate, the consistency of said stabilized gouges being dependent on said axial angle of divergence as limited in said top plasma passageway, and the physical dimensions of said gouges being dependent on said working parameters.

4,187,410

METHOD OF MULTI-PASS NARROW GROOVE ARC WELDING

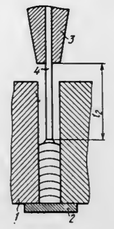
Nikolai A. Eroshkin; Alfred V. Ivanmikov; Vyacheslav N. Matveev, all of Leningrad, and Anatoly I. Sergienko, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky, Proektno-Konstruktorsky i Tekhnologichesky Institut Elektrosvarochnogo Oborudova, Leningrad, U.S.S.R.

Filed Mar. 10, 1977, Ser. No. 776,198

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—137.2 **3 Claims**

1. A method of multi-pass arc welding with a consumable electrode in a protective atmosphere for welding heavy-gauge metal with narrow grooving comprising: placing a current supply conductor which supports the consumable electrode passing therethrough above said narrow grooving which will form the welded joint, and adjusting the initial length of extension of the consumable electrode to be greater than the thickness of said heavy-gauge metal which corresponds to the depth of said narrow grooving of the welded joint, conducting the welding plural passes with the length of extension of the consumable electrode continuously decreasing upon each pass, maintaining the vertical position of the current supply conductor relative to the top surface of said metal unchanged, the voltage applied to the current supply conductor, rate of feed of the consumable electrode and welding speed being reduced with the continuous decrease in the length of extension of the consumable electrode, whereby the current and voltage in the arc gap are maintained substantially constant.



4,187,411

ARC WELDING

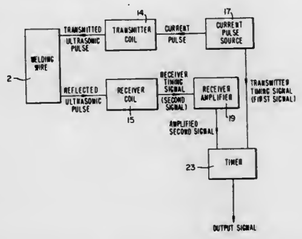
Graham W. Bryce, Giffnock, and Joseph J. Hunter, East Kilbride, both of Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 18, 1977, Ser. No. 843,187

Claims priority, application United Kingdom, Oct. 25, 1976, 44150/76

Int. Cl.[2] B23K *9/10*

U.S. Cl. 219—137.2 **16 Claims**



1. Welding apparatus comprising a welding torch, means for substantially continuously feeding a strip of consumable weld filler material through said welding torch during the course of a welding operation, and means for monitoring the stick-out distance of said strip of consumable weld filler material beyond the tip of said welding torch while said strip is in motion through said torch, said monitoring means comprising

means for transmitting a pulse in the form of an ultrasonic sound disturbance along said moving strip;

means for providing a first signal at an instant corresponding to the passage of the pulse past a first station separated from the welding torch tip by a fixed path length of said moving strip;

means for providing a second signal at an instant corresponding to the passage past a second station of the pulse reflected from the free end of said moving strip, the second station being separated from the welding torch tip by a fixed path length of the strip;

and means responsive to the time interval between the first and second signals for providing a measure of the magnitude of the stick-out distance of said moving strip of weld filler material.

4,187,412

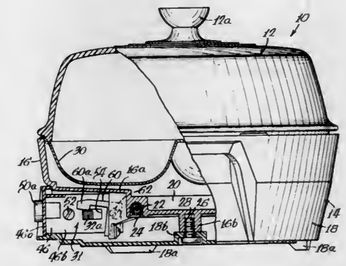
AUTOMATIC CONTROL FOR ELECTRIC HEATING DEVICE

Peter J. Ernster, Glendale; Ernest Canamero, Appleton, and James B. Cockroft, Wauwatosa, all of Wis., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 10, 1978, Ser. No. 922,936

Int. Cl.[2] F27D *11/02*

U.S. Cl. 219—441 **5 Claims**



1. An electric heating appliance comprising a metal vessel, an electric heating element electrically insulated from and in intimate heat exchange relationship with said vessel, a slide switch connecting said heating element to a source of electric energy, said slide switch including a housing having fixed and movable contacts contained therein, said movable contacts being supported by a switch actuator having a switch knob projecting from said housing and linearly movable between an open circuit position and a closed circuit position, said switch knob being normally biased to said open position, means for manually moving said slide switch to the closed position, a latch mounted adjacent to said slide switch for engaging said switch knob when said switch is moved to the closed position to hold said slide switch in such closed position, and means responsive to the attainment of a predetermined temperature of said vessel for releasing said latch.

4,187,413

HEARING AID WITH DIGITAL PROCESSING FOR: CORRELATION OF SIGNALS FROM PLURAL MICROPHONES, DYNAMIC RANGE CONTROL, OR FILTERING USING AN ERASABLE MEMORY

Ludwig M. Moser, Estenfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,348

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716336

Int. Cl.[2] H04R *25/00*

U.S. Cl. 179—107 FD **10 Claims**



1. A method for adapting the transmission function of a hearing aid to various types of hearing difficulty, characterized in that the analog sound signal to be transmitted is converted

into a digital signal, is then subjected to a discrete signal processing based on selected stored parameters matched to the difficulty in hearing for which provision is to be made, that the digital signal is then converted back into an analog electrical signal and is converted into sound in a manner known in the case of hearing aids, characterized in that several input signals are individually converted to digital signals, and are correlated in a digital arithmetic unit to provide a resultant output.

2. A hearing aid system comprising

receiving means for receiving an audio signal,

output means comprising a transducer for producing an auditory signal,

an analog to digital converter coupled to said receiving means and operative to supply a converted signal in digital form in accordance with the audio signal,

discrete signal processing means connected with said analog to digitz' converter and comprising ₂ finite impulse response (FIR) filter circuit for processing an input signal in accordance with said converted signal to provide a filtered signal with a frequency response adapted to the frequency response of the receiving and output means and of the ear, and erasable memory means for storing filter parameters for said finite impulse response (FIR) filter circuit,

a digital to analog converter connected with said filter circuit to supply an analog signal in accordance with said filtered signal, and

circuit means for amplifying the analog signal to provide an amplified analog signal and for supplying said amplified analog signal to said output means for producing an auditory signal in accordance therewith.

3. A hearing aid system comprising

receiving means for receiving an audio input signal,

an analog to digital converter coupled to said receiving means for supplying a converted signal in digital form in accordance with said audio input signal,

memory means connected with said analog to digital converter and having an input-output characteristic to supply a translated signal in accordance with said converted signal but with each input digital value translated into an output digital word, the input-output characteristic of said memory means serving to adjust the dynamic range of the audio input signal without introducing time delay, said memory means comprising an erasable memory for storing input-output characteristic values for providing said input-output chacteristic,

a digital to analog converter coupled with said memory means to supply an analog signal with adjusted dynamic range in accordance with the translated signal,

circuit means to amplify and process the analog signal, and

transducer means responsive to the amplified and processed analog signal for producing an audio output signal.

4,187,414

CIRCUIT ARRANGEMENT FOR AN INTERFERENCE DATA ALARM SYSTEM IN COMMUNICATION FACILITIES, PARTICULARLY IN TELEPHONE EQUIPMENT

Franz Fahrenschon, Neuried; Heinz Huettl, Wolfratshausen, and Ewald Dotzauer, Sauerlach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

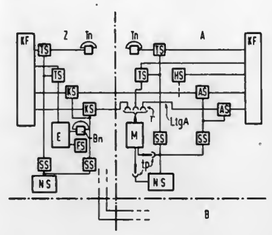
Filed Mar. 23, 1978, Ser. No. 889,260

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713937

Int. Cl.² G08B *29/00*; H04M *11/00*

U.S. Cl. 179—175.3 S **7 Claims**

1. A circuit arrangement for an interference data alarm system in communication facilities, particularly in telephone equipment, operable for communication with a maintenance control station located at one of the facilities and including a receiver test unit for receiving all error and condition messages, which are determined and transmitted by transmitting test units of unmanned secondary stations, characterized in the circuit arrangement comprising means for inserting the transmitting test unit (M) of each of the secondary station (A, B) into lines (Ltg1, Ltg2) used for normal telecommunication traffic with the one facility (Z), in which the maintenance control station (E, Bn, FS) is located, and comprising devices forming part of the transmitting test unit (M) which are operable independently of the switching equipment (e.g. AS, KF) of the secondary station (A), to independently undertake the connecting preparation and the transmission of the messages via said lines (Ltg1, Ltg2).



4,187,415

REMOTE LOCATING SYSTEM FOR TRANSMISSION FAULTS IN DATA TRANSMISSION LINE HAVING REGENERATIVE REPEATERS

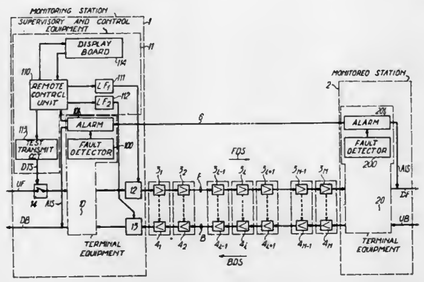
Patrick E. Boutmy, and Jean-Marc A. Camborde, both of Lannion, France, assignors to Etat Francaise, Issy-les-Moulineaux and Societe Anonyme de Telecommunications, Paris, both of, France

Filed Jun. 5, 1978, Ser. No. 912,727

Claims priority, application France, Jun. 20, 1977, 77 18879

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 F **5 Claims**



1. A remote locating system for remote locating the N pairs of regenerative repeaters which are interconnected by line sections of a bidirectional data transmission line which is interconnected between a monitoring station and a monitored station, said bidirectional data transmission line comprising;

a forward transmission channel, having forward transmission regenerative repeaters, conveying in the forward direction from said monitoring station to said monitored station a first data signal, and

a backward transmission channel, having backward transmission regenerative repeaters, conveying in the backward direction from said monitored station to said monitoring station a second data signal; said monitoring and monitored stations comprising:

means in each of said stations for detecting transmission faults on said backward and forward transmission channels; and

means in each of said stations for producing first and second alarm signals in response to the detection of a transmission fault on said backward and on said forward transmission

channels respectively; said monitoring station also comprising:

a first means for continuously generating a first low frequency signal in said forward direction on said forward transmission channel in response to said first alarm signal, said first low frequency signal being mixed with said first data signal; and

a second means for generating a second low frequency signal in said forward direction on said backward transmission channel, after said first low frequency signal is produced; said second low frequency signal being modulated by at most (N−1) pulses and being mixed with said first data signal on said backward transmission channel when a forward transmission regenerative repeater is connected to a backward transmission regenerative repeater:

said forward transmission regenerative repeater of each said regenerative repeater pair comprising:

means for detecting said first low frequency signal, and

means for transmitting said first low frequency signal on said forward transmission channel to the next forward transmission regenerative repeater; and said backward transmission regenerative repeater of each said regenerative repeater pair comprising;

means for detecting a first pulse of said second low frequency signal which is transmitted from the preceding backward transmission regenerative repeater in said forward direction on said backward transmission channel;

means for connecting the output terminal of said forward transmission regenerative repeater to the input terminal of said backward transmission regenerative repeater in response to said detection of said first low frequency signal by said first low frequency signal detecting means,

while disconnecting said input terminal of said backward transmission regenerative repeater of one pair and the output terminal of the backward transmission regenerative repeater of the next pair;

means for disconnecting said output terminal of said forward transmission regenerative repeater of said pair from said input terminal of said backward transmission regenerative repeater of said pair in response to said detection of said first pulse of said second low frequency signal by said first pulse detection means;

while connecting said input terminal of said backward transmission regenerative repeater of said pair and said output terminal of said backward transmission regenerative repeater of the next pair; and

means for transmitting in said backward direction on said backward transmission channel to said output terminal of said backward transmission regenerative of said next pair, only the pulses of said second low frequency signal which succeed said first detected pulse.

4,187,416

HIGH POWER RF COAXIAL SWITCH

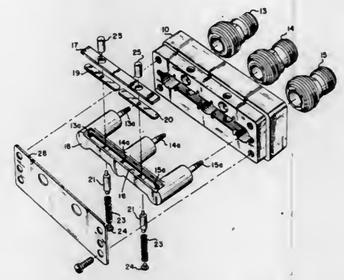
Edward R. Caro, Monterey Park, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 835,419, Sep. 21, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 949,886

Int. Cl.² H01P *1/10*; H01H *13/10*

U.S. Cl. 200—153 S **11 Claims**

1. A coaxial switch comprising RF switch conductors, a metal enclosure for said switch conductors, and a solid dielectric completely surrounding said conductors within said metal enclosure, said dielectric electrically isolating said conductors and said metal enclosure to eliminate any space through which electrons may be accelerated to cause secondary emission by collision with said metal enclosure, wherein said switch is for connecting the center conductors of coaxial connectors having their outer conductors connected to said metal enclosure, said switch being comprised of at least two parallel conductors of coaxial connectors, said conductors being center conductors of said coaxial connectors and extending into said enclosure and dielectric, a movable elongated bar across said parallel conductors, an elongated cavity in said dielectric extending across said parallel conductors for said elongated bar to be moved out of contact with said parallel conductors, a transverse hole through said dielectric surrounding said parallel conductors and elongated bar, said transverse hole intersecting said cavity at the center of said bar in a direction normal to said bar and



said parallel conductors, a dielectric pushing means in said hole on one side of said bar, spring means biasing said dielectric pushing into said hole against said bar to move said bar away from said conductors, a dielectric plunging means in said hole on a side opposite said pushing means, and means for thrusting said plunging means in said hole into said bar and against said spring means to move said bar against said conductors.

4,187,417

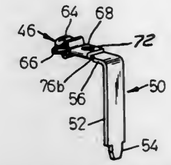
PRINTED CIRCUIT CONTACT

Joseph J. Zehel, Milwaukee, and Joseph W. Kreis, West Bend, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Feb. 2, 1978, Ser. No. 874,503

Int. Cl.² H01H *1/42, 21/54*

U.S. Cl. 200—254 **11 Claims**



1. A one piece printed circuit contact for attachment to an insulative substrate of an electrical control device, the contact being electrically conductive and comprising:

a body portion for attachment to said substrate, said body portion having opposite ends, opposite faces and longitudinal edges;

a first jaw integrally attached to one end of said body portion;

a jaw supporting tab in juxtaposition with one face of said body portion and integrally joined to one edge of said body portion;

a second jaw integrally attached to said jaw supporting tab and in parallel adjacent relationship with said first jaw, said first and second jaws forming a spring clip; and,

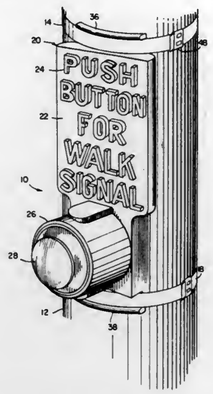
a tail integrally joined to the other end of said body portion and angularly disposed with respect to said body portion, said tail comprising a single material thickness and having an end defining a plug, and wherein the thickness of said tail is greater than the thickness of at least one of said jaws.

4,187,418

COMBINATION PEDESTRIAN SIGN AND PUSH BUTTON

Richard C. Harris, 30 Westwood Rd., Medford, Mass. 02155

Filed Jun. 30, 1978, Ser. No. 920,829
Int. Cl.[2] H01H *9/02*
U.S. Cl. 200—295 **3 Claims**



1. A combination sign and pushbutton mountable by separate flexible strapping bands to a cylindrical post for pedestrian control of traffic lights, comprising:
(a) a solid plaque,
(b) said plaque being formed with front and rear faces,
(c) said rear face being contoured in the form of a semi-cylindrical cavity to conform to the contour of said post,
(d) said front face being generally flat and formed with integral raised lettering providing an instructional legend for pedestrians,
(e) said plaque being formed at the upper and lower portions thereof with forwardly facing arcuate grooves generally concentric with the contour of said rear face and adapted to receive said flexible strapping bands wrapped about said post and along said grooves, and
(f) a pushbutton unit mounted to the front face of said plaque,
(g) said unit including a housing secured to said plaque, a switch mounted in said housing, a spring biased pushbutton extending through said housing and operatively connected to said switch, and means for connecting said switch to said lights.

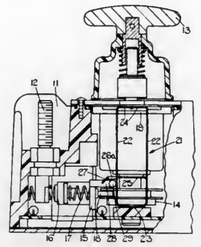
4,187,419

ELECTRICAL SWITCH

John Warren, Colne, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 7, 1978, Ser. No. 875,925
Claims priority, application United Kingdom, Feb. 8, 1977, 5044/77
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—308 **6 Claims**

1. An electrical switch including a fixed electrical contact, a movable electrical contact, means for moving the movable contact into and out of engagement with the fixed contact, a first legend carried by a fixed part of the switch and indicative of one of the operative states of the switch, a second legend carried by a means for obscuring, movable relative to said fixed part and indicative of the other operative state of the switch, said means for obscuring being movable between a position wherein the first legend is revealed and the second legend is obscured and a position wherein said means for obscuring obscures the first legend and the second legend is revealed, resilient means urging said means for obscuring to one of said positions, releasable latch means for retaining said means for obscuring in the other of said positions against the action of said resilient means, release means for releasing said latch means at a predetermined point in the movement of the movable contact relative to the fixed contact and return means for returning the means for obscuring to said other position against the action of said resilient means.

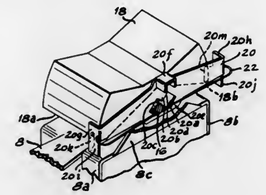


4,187,420

ROCKER SWITCH WITH SELECTIVE LOCKOUT MEANS SHIFTABLE TRANSVERSELY OF THE PIVOTAL AXIS

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 17, 1978, Ser. No. 906,875
Int. Cl.[2] H01H *21/50, 21/06*
U.S. Cl. 200—321 **19 Claims**



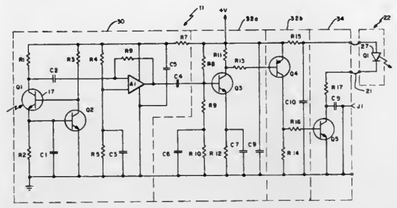
1. A rocker switch with selective lockout means comprising:
a switch housing;
contact means mounted in said housing;
a rocker button pivotally mounted to said housing for actuating said contact means, said rocker button having a designated tilted position corresponding to a designated condition of said contact means; and
selective lockout means including mounting means therefor rendering the same shiftable transversely of the pivotal axis of said rocker button to a designated selective position for preventing rocking of said rocker button to said designated tilted position and thus lockout said designated condition of said contact means, said selective lockout means comprising a slider member having an interference ear portion protruding into the path of motion of said rocker button when said slider member is in said designated selective position, wherein said rocker button is pivotally mounted to said housing by means of a shaft, and wherein said mounting means comprises resilient means biasing said slider member into engagement with said shaft.

4,187,421

OPTICAL RELAY

Paul F. Key, San Martin, and Anthony R. Lazzara, Portola Valley, both of Calif., assignors to Scientific Technology Inc., Mountain View, Calif.

Filed Mar. 18, 1977, Ser. No. 778,883
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **8 Claims**



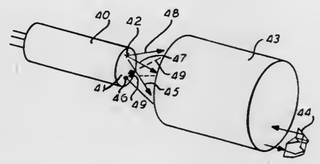
1. Apparatus for relaying a directional electromagnetic radiation beam containing pulse frequency components above a predetermined frequency, said apparatus comprising:
(a) movable means for receiving said radiation beams and producing a shaped electrical signal in response to and substantially in phase with said pulse frequency components, said receiving means being insensitive to electromagnetic pulse components below said predetermined frequency;
(b) electromagnetic radiation source driving means coupled to said receiving means for providing an electrical drive signal in response to and substantially in phase with said shaped signal;
(c) an electromagnetic radiation source coupled to said driving means and responsive to said drive signal for producing a pulsating output beam of electromagnetic radiation at substantially the same frequency as and substantially in phase with said received pulse frequency components; and
(d) means responsive to one of said electrical signals for producing an audio output signal having a frequency dependent upon said one signal and having a maximum amplitude when said receiving means is aligned with said beam said lastnamed means including means for producing said audio signal even if the frequency components are not within the audio range and a jack removably connectable in circuit with said receiving means.

4,187,422

INTERNAL REFERENCE FOR STELLAR TRACKER

Bart J. Zoltan, Old Tappan, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Dec. 5, 1977, Ser. No. 857,157
Int. Cl.[2] G01B *11/26*
U.S. Cl. 250—203 R **7 Claims**



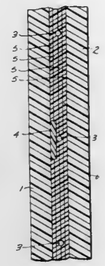
1. A stellar tracking system comprising:
means for detecting the presence of a source of stellar light,
means for focusing said stellar light on said detecting means,
means on said detecting means indicating the orientation of said detecting means relative to a fixed position, and
means responsive to said orientation means for indicating the deviation of said detecting means from said fixed position.

4,187,423

ARTICLE FOR MEASURING LOWER EXTREMITIES COMPRISING LAMINAE OF BOTH PVC AND ACRYLIC

Henry B. Ehrhardt, Arlington, Wash., assignor to Larry C. Petersen and Stanley M. Smith, both of Marysville, Wash.

Filed Mar. 27, 1978, Ser. No. 890,296
Int. Cl.[2] A61B *6/00, 6/12*
U.S. Cl. 250—312 **3 Claims**



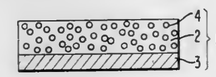
1. A lower extremity measuring article having a suitable surface area for a person to lay on, and permeable to X-ray with imbedded numerals and wires nonpermeable to X-ray used between a source of X-ray and X-ray film so as to produce a permanent image of numbered and parallel spaced lines on the film, the spacing of which corresponds to the measurements of a system of length, the article being made of acrylic plastic and polyvinyl chloride layers nonopaque to X-ray, and the numerals and wires being disposed between said layers and fused together under heat and pressure to form a laminated hermetically sealed structure nontoxic to humans and easily sterilized.

4,187,424

RADIOELECTROPHOTOGRAPHY PROCESS

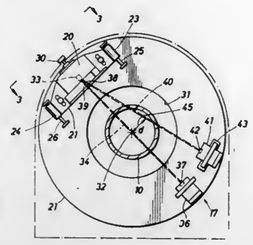
Eiichi Inoue, Tokyo, and Takashi Yamaguchi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 18, 1977, Ser. No. 797,954
Int. Cl.[2] B41M *5/00*
U.S. Cl. 250—315.1 **9 Claims**



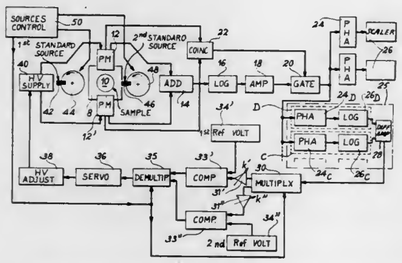
1. A process for radioelectrophotography, which comprises imparting a uniform electrostatic charge to the surface of a recording layer of an image-recording material containing dispersed therein many cells and/or pores with gas sealed therein so as to cause a sufficiently strong electric charge to act on the gas inside said cells and/or pores to substantially ionize said gas, and irradiating said recording layer with penetrating radiation carrying image information to imagewise remove the charge on the surface of said recording layer and form an electrostatic latent image, wherein the gas is selected from the group consisting of air, nitrogen, a halogen, oxygen, carbon dioxide, carbon monoxide, a rare gas, and mixtures thereof the size of said cells in said recording layer ranges from about 0.0025 mμ to about 100 mμ and the degree of porosity of said recording layer ranges from about 27 to about 85 volume %.

4,187,425
PIPE INSPECTION SYSTEMS
Carroll R. Thompson, Odessa, Tex., assignor to NDT Systems, Inc., Odessa, Tex.
Filed Apr. 14, 1978, Ser. No. 896,384
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—358 P **10 Claims**



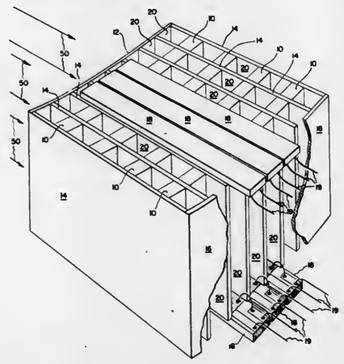
1. A method for radioactive inspection of a pipe member comprising the steps of:
- passing a beam of radiation through two wall segments of a pipe in a direction transverse to the axis of the pipe where the chord beam of radiation intersects a perpendicular radius for the outer wall of the pipe at a distance from the center axis which is a function of approximately 0.6 times the radius for the outer wall of the pipe;
- moving the pipe longitudinally and radially relative to the beam of radiation; and
- measuring the radioactivity transmitted through the wall segments as a function of angular and lengthwise positions of the pipe so as to provide a measure of pipe eccentricity.

4,187,426
LIQUID SCINTILLATION SPECTROMETRY PROCESS AND APPARATUS
Pierre Jordan, Carmenstr. 41, CH-8032 Zurich, Switzerland
Filed Mar. 24, 1978, Ser. No. 889,885
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—364 **19 Claims**



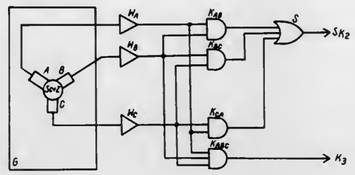
1. A liquid scintillation spectrometry process for samples having a quenching of the fluorescent efficiency resulting more particularly from colour quenching, wherein said colour quenching is measured by the folowing operations:
- a first standard solution is prepared having no colour quenching;
- this first standard solution is exposed to a first standard external scintillation source which emits fluorescent radiation;
- the radiation which has passed through the first standard solution is subject to spectrometry;
- once and for all, one of the characteristics of the spectrum obtained is recorded and this constitutes a reference characteristic;
- the first standard solution is replaced by one of the samples to be measured;
- the sample is exposed to radiation from the first standard source;
- the radiation which has passed through the sample is subject to spectrometry;
- the characteristic of the spectrum obtained is measured;
- the measured characteristic is compared with the recorded reference characteristic, said comparison giving the colour quenching of the sample.

4,187,427
STRUCTURE FOR COLLIMATED SCINTILLATION DETECTORS USEFUL IN TOMOGRAPHY
Dominic A. Cusano, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jan. 9, 1978, Ser. No. 868,045
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—366 **12 Claims**



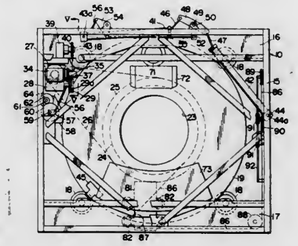
1. A scintillation detector for use in computerized tomography comprising:
- a front wall member with an internal and external surface, said front wall member being substantially transparent to supra-optical electromagnetic radiation and having its internal surface coated with an optically reflective material;
- a rear wall member with an internal surface and an external surface, said rear wall member being substantially parallel to said front wall member and having its internal surface coated with an optically reflective material;
- at least three collimator wall members oriented substantially perpendicular to said front and rear wall members, said collimator members being substantially impervious to supra-optical electromagnetic radiation, said collimator and wall members defining a plurality of cells with open ends and said collimator members having all surfaces facing the interior of said cells, coated with an optically reflective material;
- at least one scintillator body in each of said cells; and
- a plurality of photoelectrically responsive detector means each of which is disposed so as to receive optical radiation emitted by the scintillator material in a single cell so as to produce an electrical signal representative of the intensity of the spura-optical electromagnetic radiation impinging upon each of said cells.

4,187,428
METHOD AND APPARATUS FOR ABSOLUTE ACTIVITY DETERMINATION OF RADIONUCLIDES
Krzysztof K. Pochwalski, and Tomasz E. Radoszewski, both of Warsaw, Poland, assignors to Instytut Badan Jadrowych, Warsaw, Poland
Filed May 15, 1978, Ser. No. 906,343
Claims priority, application Poland, May 17, 1977, 198185
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—366 **7 Claims**



1. A method for the absolute activity determination of radionuclides comprising producing pulses from three photomultipliers optically coupled to a scintillator and to a radionuclide source to be measured, producing further pulses representing multiples of coincidence of the first said pulses and correlating the counts obtained from the further pulses of the various multiples of coincidence to obtain a measure of the absolute activity of the radionuclide source.

4,187,429
SCANNING APPARATUS FOR CROSS-SECTIONAL INSPECTION EQUIPMENT
Chuji Tomita, Tokyo, and Hiroshi Abe, Kashiwa, both of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan
Filed May 15, 1978, Ser. No. 906,278
Claims priority, application Japan, May 13, 1977, 52/55006; May 13, 1977, 52/55007
Int. Cl.[2] A61B *6/00*
U.S. Cl. 250—445 T **13 Claims**



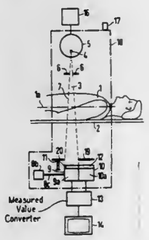
1. A scanning apparatus, comprising:
- a frame;
- rollers rotatably secured on said frame;
- a rotatable disc supported at its circumferential surface by said rollers;
- a hollow drum provided in the vicinity of the rotation axis of said rotatable disc for the insertion therethrough of an object to be inspected;
- an X-ray source and a detector arranged in positions opposed to each other with said drum intervening therebetween;
- drive means for rotating said rotatable disc in a forward direction and in a reverse direction;
- a striker provided on the rotatable disc;
- two speed accelerating and reducing means movable alternately to a first position for engagement with said striker and to a second position for non-engagement with said striker; and
- synchronizing means for bringing one of said two speed accelerating and reducing means to said first position in association with the forward rotation of said rotatable disc and for bringing the other one of said two speed accelerating and reducing means to said first position in association with the reverse rotation of said rotatable disc,
- whereby said respective speed accelerating and reducing means are brought into engagement with said striker to perform braking the rotation and acceleration of speed of rotation of said rotatable disc.

10. A scanning apparatus, comprising:
- a frame;
- rollers rotatably secured to said frame;
- a rotatable disc supported at its cicumferential surface on said rollers;
- a hollow drum provided in the vicinity of the rotation axis of said rotatable disc for the insertion therethrough of an object to be inspected;
- an X-ray source and a detector which are mounted on said rotatable disc in positions opposed to each other with said drum intervening therebetween;
- drive means for driving said rotatable disc to make at least one whole revolution; and
- guide means for guiding a cable extending from equipment including said X-ray source and said detector which are mounted on said rotatable disc,

said guide means comprising:
- a guide panel movably mounted on said frame;
- a weight plate movably mounted on said frame; and
- a rope having one end fixed to said drum and releasably wound around this drum and having the other end connected to said weight plate and engaged with said guide panel so as to allow said weight plate to move said guide panel in a certain direction,

said cable being releasably wound around said drum in a direction opposite to that in which said rope is wound therearound and being engaged with said guide panel and being led out to the outside of the apparatus.

4,187,430
TOMOGRAPH FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES
Martin Schmidt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Sep. 5, 1978, Ser. No. 939,461
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744226
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **1 Claim**



1. A tomographic apparatus for the production of transverse layer images of a radiography subject with a radiation measuring arrangement comprising a radiation source which produces a fan-shaped beam of rays penetrating the radiography subject, whose cross-sectional extent, perpendicular to the layer plane, is equal to the layer thickness, and which is of sufficient extent in the layer plane that the entire radiography

subject is penetrated, and comprising a radiation receiver which determines the radiation intensity behind the subject, a rotating device for the measuring arrangement for irradiating the radiography subject from different directions, and a measured value converter for the transformation of the signals delivered by the radiation receiver into a layer image, wherein the radiation receiver consists of a number of individual detectors, wherein the radiation receiver has two or more mutually parallel and adjacently arranged detector rows, each of which is assigned to a specific body region and corresponds in its length to the width of the body region assigned to it, wherein the number of detectors per unit of length of one detector row is greater the shorter the detector row, wherein a control device is present for the radiation receiver which renders possible the selective detection of the x-ray beam by one detector row in each case, and wherein one collimator with laminae aligned with respect to the radiation source is disposed before each detector series, characterized in that after each of the collimators (11, 12) for each of the detector rows (9, 10) as viewed in the radiation direction the radiation receiver has one light -and airtight chamber (29, 30) with a partition (35, 37) made of radiation-absorbing material between the chambers (29, 30) and the two collimators (11, 12).

4,187,431

METHOD FOR THE ADJUSTMENT OF A SEMICONDUCTOR DISC RELATIVE TO A RADIATION MASK IN X-RAY PHOTOLITHOGRAPHY

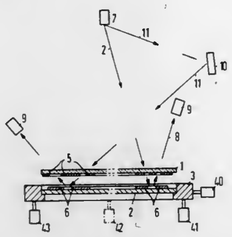
Eckart Hundt, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,597

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723902

Int. Cl.² G02B *27/00*

U.S. Cl. 250—492 A **6 Claims**



1. A method for the adjustment of a semiconductor disc relative to a radiation mask in x-ray photolithography where in order to determine the relative positions of semiconductor disc and radiation mask the intensity of a beam of x-rays is determined which impinges on an adjustment mark on the semiconductor disc and on an adjustment mark on the radiation mark, characterized by the fact that for one of the adjustment marks (5, 6) a reflecting adjustment mark is used which reflects at least a portion of the beam of x-rays (8; 11) impinging thereon, and sensing the intensity of the reflected beam as a measure of relative position.

4,187,432

SOURCE HOLDER FOR MOUNTING RADIOACTIVE FOIL AND HOLDER-FOIL ASSEMBLY

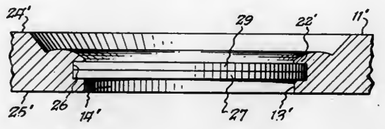
Jay R. Mileham, Tonawanda, N.Y., assignor to NRD, Division of Mark IV Industries, Inc., Grand Island, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,208

Int. Cl.² G21G *4/00*

U.S. Cl. 250—493 **2 Claims**

1. A source holder for mounting a radioactive foil comprising a disc, an opening in said disc, a lip on said disc, a first wall on said lip defining the size of a first portion of said opening through which said foil is to radiate, a second wall on said lip oriented transversely to said first wall for providing a shelf to support said foil, a counterbore portion in said opening including a third wall extending transversely relative to said second wall on the opposite side thereof from said first wall for providing a chamber for receiving said foil, a readily deformable portion adjacent said third wall remote from said lip for permitting deformation of said third wall inwardly toward said opening to retain said foil in said counterbore, said disc including first and second opposite surfaces, and said lip being adjacent said first surface, and said fifth wall merging into said second surface.



4,187,433

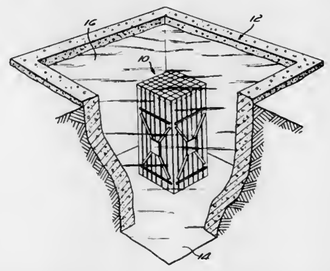
HIGH DENSITY FUEL STORAGE RACK

Louis J. Zezza, Ossining, N.Y., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 5, 1977, Ser. No. 822,084

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **13 Claims**



1. A storage rack for the high density storage of spent nuclear fuel assemblies, said storage rack comprising:

first and second grids, said first and second grids being spaced one above the other so that said first grid is positioned above said second grid, said first and second grids defining vertically aligned openings therethrough; wherein said first and second grids provide an integral support structure for said assemblies;

upright separately, supported tubular storage cells in said openings so that said fuel cells are retained in upright position and are retained spaced from each other so that when said storage rack is immersed in a storage pool spent nuclear fuel assemblies can be placed in said storage cells, most of said cells being contained in said opening from floating movement in a direction normal to said grids.

4,187,434

LONG LIFE RADIATION SHIELD FOR GAS TEMPERATURE MEASUREMENT

Frank R. Pater, Jr., Brackenridge, and Joseph M. Kapusnik, Verona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 31, 1978, Ser. No. 938,627

Int. Cl.² G01K *13/00*

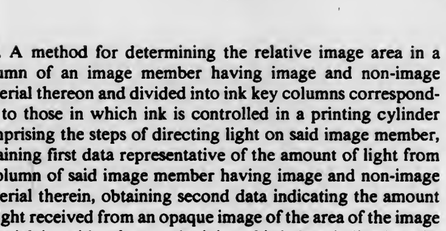
U.S. Cl. 250—515 **14 Claims**

1. A suction pyrometer radiation shield comprising

a. an elongated first alumina refractory tube

b. a series of smaller alumina refractory tubes arranged around and bonded to the inside surface of said first tube forming a central passageway

c. an outer fracture resistant alumina refractory tube surrounding said first tube



d. an alumina refractory washer closely surrounding said first tube in abutting contact with said outer alumina refractory tube.

4,187,435

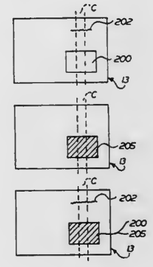
APPARATUS FOR DETERMINING IMAGE AREAS FOR PRINTING WITH CORRECTION FOR EXTRANEOUS MATTER

Roland T. Palmatier, Westerly, R.I., and Francis J. Sciulli, Palm Bay, Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Jun. 7, 1978, Ser. No. 913,520

Int. Cl.² G01N *21/30*

U.S. Cl. 250—559 **6 Claims**



1. A method for determining the relative image area in a column of an image member having image and non-image material thereon and divided into ink key columns corresponding to those in which ink is controlled in a printing cylinder comprising the steps of directing light on said image member, obtaining first data representative of the amount of light from a column of said image member having image and non-image material therein, obtaining second data indicating the amount of light received from an opaque image of the area of the image material in said column, obtaining third data indicating the amount of light received from an image including an opaque image of the area of the image material in said column and including said non-image material in said column, subtracting the second data for said column from the third data for said column to obtain a difference, and subtracting said difference from said first data for said column to remove the effect of said non-image material on said first data.

4,187,436

DEVICE FOR REGULATING THE SOURCE OF ELECTRIC ENERGY ON A HYBRID ELECTRIC VEHICLE

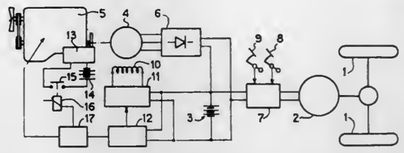
Michel Etienne, Valmondois, France, assignor to Automobiles Peugeot, Paris, France

Filed Jan. 9, 1978, Ser. No. 867,838

Claims priority, application France, Jan. 12, 1977, 76 00749

Int. Cl.² B60L *11/12*

U.S. Cl. 290—27 **7 Claims**



1. A regulating device for regulating the source of electric energy on a hybrid electric vehicle having driving wheels, comprising at least an electric motor for driving the driving wheels of the vehicle and supplied with current by said source of energy, and a generating set comprising a heat engine and a current generator which has an excitation winding and is combined with the heat engine and a first circuit connecting the generator to said source for supplying current to said source, a second circuit for determining the state of charge of said source, a device for operating and stopping the heat engine, and a third circuit associated with the excitation winding of the generator for controlling said winding as a function of the state of charge of said source, the device for operating and stopping the heat engine comprising a logic circuit controlled by said second circuit, wherein said second circuit comprises means providing a reference voltage and means for detecting a low level and means for detecting a high level of the voltage of said source relative to said reference voltage, means for memorizing an electric signal corresponding to a level of voltage of said source which is lower than said low level and means for erasing the information contained in said memory connected to an output of said means for detecting the high level of a voltage of the source of energy.

4,187,437

SWITCHING APPARATUS FOR MEDIUM-VOLTAGE CABLE NETWORKS

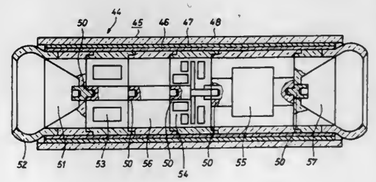
Bruno Müller, Berlin, and Werner Kohler, Bentfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,293

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636410

Int. Cl.² H02G *9/02*; H02B *1/20*

U.S. Cl. 307—147 **5 Claims**



1. A single-pole switching unit adapted to be imbedded in the soil and to be used for medium voltage cable networks, said unit comprising:

a protective housing having opposed ends and adapted to be imbedded in the soil;

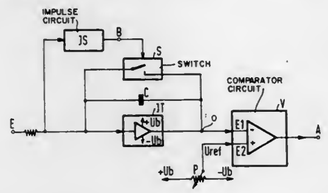
a switching element axially disposed in said protective housing;
actuating means for actuating said switching element, said actuating means being controlled remotely of said unit;
cable plug-in means disposed adjacent to said ends of said housing coaxially with said switching element for connecting cables of a cable network substantially coaxially with said cable plug-in means; and
coupling means disposed in said housing coaxially with said switching element and said cable plug-in means for connecting said switching element and said cable plug-in means.

4,187,438

"CIRCUIT ARRANGEMENT FOR UNILATERALLY SCANNING DISTORTED TELETYPE CHARACTERS

Werner Müeller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,283
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654927
Int. Cl.² H03K *5/04*
U.S. Cl. 307—268 **7 Claims**



1. A circuit arrangement for unilaterally scanning distorted Teletype characters, wherein the characters are supplied to the inputs of an impulse circuit (IS) which can be controlled by step changes of a character and to an integration circuit (IT), a comparator (V) with a first input (E1) connected to the output of said integration circuit (IT) and which assumes a definite condition with each step change, a switch (S) controlled by the impulses of the impulse circuit (IS) connected in parallel with said integration circuit, a reference signal source (Uref) connected to a second input (E2) of said comparator circuit (V), and said reference signal source adjustable as a function of the desired time delay of the descending or ascending edges of the step changes.

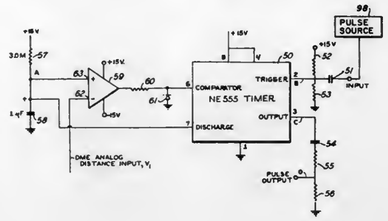
4,187,439

ANALOG CONTROL OF PULSE RATES

Andrew M. Vesel, Mount Arlington, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Continuation of Ser. No. 748,341, Dec. 7, 1976, abandoned, which is a division of Ser. No. 561,466, Mar. 24, 1975, Pat. No. 4,014,025. This application Feb. 21, 1978, Ser. No. 879,522
Int. Cl.² H03K *1/16*
U.S. Cl. 307—271 **2 Claims**

1. A pulse rate controller for receiving input pulses and generating output pulses with an output pulse rate limited by the amplitude of an analog control signal, said controller comprising:
first input means for receiving input pulses;
second input means for receiving an analog control signal;
a voltage ramp generator for generating a voltage ramp signal;
a voltage comparison circuit having a first input terminal connected to said second input means and a second input terminal connected to said voltage ramp generator and assuming a first comparison condition when the analog control signal is of a greater voltage than is the voltage ramp signal and a second comparison condition when the analog control signal is of a lesser voltage than is the voltage ramp signal;
circuit means connected to said first input means, to said voltage ramp generator, and to said voltage comparison circuit; said circuit means, in response to said voltage comparison circuit assuming said second comparison condition, assuming a first state in which said circuit means disables and discharges said voltage ramp generator to prevent generation of a voltage ramp signal; said circuit means in response to an input pulse received at said first input means assuming a second state in which said circuit means enables said voltage ramp generator to generate a voltage ramp signal; and
pulse generating means connected to said circuit means for generating an output pulse in response to said circuit means assuming said second state.

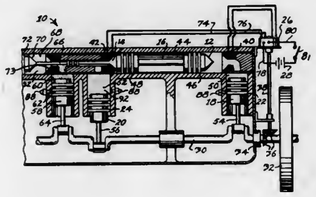


4,187,440

ELECTROMAGNETIC ENGINE

Jamie F. Ulmer, Rte. 5, Hwy. 70, Mount Juliet, Tenn. 37122

Continuation-in-part of Ser. No. 801,143, May 27, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,672
Int. Cl.² H02K *33/12*
U.S. Cl. 310—24 **1 Claim**



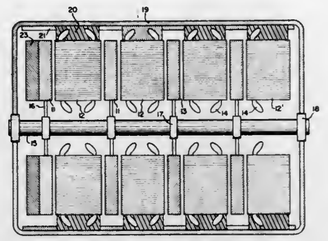
1. A reciprocating device comprising, in cooperative association,
at least one pair of pistons and connecting rods mounted in respective associated cylinder chambers,
a piston and cylinder chamber located intermediate said pair of pistons and associated chambers, the intermediate chamber being connected in fluid communication with said pair of chambers,
an electrical coil located at each end of the intermediate chamber,
means for alternately applying an electrical potential to the coils of the intermediate chamber,
the alternate application of the electrical potential to the coils being effective to move the intermediate piston back and forth in the intermediate chamber, and thereby effect translation of the pair of pistons in their respective chambers.

4,187,441

HIGH POWER DENSITY BRUSHLESS DC MOTOR

Wilford R. Oney, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 780,407, Mar. 23, 1977, abandoned. This application May 30, 1978, Ser. No. 910,677
Int. Cl.² H02K *7/20*
U.S. Cl. 310—112 **6 Claims**



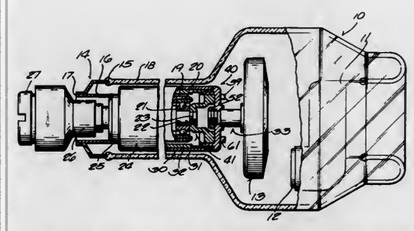
1. A high power density self-fed brushless dc motor comprising
a plurality of interleaved and alternating annular rotor disks and annular stator disks spaced from one another to establish an axial air gap between adjacent disks, and magnetic yoke means at either end of said interleaved rotor and stator disks for carrying peripheral flux which is provided at one end by a solid metal disk attached to an endmost rotor disk,
a housing having a shaft journalled for rotation therein, and mounting means for supporting said stator disks on said housing and for attaching said rotor disks for rotation with said shaft,
each rotor disk comprising a plurality of circularly spaced, opposite polarity cobalt-rare earth permanent magnet sectors,
each stator disk intermediate between two rotor disks comprising a laminated magnetic core made of spirally wound metal strip and having opposing sides and a set of radial and outwardly directed stator slots at both core sides in which are respectively inserted a stator winding.

4,187,442

ROTATING ANODE X-RAY TUBE WITH IMPROVED THERMAL CAPACITY

Robert E. Hueschen, Hales Corners, and Richard A. Jens, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,540
Int. Cl.² H01J *35/10*
U.S. Cl. 313—60 **7 Claims**



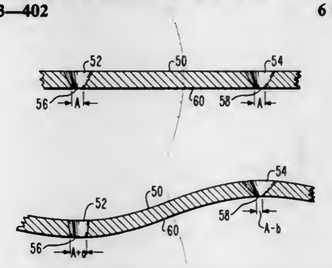
1. In a rotating anode x-ray tube comprising an envelope, a shaft journaled in bearings for rotation within said envelope, a rotatable x-ray target disk and a coaxial stem on which said disk is mounted, an elongated cylindrical element in said envelope surrounding said shaft concentrically and subject to be rotated under the influence of a magnetic field and treated on its surface for enhancing thermal emission, a rotor hub for coupling said stem to said cylindrical element and a bearing hub for coupling said rotor hub to said shaft, the improvement for increasing the thermal capacity of said tube by restricting the flow of heat flowing from said target disk to said bearings and by increasing the flow of heat flowing to said cylindrical element wherein:
said rotor hub is made of high thermally conductive molybdenum-based alloy having a conductivity at 500° C. of at least 0.29 cal/cm²/cm/sec/°C. and is comprised of no less than 99.25% of molybdenum,
said bearing hub is made of low thermally conductive nickel-based alloy having a conductivity at 500° C. of one-seventh or less than one-seventh of the conductivity of said molybdenum-based alloy and is comprised of no less than about 45% and no more than about 67% of nickel, and
said stem is composed substantially of columbium and is non-tubular.

4,187,443

COLOR PICTURE TUBE HAVING IMPROVED CORRUGATED APERTURED MASK AND METHOD OF MAKING SAME

Ralph J. D'Amato, and Richard A. Nolan, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1978, Ser. No. 940,570
Int. Cl.² B23P *15/16;* **H01J** *9/14, 29/07*
U.S. Cl. 313—402 **6 Claims**



1. In a method of constructing a corrugated mask for use in a color picture tube, wherein the mask is first apertured and thereafter formed into a corrugated shape, the improvement comprising,
in an unformed mask, forming the apertures in first locations with greater widths than the desired widths at the first locations and forming the apertures in second locations with lesser widths than the desired widths at the second locations, and
forming said mask into a corrugated shape such that the apertures in said first locations are compressed in width to the desired widths and the apertures in said second locations are stretched to the desired widths.

4,187,444

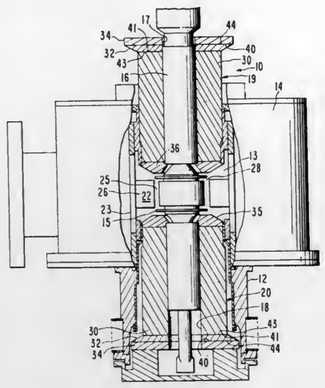
OPEN-CIRCUIT MAGNET STRUCTURE FOR CROSS-FIELD TUBES AND THE LIKE

William A. Gerard, Andover, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 19, 1978, Ser. No. 870,963
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.71 **32 Claims**

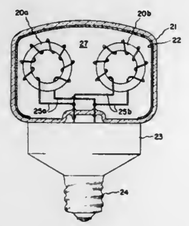
1. In an open permanent circuit defining a relatively small working gap a permanent magnet assembly comprising:
a first body comprising magnetic material including Alnico and having north and south pole faces, said body defining one boundary of said working gap with one of said pole faces;
a second body comprising magnetic material including Co-

balt in chemical union with a rare earth element and having north and south pole faces;
and a transition member comprising iron, said member being interposed between said first and second bodies in contact with opposite pole faces of said bodies such that said first



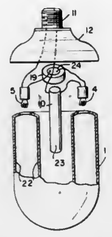
body contacts said transition member with the other of said pole faces, and said second body contacts said transition member with a pole face thereof which is polarized oppositely to said other pole face of said first body, whereby the flux density within said working gap is enhanced.

4,187,445
SOLENOIDAL ELECTRIC FIELD LAMP WITH REDUCED ELECTROMAGNETIC INTERFERENCE
John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jun. 21, 1978, Ser. No. 917,498
Int. Cl.[2] H01J *65/00;* H05B *41/24*
U.S. Cl. 315—54 **16 Claims**



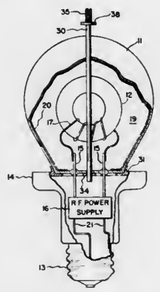
1. A solenoidal electric field lamp comprising:
a transparent envelope internally coated with a phosphor material which emits electromagnetic radiation at visible wavelengths upon stimulation by electromagnetic radiation;
a radio frequency electric energy source;
an ionizable fill gas disposed within said envelope; and
a plurality of substantially toroidal shaped magnetic cores mounted within said envelope and electromagnetically coupled to receive said radio frequency energy from said source so as to establish a varying magnetic field which establishes a solenoidal electric field which ionizes said fill gas and produces therein circulating discharge currents, said cores being so connected to said energy source and so oriented within said envelope that the magnetic dipole fields produced by said discharge currents substantially oppose each other so as to reduce the level of radio frequency electromagnetic interference radiated by said lamp.

4,187,446
SCREW-IN FLUORESCENT LAMP WITH MAGNETIC ARC SPREADING
Leo Gross, 36-11, 217 St., Bayside, N.Y. 11361, and Merrill S. Skeist, 7 Fairchild, Plainview, N.Y. 11803
Filed Sep. 21, 1977, Ser. No. 834,651
Int. Cl.[2] H01J *17/14, 17/34*
U.S. Cl. 315—58 **4 Claims**



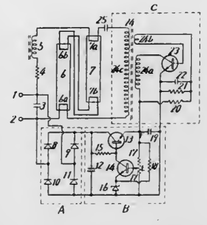
1. A fluorescent lamp comprising an outer envelope having a hollow center, partitions defining at least one chamber in said envelope, said partitions constraining the arc discharge to follow a zigzag path around the envelope, said chamber containing two electrodes to form the arc discharge, and a luminescent phosphor coating all interior walls of said chamber and envelope, ballast and circuitry means in said hollow center, and a screw-in base secured to said envelope and electrically operatively connected to said ballast and circuitry means and said filaments.

4,187,447
ELECTRODELESS FLUORESCENT LAMP WITH REDUCED SPURIOUS ELECTROMAGNETIC RADIATION
Virgil L. Stout, and John M. Anderson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Sep. 11, 1978, Ser. No. 941,126
Int. Cl.[2] H01J *1/52*
U.S. Cl. 315—85 **9 Claims**



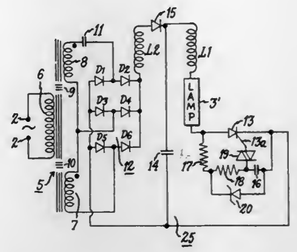
1. A fluorescent lamp exhibiting reduced electromagnetic interference comprising:
an evacuable, light-transmissive envelope of generally globular configuration;
a toroidally-shaped magnetic core;
means coupled to said core for establishing a radio frequency magnetic field about said core;
a gaseous medium within said envelope adapted to sustain an electrical discharge when subjected to said radio frequency magnetic field established about said core and to emit radiation at a first wavelength when sustaining said discharge;
a phosphor coating disposed on the interior surface of said envelope and adapted to emit visible light when excited by radiation of said first wavelength; and
a continuous, conductive loop situated about said envelope and said core, the plane of said loop being oriented substantially normal to the plane of said core, such that the radio frequency magnetic field about said core induces current within said loop that establishes a radio frequency magnetic field tending to cancel, at a distance from said lamp, the radio frequency magnetic field established about said core.

4,187,448
DISCHARGE LAMP LIGHTING DEVICE
Hisashi Kuroi; Masayoshi Miyajima, both of Kyoto, and Takao Matoba, Wakayama, all of Japan, assignors to Kuroi Kosan Co., Ltd., Kyoto, Japan
Filed Dec. 7, 1977, Ser. No. 858,473
Claims priority, application Japan, Dec. 13, 1976, 51-150133; Dec. 13, 1976, 51-150134; Dec. 13, 1976, 51-150135
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—176 **7 Claims**



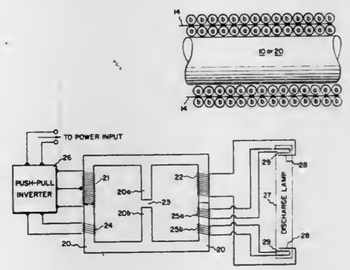
1. A circuit for turning ON a discharge lamp means and maintaining said discharge lamp means ON for an ON period of a selected duration, said discharge lamp means having a characteristic negative impedance, the improvement comprising:
first impedance means in a series loop with said discharge lamp for effectively canceling said negative impedance of said discharge lamp in said series loop when said discharge lamp is ON;
power supply means for generating a low frequency alternating current voltage commensurate with commercial power amplitude and frequency values;
means for applying said alternating current voltage from said power supply across said discharge lamp;
oscillator means for generating a high frequency alternating current voltage;
means for superposing said high frequency alternating current voltage on said low frequency alternating current voltage across said discharge lamp means during the entire ON period of said discharge lamp; and
second impedance means in said series loop between said discharge lamp means and said power supply for blocking high frequency voltages but passing the low frequency alternating current voltage of said power supply to said discharge lamp means;
whereby said discharge lamp means is maintained ON by the superposed alternating current voltages of said power supply means and said oscillator means.

4,187,449
DISCHARGE LAMP OPERATING CIRCUIT
David W. Knoble, East Flat Rock, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed May 8, 1978, Ser. No. 904,059
Int. Cl.[2] H05B *41/16*
U.S. Cl. 315—205 **15 Claims**



1. A lamp operating circuit comprising, in combination, an AC source, a ballast transformer comprising a primary winding connected to said AC source, first and second secondary windings arranged on opposite sides of said primary winding magnetically coupled thereto, and magnetic shunts separating said primary winding from the respective secondary windings, a capacitor connected to one of said secondary windings forming therewith a leading current circuit, the other secondary winding in combination with the magnetic shunt adjacent thereto forming a lagging current circuit, rectifier bridge means connected to said leading and lagging current circuits, and means for connecting lamp means to the output of said rectifier bridge means, whereby DC current of low ripple content is produced for operation of the lamp means.

4,187,450
HIGH FREQUENCY BALLAST TRANSFORMER
DeYu Chen, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 9, 1978, Ser. No. 884,767
Int. Cl.[2] H05B *41/26*
U.S. Cl. 315—278 **9 Claims**



1. A high frequency ballasting transformer providing integral ballasting and permitting non-bifilar windings comprising:
a closed loop magnetic core of low relucatance material;
a first, single layer primary winding portion having a plurality of turns and being disposed about a first portion of said closed loop core;
a second, single layer primary winding portion having a plurality of turns and being disposed about said first primary winding and being serially connected therewith;
a secondary winding having a plurality of turns and being disposed about a second portion of said closed loop core; and

a magnetic shunt with air gap therein bypassing said closed loop magnetic core, said shunt furnishing reactance in parllel with said secondary winding.

4,187,451

COLOR PICTURE DISPLAY DEVICE WITH A CIRCUIT FOR GENERATING A SCREEN GRID VOLTAGE

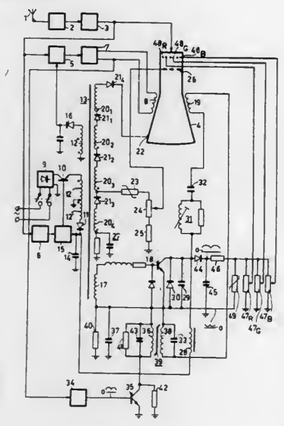
Antonius Boekhorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 8, 1978, Ser. No. 932,288

Claims priority, application Netherlands, Sep. 12, 1977, 7709969

Int. Cl.² H01J *29/52*

U.S. Cl. 315—381 **7 Claims**



1. A color picture display device comprising a color picture display tube having at least a final anode and a screen grid electrode, a high tension generator for generating a high tension for the final anode and a line deflection generator for generating a line deflection current through a line deflection coil, and comprising a rectifier for rectifying line flyback pulses for generating a supply voltage for the screen gride electrode, said generators being separated from one another, said display device furthermore comprising a field deflection generator for generating a field deflection current through a field deflection coil and an east-west raster correction generator for the field-frequency parabolic modulation of the amplitude of the line deflection current, wherein the screen grid electrode is coupled via a resistance element to a source generating a parabolic voltage of the field frequency with a curvature opposite to that obtained by rectifying the line flyback pulses, the resistance element having in operation a dynamic resistance which is many times lower than the static resistance thereof.

4,187,452

ELECTROMECHANICAL TORSIONAL OSCILLATOR WITH RESONANT FREQUENCY AND AMPLITUDE CONTROL

LaVerne F. Knappe; Roger H. Peterson, and Gary J. Stroebel, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,120

Int. Cl.² H02K *41/00*

U.S. Cl. 318—128 **8 Claims**

1. An electromagnetic actuator comprising:

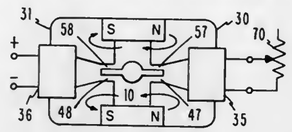
first and second "C" shaped core members of soft magnetic material each having a pair of opposing pole faces defining an air gap,

first and second permanent magnet means connecting said "C" shaped core members to create similar magnetic poles at the opposing pole faces of said "C" shaped core members,

an armature of soft magnetic material,

torsion bar means for supporting said armature for movement about the center of mass of said armature with the ends of said armature positioned largely within the air gaps of said "C" shaped core members,

a drive winding on said first "C" shaped core member, adapted to be energized with an alternating current drive



signal to create a differential flux density between said armature and opposing pole faces of said first "C" shaped core member causing said armature to move initially in the direction of the pole face having the air gap with the higher flux density and thereafter, to oscillate at the frequency of said alternating current drive signal, and

variable impedance means connected in series with said drive winding for selectively adjusting the Q of said actuator.

4,187,453

ELECTRIC MOTOR DRIVE SYSTEM

J. Kirkwood H. Rough, Palo Alto, Calif., assignor to Jim Zegeer, Alexandria, Va., a part interest

Continuation of Ser. No. 538,979, Jan. 6, 1975, abandoned. This application May 11, 1976, Ser. No. 685,482

Int. Cl.² H02K *41/02*

U.S. Cl. 318—135 **23 Claims**

1. An electric stepping motor comprising,

a thin, light, non-metallic, non-magnetic carrier member, and means mounting said carrier member for movement in a selected direction of drive,

a plurality of first conductor members, each of said first conductor members being formed on a surface of said thin carrier member and traversing a path transverse to said selected direction of drive, said first conductor members being spaced a selected distance apart and constituting a first array of active run portions, and first connector means connecting the ends of said active run portions to form a first serpentine winding,

at least a plurality of second conductor members on a surface of said thin carrier member, each traversing a companion path transverse to said direction of drive and displaced a selected distance with respect to said first plurality of conductors and constituting a second array of active run portions and second connector means connecting the ends of said second plurality of conductor members to form a second serpentine winding separate from said first serpentine winding,

means establishing a series of incremental polarized magnetic fields arranged along said direction of drive to form magnetic drive detents between the said magnetic fields and said active conductor members upon energization of said conductor members, and

means connected to the first of said serpentine windings for supplying a first operating current thereto and means connected to the second of said serpentine windings for separately supplying a second operating current thereto.

4,187,454

INDUSTRIAL ROBOT

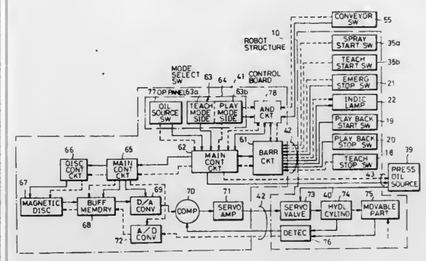
Yoshimasa Ito, Yokohama, and Junichi Ikeda, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed May 1, 1978, Ser. No. 901,841

Claims priority, application Japan, Apr. 30, 1977, 52-50105; Sep. 20, 1977, 52-112996; Sep. 20, 1977, 52-112997

Int. Cl.² G05B *19/42*

U.S. Cl. 318—568 **4 Claims**



1. An industrial robot comprising: a robot structure having a movable part; driving means for driving said movable part; detection means for detecting a substantial displacement of said movable part and for generating a position detection signal; memory means for memorizing the signal from said detection means and reading out the signal thus memorized, said memory means being capable of a plurality of operation programs corresponding to kinds of workpieces: control means adapted to control a memorizing operation and read out operation of said memory means and control of said driving means responsive to the signal read out from the memory means; program number selection means for selecting a pre-determined program connected to the control means, whereby a program corresponding to the program number thus selected by said program number selection means is read out from said memory means; workpiece conveying means for conveying a workpiece through a space in which said movable part of said robot structure moves, allowing working to said workpiece at a predetermined working place; and workpiece detection means disposed near entrance to the working place in a conveying path of said conveying means, for detecting the workpiece conveyed to the working place and to thereby send out a detection signal to said control means, said control means undergoing operation in response to the work detection signal supplied thereto.

4,187,455

STEPPER MOTOR FEEDBACK IN POSITION SERVO LOOP

Anthony N. Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1975, Ser. No. 601,816

Int. Cl.² G05B *11/18*

U.S. Cl. 318—594 **2 Claims**

1. A stepping motor position servo loop comprising:

a rotary mechanical device;

a stepper motor having a plurality of separately-energizable windings and a rotor mechanically connected to said mechanical device for rotating said device to a position determined by the particular windings which are energized by signals applied thereto;

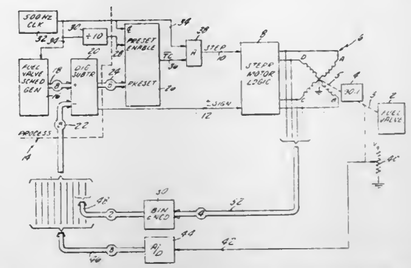
first means connected to said mechanical device for generating a first digital word indicative of the position of said mechanical device comprising a plurality of high order data bits and a number of low order data bits;

second means separately connected to each of the windings of said stepper motor and responsive to the particular windings being energized for generating a second digital word having said number of bits and representative of the position of said stepper motor;

third means for presenting a digital word indicative of a position command for said mechanical device;

means responsive to said first, second and third means for subtracting a digital word, consisting of said second digital word and said plurality of high order bits of said first digital word, from said position command digital word for generating a position error manifestation; and

means responsive to said position error manifestation for applying signals to particular windings of said stepper motor for controlling the position thereof and over corresponding connections to said second means.



4,187,456

INCREMENTAL POSITIONING SYSTEM

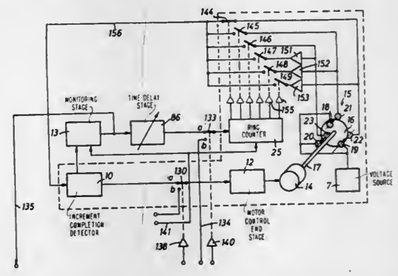
Johann von der Heide, Mönchweiler, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen/Schwarzwald, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,784

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647956

Int. Cl.² G05B *5/01*

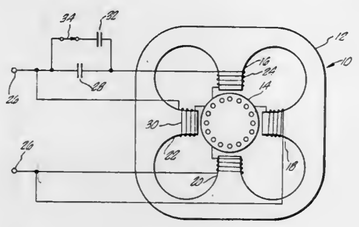
U.S. Cl. 318—616 **6 Claims**



1. In an incremental positioning system of the type including a positioning motor, an incremental-displacement transducer coupled to the positioning motor and operative for generating a transducer output signal comprised of periodic signal components indicating successive increments of displacement of the positioning motor, position-control means receiving the transducer output signal and operative for causing the positioning motor to become arrested upon completion of any of the positioning-motor displacement increments indicated by any of the periodic signal components of the transducer output signal by applying to the positioning motor an actuating signal derived from the transducer output signal and dependent upon a component proportional to the transducer output signal and a component proportional to the time-derivative of the transducer output signal, a novel incremental-displacement transducer, the novel incremental-displacement transducer comprising a plurality of light detectors; a synchronizing structure

coupled to the positioning motor for movement therewith and moving through the light paths of the light detectors causing the light detectors to each generate a respective one of a plurality of mutually phase-shifted first periodic signal components; and signal-processing means operative for increasing the number of periodic signal components in the transducer output signal and thereby increasing the number of definite positions at which the position-control means can cause the positioning motor to become arrested by deriving from the first signal components second periodic signal components phase-shifted relative to the first signal components and combining the first and second signal components to form the transducer output signal.

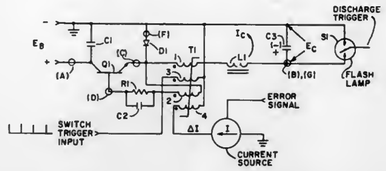
4,187,457
POLYPHASE ELECTRIC MOTOR HAVING CONTROLLED MAGNETIC FLUX DENSITY
Cravens L. Wanlass, 9871 Overhill Dr., Santa Ana, Calif. 92705
Continuation-in-part of Ser. No. 597,529, Jul. 21, 1975, Pat. No. 4,063,135. This application Apr. 25, 1977, Ser. No. 790,758
Int. Cl.² H02F *1/44*
U.S. Cl. 318—729 **52 Claims**



1. A polyphase electric motor comprising:
a stator including a core of magnetic material;
a rotor;
a main polyphase stator winding wound on said core and encompassing said magnetic material, said winding comprising a plurality of coils, each coil representing a single phase;
a plurality of input terminals adapted to be connected to a source of polyphase AC voltage;
a plurality of capacitors; and
means connecting each of said coils in a series circuit with one of said capacitors and said series circuits being connected with said input terminals;
each of said capacitors being capable of being charged to a voltage sufficient, when added to said AC voltage, to develop a volt-second value across the magnetic material of said stator core greater than the volt-second capacity of said magnetic material so that said magnetic material will periodically be driven into saturation in opposite directions upon changes in polarity of the phases of said polyphase AC voltage.

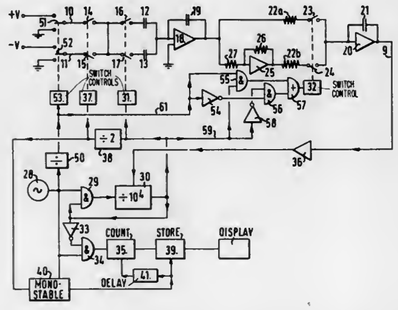
4,187,458
CONSTANT POWER REGENERATIVE MAGNETIC SWITCHING REGULATOR
Walter E. Milberger, Severna Park, Md., and Larry G. Wright, Salisbury, N.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 7, 1978, Ser. No. 931,356
Int. Cl.² H02M *3/335*; G05F *1/56*
U.S. Cl. 323—17 **5 Claims**

1. A constant power regenerative magnetic switching regulator comprising: a transistor, a diode, a transformer having a plurality of windings, a choke, and a load capacitance, said transistor being adapted to receive a collector input voltage signal and being emitter output coupled in series through a first winding of said transformer and said choke to said output capacitance, a circuit common being coupled to said output capacitance to provide a complete charging path therethrough, said diode being coupled between said transistor emitter output and said circuit common, and said transformer being adapted for receiving a switching trigger input signal across a second of said plural windings, said transistor base is coupled through a third of said transformer windings to said



emitter diode junction for providing biasing levels to said transistor, a fourth winding of said plural transformer windings is adapted to receive a biasing current signal therethrough, and a current amplifier coupled between the output capacitor and said fourth transformer winding, said current amplifier having a reference signal input for comparing with the signal developed across said output capacitor to provide a variable control signal output to said fourth transformer winding.

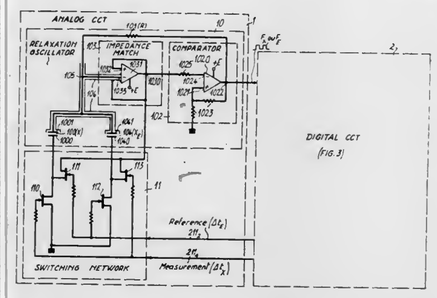
4,187,459
DIGITAL MEASUREMENT OF IMPEDANCE RATIOS
Peter C. F. Wolfendale, Milton Keynes, England, assignor to Automatic Systems Laboratories Limited, Bedfordshire, England
Filed Feb. 13, 1978, Ser. No. 877,542
Int. Cl.² G01R *27/26*
U.S. Cl. 324—60 C **6 Claims**



1. A circuit arrangement for measuring the ratio of the values of first and second electrical capacitances, and arrangement comprising:
(a) means for switching a supply voltage to provide an alternating supply voltage to each of said first and second capacitances,
(b) synchronous demodulator means,
(c) amplifying means coupling said capacitances to said synchronous demodulator means,
(d) said synchronous demodulator means being connected to demodulate the alternating supply signal transmitted from said capacitors,
(e) integrator means connected to receive the demodulated signal to provide an integral signal representative of the time-integral thereof,
(f) control means providing a control signal to control said switch means, said control signal having first and second values whereby to provide a cycle of operation having two stages, namely a first stage wherein said alternating

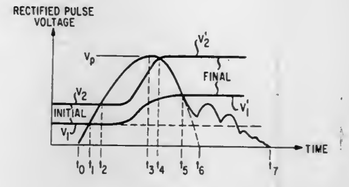
supply voltage is applied to said first capacitance for a first predetermined interval of time and the value of said integral signal increases from a threshold value to a value dependent on the value of said first capacitance during said first time interval and a second stage in which said alternating supply voltage is applied to said second capacitance and the value of said integral signal returns to said threshold value in a second interval of time, the value of said second interval being dependent on the value of said second capacitance, and
(g) means for determining the value of said second time interval relative to said first time interval to provide an indication of the ratio on the values of the first and second capacitances.

4,187,460
CAPACITANCE MEASURING BY COMPARISON TO REFERENCE CAPACITANCE
Gilbert V. Dauge, Lagny, and Jacques F. Langlais, Coudray Montceaux, both of France, assignors to Testut Aequitas, Paris, France
Filed Sep. 25, 1978, Ser. No. 945,413
Claims priority, application France, Sep. 23, 1978, 77 28758; Sep. 13, 1978, 78 26295
Int. Cl.² G01R *27/26*
U.S. Cl. 324—60 CD **10 Claims**



1. A capacitance measuring device for measuring the capacitance X of a first capacitor by means of the comparison of the charge and discharge periods of a second capacitor having a calibrated reference capacitance X_E with said first capacitor during two successive reference and measuring phases of a comparison cycle, said device comprising:
an oscillating circuit including one of said first and second capacitors and having an oscillation period proportional to the capacitance of said included capacitor and a high stability,
switching means for connecting at the beginning of each of said reference and measuring phases said second and first capacitors in said oscillating circuit respectively,
means for counting a predetermined number N_E of pulses delivered from said oscillating circuit during said reference phase so as to define a determined duration of said reference phase and for counting a number N_X of pulses delivered from said oscillating circuit during said measuring phase, the ratio of said oscillation pulse numbers N_E and N_X being inversely proportional to the ratio of said capacitances X_E, X of said second and first capacitors,
timing means for generating pulses having at least a clock frequency,
means for counting and down-counting said clock pulses during said reference and measuring phases respectively,
means controlled by said counting means for changing the counting condition to the down-counting condition of said counting and down-counting means when the count of said counting means is equal to said predetermined number N_E at the end of said reference phase,
means controlled by said counting and down-counting means for stopping the counting of said counting means when the count of said counting and down-counting means is equal to zero at the end of said measuring phase so that the duration of said measuring phase is equal to or in a predetermined ratio R with said determined duration of said reference phase,
means for computing a physical quantity proportional or inversely proportional to the value $(N_E X_E)/(R\ N_X)$ equal to said capacitance X of said first capacitor, and
means for displaying the value of said physical quantity.

4,187,461
DYNAMIC THRESHOLD IMPULSE DIRECTIVITY INDICATOR
Philip P. Cox, Piscataway, N.J., assignor to Dranetz Engineering Laboratories, Inc., South Plainfield, N.J.
Filed Feb. 21, 1978, Ser. No. 879,234
Int. Cl.² G01R *19/00, 31/08*
U.S. Cl. 324—102 **11 Claims**

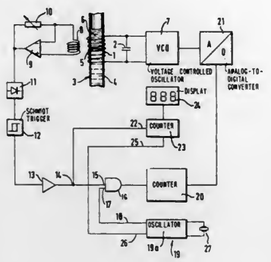


8. In a circuit for indicating the direction of origin of a transient disturbance the combination comprising:
means for preliminarily storing indications of the polarities of the transient current and voltage accompanying said disturbance while the magnitude of said disturbance is rising through a first threshhold; and
means thereafter controlled while said magnitude of said disturbance is passing through a second threshhold higher than said first threshhold for displaying said stored indication.

4,187,462
ELECTRONIC SYSTEM FOR DETERMINING BLOOD SEDIMENTATION RATE USING A CONTINUALLY RETUNED RESONANT CIRCUIT
Rolf Haker, Frankenthal; Klaus Schrader, Heidelberg, and Joachim Thiery, Mannheim, all of Fed. Rep. of Germany, assignors to Labora Mannheim GmbH fur Labortechnik, Mannheim, Fed. Rep. of Germany
Filed Jan. 20, 1978, Ser. No. 870,939
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702557
Int. Cl.² G01R *33/12*
U.S. Cl. 324—204 **8 Claims**

1. Electronic system for determining the blood sedimentation rate of erythrocytes in plasma in a substantially vertical test tube, where the electrical or magnetic property of a given volume of liquid in the test tube, changed by the sedimentation of the erythrocytes, is measured as a function of time, comprising a voltage-controlled oscillator with an output circuit which is coupled with the volume of liquid to be measured for change in property with time, in which output circuit a tuned L-C circuit, connected to the voltage-controlled oscillator, is inductively coupled with its coil to the volume of liquid to be measured at a defined height of the test tube; another coil inductively coupled to said coil of the tuned L-C circuit; and delivering high voltage if said L-C circuit is at resonance, and low voltage if said L-C circuit is out of resonance; a retuning

circuit formed of a pulse-forming circuit and a tuning circuit connected in series, said pulse-forming circuit being connected to said other coil and delivering an output pulse of a defined logic state when said L-C circuit is out of resonance; a pulse counter connected to said pulse-forming circuit for receiving and counting said output pulses of said pulse-forming circuit, a quartz-stabilized oscillator connected to said pulse counter for delivering a quartz time base for the counting process in said counter and a pulse sequence to a first input of the tuning

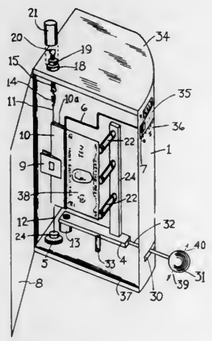


circuit, a second input of said tuning circuit being connected to an output of said pulse-forming circuit, and an output of said tuning circuit being connected to the input of said voltage-controlled oscillator, said tuning circuit getting pulses of said pulse sequence, when said pulse-forming circuit delivers an output pulse, and generating a voltage change, which lasts until resonance is again established, said pulse counter indicating the number of retunings of the voltage controlled oscillator within said time base and therefore the sedimentation rate of erythrocytes.

4,187,463
COUNTERFEIT DETECTOR FOR PAPER CURRENCY

Gilbert Kivenson, 22030 Wyandotte St., Canoga Park, Calif. 91303

Filed Apr. 20, 1978, Ser. No. 898,376
Int. Cl.² G07O 7/00
U.S. Cl. 324—228 **1 Claim**



1. In a counterfeit detector for United States paper currency which makes use of the magnetic properties of the imprinted ink as its operating principle, an assembly comprised of the following:

a. a pinch clamp for firmly grasping a sample of paper currency, said clamp being mounted between flexible suspension elements which are in turn supported at their extremities and maintained in tension, said flexible suspension elements permitting elastically restrained motion of the pinch clamp and its grasped sample of paper currency;

b. an indicating means mounted on said clamp for the measurement of clamp motion;

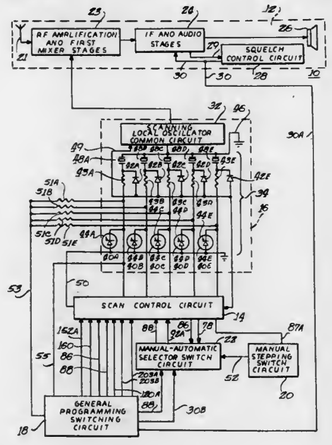
c. a moveably mounted magnet which can be brought into contact with said currency sample and then drawn away, inducing initial adherence between genuine currency and said magnet, and then, a separation with increased magnet movement because of increased counter torque of said flexible suspension elements;

d. a scale fixedly mounted with reference to said indicating means and calibrated to facilitate the reading of the separation point, said point being within a limited range of clamp motion if the currency being tested is not counterfeit.

4,187,464
SCANNING RECEIVER

Joseph T. Yiu; Jeffrey G. Lea, both of Lincoln, and Roy L. Holmes, Lexington, all of Nebr., assignors to Hy-Gain de Puerto Rico, Inc., Lincoln, Nebr.

Filed Jul. 14, 1977, Ser. No. 815,577
Int. Cl.² H04B 1/32
U.S. Cl. 325—470 **17 Claims**



1. Radio apparatus comprising:

radio frequency means for receiving radio frequency energy;

signal processing means for selecting certain wavelengths of said radio frequency energy and for producing audio intelligence from said wave lengths of radio frequency energy;

said signal processing means including mixer means for converting radio frequency energy to lower frequency energy;

control means for selecting the frequency of radio frequency energy that is to be converted to lower frequency energy;

said control means including oscillator means for repeatedly generating a series of selected frequencies from a plurality of different frequency local oscillations for transmission to said mixer means, whereby a plurality of frequencies are repeatedly scanned and signal means for generating a series of control signals differentiating between each of said different frequency local oscillations to be transmitted to said mixer means and certain other of said plurality of frequencies in each scan;

programming means for generating programming signals representing at least one programmed frequency in said series of frequencies of a scan;

said signal means including control-signal means for changing said control signals in response to said programming signals whereby different frequencies of said plurality of

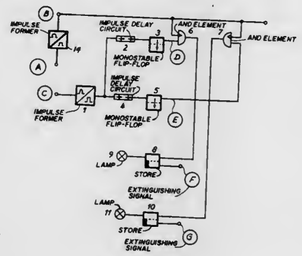
different frequencies in a scan are applied to said mixer means; and

said control signal means including memory means for recording said programming signals and read means for reading said programming signals from said memory means at least as soon as said control signal generating means generates a control signal representing said programmed frequency in said scan.

4,187,465
DEVICE FOR PROTECTION AGAINST TRANSMISSION ERRORS IN AN INFORMATION TRANSMISSION SYSTEM

Kurt Garbrecht, Neuried, and Bernhard Hildebrandt, Hochbrück, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,600
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618148
Int. Cl.² H04B 1/00
U.S. Cl. 325—31 **2 Claims**

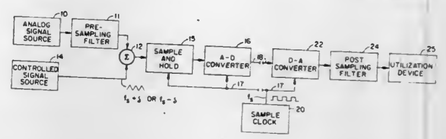


1. A system for protection against the presence of transmission errors in an information transmission system in railroad systems having an interrogation apparatus means for emitting a periodically variable frequency interrogation signal within a specified frequency band formed of successive frequency ranges, each frequency range being formed of a plurality of sub-ranges, and a reply apparatus means for dampening the interrogation signal in at least one sub-range in accordance with information to be transmitted, said reply apparatus means frequency-selectively reflecting the interrogation signal to the interrogation apparatus means and providing a characteristic power penetration in the at least one sub-range, said system comprising: a first means for producing a first impulse sequence whose impulses lie centrally at a border of all of said sub-ranges, a first comparator means, and an interference signal device means for providing an interference signal if said comparator means determines that a center of the power penetration lies within one of the impulses at the border of the respective sub-range, a second means for producing a second impulse sequence whose impulses lie centrally at the border of all of said sub-ranges and which are wider than the impulses of the first impulse sequence, a second comparator means, and an alert signal device means for providing an alert signal if said second comparator means determines that the center of the power penetration lies within one of the impulses of the second impulse sequence at the border of the respective sub-range.

4,187,466
SIGNAL INJECTION TECHNIQUE

James M. Kasson, San Mateo, and Martin H. Graham, Berkeley, both of Calif., assignors to Rolm Corporation, Santa Clara, Calif.

Filed Jan. 16, 1978, Ser. No. 869,745
Int. Cl.² H04B 1/00
U.S. Cl. 325—42 **22 Claims**



1. A method for reducing noise in a digital information transmission system, said method comprising the steps of:

a. generating an analog input signal having a spectral content lying within a predetermined operating frequency band;

b. generating a periodic controlled signal having a spectral content substantially devoid of frequency components within the limits of said operating frequency band;

c. providing a digital signal at a pre-selected sampling rate to a transmission medium, said digital signal representing a composite of said analog input signal and said periodic controlled signal, said analog input signal being quantized with a predetermined number of quantizing levels of predetermined magnitude, and said periodic controlled signal having an amplitude satisfying the conditions of the uniform probability density functions and a peak-to-peak amplitude of not less than one quantization level;

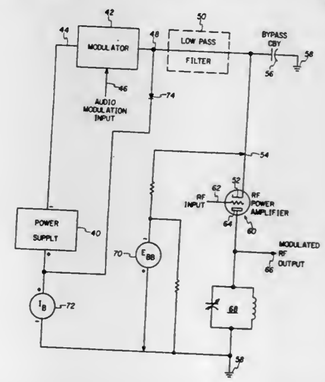
d. converting said digital signal to analog form at a receiving end of said transmission medium; and

e. filtering said converted analog signal to remove substantially all frequency components lying outside of said predetermined operating frequency band.

4,187,467
GROUNDED RF POWER AMPLIFIER CIRCUIT APPARATUS

Forest M. Cummings, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

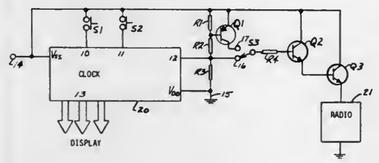
Filed Feb. 24, 1978, Ser. No. 881,098
Int. Cl.² H04B 17/00
U.S. Cl. 325—133 **11 Claims**



1. The method of reducing hazardous voltage potentials on anode voltage meters used in the final stage of an RF power amplifier of a radio transmitter comprising, the steps of:

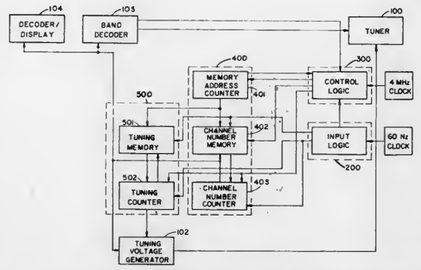
connecting an anode of a RF power amplifier tube to DC ground potential;
connecting a series circuit cathode modulator between the cathode of said RF tube and a high negative voltage power terminal with respect to said DC ground potential; and
connecting an anode voltage meter in parallel with RF power amplifier tube for measuring anode-to-cathode voltage.

4,187,468
ELECTRONIC CLOCK RADIO HAVING NAP/SLEEP FEATURE
Lin Kao, Hong Kong, Hong Kong, assignor to GTE Sylvania Far East Limited, Kowloon, Hong Kong
Filed Apr. 25, 1977, Ser. No. 790,441
Claims priority, application United Kingdom, Jun. 29, 1976, 27122/76
Int. Cl.[2] H04B *1/06;* G04C *21/16*
U.S. Cl. 325—396 **1 Claim**



1. Apparatus comprising:
a clock integrated circuit having a clock input connection to which a first energizing potential may be applied and an output connection, said circuit also having first and second mutually exclusive electric states, said circuit normally being in said first state and being placed in said second state for a selected interval of time after said first potential is applied to said clock input connection, said circuit including means for selecting the duration of said interval for time intervals not greater than 60 minutes;
a radio having a radio input connection and normally being in an OFF state, said radio being placed in an ON state upon receiving a second energizing potential applied to said radio input connection;
NAP/SLEEP switch means connected to said clock circuit input connection for supplying said first energizing potential to said clock; and
control means including a two position manually operable switch and being connected to said radio input connection, said control means when said switch is in one position supplying said second potential to said radio input when said clock circuit is in the first state, and said control means when said switch is in the other position also supplying said second potential to said radio input when said clock circuit is in said second state, wherein said control means further comprises:
a ground potential terminal;
a first terminal for connection to a source of energizing potential;
a first transistor having a base, emitter, and collector, said emitter being connected to said first terminal;
a second transistor having a base, emitter and collector, said collector of said second transistor being connected to said first terminal;
a third transistor having a base, emitter and collector, said collector of said third transistor being connected to said first terminal, said base of said third transistor being connected to said emitter of said second transistor, and said emitter of said third transistor being connected to said radio input;
said manually operable switch having a common terminal and first and second switch terminals, said first switch terminal being connected to said clock output and said second switch terminal being connected to said collector of said first transistor;
a first resistor connected between said first terminal and said base of said first transistor;
a second resistor connected between said base of said first transistor and said clock output;
a third resistor connected between said clock output and said ground potential; and
a fourth resistor connected between the common terminal of said switch and said base of said second transistor.

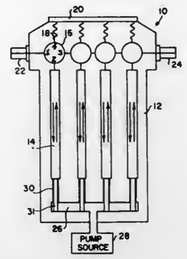
4,187,469
LIMITED CHANNEL TELEVISION RECEIVER WITH ORGANIZED MEMORY
Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.
Filed Oct. 7, 1977, Ser. No. 840,340
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—464 **15 Claims**



10. A tuning system for a television receiver including a limited location channel number memory for storing tuning information corresponding to desired television signals comprising:
a channel number counter;
a memory address counter, initially scanning all said memory locations responsive to operation of said channel number counter;
means for entering channel numbers and channel number-related tuning information in said memory locations;
a tuning voltage generator;
means for reading out said information for controlling said tuning voltage generator; and
sequence means for controlling said memory address counter such that said memory locations are subsequently read out in channel number irrespective of the order of entry of said tuning information.

4,187,470
DIELECTRIC-LOADED WAVEGUIDE CIRCULATOR FOR CRYOGENICALLY COOLED AND CASCADED MASER WAVEGUIDE STRUCTURES
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert C. Clauss, La Crescenta, and Rex B. Quinn, La Canada, both of Calif.
Filed Feb. 9, 1978, Ser. No. 876,432
Int. Cl.[2] H01S *1/00*
U.S. Cl. 330—4 **10 Claims**

1. A dielectrically loaded four-port waveguide circulator for use with a reflected-wave maser connected to a second port opposite a fourth port between first and third ports thereof to form one of a plurality of cascaded maser waveguide structures, wherein said fourth port is connected to a waveguide loaded with microwave energy absorbing material, said third port of one maser waveguide structure is connected by a waveguide loaded with dielectric material to the first port of an adjacent maser waveguide structure, and the second port is connected to a reflected-wave maser by coupling means which passes the signal energy to be amplified into and out of the reflected-wave maser and blocks pumping energy in the reflected-wave maser from entering the circulator.

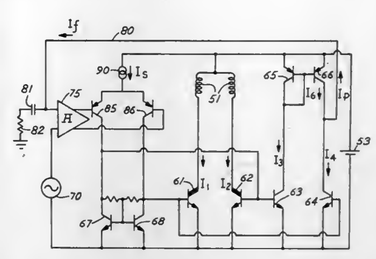


4,187,471
BIAS CIRCUIT
Yutaka Shimoji, Ebina, and Youichi Arai, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 21, 1978, Ser. No. 935,646
Claims priority, application Japan, Sep. 2, 1977, 52-104722
Int. Cl.[2] H03F *3/189, 3/68*
U.S. Cl. 330—277 **16 Claims**

1. An amplifier circuit, having a bias circuit, comprising a pair of amplifier modules each of said pair of amplifier modules having an input and an output and at least one directional quadrature coupler operatively connected to said pair of amplifier modules, said at least one directional quadrature coupler having four ports including an isolation port, wherein said bias circuit is directly connected to said isolation port of said at least one directional quadrature coupler and wherein a dc bias current is supplied from said isolation port to said pair of amplifier modules through said at least one directional quadrature coupler.

4,187,472
AMPLIFIER EMPLOYING MATCHED TRANSISTORS TO PROVIDE LINEAR CURRENT FEEDBACK
Dooho Yum, Elk Grove Village, Ill., assignor to Beltone Electronics Corporation, Chicago, Ill.
Filed Jan. 30, 1978, Ser. No. 873,217
Int. Cl.[2] H03F *1/34*
U.S. Cl. 330—260 **6 Claims**

1. A solid-state linear amplifier comprising, in combination,
a high-gain amplifier having an input and an output,
a source of signals connected to supply an input signal current to the input of said amplifier,
a load circuit,
at least one bipolar junction output transistor having its collector connected to said load circuit,
a bipolar junction feedback transistor, said feedback and said output transistors having substantially identical compositions and substantially different effective junction areas,
means for connecting the output of said amplifier across the base-emitter junction of both said output transistor and said feedback transistor,



and means for connecting the collector of said feedback transistor to the input of said amplifier.

4,187,473
ELECTRONIC PHASE LOCKED LOOP CIRCUIT
Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 791,264, Apr. 27, 1977, Pat. No. 4,126,831.
This application May 8, 1978, Ser. No. 903,422
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—8 **2 Claims**

1. A phase locked loop circuit comprising:
(a) a sawtooth signal generator means having an input for receiving a reference clock signal, said generator means being responsive to said reference clock signal for generating a sawtooth-shaped signal with the same period as said reference clock signal;
(b) sample and hold circuit means comprised of:
(i) a first MOS transistor having source, drain and gate electrodes, the source electrode being coupled to said sawtooth generator means for receiving said sawtooth-shaped signal and the gate electrode being coupled to receive a digital sampling clock signal of selectively controllable clock rate;
(ii) an MOS load transistor;
(iii) an MOS source transistor serially coupled to said load transistor, said source transistor having a gate electrode coupled to the drain electrode of said first MOS transistor for receiving samples of said sawtooth-shaped signal and having a Miller capacitance for holding the most current sample of said sawtooth-shaped signal; and
(iv) output means coupled to said source transistor for generating a phase detection signal of a magnitude proportional to the magnitude of a sample held by said Miller capacitance;
(c) programmable counter means coupled to receive multibit digital commands from a digital processor means for generating said digital sampling clock signal at a clock rate selected according to said multibit digital commands;
(d) a voltage-controlled oscillator circuit coupled to the output means of said sample and hold circuit means, said oscillator circuit for generating an output clock signal at a

frequency proportional to the magnitude of said phase detection signal; and

(e) a feedback loop coupling said voltage-controlled oscillator circuit to said programmable counter means for selectively locking the phase locked loop circuit to a frequency selected by said digital processor means.

4,187,474

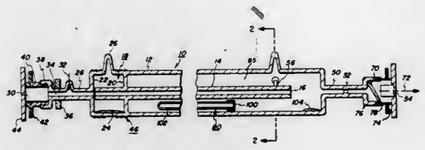
METAL VAPOR LASER DISCHARGE TUBE

William F. Hug, Pasadena; Randolph W. Hamerdinger, Glendora; Phillip D. Dunn, West Covina, and Robert C. McQuillan, Glendora, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1977, Ser. No. 823,553

Int. Cl.[2] H01S *3/02*

U.S. Cl. 331—94.5 D **8 Claims**



1. A gas laser comprising an envelope having opposite open ends; an active gaseous medium disposed within said envelope, said medium comprising a mixture of gases or materials including at least one component having a lower ionization potential than the ionization potential of at least one other component in said mixture; at least one anode and at least one cathode disposed within said envelope; means for applying a DC voltage between said anode and said cathode to provide a discharge in said active gaseous medium which results in stimulated emission gain for continuous wave generation of laser radiation; means adjacent to said anode for supplying the low ionization potential component of said gaseous mixture which flows after ionization by DC cataphoresis in the direction of said cathode during the continuous wave generation of said laser radiation; means for continuously removing said low ionization potential component from said gaseous mixture and from the path of said laser radiation after it has flowed over said mixture length; means disposed at the opposite ends of said gas envelope for sealing said envelope open ends; an active reservoir control which controls said low ionization potential component; and loss compensation means for said other component in said mixture, said loss compensation means comprising a member containing additional amounts of said other component, a predetermined amount of said additional other component entering into said envelope from said member during operation of said gas laser.

4,187,475

CONTINUOUSLY VARIABLE LASER OUTPUT COUPLER

Irwin Wieder, Los Altos, Calif., assignor to Analytical Radiation Corp., Los Altos, Calif.

Filed Jan. 5, 1978, Ser. No. 867,005

Int. Cl.[2] H01S *3/08*

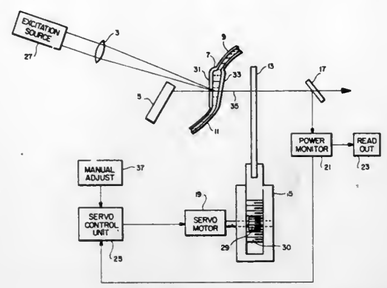
U.S. Cl. 331—94.5 S **12 Claims**

1. A method for optimizing the output of a laser comprising:

providing as part of a laser cavity an output mirror with a range of transmission values, said transmission values varying in a known way as a function of wavelength and position along a gradient,

monitoring the output power of said laser, and

moving said output mirror along a gradient in the plane of said output mirror so that said plane remains essentially



perpendicular to the laser beam axis, and until said monitored output power is optimized.

4,187,476

SHF BAND OSCILLATOR CIRCUIT USING FET

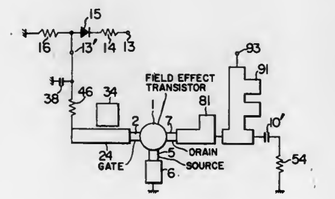
Keiro Shinkawa; Hiroji Shoyama, and Chuichi Sodeyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 30, 1978, Ser. No. 873,526

Claims priority, application Japan, Jan. 31, 1977, 52-8650; Jan. 31, 1977, 52-8651; Feb. 14, 1977, 52-14232; Feb. 14, 1977, 52-14233

Int. Cl.[2] H03B *5/04, 5/18*

U.S. Cl. 331—117 D **5 Claims**



1. An oscillation circuit using a field effect transistor which compensates for the change of an oscillation frequency due to a change of ambient temperature, and generates a signal at an SHF band frequency, comprising:

first means having an input terminal connected to a gate of said field effect transistor and applying feedback between an output terminal and the input terminal of said field effect transistor;

a microstrip line connected to the gate of said field effect transistor;

a first resistor having an impedance approximately equal to the characteristic impedance of said microstrip line and connected to a terminal end of said microstrip line;

second means including said first resistor and a temperature sensitive semiconductor device for applying a bias voltage to said gate wherein said bias voltage changes with the change of the ambient temperature; and

a resonator arranged adjacent to said microstrip line and having a resonance frequency approximately equal to a desired oscillation frequency.

4,187,477

NOISE REDUCTION SYSTEM

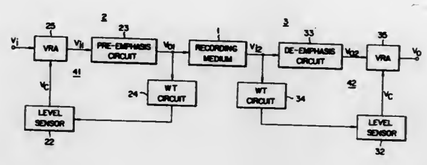
Kenjiro Endoh; Motokazu Ohkawa, both of Yokohama; Kazuo Kitagawa, Kawasaki, and Hideshi Kira, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

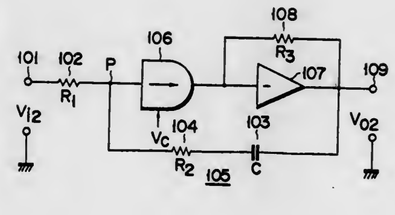
Filed Oct. 21, 1977, Ser. No. 844,435

Claims priority, application Japan, Oct. 21, 1976, 51-126565

Int. Cl.[2] H04B *1/64*

U.S. Cl. 333—14 **8 Claims**





1. A noise reduction system having an encoder for compressing the dynamic range of an audio input signal in accordance with the amplitude thereof and for delivering the compressed audio signal to a signal transmission medium, and a decoder for expanding the dynamic range of an audio signal reproduced from the signal transmission medium in accordance with the amplitude thereof, said noise reduction system comprising: a first controlled amplifier circuit provided in the encoder in which, when the input signal is in the low- and middle-level, the high-frequency range of the signal is sufficiently emphasized and, when the signal is high, the emphasis quantity in the high-frequency range is restrictive; and the decoder including a second controlled amplifier circuit having a transfer function related to that of said first controlled amplifier circuit substantially in inverse-function manner; said second controlled amplifier including a voltage-current converting circuit for converting the voltage of the reproduced audio signal into current and a first variable response amplifier having a series circuit including a capacitor and a resistor connected at one end to the output of the voltage-current converting circuit and at the other end to the output terminal of the variable response amplifier, a current amplifier with variable gain for amplifying current obtained from the connection point between said voltage-current converting circuit and said series circuit, and a current-voltage converting circuit for converting the output current of said current amplifier into voltage to be directed to the output terminal of the decoder through the output terminal of the first variable response amplifier.

4,187,478

NOISE REDUCTION SYSTEM HAVING SPECIFIC ENCODER CIRCUITRY

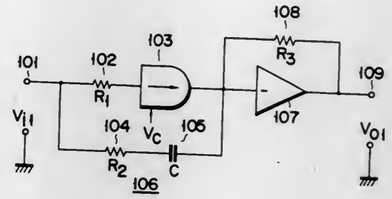
Kenjiro Endoh; Motokazu Ohkawa, both of Yokohama; Kazuo Kitagawa, Kawasaki, and Hideshi Kira, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 21, 1977, Ser. No. 844,436

Claims priority, application Japan, Oct. 21, 1976, 51-126564

Int. Cl.[2] H04B *1/64*

U.S. Cl. 333—14 **8 Claims**



1. A noise reduction system having an encoder for compressing the dynamic range of an audio input signal in accordance with the amplitude thereof and for delivering the compressed audio signal to a signal transmission medium, and a decoder for expanding the dynamic range of an audio signal reproduced from the signal transmission medium in accordance with the amplitude thereof, said noise reduction system comprising: a first controlled amplifier circuit provided in the encoder in which, when the input signal is in the low- and middle-level, the high-frequency range of the signal is sufficiently emphasized and, when the signal is high, the emphasis quantity in the high-frequency range is restrictive; and a second controlled amplifier circuit provided in the decoder and having a transfer function related to that of said first controlled amplifier circuit substantially in inverse-function manner; said first controlled amplifier circuit including a first variable response amplifier having a first resistor connected at one end to the input terminal of the encoder, a current amplifier with variable gain for amplifying current extracted from the other end of said first resistor, a series circuit having a second resistor and a capacitor and connected at one end to the input terminal of the encoder, and means for adding the output current of the other end of the series circuit with the output current of the current amplifier and means for converting the summed current into voltage directed to the output terminal of the encoder.

4,187,479

VARIABLE EQUALIZER

Kohei Ishizuka, Hachioji; Yoshitaka Takasaki, Tokorozawa; Yasuhiro Kita, Hachioji; Yoshinori Nagoya, Yokohama, and Takeo Kusama, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1977, Ser. No. 860,098

Claims priority, application Japan, Dec. 22, 1976, 51/153377

Int. Cl.[2] H03H *7/14*

U.S. Cl. 333—28 R **6 Claims**

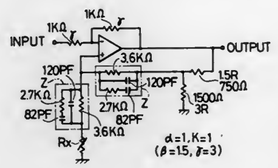
1. In a variable equalizer comprising:

a differential amplifier which has a first anti-phase input terminal, a second in-phase input terminal, and an output

terminal forming the output terminal of the variable equalizer;

a first circuit which applies a voltage of an input signal to-be-equalized which is applied to an input terminal of said variable equalizer to the first anti-phase input terminal of the differential amplifier, said first circuit including a first resistance element which is connected between said input terminal of said variable equalizer and said first anti-phase input terminal, and a second resistance element which is connected between said output terminal of said variable equalizer and said first anti-phase input terminal; and

a second circuit which applies a voltage of said input signal to-be-equalized which is applied to said input terminal of said variable equalizer to the second in-phase input terminal of the differential amplifier, said second circuit including a voltage divider having a voltage dividing terminal, one end of which voltage divider is connected to one of said input terminal and said output terminal of said variable equalizer and the other end of which is grounded, and first and second impedance circuits and a variable resistor which are connected in series between said voltage dividing terminal and ground with the first impedance circuit connected to said voltage dividing terminal, the second impedance circuit connected to the first impedance circuit, and the variable resistor connected between the second impedance circuit and ground, wherein a junction point between said first and second impedance circuits is connected to said second in-phase input terminal of said differential amplifier.



4,187,480

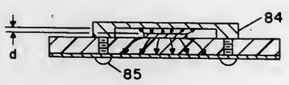
MICROSTRIP NETWORK HAVING PHASE ADJUSTMENT

Richard F. Frazita, Deer Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 783,237, Mar. 31, 1977, Pat. No. 4,117,494. This application May 12, 1978, Ser. No. 905,496

Int. Cl.² H01P *3/08, 1/18, 9/00*

U.S. Cl. 333—161 **2 Claims**



1. A phase adjustable microstrip transmission line comprising:

a ground plane;

a dielectric substrate attached to said ground plane;

a conductive strip attached to said substrate; and

a conductive plate on the side of said strip away from said substrate and separated from said strip by a selected spacing and having a length in the direction of said conductive strip which corresponds to an integral number of half wave lengths of a signal on said microstrip to thereby vary the fields of signals on said microstrip so as to adjust the transmission phase of said transmission line.

4,187,481

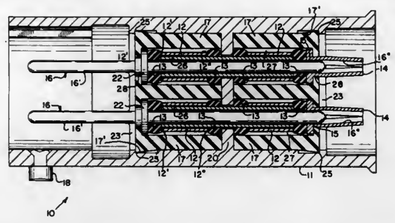
EMI FILTER CONNECTOR HAVING RF SUPPRESSION CHARACTERISTICS

Kamal S. Boutros, Downsview, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 23, 1977, Ser. No. 863,642

Int. Cl.² H03H *17/04, 13/00;* **H01R** *17/10, 17/12*

U.S. Cl. 333—182 **6 Claims**



1. An electrical connector assembly capable of attenuating electromagnetic and radio frequency interference comprising:

an electrically conductive shell including a generally transverse ground plate formed integrally therewith;

at least one elongated electrical contact member extending longitudinally within said shell and through an aperture in said ground plate;

a filter assembly associated with said contact member including means mounted coaxially over said contact member and also extending through said aperture for providing a series inductance for said filter assembly, capacitor means mounted coaxially over said inductance means on opposite sides of said ground plate, and electrically conductive first elastomeric grommet means disposed at opposite ends of said filter assembly and second elastomeric grommet means interposed between said capactor means and said ground plate; and

two dielectric inserts, each retained within said shell on an opposite side of said ground plate and including at least one cavity for receiving and supporting said contact member and its associated filter assembly, said insert cavity having a length such that said grommet means are axially compressed to resiliently support said filter assembly.

4,187,482

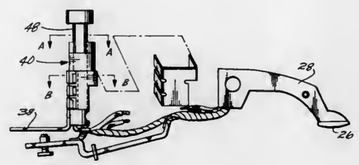
MULTIPLE CAPACITY CIRCUIT BREAKER

Russell R. Kosup, Laguna Niguel, Calif., assignor to Unicorn Industries, Anaheim, Calif.

Continuation-in-part of Ser. No. 752,393, Dec. 20, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,712

Int. Cl.² H01H *9/00*

U.S. Cl. 335—12 **22 Claims**



1. A circuit breaker comprising:

a housing, an overload current responsive trip mechanism mounted in the housing, the trip mechanism including a current sensitive element forming a first load current conductive path for activating the trip mechanism in response to the level of current through said first path, and switch means forming at least one shunt load current conductive path in parallel with said first path, the switch means selectively opening or closing the current path in shunt with the current sensitive element to change the current rating of the circuit breaker.

4,187,483

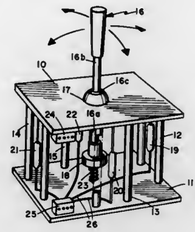
MULTI-THROW MAGNETIC REED SWITCH

C. David Whitney, 9320 Earl St., Apt. #28, La Mesa, Calif. 92041

Filed Aug. 30, 1978, Ser. No. 938,221

Int. Cl.² H01H *9/00*

U.S. Cl. 335—206 **10 Claims**



1. A multi-throw magnetic switch comprising:

a pair of spaced apart parallel plates, one of said plates having a hole through it;

a first plurality of reed switches lying between and perpendicular to said plates, said reed switches being equal distant from said hole and equal distant from each other;

a single control arm having one portion protruding through said hole to approximately midway between said plates, and having a second portion extending above said hole;

a permanent magnet means fixedly mounted on said one portion of said arm at approximately midway between said plates; and

pivot means for allowing said arm to be pivoted about said hole by manually moving said second portion of said arm to thereby move said magnet in close proximity with, and thereby close, selectable ones of said reed switches.

4,187,484

TIMING DEVICE UTILIZING A UNIQUE CLUTCH ASSEMBLY

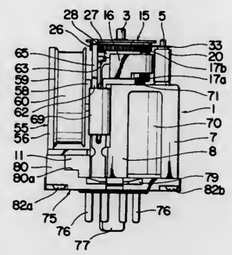
Isamu Ohara, Okayama; Tsutomu Muranaka, Tamano, and Hideo Eizumi, Okayama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 4, 1977, Ser. No. 839,304

Claims priority, application Japan, Oct. 12, 1976, 51-122559; Mar. 9, 1977, 52-26381; May 23, 1977, 52-59592

Int. Cl.² H01H *3/54*

U.S. Cl. 335—75 **9 Claims**



1. A timing device comprising:

A motor having an output shaft;

a driven element having a cam surface mounted thereon, said cam surface including an actuating portion;

a clutch means comprising a first gear selectively engageable with said output shaft and a second gear continuously engaged with said driven element for moving the same, said first and second gears being mounted on a common shaft;

an arm rotatably mounted holding said first and second gears;

means for rotatably biasing said arm to a position at which said motor output shaft and first gear engage;

electromagnet means having an armature which normally pressably rotates said arm against the force of said biasing means to a position at which said motor output shaft disengages from said first gear;

a switching element for selectively supplying power to said motor when actuated;

means engaged with said cam surface and initially moved by a first movement of said armature for actuating said switching element, said means for actuating being further moved by said actuating portion of said cam surface to deactuate said switching element;

means for initially rotating said driven element a desired amount to set a delay time; and

means for supplying power to said electromagnet means and switching element to cause said first movement of said armature and the release of the armature pressing force against said arm to thereby allow said arm to rotate in response to said biasing means to said position at which said motor output shaft and first gear engage.

4,187,485

COIL ARRANGEMENT FOR ELECTROMAGNETICALLY INFLUENCING MAGNETIC FIELDS, IN PARTICULAR FOR HOMOGENIZING MAGNETIC DIPOLES

Hermann Wollnik, No. 30, Auf der Platte, 6301 Fernwald, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,910

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659775

Int. Cl.² H01F *5/00*

U.S. Cl. 335—299 **10 Claims**



1. An arrangement for homogenizing a magnetic field between two pole shoe surfaces of a magnet comprising:

(a) at least one correction coil adjacent to each pole shoe surface;

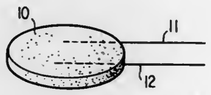
(b) each coil comprising a carrier of insulating material, an areal arrangement of a plurality of electrically conductive strips fixed to at least one side thereof and located along lines of magnetic flux and mutually spaced by a stable magnetic field intensity, the width of said electrically conductive strips corresponding to a predetermined fraction of the field intensity difference between adjacent strips, and means connecting said electrically conductive strips in series to form at least one current circuit.

4,187,486

OXYGEN CONCENTRATION DETECTING ELEMENT AND METHOD OF PRODUCING THE SAME

Hideaki Takahashi, Aichi, and Takashi Takeuchi, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 20, 1978, Ser. No. 898,372
Claims priority, application Japan, Apr. 20, 1977, 52-45589
Int. Cl.[2] H01L *49/00*; H01B *1/02*
U.S. Cl. 338—34 **17 Claims**



1. An oxygen concentration detecting element which is an electrical resistance element for the detection of oxygen concentration in the exhaust gases of internal combustion engines comprising a shaped molded and sintered porous body consisting essentially 70 to 99 weight percent of oxide-semiconductor material selected from the group consisting of titanium oxide, cerium oxide, niobium oxide, tantalum oxide, cobalt oxide and hafnium oxide and 1 to 30 weight percent of platinum particles sintered together with the powder form of said oxide semiconductor material, said platinum particles being dispersed substantially uniformly throughout said porous body thus obtained at an average particle-to-particle spacing of 0.1μ to 10μ, said element being so designed that a change in the resistance of the sintered porous body due to a change in oxygen concentration of gases in which the element is placed may be measured.

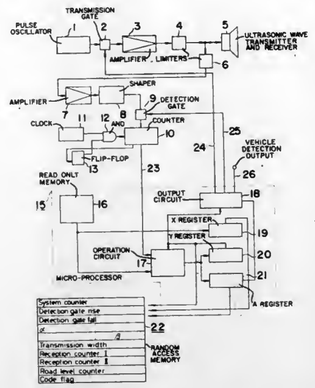
4,187,487

MOVING OBJECT DETECTION SYSTEM

Hiroshi Numata, Otokuni; Akihiko Otani, Uji, and Masao Mizuno, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 28, 1978, Ser. No. 901,396
Claims priority, application Japan, Apr. 28, 1977, 52-49124; Apr. 28, 1977, 52-49465
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—93 **11 Claims**

1. A detection system for detecting the presence of moving objects and the like through utilization of ultrasonic energy which comprises a predetermined location provided in a memory unit and having stored therein time from transmission of ultrasonic energy till reception of reflected energy corresponding thereto from a standard surface, means for computing the difference a between the immediately preceding time from transmission of ultrasonic energy till reception of reflected energy corresponding thereto stored in said predetermined location and current time from transmission of ultrasonic energy and reception of reflected energy corresponding thereto, means for storing in said predetermined location said current time from transmission of ultrasonic energy till reception of reflected energy corresponding thereto when the difference a is smaller than a predetermined time α and means for outputing



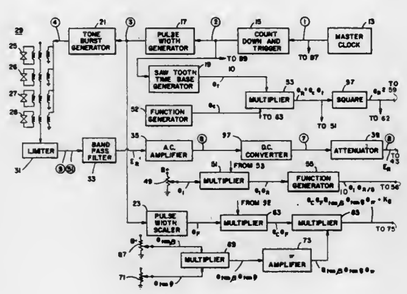
a moving object detection signal when said difference a is larger than a preset time β which is larger than said time α.

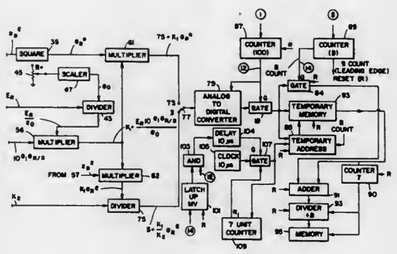
4,187,488

REVERBERATION BACKSCATTER MEASUREMENT SYSTEM

William B. Anderson, Silverdale, and David B. Markwald, Bremerton, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1978, Ser. No. 888,080
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—13 **9 Claims**





1. A reverberation backscatter measurement system comprising:

(a) means for transmitting an acoustic signal in a fluid environment;

(b) means for receiving reflected acoustic signals of said transmitted acoustic signal from a target and for converting said reflected acoustic signal into a corresponding electrical signal;

(c) means for calibrating and adjusting said electrical signal against a standard signal, said calibrating means receiving as input said electrical signal;

(d) first correction means receiving as input the output of said calibrating means, said first correction means providing an output signal representing the acoustic target strength of said reflected acoutic signal corrected for velocity of sound in said fluid medium in situ and for the frequency used for said transmitted signal;

(e) second correction means receiving as input the output of said calibrating means, said second correction means providing a parallel output signal to said output of said first correction means representing said acoustic target strength per unit volume of fluid medium of said reflected acoustic signal corrected for the wide and narrow beam angles of said transmitting means and for the pulse length of said transmitted signal; and

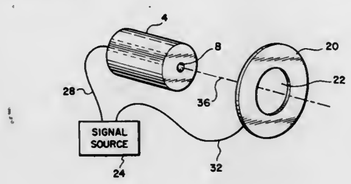
(f) means for selecting for analysis said output signal of said first correction means representing acoustic target strength of said reflected acoustic signal or said output of said second correction means representing acoustic target strength of said reflected acoustic signal per unit volume of said fluid medium.

4,187,489

METHOD AND APPARATUS FOR PROPAGATING ELECTRICAL SIGNALS THROUGH A CONDUCTING DIELECTRIC FLUID

Paul A. Silberg, 2002 Woody Dr., Billings, Mont. 59102

Filed Apr. 27, 1978, Ser. No. 900,767
Int. Cl.[2] H04B *13/02*
U.S. Cl. 340—852 **17 Claims**



1. Apparatus for producing an electrical signal for transmission through a conducting dielectric fluid comprising

a first electrode immersed in the fluid coincident with a certain axis, said electrode having predetermined height and width dimensions,

a second electrode immersed in the conducting fluid along said axis and axially spaced from said first electrode, said second electrode having a generally planar profile with height and width dimensions greater than the height and width dimensions of said first electrode,

means for applying electrical energy to said first and second electrodes to produce a time-varying voltage difference and thus a non-uniform electric field therebetween.

4,187,490

RANGE DETERMINING SYSTEM

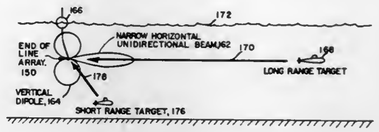
Samuel S. Ballard, Hollis, and Ronald P. White, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashau, N.H.

Filed Aug. 3, 1978, Ser. No. 930,834
Int. Cl.[2] G01S *3/80*
U.S. Cl. 367—121 **7 Claims**

1. A method for acoustically distinguishing between short range and long range targets within a body of water comprising the steps of:

providing acoustic sensing means having a vertical dipole pattern;

providing acoustic sensing means having a horizontal pattern; and



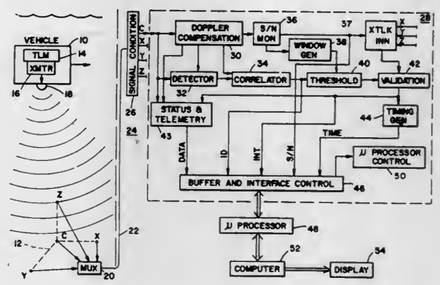
detecting in which of said patterns acoustic energy from said targets is located, whereby, depending on the pattern, it can be ascertained whether the energy is coming from a short range or long range target.

4,187,491

DOPPLER COMPENSATED PSK SIGNAL PROCESSOR

Alan L. Lindstrum, Bainbridge Island, and Jay V. Chase, Poulsbo, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1978, Ser. No. 931,691
Int. Cl.[2] G01S *5/18*
U.S. Cl. 367—125 **17 Claims**



1. A Doppler compensated PSK signal processor for underwater acoustic telemetry messages having an identity code portion and a status and telemetry portion, said messages being transmitted from a plurality of vehicles moving relative to a sensor array and to each other, comprising means for processing independently said telemetry message received by each sensor of said sensor array, said processing means for each sensor comprising:

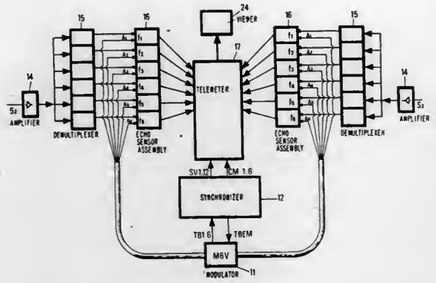
(a) means for generating a plurality of timing signals from said received telemetry message, said timing signals tracking the carrier frequency of said received telemetry message to compensate for Doppler frequency shifts due to the movement of the particular transmitting vehicle relative to said sensor array; and

(b) means for validating said received telemetry message and generating a timing mark upon recognition of a valid identity code for said particular transmitting vehicle, said validating and generating means being Doppler compensated by said timing signals, and said timing mark establishing a time which is a function of the range of said particular transmitting vehicle from said sensor.

4,187,492
DEVICE FOR DETERMINING THE RELATIVE POSITION OF ELONGATE MEMBERS TOWED BEHIND A SHIP

Robert Delignieres, Mareil Marly, France, assignor to Institut Francais du Petrole, France

Filed Nov. 11, 1977, Ser. No. 850,835
Claims priority, application France, Nov. 18, 1976, 76 35162
Int. Cl.² G01V *1/38*
U.S. Cl. 367—127 **10 Claims**

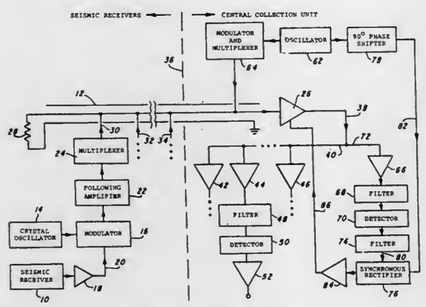


1. A device for determining the relative position of at least a first elongate member with respect to a second elongate member, both members being towed behind a ship, comprising a plurality of devices for transmitting acoustic pulses, distributed along said second member, a plurality of devices for receiving transmitted acoustic pulses, distributed along said first member and a telemetrical system for measuring the relative distance between the elongate members by determination of the travel times of acoustic pulses between said transmitting devices of said second elongate member and said receiving devices of said first elongate member, and wherein each transmitting device includes means for selectively transmitting signals at a respective determined frequency and each receiving device includes means to selectively sense acoustic signals issued from a single transmitting device.

4,187,493
FREQUENCY MULTIPLEXED SEISMIC CABLE

John D. Patterson, Arlington, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 750,024, Dec. 13, 1976, abandoned, which is a continuation of Ser. No. 527,913, Nov. 27, 1974, abandoned. This application Jun. 12, 1978, Ser. No. 914,709
Int. Cl.² G01V *1/22*
U.S. Cl. 367—135 **12 Claims**



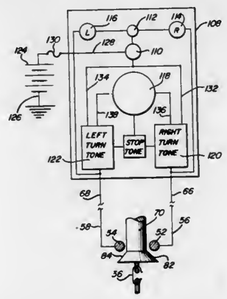
1. In a seismic cable for electrically coupling the signals induced at a plurality of seismic receivers to a central collecting unit, the improvement comprising:

(a) a transmission line located in said cable for providing an output signal at said central collecting unit,
(b) means at at least two of said seismic receivers for modulating a carrier signal with a signal representative of the seismic receiver signal, the frequencies of said carrier signals being mutually distinct at at least two of said seismic receivers, and
(c) means for impressing the modulated signals on said transmission line, said means for impressing further comprising a summing amplifier with a first input for receiving the modulated signals and a second input matched to the characteristic impedance of said transmission line for receiving signals appearing on said transmission line, and having an output impedance matched to the characteristic impedance of said transmission line for coupling the summed signals to said transmission line.

4,187,494
VEHICLE GUIDANCE DEVICE

John W. Jessee, 2481 Roland Rd., Sacramento, Calif. 95821

Filed Nov. 4, 1977, Ser. No. 848,713
Int. Cl.² B60Q *1/00*
U.S. Cl. 340—52 R **9 Claims**



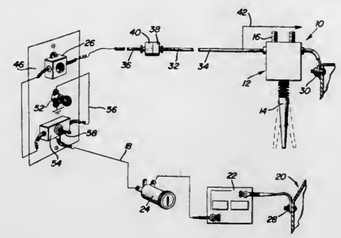
1. A guidance device to aid an operator in positioning a hitch element on a towing vehicle in desired relationship to a hitch element on a towed vehicle comprising a flexible tension member connectible between the vehicles, means mounted on one of said vehicles to maintain tension in said tension member as the towing vehicle is maneuvered in relation to the towed vehicle, sensing means mounted on one of said vehicles and engageable by the flexible tension member to sense the angular relation of the flexible tension member to said one vehicle and the linear position of the flexible tension member in relation to said one vehicle, an indicator means actuated in response to the sensing means to provide signals to the operator of the towing vehicle to enable the operator to maneuver the towing vehicle properly as it approaches the towed vehicle and to stop the towing vehicle when the towing vehicle is positioned with the hitch element thereon accurately positioned in desired relationship both laterally and longitudinally with respect to the hitch element on the towed vehicle, said indicator means signals providing distinguishable audible signals to the towing vehicle operator representing said angular relation and linear position of said flexible tension member without requiring the operator to visually observe the indicator means.

4,187,495
LOW TIRE PRESSURE WARNING SYSTEM

Walter A. Mitchell, P.O. Box 126, Redway, Calif. 95560

Filed Feb. 27, 1978, Ser. No. 881,720
Int. Cl.² B60C *23/06*
U.S. Cl. 340—58 **9 Claims**

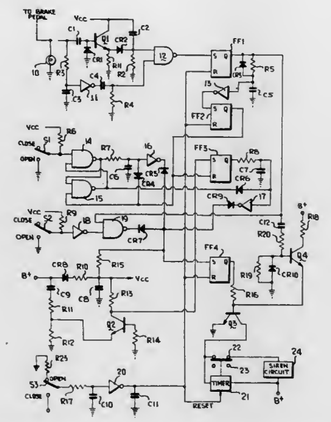
1. A low tire pressure warning system for vehicles equipped with pneumatic tires, said system including at least one actuating switch for support from a portion of a vehicle from which a wheel thereof equipped with a pneumatic tire is journaled, said switch including a depending 360 degree wobble actuator for contact with the ground closely adjacent the point of contact of said tire with the ground or contact with the adjacent side wall portion of said tire when the latter becomes deflated and the side wall bulges laterally outwardly adjacent the point of contact of the tire with the ground, said switch being serially connected in a main circuit in which a source of electrical potential is also serially connected, and first electrical audible signal generating means also serially connected in said circuit, said actuating switch being normally open and being closable upon said wobble actuator being laterally deflected adjacent its lower end beyond a predetermined extent, said circuit including bypass circuit, in which said source is serially connected, connected in parallel with the first mentioned circuit and bypassing said signal generating means and said switch, said bypass circuit including second electrical visual signal generating means serially connected therein, and control switch means including control means for selectively bypassing that portion of said main circuit in which said audible signal generating means is serially connected and actuating said bypass circuit in which said visual signal generating means is serially connected or bypassing said bypass circuit and actuating that portion of said main circuit in which said audible signal generating means is serially connected.



4,187,496
KEYLESS VEHICLE INTRUSION ALARM

Michael L. Kovens, Randallstown, and Henry H. Hoge, Baltimore, both of Md., assignors to Universal Security Instruments, Inc.

Filed Dec. 12, 1977, Ser. No. 859,975
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **7 Claims**



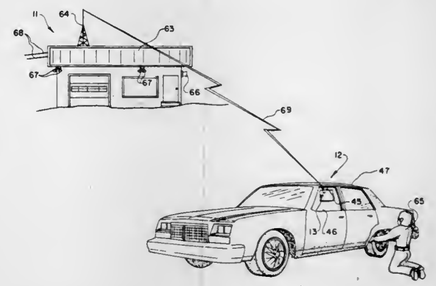
1. An intrusion alarm system for a vehicle having a plurality of doors for egress and ingress to a passenger compartment, said system comprising:

an armable circuit;
first circuit means responsive to momentary actuation of a predetermined accessory of said vehicle for arming said armable circuit;
sensing means associated with each of said doors and responsive to opening of that door when said armable circuit is armed for providing an alarm actuation signal;
alarm means responsive to alarm actuation signal for sounding an audible alarm signal;
egress delay means responsive to arming of said armable circuit for establishing a first delay interval during which said alarm means is prevented from responding to intrusion into said vehicle to permit an authorized vehicle operator to egress from the vehicle;
disarming means for permitting selective disarming of said armable circuit;
ingress delay means responsive to said armable circuit being armed and to opening of only a predetermined one of said doors for establishing a second delay interval; and
means for delaying sounding of said audible alarm signal during said second delay interval to permit an authorized operator of said vehicle to actuate said disarming means.

4,187,497
PORTABLE VEHICLE ALARM SYSTEM

Steven G. Howell, Dogwood La., Wake Forest, N.C. 27587, and Orville F. Harless, 2506 Briarwood Dr., Burlington, N.C. 27215

Filed Mar. 22, 1978, Ser. No. 888,844
Int. Cl.² B60R *25/10*
U.S. Cl. 340—65 **10 Claims**



1. An alarm system comprising: a remote receiver; alarm means operatively connected to said receiver; a plurality of portable transmitters; trip means operatively connected to each of said transmitters; motion sensitive closure means operatively connected to each of said trip means whereby when one of said transmitters is disturbed, said motion sensitive closure will activate said trip means to cause said transmitter to transmit a signal to said receiver which will activate said alarm means; and visual indicator means operatively connected to each of said transmitters and viewable exteriorly thereof for visually indicating when said transmitter has been tripped whereby, when one of the plurality of portable transmitters adapted to send an alarm signal to a single remote receiver has been tripped, such tripped transmitter can be readily located for resetting.

4,187,498

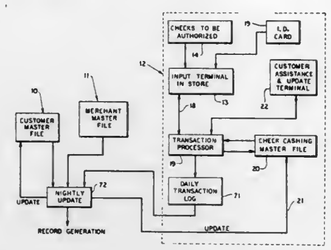
CHECK VERIFICATION SYSTEM

Robert V. Creekmore, Marietta, Ga., assignor to 1st National Bank, Atlanta, Ga.

Division of Ser. No. 619,663, Oct. 6, 1975, Pat. No. 4,109,238. This application Feb. 2, 1978, Ser. No. 874,691

Int. Cl.² H04Q *9/00*

U.S. Cl. 340—149 A **5 Claims**



1. Method of verifying the check presentation history of a number of persons who may present various types of checks for acceptance, comprising the steps of:

establishing signals corresponding to predetermined categories of checks which each individual customer may desire to present;

establishing signals corresponding to a predetermined maximum number of checks, for each of said check categories that are predetermined for such individual customer, which will be approved for acceptance if presented by such individual customer within a certain period of time;

establishing signals corresponding to a separate customer-supplied predetermined personal authorization code for each individual customer;

at the time of each present request by a customer for acceptance of a particular category of check accompanied by signals corresponding to a customer-furnished possible personal code, initially comparing said possible personal code signals for identity with said predetermined personal code signal for that customer, and if identical;

comparing said predetermined check category signals with signals corresponding to the particular requested category of check to determine whether the particular requested category of check is one of the categories that was predetermined for that particular customer, and if so;

comparing said signals corresponding to a predetermined maximum number of checks with signals corresponding to the number of times that particular customer has requested approval of said particular category of check within said certain period of time to determine whether granting the present request for acceptance will exceed said predetermined maximum number of times said particular requested category of check has been approved for acceptance for that particular customer within said certain period of time, and if not;

providing a signal corresponding to approval of said present request for acceptance.

4,187,499

ELECTRICAL PROGRAMMER FOR THE AUTOMATIC CONTROL OF A HOUSEHOLD APPLIANCE

Erich Scheer, St. Georgen-Peterzell, Fed. Rep. of Germany, assignor to KUNDO - Kieninger & Obergfell, St. Georgen/Schwarzwald, Fed. Rep. of Germany

Filed Sep. 20, 1977, Ser. No. 834,873

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642188

Int. Cl.² H04Q *3/00*

U.S. Cl. 340—309.1 **13 Claims**

1. A system for the automatic control of an electrical appliance to be sequentially stepped through a predetermined number of operating phases, comprising:

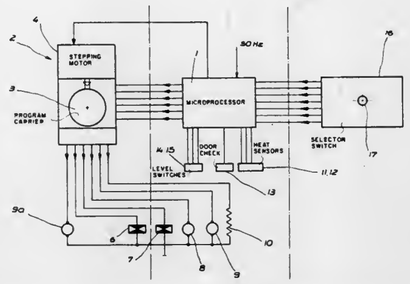
a read-only memory for storing a multiplicity of instruction codes defining consecutive phases of a maximum operating program;

electronic counting means connected to said read-only memory for sequentially addressing same to read out said instruction codes in a predetermined order of succession;

a rotatable control unit including a program carrier generating, in successive working positions, a multiplicity of signal patterns respectively corresponding to said instruction codes, said control unit further having output means for the selective activation and deactivation of components of a controlled appliance in any of said working positions;

drive means for rotating said control unit;

electronic comparison means, with input connections to said memory means and to said program carrier, connected to



said drive means for arresting said control unit upon detecting a match between an instruction code emitted by said memory means and a signal pattern generated by said program carrier;

a source of stepping pulses connected to said counting means for progressively advancing same to command the sequential readout of successive instruction codes of said maximum operating program;

presettable decoding means connected to said read-only memory in parallel with said comparison means for detecting certain instruction codes pertaining to unwanted phases of said maximum operating program and, in response to such detection, inhibiting the arresting of said drive means by said comparison means with simultaneous emission of a phase-skipping pulse fed to said counting means for advancing same out of turn; and

selector means connected to said decoding means for varying the setting thereof.

4,187,500

METHOD AND DEVICE FOR REDUCTION OF FIBONACCI P-CODES TO MINIMAL FORM

Alexei P. Stakhov; Jury M. Vishnyakov; Vladimir A. Luzhetsky; Alexandr V. Ovodenko; Nikolai A. Solyanichenko, and Alexandr V. Fomichev, all of Taganrog, U.S.S.R., assignors to Taganrogsky Radiotekhnichesky Institut, USSR, Taganrog, Taganrog and Vinnitsky Politekhnichesky Institut, USSR, Vinnitsa, Vinnitsa, both of, U.S.S.R.

Filed Jul. 15, 1977, Ser. No. 816,510

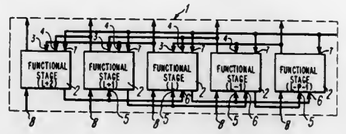
Claims priority, application U.S.S.R., Jul. 19, 1976, 2386002

Int. Cl.² H03K *13/24*; G06F *5/00*

U.S. Cl. 340—347 DD **21 Claims**

1. A method of reduction of Fibonacci p-codes to minimal form, comprising the steps of performing all convolutions of bits of an original Fibonacci p-code of a number whereto an original combination of binary signals corresponds, processing said original combination of binary signals by replacing a

binary signal corresponding to a 0 value of the lth digit of the original Fibonacci p-code of the number by its inverse signal,



and replacing binary signals corresponding to 1 values of the (l−1)th and the (l−p−1)th digit of the original Fibonacci p-code of the number by its inverse signal.

4,187,501

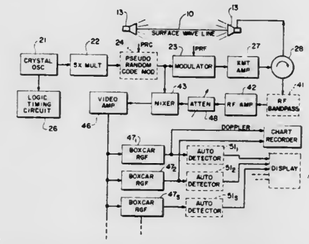
ELECTRONIC INTRUDER DETECTION SYSTEM

Reinhard G. Olesch, Kronberg, Fed. Rep. of Germany, and Otto E. Rittenbach, Neptune, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 7, 1977, Ser. No. 840,206

Int. Cl.² G01S *9/06*; G08B *13/24*

U.S. Cl. 340—554 **18 Claims**



1. An electronic intrusion detection system, which comprises:

a transmission line;

means for launching radio frequency energy onto one end of said line, said launching means comprising a radio-frequency generator, means for phase-modulating the output of said radio-frequency generator with a pseudo-random code, and means for pulse-modulating the output of said phase-modulating means;

the intrusion of a target into a defined region of space about said line causing a return echo; and

means for detecting said return echo thereby to detect the presence of said intruding target.

4,187,502

SWIMMING POOL ALARM SYSTEM

Frank O. Beverly, 2396 Via Camino, Carmichael, Calif. 95608, and Karl H. Nagel, 1025 NW. 66th Ter., Margate, Fla. 33063

Filed Dec. 12, 1977, Ser. No. 859,301

Int. Cl.² G08B *13/22*

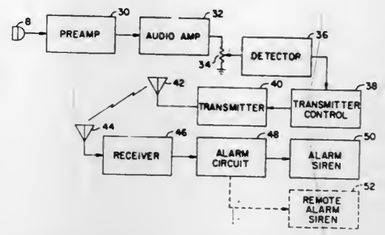
U.S. Cl. 340—566 **14 Claims**

1. A swimming pool alarm system comprising

water-resistant hydrophone means for generating signals in response to received pressure variations in a range of frequencies between approximately 100 Hz and 10 kHz,

means for holding said hydrophone means immersed in a swimming pool, said holding means substantially mechanically decoupling said hydrophone means, whereby said hydrophone means is responsive to substantially only pressure waves in the swimming pool,

circuit means connected to said hydrophone means for generating an alarm signal when the signals from said hydrophone means exceed a predetermined threshold, and



alarm means for generating a physically discernible alarm in response to said alarm signal.

4,187,503

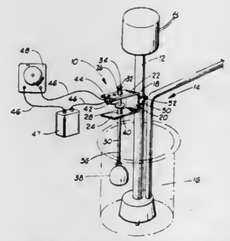
SUMP ALARM DEVICE

Robert G. Walton, 8415 Limerick, Wichita, Kans. 67206

Filed Sep. 5, 1978, Ser. No. 939,365

Int. Cl.² G08B *21/00*

U.S. Cl. 340—624 **1 Claim**



1. A sump alarm device adapted for receipt on a vertical pump shaft of a sump pump, the sump pump disposed in a sump for pumping water therefrom, the device comprising:

a "U" shaped float rod guide having a vertical base with two outwardly extending horizontal arms, the arms including an upper arm and a lower arm, the upper arm and the lower arm having apertures therethrough;

a screw clamp adapted for receipt around the vertical pump shaft of the sump pump, said screw clamp attached to the vertical base of said float rod guide;

a vertical float rod slidably received through the apertures in the upper and the lower arms of said float rod guide;

a float mounted on the lower end of said float rod;

a microswitch attached to the upper arm of said rod guide and having a switch lever extending outwardly therefrom and disposed adjacent said float rod;

a switch lever trip mounted on said rod and disposed between the upper and lower arms of said rod guide, said switch lever trip disposed below said switch lever, said switch lever trip contacting said switch lever and closing said microswitch when said switch lever trip is raised on said rod; and

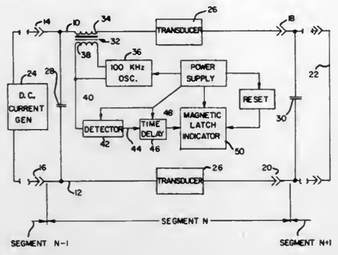
a battery operated alarm electrically connected to said microswitch, said alarm activated when said switch is closed.

4,187,504

FAULT MONITORING AND INDICATOR SYSTEM

Henry L. Cantrell, Urbana, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 3, 1978, Ser. No. 874,771
Int. Cl.² G08B *21/00*
U.S. Cl. 340—652 **7 Claims**



1. A continuity monitor and indicator circuit for monitoring the continuity of a segment of a pair of control conductors along which a control current flows, comprising:

a capacitor means at each end of said segment of said control conductors bridging said conductors and providing an a.c. electrical path therebetween,

a transformer having its secondary winding connected in series with one of said control conductors in said segment,

oscillator means including a tank circuit connected to the primary winding of said transformer and having an oscillator output, said tank circuit being such that said oscillator output is in a first oscillatory state when a closed a.c. electrical loop is provided by the secondary winding of said transformer, the control conductor segment, and the bridging capacitor means, and said oscillator output is in a second oscillatory state when no such closed a.c. electrical loop is formed,

detector means, responsive to said oscillator output, for detecting when said second oscillatory state is provided at said oscillator output and for providing a detector output in response thereto,

delay means, responsive to said detector means, for providing an alarm output upon receipt for a predetermined period of time of a detector output and

indicator means, responsive to said alarm output for providing an alarm indication,

whereby interruption in the continuity of said closed a.c. electrical loop is detected and an alarm indication provided in response thereto.

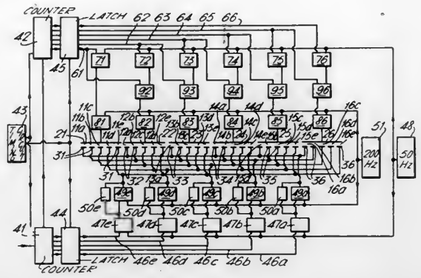
4,187,505

DISPLAY APPARATUS

Colin A. Morley, Caterton; Richard N. Thomas, Weybridge, and Bela Kollar, Hollington, all of England, assignors to Smiths Industries Limited, London, England

Filed Oct. 31, 1977, Ser. No. 847,386
Claims priority, application United Kingdom, Oct. 29, 1976, 45040/76
Int. Cl.² G01D *7/00*
U.S. Cl. 340—753 **9 Claims**

1. Display apparatus for displaying the magnitude of a physical parameter, comprising a plurality of electrically-operable display regions each of which contains a plurality of electrically-operable display sections, means for supplying an electric signal representative of the said magnitude, and electric circuit means responsive to the said electric signal to operate the said display sections in a cyclic manner in accordance with the electric signal to provide a representation of the said magnitude, each said cycle of operation of the display regions having first and second periods, the said electric circuit means include first means operable during the said first period of each cycle to effect operation of any said display region in which all display sections therein require to be operated, and second means operable during said second period of each cycle to



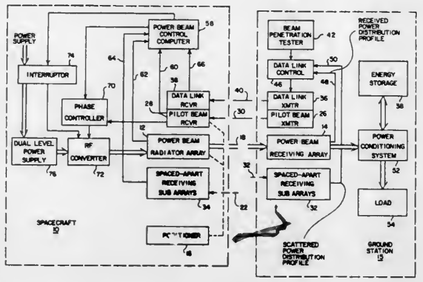
effect operation of any said display region in which one of the display sections thereof requires to be operated.

4,187,506

MICROWAVE POWER TRANSMISSION BEAM SAFETY SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Richard M. Dickinson, La Crescenta, Calif.

Filed Oct. 16, 1978, Ser. No. 951,829
Int. Cl.² H04B *7/185*
U.S. Cl. 343—100 R **23 Claims**



16. In a method of transmitting a microwave power beam between a microwave power beam radiator array and a microwave power beam receiving antenna array, the improvement comprising:

sensing power profiles to determine if an object is within said microwave power transmission beam; and

controlling said microwave power transmission beam in accordance with said sensing step.

4,187,507

MULTIPLE BEAM ANTENNA ARRAY

Patrick E. Crane, Tampa; Robert E. Lazarchik, Largo, both of Fla., and Arthur H. Schaufelberger, deceased, late of New Port Richey, Fla. (by Ruth L. Schaufelberger, administratrix), assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,216
Int. Cl.² H01Q *19/06, 13/00, 3/26*
U.S. Cl. 343—754 **10 Claims**

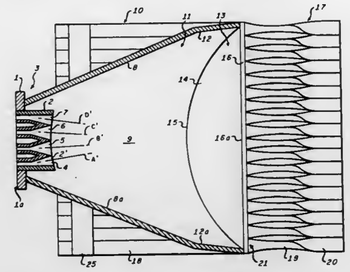
1. Apparatus having focal properties for the collimation and transfer of high frequency electromagnetic energy comprising:

spaced electrically conducting planar broad wall means forming symmetric truncated triangular energy propagation means having first and second opposed energy exchanging port means and characterized by an axis of mirror symmetry,

cylindric dielectric lens means adjacent said first port means disposed within said energy propagation means,

said cylindric dielectric lens means having a substantially planar surface at said first port means,

said cylindric dielectric lens means further having a convex substantially hyperbolic surface symmetrically disposed within said energy propagation means,



first plural wave guide coupling means at said first port means in energy exchanging relation with said planar surface of said cylindric dielectric lens means, and

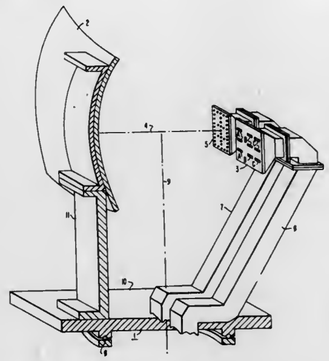
second plural wave guide coupling means at said second port means in energy exchanging relation therewith.

4,187,508

REFLECTOR ANTENNA WITH PLURAL FEEDS AT FOCAL ZONE

Gary E. Evans, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 722,260, Sep. 10, 1976, abandoned. This application Nov. 1, 1978, Ser. No. 956,779
Int. Cl.² H01Q *19/14*
U.S. Cl. 343—770 **4 Claims**



1. An antenna assembly comprising,

a reflector having a surface curvature to concentrate microwave energy at a localized region intermediate its ends thereof to provide a focal axis intermediate its ends for forming a beam of electromagnetic wave energy thereon,

a first feed means positioned in direct alignment with said focal axis, and

second feed means for such energy positioned at one side of said focal axis,

said second feed means including an array of horizontal rows of feed elements positioned at said one side to illuminate a common horizontal segment of said reflector on the focal axis and at opposite sides of said focal axis,

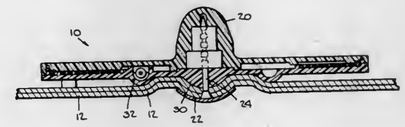
at least certain of said rows of feed elements being horizontally spaced apart selected unequal distances from each other at said one side of the focal axis, said distance being selected such that the summation vectors of the beam reflected from said one side of said focal axis point in a different direction than the summation vectors of the beam reflected from the opposite side of said focal axis and the summation vectors of both said beams point in different directions than the beam reflected from the focal axis for reducing sidelobe content of such beam.

4,187,509

WAFER AND FASTENER FOR USE IN ELECTRONIC THEFT DETECTION SYSTEM

Arnold Weiner, Brooklyn, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,362
Int. Cl.² G08B *13/00*; H01Q *1/36*
U.S. Cl. 343—873 **12 Claims**



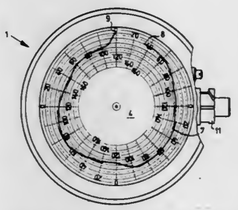
1. A target wafer for use in an electronic theft detection system, said wafer comprising upper and lower members which are generally flat and coextensive and which are laminated to each other, one of said members having a continuous, spiral shaped groove formed in the surface thereof facing the other member, an elongated electrical conductor lying in said groove, a capacitor also contained between said members, said capacitor being electrically connected to said electrical conductor near each end thereof to form a resonant electrical circuit.

4,187,510

DEVICE FOR RECORDING VEHICLE SPEEDS

Berthold Dold, Schramberg, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,230
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718681
Int. Cl.² G07C *5/12*
U.S. Cl. 346—21 **6 Claims**



1. Recording device for vehicles comprising a housing, a lid removably mounted on said housing, said lid including a ring forming the outer circumferential periphery of said lid and a cover part extending across said ring, said ring shaped to interengage with said housing so that said ring can be releasably disengaged from said housing, a record carrier located in said housing under said lid, said record carrier having an erasable recording layer thereon formed of a suitable paste for recording speeds of a vehicle, means within said housing for driving said record carrier in accordance with at least one of time and distance traveled, said record carrier is removably mounted in said housing and is arranged to prevent tampering with the recording layer, means on said ring and said record carrier for interconnecting said lid and record carrier as an

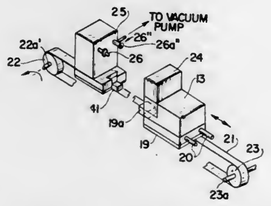
inseparable unit so that both parts can be removed as a unit from said housing of the recording device, said unit having a first outer surface and a second outer surface each extending transversely of the axis of said ring with said cover part forming the first outer surface and said record carrier forming the second outer surface, said record carrier having a surface facing toward the cover part of said lid and facing in the opposite direction from the second outer surface, and said recording layer formed on the surface of said record carrier facing said cover part so that the recording layer is located between the lid and the record carrier.

4,187,511

METHOD AND APPARATUS FOR FILLING THE MOVABLE RESERVOIR OF AN INKJET PRINTER

Prentice Robinson, Pelham, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Mar. 20, 1978, Ser. No. 890,620
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **14 Claims**



1. Means for providing ink for an inkjet printer, said printer including an inkjet print head and carriage means for supporting the print head;

means for moving said carriage means between left and right hand margins of the printer so as to effect printing of lines of characters of other graphic patterns on said web;

a small size ink reservoir mounted upon said carriage means;

a large size ink supply reservoir mounted in a stationary fashion upon said printer and adjacent to one of the aforesaid margins;

means for sensing an ink low condition in said small reservoir for generating an ink low signal;

means responsive to said ink low signal for moving said carriage means toward said stationary ink supply reservoir;

nozzle means including means normally biasing said nozzle means to a closed condition whereby said nozzle means is moved responsive to movement of the carriage adjacent to said stationary ink supply reservoir to become unsealed and to span between openings in said large and small ink supply reservoirs for causing ink to flow from said large reservoir to said small reservoir thereby enabling printing to continue.

4,187,512

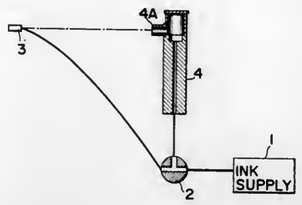
INK LIQUID SUPPLY SYSTEM FOR AN INK JET SYSTEM PRINTER

Shoichi Matsunaga; Fumio Siozaki, both of Yamatokoriyama, and Masahiko Aiba, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1978, Ser. No. 917,591
Claims priority, application Japan, Jun. 27, 1977, 52-76754
Int. Cl.[2] G01D *15/16, 15/18*
U.S. Cl. 346—140 R **5 Claims**

1. An ink liquid supply system for an ink jet system printer comprising an ink liquid supply source for supplying ink liquid to a nozzle under a predetermined pressure, an ink liquid drain system for returning the ink liquid from said nozzle, and a valve means for selectively connecting said nozzle with said ink liquid supply source and with said ink liquid drain system, said ink liquid drain system comprising:

a pressure controlling drain pipe connected to said selection valve means; and an outlet formed in the pressure control-



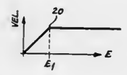
ling drain pipe for maintaining the internal pressure of said pressure controlling drain pipe at the atmospheric pressure, said outlet being located at a height substantially identical with that of the tip end of said nozzle.

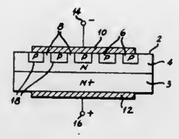
4,187,513

SOLID STATE CURRENT LIMITER

Gordon B. Spellman, Mequon, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 30, 1977, Ser. No. 855,933
Int. Cl.[2] H01L *47/00*
U.S. Cl. 357—1 **14 Claims**





1. A solid state current limiter comprising a substrate of semiconductor material having a plurality of active spot regions each of a diameter within an order of magnitude of 100 microns formed therein separated by an inactive region, said active spot regions having a total cumulative area of at least 0.002 square centimeters, said active spot regions forming conduction channels through which a limited amount of current flows upon application across said substrate of an electric field above a predetermined magnitude, said inactive region serving a block current flow therethrough and to act as a heat sink around each of said active spot regions.

4,187,514

JUNCTION TYPE FIELD EFFECT TRANSISTOR

Yutaka Tomisawa, Yokohama, and Tatsuro Mitani, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

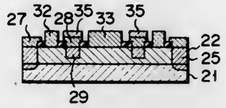
Filed Nov. 4, 1977, Ser. No. 848,569
Claims priority, application Japan, Nov. 9, 1976, 51-133724
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **14 Claims**

1. A junction type field effect transistor comprising:

a semiconductor substrate including a semiconductor layer of one conductivity type having an exposed major surface,

said substrate formed on a semiconductor body of opposite conductivity type constituting a lower gate region;

semiconductor regions formed in said semiconductor layer and exposed on said major surface thereof including an exposed source region of said one conductivity type, an exposed gate region of said opposite conductivity type, an exposed drain region of said one conductivity type, an exposed isolation region of said opposite conductivity



type constituting a closed path to surround said source, gate, and drain regions; said gate region having a sufficient length for said field effect transistor to attain pentode characteristics; and

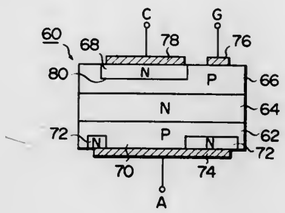
a polycrystalline semiconductor layer formed on the exposed surface of said gate region between said exposed drain and isolation regions, said polycrystalline semiconductor layer containing an impurity of said opposite conductivity type.

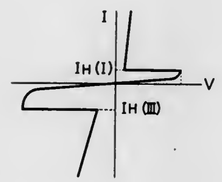
4,187,515

SEMICONDUCTOR CONTROLLED RECTIFIER

Tetsuo Machii, Tokyo, and Shuji Sugioka, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 770,220, Feb. 18, 1977 and Ser. No. 601,184, Aug. 1, 1975, both abandoned, said Ser. No. 770,220 is a continuation-in-part of said Ser. No. 601,184. This application Jul. 14, 1978, Ser. No. 924,707
Claims priority, application Japan, Aug. 15, 1974, 49-93750
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 **4 Claims**





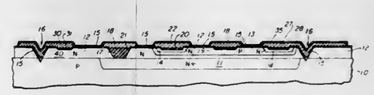
1. A semiconductor controlled rectifier of an asymmetrical construction which, only when supplied with a reverse surge voltage, is turned ON in the reverse direction comprising a semiconductor body having three contiguous regions forming an inner region of one conductivity type and two outer regions of the opposite conductivity type, a first external region of the one conductivity type provided adjacent a first one of said outer regions, a second external region of the one conductivity type provided adjacent a second one of said outer regions and partially overlapping said first external region, said external regions being positioned in such a manner that a portion of each said outer regions is exposed, a cathode electrode formed on only said first external region, an anode electrode formed on said second external region and said exposed portion of the said second outer region, and a gate electrode in conductive contact with said exposed portion of first outer region alone, said cathode electrode and said second external region overlapping each other such that the overlapped area of the second external region is within a range of less than one half the area of the cathode electrode.

4,187,516

SEMICONDUCTOR INTEGRATED CIRCUITS

Wilhelm H. Legat, Wilmington, Mass.; Keith G. Taft, Ben Lomond, Calif., and Karl H. Tiefert, Los Altos, Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 719,201, Aug. 30, 1976, which is a continuation of Ser. No. 563,429, Mar. 31, 1975, abandoned, which is a continuation of Ser. No. 401,319, Sep. 27, 1973, abandoned, which is a continuation of Ser. No. 242,457, Apr. 10, 1972, abandoned. This application Sep. 13, 1977, Ser. No. 832,846
Int. Cl.[2] H01L *29/04*
U.S. Cl. 357—60 **8 Claims**



1. In combination:

a semiconductor substrate of a first conductivity type having a plurality of high conductivity regions of a second conductivity type diffused therein;

a plurality of active semiconductor elements in an epitaxial layer of monocrystalline semiconductor material having a <100> crystallographic surface plane and supported by said substrate;

each of said elements comprising a plurality of emitter regions formed in a common base region and having separate emitter contacts formed therewith and electrically isolated from each other;

said elements having unidirectionally conductive collector junctions comprising regions of said layer contacting said high conductivity regions;

portions of said layer extending beyond said highconductivity regions and providing regions of substantial resistance directly connected in said collector junction regions; and

isolation regions etched from said <100> surface plane along <101> crystallographic surface planes completely through said layer between at least portions of said semiconductor elements and bounding portions of said resistance regions.

4,187,517

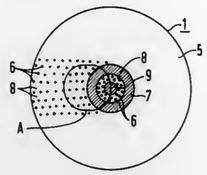
SEMICONDUCTOR COMPONENT

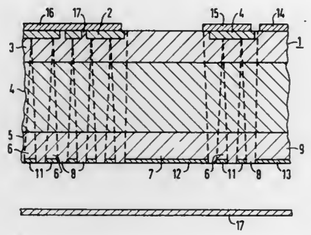
Karl Platzöder, Haimhausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,247
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710701
Int. Cl.[2] H01L *29/167*
U.S. Cl. 357—64 **3 Claims**

1. A semiconductor component comprising a semiconductor body having at least two zones of alternately opposite conductivity type, an anode electrode, an anode connected to said anode electrode along the entire surface of said body, a cath-

ode, said body including recombination centers therein and at least one layer for gettering the recombination centers upon said cathode, said body including a recombination center characteristic in which there is a drop in the concentration of recombination centers from the anode side and cathode side toward a central zone, said central zone being divided, at least on the anode side, into zone elements exhibiting differing concentrations of recombination centers, the ratio of the zone





elements being set such that in the central zone the anode side mean value of the concentration of recombination centers is higher than the cathode side mean value of the concentration of recombination centers, said central zone including a first portion which is divided into said zone elements and a remainder portion which possesses a concentration of recombination centers which is lower than the concentration mean value determined by the division of said first portion into said zone elements.

4,187,518

TIMING DEVICE

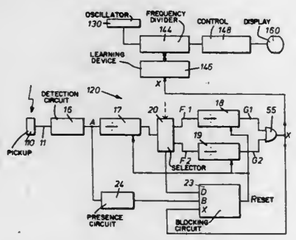
Jean-Claude Martin, Neuchâtel, and Jean F. Perotto, Hauterive, both of Switzerland, assignors to Centre Electronique Horloger SA, Neuchâtel, Switzerland

Filed Jan. 23, 1978, Ser. No. 871,541

Claims priority, application Switzerland, Feb. 21, 1977, 2140/77

Int. Cl.² G04B *27/00*; G04C *9/00*

U.S. Cl. 358—93 **17 Claims**



1. A timing device comprising an oscillator forming a time base, a time display device and a control device intermediate between the oscillator and the display for formatting display signals from said time base, characterized in that it comprises at least one pickup responsive to low-frequency pulses radiated by a television receiver and a treatment circuit for treating said pulses to extract control information therefrom, said treatment circuit having one input connected to the pickup and one output connected to a means for regulating the control device, said means for regulating being responsive to said treatment circuit to produce in said control device at least one of the operations of rate regulation and resetting.

4,187,519

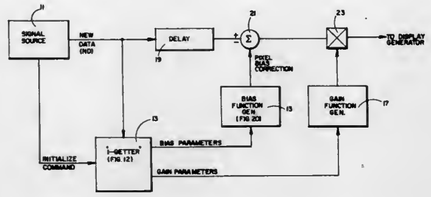
SYSTEM FOR EXPANDING THE VIDEO CONTRAST OF AN IMAGE

Visvaldis A. Vitols, Orange, and Stanley A. White, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1978, Ser. No. 934,657

Int. Cl.² H04N *5/14*

U.S. Cl. 358—169 **8 Claims**



1. A system comprising:

non-multiplicative first means responsive to an input sequence of pixels representative of an image for digitally developing bias parameters and gain parameters; and

second means responsive to the input sequence of pixels and to the bias and gain parameters for substantially increasing the dynamic range of the input sequence of pixels, said second means comprising:

first and second function generators respectively responsive to the bias and gain parameters for respectively developing pixel bias correction signals and pixel gain correction signals;

third means selectively responsive to the input sequence of pixels and to the pixel bias correction signals for producing a substantially minimized sequence of pixels; and

fourth means selectively responsive to the substantially minimized sequence of pixels and to the pixel gain correction signals for developing an output enhanced sequence of pixels in which the dynamic range of contrast has been substantially expended in comparison with that of the input sequence of pixels.

4,187,520

FACSIMILE TRANSMISSION INSTALLATION IN PARTICULAR FOR COPYING FORMS

Michel Beduchaud, Palaiseau, and Martin de Loye, Versailles, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 31, 1978, Ser. No. 911,244

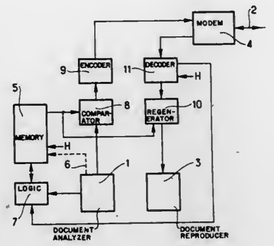
Claims priority, application France, May 31, 1977, 77 16564

Int. Cl.² H04N *1/38*

U.S. Cl. 358—257 **7 Claims**

1. A facsimile transmission installation for transmitting documents which include a portion which is common to a plurality of transmissions and a portion which may vary from transmission to transmission, such documents being referred to as forms; the installation comprising a transmitter terminal including a document analyzer together with means for generating a facsimile signal therefrom, a receiver terminal including means for receiving the facsimile signal together with a document reproducer responsive thereto, and means for conveying the facsimile signal from the transmitter terminal to the receiver terminal wherein each terminal includes a memory for

recording the portions of documents which are common to a plurality of transmissions, the recorded portions of documents being referred to as "blank forms", means for selecting a particular blank form from the memory; wherein the transmitter terminal includes a comparator connected to the memory and to the analyzer to receive respectively a memorized signal and an analysis signal therefrom and to generate in response thereto a useful signal representative of the difference between the completed form being analyzed and the memorized blank



form, and a date compression encoder connected to receive the useful signal and to generate said facsimile signal; and wherein the receiver terminal includes a decoder-expander to receive the facsimile signal and to restore the useful signal therefrom, and a generator connected to said decoder-expander and to the receiver memory and to receive respectively the useful and the memorized signal therefrom and to generate in response thereto a restored analysis signal which represents the contents of the completed form and to apply the restored analysis signal to the document reproducer.

4,187,521

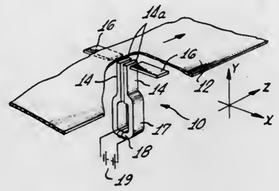
DC ERASE HEAD

Gerhard Rotter, Mission Viejo, Calif., and Klaus D. Schomann, Frankfurt, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,842

Int. Cl.² G11B *5/02, 5/47*

U.S. Cl. 360—118 **5 Claims**



1. An erase head for erasing recorded material from single tracks of a multi-track magnetic recording tape, said erase head comprising:

a pair of pole pieces having faces locatable in an operative relationship with respect to a moving magnetic recording tape, said faces being in a generally parallel relationship spaced across the width of the tape to provide a magnetic field directed primarily perpendicular to the direction of tape movement;

magnetic circuit means providing a low reluctance path between said pole pieces;

a source of constant magnetomotive force applied to said magnetic circuit means, to provide an unvarying magnetic field between said pole pieces; and

magnetic shielding means spaced outwardly from said pole pieces in a substantially coplanar relationship with said faces, whereby the resultant magnetic field strength in a plane perpendicular to the direction of movement of the tape is substantially uniform in a region inward of said shielding means but is minimized outside the region.

4,187,522

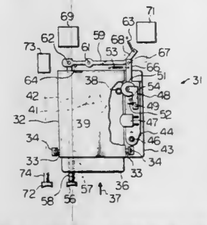
MAGNETIC TAPE PLAYER COMPRISING ELECTROMAGNETIC LATCH DEVICE

Itsuki Ban, Tokyo, and Hidenori Kanno, Funabashi, both of Japan, assignors to Secoh Giken Inc., Tokyo, Japan

Filed Jul. 12, 1978, Ser. No. 923,830

Int. Cl.² G11B *19/02, 15/02*

U.S. Cl. 360—137 **14 Claims**



1. An apparatus for playing a magnetic tape comprising:

sound reproduction means operatively engageable with the tape;

tape drive means;

a movable member for controlling the tape drive means to drive the tape at a normal speed when in a released position and at a fast speed when in a depressed position;

a magnet;

a ferromagnetic lever pivotally connected to the movable member and being engageable with the magnet when the movable member is in the depressed position, the lever being configured to provide a mechanical advantage to the magnet for holding the movable member in the depressed position; and

sensor means operatively connected to the sound reproduction means for sensing a blank area on the tape and removing a force of the magnet from the lever for releasing the movable member in response thereto.

4,187,523

DETECTING A SHORT CIRCUIT FAULT IN A DYNAMO ELECTRIC MACHINE

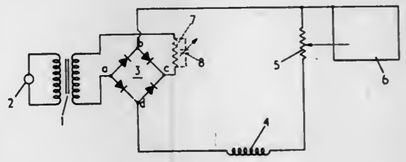
George W. Gray, Sheffield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Aug. 21, 1978, Ser. No. 934,742

Claims priority, application United Kingdom, Aug. 26, 1977, 35907/77

Int. Cl.² H02H *7/08*

U.S. Cl. 361—30 **8 Claims**



1. Apparatus for operating a dynamo-electric machine which is provided with a protective circuit arrangement

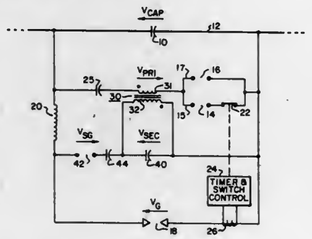
whereby the machine is caused to be switched off if a short circuit current flowing in the machine exceeds a predetermined level, including a voltage transformer and a current transformer, means for deriving a d.c. voltage proportional to the current flowing in the machine, the voltage transformer being connected across the machine supply and the current transformer having its input connected in the current supply to the machine, the protective circuit being arranged to receive current during that period only of a cycle when the outputs from the current and voltage transformers are in phase.

4,187,524

SERIES CAPACITOR PROTECTION EQUPMENT WITH EXTENDED RANGE DUAL SPARKOVER FEATURE

Charles A. Peterson, Van Buren Township, County of Monroe, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1978, Ser. No. 876,819
Int. Cl.[2] H02H *7/16*
U.S. Cl. 361—16 **2 Claims**



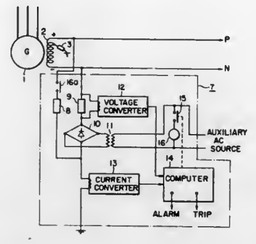
1. Series capacitor equipment comprising:
a main capacitor connected in series in an alternating current transmission line;
a first circuit branch connected across said main capacitor and including a first trigger spark gap having a first overvoltage protection level;
a second circuit branch connected across said main capacitor and including a second trigger spark gap having a second overvoltage protection level higher than said first protection level;
a third circuit branch connected across said main capacitor and including a main spark gap;
means for disabling said first circuit branch upon the occurrence of a sparkover of said main spark gap and for restoring said first circuit branch to its original operating condition at a predetermined time after it is disabled;
voltage buildup means for ensuring rapid operation of said second trigger spark gap and said main spark gap upon initial operation of said first trigger spark gap, said voltage buildup means comprising a pulse transformer with a primary winding connected in series with said first trigger spark gap across said main spark gap, and with a secondary winding operatively connected to apply a voltage pulse of a magnitude to said main spark gap causing its operation quickly after initial operation of said first overvoltage protection means;
said voltage buildup means pulse transformer having its primary and lower voltage winding in series with both said first and second trigger spark gaps and forming part of both said first and second circuit branches; and
said pulse transformer having its secondary and higher voltage winding connected in a fourth circuit branch across said main capacitor, said second winding being connected to charge capacitive means arranged in series with a slave spark gap which sparks over to cause rapid voltage buildup across said main spark gap.

4,187,525

GROUND FAULT PROTECTIVE APPARATUS OF FIELD WINDINGS

Yukihiro Nagura, Iama, and Yoshihiko Toda, Koganei, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 21, 1978, Ser. No. 879,807
Claims priority, application Japan, Feb. 23, 1977, 52-18087
Int. Cl.[2] H02H *7/06*
U.S. Cl. 361—42 **3 Claims**



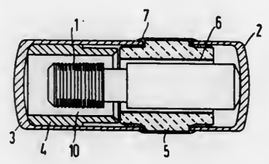
1. Ground fault protective apparatus for a field winding of a synchronous dynamo electric machine comprising a first impedance, a source of direct current, and a current converter which are connected in series between one terminal of said field winding and ground for passing ground fault current of said field winding, a voltage detector for detecting voltage drop across said first impedance, a second impedance connected between the other terminal of said field winding and said current converter through a switch, means responsive to the output of either one of said current converter and said voltage detector for detecting said ground fault, memory means for storing the outputs of said current converter and said voltage detector when said ground fault is detected by said ground fault detecting means, means for closing said switch for passing current from said other terminal of said field winding through said second impedance and said current converter when said ground fault is detected, and means for calculating grounding resistance of said ground fault by using the outputs of said current converter and of said voltage detector before and after closure of said switch thereby judging the magnitude of said ground fault.

4,187,526

GAS-DISCHARGE SURGE ARRESTER WITH CONCENTRIC ELECTRODES

Klaus D. Heinze, and Gerhard Lange, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 890,634
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714122
Int. Cl.[2] H02H *9/06*
U.S. Cl. 361—120 **15 Claims**



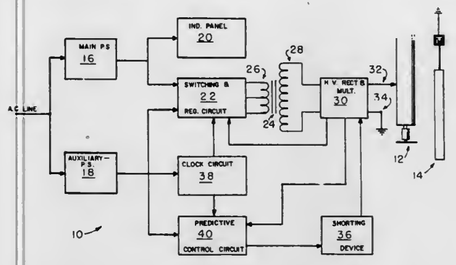
1. A gas-discharge surge voltage arrester having two concentrically arranged electrodes separated from each other by a discharge space, a hollow cylindrical insulating body interposed between said electrodes at a position remote from said discharge space, and an electrically conductive layer supported on the interior surface of said insulating body, said conductive layer taking the form of a continuous conductive surface coating.

4,187,527

ELECTROSTATIC COATING SYSTEM

Stanley L. Bentley, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 712,781, Aug. 9, 1976, Pat. No. 4,075,677. This application Nov. 14, 1977, Ser. No. 851,128
The portion of the term of this patent subsequent to Sep. 21, 1995, has been disclaimed.
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—235 **20 Claims**



1. A system for controlling voltage across a pair of output terminals including a power supply for generating the voltage, means for coupling the supply to the output terminals, means for sensing the output current flowing between the terminals, means for disrupting the impressed voltage, the disrupting means being coupled to the terminals and having at least one control electrode, a control circuit, first circuit means for coupling the control circuit to the sensing means for providing an output current-related signal at a terminal of the control circuit, the control circuit including sample-and-hold circuit means for sampling a signal related to the output current-related signal during successive sampling intervals and for storing the value of such signal between successive sampling intervals, circuit means for generating an input signal related to the output current-related signal by a predetermined non-negative selectively variable multiplier, and a comparator for comparing the value stored in the sample-and-hold circuit means to the input signal and for generating an output signal when the input signal exceeds the stored value and means for coupling the comparator to the control electrode, the output signal controlling the disrupting means.

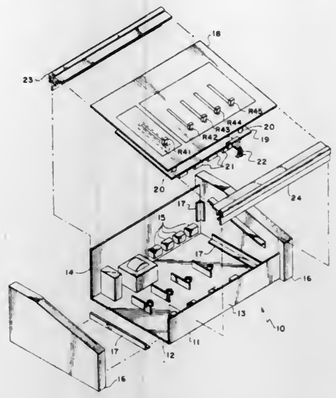
4,187,528

POWER CONTROL UNIT

James W. Morriss, Roanoke, Tex., assignor to Hunt Electronics, Inc., Dallas, Tex.

Filed Jul. 1, 1977, Ser. No. 812,416
Int. Cl.[2] H05R *1/04*
U.S. Cl. 361—399 **3 Claims**

1. A control unit enclosure, comprising:
a base sheet shaped to form front, bottom and rear walls of the enclosure, said rear wall having a greater height than the front wall;
a pair of side walls against opposite edges of said sheet, thereby in contact with opposite edges of said front, bottom and rear walls;
means for connecting each of the side walls with said front, bottom and rear walls;
a cover sheet forming the top wall of the enclosure and having controls mounted thereon for access from outside the enclosure, said sheet having a rear portion near said rear walls;
a circuit board mounted to the underside of the cover sheet and having a first group of electrical components connected with said controls;
a second group of electrical components mounted on the inside of the base sheet, including a plurality of power receptacles mounted to project through one of the walls thereof;



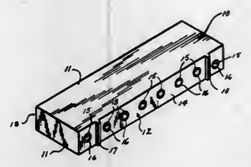
an electrical cable interconnecting said first and second groups of components and having a length and flexibility sufficient for said cover sheet to be optionally installed with the rear portion thereof near the front wall of the enclosure; and
first and second mounting pieces for attaching said cover sheet to the base sheet at top edges thereof.

4,187,529

TERMINAL CONSTRUCTION FOR ELECTRICAL CIRCUIT DEVICE

John E. Bartley, Greenfield; Orville R. Penrod, and Lawrence D. Radosevich, both of Muskego, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 609,780, Sep. 2, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,788
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—404 **6 Claims**



1. In an electrical circuit device, including a substrate of electrically insulating material having parallel upper and lower planar surfaces, electrical circuit components disposed upon at least one of said planar surfaces, a pair of end surfaces in spaced relationship; and spaced apart parallel front and rear sidewall surfaces and:
a plurality of transversely disposed, spaced apart openings lying in a plane parallel with said upper and lower surfaces and extending through said substrate and intersecting said front and rear sidewall surfaces;
a plurality of spaced apart terminal leads disposed in respective ones of said openings, each lead having an internal and external portion, the external portions of each of said leads projecting from said front sidewall surface, the internal portions of each of said leads being disposed

inwardly of a respective one of said transverse openings, and including a deformed area having a lateral dimension sufficient to provide intimate contact with the defining internal surface of its respective opening, the frontmost point of contact of said deformed area with said internal surface being spaced inwardly from said front sidewall surface;

a plurality of laterally spaced, continuous, conducting termination coating areas deposited transversely of said front sidewall surface, each of said coating areas extending from its associated lead onto said planar surface and in electrical contact with the electrical circuitry disposed thereon; and

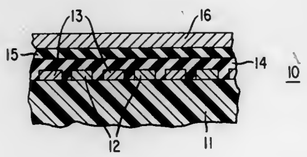
a conducting solder coating on each of said termination coating areas and on the portion of the lead in the proximity of said termination coating areas and extending a relatively short distance inwardly of said front sidewall surface and spaced forwardly from the aforesaid frontmost point of contact of said deformed area of said lead and said surface to retain and anchor said lead in place.

4,187,530

STRUCTURE FOR SOLID STATE SWITCH

Shobha Singh, Summit; LeGrand G. Van Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 1, 1978, Ser. No. 911,338
Int. Cl.[2] H01G *9/00*
U.S. Cl. 361—433 **13 Claims**



1. A solid state electrical switch comprising an input circuit and a readout circuit in which the read out circuit is switched from insulating to conducting state under the influence of an electric field set up by the input circuit by injecting suitable positive ions into an electrochromic material and switching from conducting to insulating state by removing the positive ions from the electrochromic material by reversing the electric field characterized in that

(a) both the readout circuit and the input circuit have a common contact called a based contact and the readout contact and the base contact are mounted on the same plane.

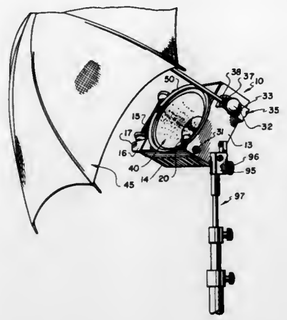
4,187,531

LIGHTING ARRANGEMENT FOR PHOTOGRAPHIC WORK INCLUDING COMBINED SPOT AND FLOOD LIGHT LUMINAIRE

Ross Lowell, P.O. Box 114, Lincolndale, N.Y. 10540, and Marvin H. Seligman, 1203 River Rd., Edgewater, N.J. 07020

Filed Apr. 25, 1978, Ser. No. 899,854
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—17 **12 Claims**

1. A combined spot and flood light luminaire, for photographic work, arranged to be either held in one hand or mounted on a suitable support and to have photographic accessories mounted thereon, said luminaire comprising, in combination, a casing; a hand grip adjustably secured to said casing whereby said casing can be held in one hand of a user; a shaft rotatably mounted in said casing and projecting outwardly thereof; a handle secured to the projecting end of said shaft adjacent said hand grip for operation by the same hand gripping said hand grip; a lamp socket mounted on said shaft intermediate its ends; a lamp mounted upright in said socket; a reflector assembly mounted in said casing and including a small diameter inner parabolic reflector, a large diameter outer parabolic reflector coaxial with said inner reflector, and a transition zone interconnecting said reflectors; said reflector assembly having a relatively elongated slot therein receiving said lamp socket for swinging of said upright lamp, about the axis of said shaft, by operation of said handle, between an inner position, in



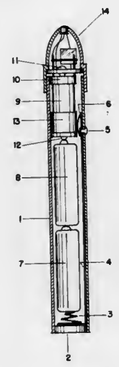
which said lamp, in cooperation with said inner parabolic reflector and also with said outer reflector, for maximum intensity, provides a broad or wide angle flood light, and an outer position, in which said lamp, in cooperation primarily with said outer reflector, provides a concentrated spot light; and mounting means on said casing for mounting said luminaire on a supporting post and for mounting of photographic accessories on said luminaire.

4,187,532

ELECTRONIC CANDLE

Vernon H. Naffier, 899 Laurel St., Dubuque, Iowa 52001

Filed Jun. 22, 1978, Ser. No. 918,068
Int. Cl.[2] F21L *7/00*
U.S. Cl. 362—186 **4 Claims**



1. An improved simulated candle using an electric lamp, said device comprising an elongated structure housing a direct current electrical energy source, a light generating element energized by said electrical energy source, disposed at top end of said elongated structure; a first means located adjacent to said light-generating element for allowing said light-generating element to be energized by said electrical energy source when said light-generating element is momentarily brought into close proximity with an external radiant means, said light-generating element remaining energized after said external radiant means is withdrawn; a second means located adjacent to said light-generating element for de-energizing said light-

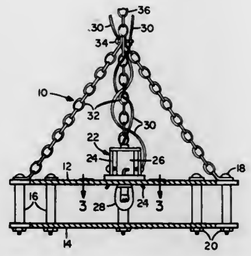
generating element by means of air movement directed toward said second means, said second means cooperating with said first means in such manner that said first means remains continuously operable; and a third means for disposing said first two means in the candle structure in said manner as to afford first two said means protection from damage in ordinary usage without hampering easy accessibility to said electrical energy source and said light-generating element for removal and replacement thereof.

4,187,533

SUBMERSIBLE FISHING LAMP ASSEMBLY

William C. Hampton, 4007 Fern Valley Rd., Louisville, Ky. 40219

Filed Feb. 6, 1978, Ser. No. 875,138
Int. Cl.[2] A01K *97/00, 85/01;* **F21L** *5/00, 15/02;* **F21V** *1/22, 1/24, 17/06*
U.S. Cl. 362—257 **4 Claims**



1. A submersible fishing lamp assembly adapted to directly illuminate surrounding water radially and horizontally outward from said assembly in a relatively narrow layer consisting essentially of

a pair of spaced opaque generally circular plates, one such plate having a hole through the center thereof through which an illuminating means can project;

means securing said plates parallel to and in registry with one another such that the diameter of said plates is at least four times greater than the distance between them, said securing means including fasteners projecting through said plates and plate spacers;

illuminating means disposed between said plates for illuminating water into which said assembly is immersed, said illuminating means comprising a standard light bulb projecting through said hole in said one plate and a light bulb socket; and suspending means connected approximately equidistant around the periphery of said one plate and secured together at a vertex point above said one plate.

4,187,534

UNIVERSAL LENS MOUNTING FOR SELECTIVE SPOTLIGHT BEAM SPREAD

Clyde L. Tichenor, Van Nuys, and Craig LeVasseur, Calabasas, both of Calif., assignors to Berkey-Colortran, Inc., Burbank, Calif.

Continuation of Ser. No. 739,694, Nov. 8, 1976, abandoned. This application Nov. 8, 1978, Ser. No. 958,610
Int. Cl.[2] F21Y *13/04*
U.S. Cl. 362—268 **10 Claims**

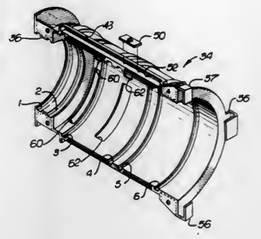
1. In a stage lighting luminaire:

(a) a generally cylindrical lens housing having a small diameter rear end and a large diameter front end;

(b) said housing comprising two complementary halves separable along a longitudinal parting plane;

(c) said housing having a plurality of internal grooves in its large diameter end and a plurality of internal grooves in its small diameter end; said grooves being axially spaced from each other along the length of said housing;

(d) a set of lenses, including small diameter and large diameter lenses and selected for accommodation in said grooves for providing by optical combinations a beam of desired angular spread; and



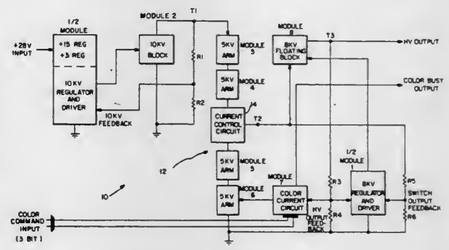
(e) means releasably securing said housing halves together releasably to lock the lenses in their selected grooves.

4,187,535

VOLTAGE POWER SUPPLY

Patrick A. Wigley; Edwin L. Dana, both of Sunnyvale, and Alfred Pletz, Jr., Milpitas, all of Calif., assignors to CPS, Inc., Sunnyvale, Calif.

Filed Mar. 31, 1978, Ser. No. 892,132
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—16 **29 Claims**



1. A voltage power supply especially suitable for providing a relatively high DC voltage output of rapidly changing amplitude, said power supply comprising:

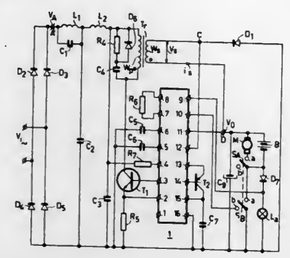
(a) inverter means adapted for connection to a fixed relatively low amplitude DC voltage input for producing an AC voltage output in response thereto;

(b) converter means connected with said inverter means and responsive to said AC voltage output for producing at its output a DC drive voltage having a fixed amplitude substantially higher than said DC voltage input;

(c) voltage varying means including a pull-up and pull-down circuit arrangement connected to the output of said converter means for producing at its output an adjustable DC output voltage having an amplitude not exceeding the amplitude of said drive voltage; and

(d) voltage adjusting means connected to said voltage varying means and adapted for connection to means for producing a coded signal for rapidly changing the amplitude of said adjustable output voltage in response to said coded signal.

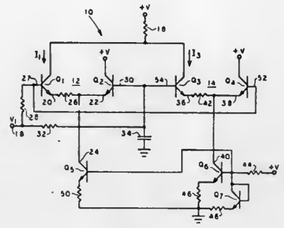
4,187,536
DEVICE FOR ENERGIZING A D.C. MOTOR, COMPRISING AN ACCUMULATOR BATTERY
George A. Govaert, Eindhoven; Meinardus A. G. Nijholt, and Lammert Rodenburg, both of Drachten, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 12, 1978, Ser. No. 914,570
Claims priority, application Netherlands, Jun. 13, 1977, 7706447
Int. Cl.² H02M 3/335
U.S. Cl. 363—21 **14 Claims**



1. A device for energizing a d.c. motor comprising a flyback converter having an output circuit to which the motor may be connected, the flyback converter comprising a control circuit, which for the greater part is designed as an integrated circuit, for generating control pulses having a fixed frequency of the order of tens of kHz and with a controlled pulse duration for controlling a switching element which is connected in series with a primary winding of a transformer in the flyback converter, the control circuit including means for controlling the pulse duration of the control pulses depending on the output voltage and the current through the primary winding of the transformer, a rechargeable accumulator battery connected in series with a secondary winding of said transformer, switching means for connecting the motor in parallel with the accumulator battery, a power-supply capacitor for energizing the control-circuit, said power-supply capacitor being charged from the secondary winding of the transformer, the control circuit further comprising a voltage-level detector which keeps the control circuit in the active state when the voltage across the power-supply capacitor exceeds a specific threshold voltage, a starting circuit including a starting capacitor for supplying, in the case of an inactive control circuit, a control current for the switching element provided that the voltage across the starting capacitor and the instantaneous input voltage exceed a specific level, and wherein the pulse duration controlling means includes a detection circuit for detecting the current through the primary winding of the transformer and also the instantaneous value of the input voltage so that the pulse duration of the control pulses is also determined by the instantaneous value of the input voltage.

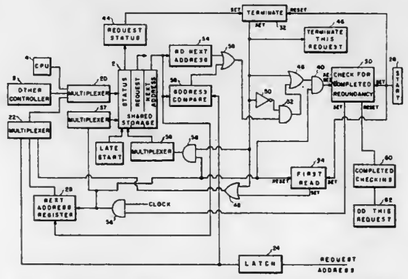
4,187,537
FULL-WAVE RECTIFIER
Richard Avicola, Addison, and George J. Tzakis, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Dec. 21, 1978, Ser. No. 972,193
Int. Cl.² H02M 7/217
U.S. Cl. 363—127 **9 Claims**

1. A full-wave rectifier, comprising:
first differential amplifier means adapted to receive an A.C. input signal and having first and second amplifiers sharing current from a common current source, said first amplifier having a D.C. operating point substantially offset from that of said second amplifier such that said first amplifier conducts substantially only on positive excursions of the A.C. input signal;
second differential amplifier means adapted to receive the A.C. input signal and having first and second amplifiers sharing current from a common current source, said first amplifier in said second differential amplifier means having a D.C. operating point substantially offset from that of said second amplifier in said second differential amplifier means such that said first amplifier in said second differential amplifier means conducts substantially only on negative excursions of the A.C. input signal;



a load impedance; and
means coupling the current conducted by the first amplifiers of said first and second differential amplifier means to said load impedance,
whereby a fully rectified version of the A.C. input signal is developed across said load impedance.

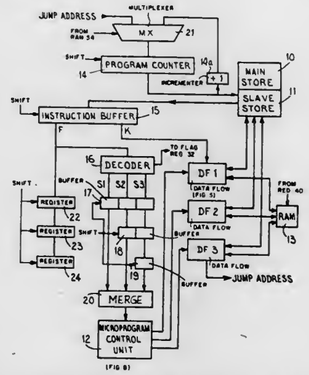
4,187,538
READ REQUEST SELECTION SYSTEM FOR REDUNDANT STORAGE
Robert H. Douglas, and Thomas L. Phinney, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 13, 1977, Ser. No. 805,963
Int. Cl.² G06F 13/00
U.S. Cl. 364—200 **4 Claims**



1. In a computer system having redundant address data storage in a plurality of data storage locations, and a shared random access memory, a method of exclusively selecting one of the redundant addresses when the corresponding data is requested by any of one or more central processor units, said method comprising:
storing information in said shared random access memory relative to an initiating data request including the address, the execution status, and the address of the redundant storage of the requested data,
querying said shared random access memory relative to said status, if said request has been executed or is being executed as a result of a previous routine, then terminating the initiating request,
if said request is not being or has not been executed, then querying said random access memory relative to said redundant address,
if said random access memory indicates no redundant address, then initiating a routine to execute the initiating request,

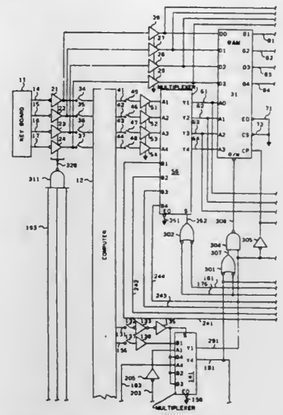
if said random access memory includes a redundant address, then querying said random access memory relative to the execution status of said redundant address,
if said redundant address status is indicated as being completed or in progress, then terminating the initiating request,
and if said redundant address status is not indicated as being completed or in progress, then initiating said routine for executing the initiating request.

4,187,539
PIPELINED DATA PROCESSING SYSTEM WITH CENTRALIZED MICROPROGRAM CONTROL
John R. Eaton, Salford, England, assignor to International Computers Limited, London, England
Filed Jul. 28, 1977, Ser. No. 819,868
Claims priority, application United Kingdom, Aug. 17, 1976, 34259/76
Int. Cl.² G06F 9/20, 9/06
U.S. Cl. 364—200 **1 Claim**



1. A data processing system comprising a plurality n of simultaneously operable data processing stages each of which contains an arithmetic unit for performing arithmetic operations on data in response to control signals, program control means for producing a sequence of control codes, a new control code being produced each time a shift signal is received by the program control means, and a plurality n of buffers connected in series, the first buffer in the series being connected to the output of the program control means, and each buffer being clocked by said shift signal so that when a said shift signal occurs the contents of each buffer is transferred into the next buffer, if any, in the series and the control code currently produced by the program control means is transferred into the first buffer in the series, whereby at any given time the series of buffers contains the latest n control codes produced by the program control means, wherein the improvement comprises
(a) means connected to all the buffers for merging together the current contents of all the buffers to form a single microprogram start address;
(b) a microprogram store containing a plurality of sequences of microinstructions;
(c) microprogram sequencing means, connected to receive the microprogram start address from the merging means, for producing a sequence of microprogram addresses starting at said microprogram start address, and for applying the sequence of microprogram addresses to the microprogram store so as to read out a corresponding sequence of microinstructions therefrom; and
(d) microinstruction decoding means for decoding each microinstruction read out of the store, to produce said control signals which are applied to said n data processing stages, and for producing said shift signal at the end of each sequence of instructions.

4,187,540
CONTROL PANEL SELF-TEST
Thomas T. Davis, and Marvin C. Burk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 18, 1978, Ser. No. 870,546
Int. Cl.² G06F 11/06, 3/14, 3/02
U.S. Cl. 364—200 **14 Claims**

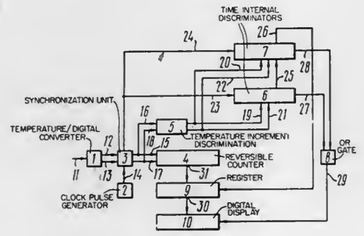


1. Apparatus comprising:
means for supplying a first binary address;
a computer means;
means for transmitting said first binary address to said computer means, said computer means performing a predetermined function in response to said first binary address;
a data display means;
means for transmitting data from said computer means to said data display means; and
means for testing said means for supplying said first binary address and said data display means, said means for testing said means for supplying said first binary address and said data display means including means for bypassing said computer means so as to supply said first binary address to said data display means, said data display means displaying a predetermined response to said first binary address if a malfunction does not occur in said means for supplying said first binary address and said data display means, said data display means displaying a response, other than said predetermined response, to said first binary address if a malfunction does occur in said means for supplying said first binary address or said data display means.

4,187,541
DIGITAL ANALYZER FOR DETERMINING LIQUIDUS TEMPERATURE OF METALS AND ALLOYS
Vladimir I. Skurikhin; Leonid S. Fainzilberg, and Leonid S. Zhitetsky, all of Kiev, U.S.S.R., assignors to Institut Kibernetiki Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.
Filed Jun. 8, 1978, Ser. No. 913,910
Claims priority, application U.S.S.R., Jun. 13, 1977, 2496567
Int. Cl.² G06F 15/20; G01N 25/02
U.S. Cl. 364—497 **2 Claims**

1. A digital analyzer for determining the liquidus temperature of metals and alloys, comprising
a converter for converting the actual temperature of metals and alloys to a digital pulse code, having an input, whereto there is applied a signal carrying information on the actual temperature of a metal or alloy being analyzed in the process of cooling, a first output for code pulses corresponding to a positive increment of temperature, and a second output for code pulses corresponding to a negative increment of temperature;

a clock pulse generator having an output;
a synchronization unit for distributing clock and code pulses in time, having
first, second and third inputs, a first output for synchronized code pulses corresponding to a positive increment of temperature, a second output for synchronized code pulses corresponding to a negative increment of temperature, and a third output for synchronized clock pulses;
a reversible counter for generating a parallel code of the actual temperature, having an add input, a subtract input, and an information output;
a discriminator of local temperature increments, having
first and second inputs, a first output whereto a signal is applied with a predetermined positive increment of temperature, and a second output whereto a signal is applied with a predetermined negative increment of temperature;
a first time interval discriminator for selecting time intervals during which the predetermined increment of temperature occurs, having
a count input, a first reset input, a second reset input, an intermediate output and an output;
a second time interval discriminator for selecting time intervals during which the predetermined increment of temperature occurs within a period of time exceeding said predetermined value, having
a count input, a first reset input, a second reset input, a disable input for blocking said second reset input, an intermediate output, and an output;



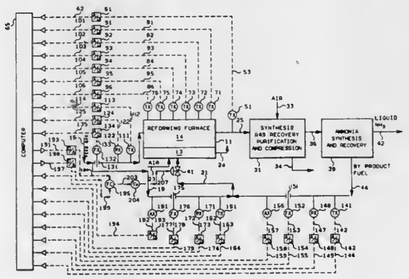
a register for storing the result of the analysis, having
an information input, a control input, and an information output;
an OR gate, having
a first input, a second input and an output;
a digital display unit for displaying the result of the analysis in a digital form, having
an information input, and a control input;
said first input of said synchronization unit, connected to said first output of said converter for converting the actual temperature of metals and alloys to a digital pulse code;
said second input of said synchronization unit, connected to said second output of said converter for converting the actual temperature of metals and alloys to a digital pulse code;
said third input of said synchronization unit, connected to said output of said clock pulse generator;
said first output of said synchronization unit, connected to said add input of said reversible counter and to said first input of said discriminator of local temperature increments;
said second output of said synchronization unit, connected to said subtract input of said reversible counter and to said second input of said discriminator of local temperature increments;
said third output of said synchronization unit, connected to said count input of said first time interval discriminator, and to said count input of said second time interval discriminator;
said first output of said discriminator of local temperature increments, connected to said first reset input of said first time interval discriminator and to said first reset input of said second time interval discriminator;
said second output of said discriminator of local temperature increments, connected to said second reset input of said first time interval discriminator and to said second reset input of said second time interval discriminator;
said intermediate output of said first time interval discriminator, connected to said disable input of said second time interval discriminator;
said output of said first time interval discriminator connected to said first input of said OR gate;
said output of said second time interval discriminator connected to said second input of said OR gate;
said intermediate output of said second time interval discriminator, connected to said control input of said register;
said information input of said register, connected to said information output of said reversible counter;
said information input of said digital display unit, connected to said information output of said register;
said output of said OR gate, connected to said control input of said digital display unit.

4,187,542

PROCESS CONTROL METHOD AND APPARATUS

Donald H. Ball, and James D. Voelkers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1978, Ser. No. 907,386
Int. Cl.[2] G06F *15/46;* F23N *1/00*
U.S. Cl. 364—502 **18 Claims**



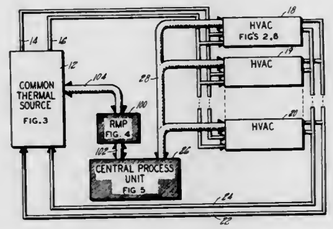
1. Apparatus comprising:
a furnace means;
means for supplying a first fuel to said furnace means;
means for supplying a second fuel to said furnace means, said first fuel being different from said second fuel;
means for supplying a feed stream to said furnace means;
means for establishing a first signal representative of the flow rate of said feed stream;
means for establishing a second signal, representative of the predicted heat input to said furnace means required to reform said feed stream in some desired manner, in response to said first signal;
means for establishing a third signal representative of the heat being supplied by said first fuel; means for establishing a fourth signal representative of the heat being supplied by said second fuel;
means for establishing a fifth signal, representative of the total heat being supplied to said furnace means, in response to said third and fourth signals;
means for establishing a sixth signal representative of the measured temperature of the effluent flowing from said furnace means;
means for establishing a seventh signal representative of the desired temperature of said effluent flowing from said furnace means;
means for establishing an eighth signal responsive to the difference between said sixth signal and said seventh signal;
means for establishing a ninth signal, representative of the actual required heat input to said furnace means, in response to said second signal and said eighth signal;
means for establishing a control signal responsive to the difference between said fifth signal and said ninth signal; and
means for manipulating the flow rate of said first fuel and the flow rate of said second fuel in response to said control signal to provide the required heat input to said furnace means.

4,187,543

TEMPERATURE CONTROL OF CHILL WATER AND STEAM IN HEATING, VENTILATION, AIR CONDITIONING (HVAC) SYSTEMS

David M. Healey, Feeding Hills, Mass., and John E. Games, Granby, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1977, Ser. No. 845,110
Int. Cl.[2] G06F *15/46;* F24F *3/00*
U.S. Cl. 364—505 **11 Claims**



1. Apparatus for controlling the discharge temperature of thermal fluid presented from a common thermal source to one or more HVAC systems in a network, each HVAC controlling the volume of thermal fluid circulating therethrough in dependence on the thermal energy demand from temperature regulated living spaces associated with each by position modulation of an associated HVAC fluid valve apparatus over a total valve position range from a full closed position for a minimum volume to a full open position for maximum volume, the apparatus comprising:
position sensing means, for providing actual valve position signals for the fluid valve apparatus associated with each HVAC system;
temperature sensing means, adapted to be disposed in the common thermal source, for providing an actual discharge temperature signal; and
electronic processing means, responsive to said position sensing means and said temperature sensing means, for providing in response to said actual valve position signals a signal manifestation having a magnitude representative of the highest HVAC system thermal energy demand in the network, said processing means further providing control of the common thermal source to provide modulation of the source discharge temperature in dependence on said signal manifestation magnitude.

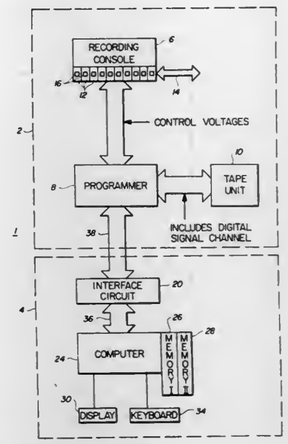
4,187,544

AUTOMATED MIXING SYSTEM WITH DISPLAY/DATA ENTRY SUBSYSTEM

Michael W. Larner, Mill Valley, Calif., assignor to Rubinson & Friends, Inc., San Francisco, Calif.

Filed Jul. 18, 1978, Ser. No. 925,741
Int. Cl.[2] H04R *29/00*
U.S. Cl. 364—514 **31 Claims**

9. Apparatus for an automated mixing-recording system having an automation programmer, a multi-track tape recording unit, and a recording console having a plurality of I/O modules thereon and fader setting means associated with each I/O module, said apparatus comprising:
(a) display means for displaying fader levels corresponding to fader setting means of said console I/O modules and for displaying fader levels previously recorded on a multi-track tape, said automation programmer providing con-



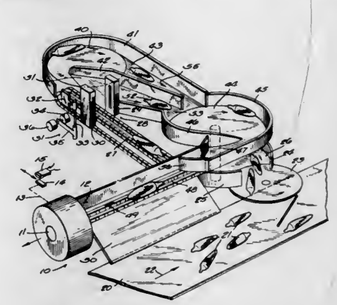
sole fader level data signals from said console and said multi-track tape recording unit; and
(b) interface means connected between said programmer and said display means for interconnecting same;
whereby representation of said console and previously recorded data signals may be displayed on said display means.

4,187,545

ARTICLE ORIENTATION DETERMINING APPARATUS

John M. Wallace, Kewaunee, and Gerald A. Pitner, Appleton, both of Wis., assignors to Frank Hamachek Machine Company, Kewaunee, Wis.

Filed Feb. 28, 1978, Ser. No. 882,288
Int. Cl.[2] G01B *11/10;* A01F *11/06*
U.S. Cl. 364—559 **21 Claims**



1. In apparatus for determining the orientation of articles that are being transported in a longitudinal direction and have a maximum size portion and other portions having different sizes measured in a direction transverse to said longitudinal direction on at least one side of said maximum size portion,
means for transporting said articles longitudinally in a predetermined path,
scanning means including a plurality of radiation source means for projecting beams of radiation across said path,

a plurality of radiation detector means disposed to receive radiation projected across said path,

means for turning said radiation sources on and off in sequence to effect a scanning cycle and means for effecting repetitions of the cycle for successive increments of length of an article as it passes between said source and detector means,

means controlled by said detector means to produce successive data words representative of the number of beams from said sources which are blocked and unblocked by said articles during each scan cycle to thereby indicate the sizes of said increments in said transverse direction,

computer means programmed to use said data words for determining said maximum transverse size portion and for determining the number of scans on each side of said portion where said other portions respectively are reduced in size by the same amount relative to said maximum size portion, and

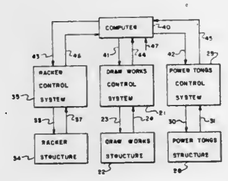
means responding to said computer means determining that one of said other portions is smaller in said transverse direction than another of said other portions by acting on the said article to which the determination relates.

4,187,546

COMPUTER-CONTROLLED OIL DRILLING RIG HAVING DRAWWORKS MOTOR AND BRAKE CONTROL ARRANGEMENT

James P. Heffernan, Des Plaines, Ill.; Loren B. Sheldon, Houston, Tex.; James R. Tomashek, Wood Dale, and Donald H. Ward, Glen Ellyn, both of Ill., assignors to B. J. Hughes Inc., Long Beach, Calif.

Filed Mar. 15, 1977, Ser. No. 777,724
Int. Cl.[2] E21B *19/00*; G06F *15/20*
U.S. Cl. 364—565 **7 Claims**



1. A closed-loop control system for controlling a drawworks motor for lifting a predetermined length of drill string to a predetermined position within an oil derrick at a predetermined velocity comprising:

a block arrangement connected to the drawworks motor and adaptable to support the upper end of a drill string during lifting thereof;

means for outputting a position signal functionally related to the elevation of the block arrangement with respect to a vertical axis extending through the derrick;

means for outputting a velocity signal functionally related to the velocity of the block arrangement;

means for outputting a load signal functionally related to the magnitude by which a weight supported by the block arrangement deviates from a predetermined portion of the weight supported by the block arrangement when the block arrangement is in a substantially static condition;

means for generating an error signal functionally related to the difference between the position signal and a signal representative of the predetermined position to the difference between the velocity signal and a signal representative of the predetermined velocity, and to the load signal; and,

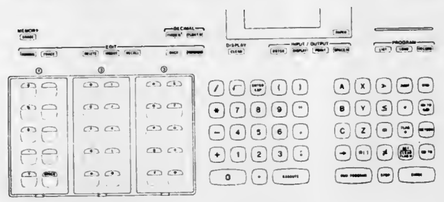
means responsive to the error signal for driving the motor in a manner so as to change the error signal in a direction such as to reduce the block velocity otherwise prevailing.

4,187,547

PROGRAMMABLE CALCULATOR INCLUDING MEANS FOR CONTROLLABLY INTRODUCING BLANK LINES ON A PRINTED RECORD DURING PROGRAM EXECUTION

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,322
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—710 **5 Claims**



1. An electronic calculator comprising:

keyboard input means having a plurality of alphabetic, numeric, and control keys for entering lines of alphameric information, including control commands, into the calculator;

memory means for storing a line of alphameric information entered into the calculator from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for processing a line of alphameric information entered into the calculator from said keyboard input means and stored in said memory means to perform selected functions; and

line printer means, coupled to said processing means, for printing lines of alphameric information on a record medium;

said control keys including an execute control key for initiating processing by said processing means of a line of alphameric information entered into the calculator from said keyboard input means and a printer control key, operative with selected ones of said plurality of alphabetic and numeric keys, for entering a printer spacing control command, including specification of a number of blank lines, into the calculator;

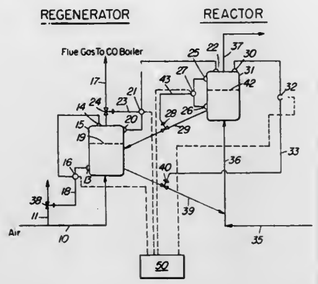
said processing means being responsive to entry from said keyboard input means of a printer spacing control command, including specification of a number of blank lines, followed by actuation of said execute control key, for causing said line printer means to introduce a number of blank lines on the record medium, as specified in the printer spacing control command.

4,187,548

SIMULATION OF CATALYTIC CRACKING PROCESS

Benjamin Gross; Solomon M. Jacob, both of Cherry Hill; Donald M. Nace, Woodbury, all of N.J., and Sterling E. Voltz, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 148,051, May 28, 1971, abandoned. This application May 23, 1974, Ser. No. 472,525
Int. Cl.[2] G06F *15/32*
U.S. Cl. 364—578 **5 Claims**



4. Apparatus for predicting the reaction product yields of a catalytic cracking process for the conversion of a stream of hydrocarbons wherein said stream is contacted with an active catalyst in a reactor maintained under catalytic cracking conditions to provide reaction products which are removed from said reactor, the catalyst in said reactor becoming contaminated by the deposition of coke thereon, said apparatus comprising:

means for lumping said hydrocarbons both kinetically and according to boiling range, two of the lumps of said hydrocarbons including: (1) the carbon atoms in aromatic rings and (2) aromatic side chains associated with the aromatic rings,

means for simulating said catalytic cracking process based on invariant simultaneous and consecutive reactions of the lumped hydrocarbons, and

means for producing an output representing the yield of said reactions based upon said model.

4,187,549

DOUBLE PRECISION RESIDUE COMBINERS/CODERS

James W. Bond, and Gary A. Dressel, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,642
Int. Cl.[2] G06F *7/48*
U.S. Cl. 364—746 **3 Claims**

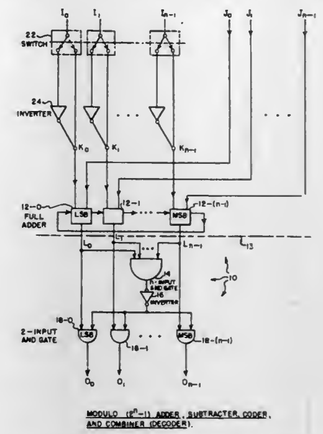
1. Apparatus for the modulo number calculation of input signals in binary form, using residue class arithmetic, comprising:

a plurality n of three-input, two-output, adding means, having one input for receiving a signal $K_0, K_1, \ldots, K_{n-1}$, where K_i=a mod (2^n-1), a second input for receiving a signal, $J_0, J_1, \ldots, J_{n-1}$, where J_i=b (mod 2^n-1), the third input, for receiving an input carry, being circularly connected to one of the outputs, a first output, of an adjacent adding means, for transmitting an output carry to it, the first output of the 0-th adding means being connected to the third input of the 1st adding means, the 1st to the 2nd, etc., through the $(n-1)$st to the 0-th;

an n-input means for adding, whose inputs comprise, and are connected to, the second outputs of the n three-input adding means, for adding the n inputs in an AND manner;

an inverting means, whose input is connected to the output of the n-input adding means, for inverting the signal at its input; and

a plurality of n two-input ANDing means, each having one of its inputs connected to the output of one of the n adding means, the other input being connected to the output of the inverting means, the output signal comprising the sum



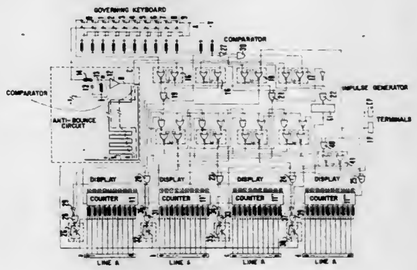
$K_i+J_i=(a+b)$ modulo (2^n-1) of two input signals, K_i=a modulo (2^n-1) and J_i=b modulo (2^n-1), whereby the apparatus serves as an adder.

4,187,550

MULTIPLE PARAMETER PROCESSING AND PROGRAMMING SYSTEM

Jose J. Garcia Ramos, Madrid, Spain, assignor to Investigacion y Desarrollo de Nuevas Technicas para Automatismo, S.A. (I.D.T.A., S.A.), Madrid, Spain

Filed Dec. 17, 1976, Ser. No. 751,373
Claims priority, application Spain, Jun. 22, 1976, 449.123
Int. Cl.[2] G06F *15/46, 3/02*
U.S. Cl. 364—900 **29 Claims**



1. A programmable multiple parameter process controller comprises a plurality of programmable units, for monitoring the relationship between a pre-selected parameter and a preselected value for that parameter and producing a pre-selected output upon the occurence of the pre-selected condition, comprising:

(a) means for selecting a desired programmable unit from said plurality of programmable units contained in said process controller;

(b) means for generating and storing a desired parameter target value in said selected programmable unit;

(c) means for generating and storing a pre-selected conditional value in said selected programmable unit;

(d) means for generating and storing in said selected programmable unit a signal representative of said pre-selected output;

(e) means for selecting one of said plurality of parameters to be monitored;

(f) means for monitoring the value of said selected parameter and comparing said value to said target value stored in said selected programmable unit to produce a signal representative of the relationship of said parameter value to said target value; and

(g) means for comparing the value of said representative signal to said pre-selected conditional value stored in said selected programmable unit and generating said pre-selected output in response thereto.

4,187,551

APPARATUS FOR WRITING DATA IN UNIQUE ORDER INTO AND RETRIEVING SAME FROM MEMORY

Geoffrey Nutter, Cheadle, and William McGibbon, Manchester, both of England, assignors to Ferranti Limited, England

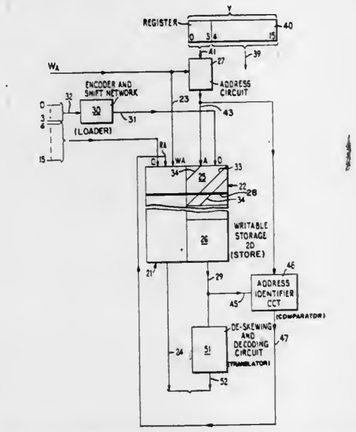
Continuation-in-part of Ser. No. 742,230, Nov. 16, 1976, Pat. No. 4,112,487. This application Nov. 21, 1977, Ser. No. 853,461

Claims priority, application United Kingdom, Nov. 21, 1975, 47988/75; Nov. 20, 1976, 48514/76

The portion of the term of this patent subsequent to Sep. 5, 1994, has been disclaimed.

Int. Cl.² G06F *7/00*

U.S. Cl. 364—900 **18 Claims**



1. Data processing apparatus for processing a plurality of information items, said data processing apparatus comprising:

(a) store means including a plurality of multi-bit word locations;

(b) address means for addressing selected word locations of said store means to enable respectively a reading and writing of information items from and into selected word locations of said store means; and

(c) translating means coupled to said store means for successively imparting to at least a portion of each of said plurality of information items a shift whereby said portion of each of the plurality of information bits is stored into a separate multi-bit word location as determined by said address means in a manner that one of said stored information items has a sequence of bits arranged in an order different from that order of any other stored information item, and for reading out from said store means a single bit of each of said plurality of information items stored in said plurality of corresponding word locations as addressed by said addressing means and for applying a shift to the single bits, the significance of said single bit being the same in each of said stored information items.

4,187,552

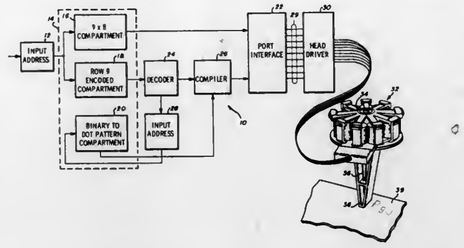
READ ONLY MEMORY CHARACTER GENERATOR SYSTEM

Brian P. Verstegen, Sunnyvale, Calif., assignor to Durango Systems, Inc., Cupertino, Calif.

Filed Sep. 20, 1978, Ser. No. 944,082

Int. Cl.² B41J *3/50*

U.S. Cl. 364—900 **7 Claims**



1. A system for generating dot print characters of a given font within a nine-column-by-nine-row dot matrix comprising:

a read only memory having memory storage devices arranged in rows and columns with a storage capacity per row of memory, the memory having a first memory means, a second memory means and a third memory means, said first memory means having nine memory row locations for each character of the font to be printed, the memory storage devices at each row location for each character being burned in pursuant to the dot matrix pattern for a partial column of dots of that given character, said second memory means having a memory row location for each character of the font to be printed with the memory storage devices at each location being burned in pursuant to the dot matrix pattern for not more than five columns of dots for a row of one of said characters and a binary-coded representation for the dot matrix pattern of the remaining columns of that row for that particular character, and said third memory means having a memory row location for each of said differing binary-coded representations with the storage devices at each location being burned in pursuant to the dot matrix pattern representative of one of said binary-coded representations;

a first input address means for receiving input information representative of a character to be printed and addressing the memory row locations of said first and second memory means corresponding to the particular character to be printed;

a decoder coupled to the second memory means for receiving the output of said second memory means and separating the dot matrix information from the binary-coded information for each character addressed;

a second address means coupled to the decoder for receiving the binary-coded information from the decoder and addressing rows of said third memory means;

a compiler for receiving the dot matrix information output of the decoder and the dot matrix information output of said third memory means and compiling the dot matrix information for each location in a single row successive column format pursuant to the row dot matrix pattern of the character addressed;

a port interface for receiving successive columns of dot matrix information for the addressed character from said first memory means and said rows of dot matrix information to the addressed character from said compiler, whereby the port interface may be coupled to driver means for activating a matrix print head responsive to successive composite columns of compiled dot information for the character addressed and the print head prints on a print medium in successive columns the dot pattern for the addressed character.

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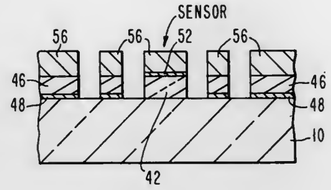
PEDESTAL BUBBLE DOMAIN CHIP AND PROCESSES FOR MAKING SAME

Kie Y. Ahn, Chappaqua; Mitchell S. Cohen, Ossining; John V. Powers, Shenorock, all of N.Y., and Lung-jo Tao, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,829

Int. Cl.² H01F *10/02*

U.S. Cl. 365—8 **25 Claims**



1. A magnetic bubble domain chip comprising a plurality of devices for manipulating bubble domains in a magnetic bubble film, comprising:

a magnetic bubble domain sensor for detection of said bubble domains, propagation elements forming shift registers for moving said bubble domains in said magnetic film, write devices for generating bubble domains in said magnetic film, and transfer switches for changing the path of bubble domains in said film,

said shift register propagation elements and transfer switches being comprised of two levels of metallurgy, including a first layer of an electrically conductive, non-magnetic material and a second layer comprising a magnetically soft material, said sensor being comprised of a portion of said magnetically soft material,

an insulating pedestal located under said sensor and localized in the general region of said sensor, said insulating pedestal being surrounded by portions of the conductive material comprising said first layer,

wherein said first and second layers are substantially planar, and parallel to one another and to said bubble domain film and wherein all of the propagation elements forming said registers are in the same plane.

4,187,554

FAULT TOLERANT BUBBLE MEMORY WITH REDUNDANCY USING A STATIONARY REGISTER ON A SINGLE CHIP

Clarence H. Kammann, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 24, 1978, Ser. No. 899,606

Int. Cl.² G11C *19/08*

U.S. Cl. 365—15 **5 Claims**

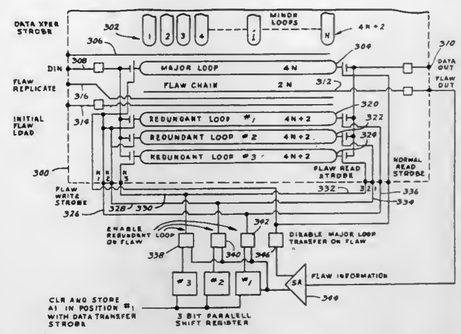
1. A fault tolerant bubble memory device comprising, in a field access type bubble memory employing a major loop-minor loop configuration:

a stationary register having at least as many register positions as the total number of minor loops placed parallel to and adjacent to the major loop in a location to act as a flaw table,

a logic element coupled with said major loop and said register so that the contents of said register and said major loop may be combined whereby defective minor loops may be disregarded and nominal memory capacity retained, said logic element receiving as its input the output of said register and having two outputs,

at least one redundant loop not associated with said major loop,

a first logic gate connected to one of said outputs from said logic element and having a connection with said major loop to disable access to said major loop in response to a flaw indication, and



at least one enable gate associated with a said redundant loop and connected to the other output of said logic element to enable access to a redundant loop in the presence of a flaw indication.

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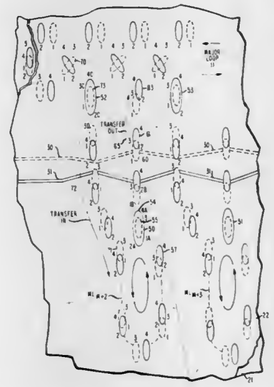
CONDUCTOR ACCESS MAGNETIC BUBBLE MEMORY ARRANGEMENT

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1979, Ser. No. 14,606

Int. Cl.² G11C *19/08*

U.S. Cl. 365—19 **8 Claims**



7. A magnetic bubble memory comprising a host layer of material in which magnetic bubble can be moved and means for moving magnetic bubbles in the layer, the means comprising first and second layers of electrically conducting material including first and second sets of like apertures respectively for defining at least first and second paths for moving magnetic bubbles therealong in response to a first pulse sequence impressed in the layers, the memory being CHARACTERIZED IN THAT the first and second layers also include relatively small and large apertures respectively, for defining a transfer location the small aperture being positioned to be encompassed by the large aperture, the transfer location being responsive to a second pulse sequence to move a bubble from the second to the first path.

4,187,556

ELECTRO-ACOUSTIC TRANSDUCER WITH LINE FOCUS

Charles H. Jones, Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1960, Ser. No. 20,230
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—155 **4 Claims**

1. A transducer for translating compressional waves in a liquid medium into electrical waves in an electric circuit and vice versa comprising an elongated transducer element having a spherically concave active face disposed with its smaller dimension between two circles of latitude spaced apart in a



hemisphere a distance substantially equal to the wavelength in the liquid medium of a predetermined operating frequency.

DESIGN PATENTS

GRANTED FEB. 5, 1980

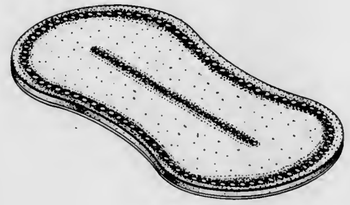
ERRATA

For CLASS	See PATENT NO.
D21-134	254,152

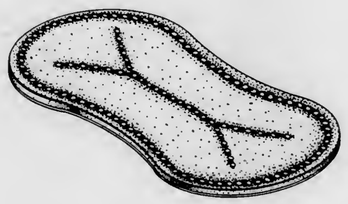
254,096
UNDERGARMENT SHIELD
Shirley T. Richards, P.O. Box 33427, St. Paul, Minn. 55133
Filed Aug. 15, 1977, Ser. No. 824,497
Term of patent 14 years
Int. Cl. D2—*99;* D24—*99*
U.S. Cl. D2—225



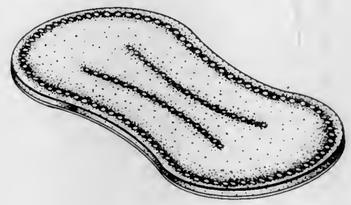
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UNDERGARMENT SHIELD
Shirley T. Richards, P.O. Box 33427, St. Paul, Minn. 55133
Filed Aug. 15, 1977, Ser. No. 824,498
Term of patent 14 years
Int. Cl. D2—*99;* D24—*99*
U.S. Cl. D2—225



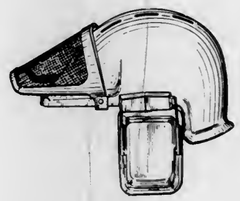
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UNDERGARMENT SHIELD
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Term of patent 14 years
Int. Cl. D2—*99;* D24—*99*
U.S. Cl. D2—225



254,099
UNDERGARMENT SHIELD
Shirley T. Richards, P.O. Box 33427, Saint Paul, Minn. 55133
Filed Aug. 15, 1977, Ser. No. 824,500
Term of patent 14 years
Int. Cl. D2—*99;* D24—*99*
U.S. Cl. D2—225



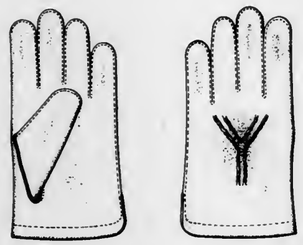
254,100
PROTECTIVE HELMET WITH EAR MUFFS AND FACE PROTECTION
Carl-Arne Breger, Malmo, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden
Filed Aug. 23, 1977, Ser. No. 827,119
Claims priority, application Sweden, Mar. 1, 1977, 77-0470
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



254,101
ATHLETIC SOCK
John H. Gilbert, Rte. 1, Box 163A1, Newton, N.C. 28658
Filed Jul. 18, 1977, Ser. No. 816,318
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—330



254,102
GLOVE
Howard Rubin, Weston, Conn., assignor to Kombi, Ltd., Norwalk, Conn.
Filed Apr. 12, 1978, Ser. No. 895,871
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—373



254,103
PAINT SCRAPER HOLDER OR SIMILAR ARTICLE
John Criswell, Rte. 1, Box 60, Corning, Iowa 50841
Filed Apr. 7, 1978, Ser. No. 894,597
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400



Fig. 1

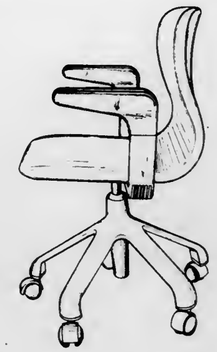


Fig. 7

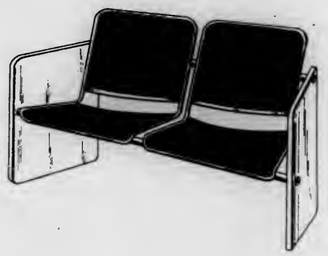
254,104
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,944
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



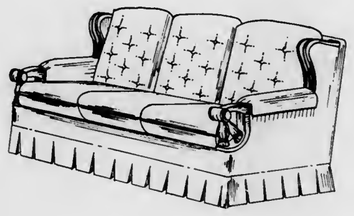
254,105
CHAIR
Isao Hosoe, Milan, Italy, assignor to Sacea S.a.s. di Tirinnanzi Giampietro & Co., Legnano, Italy
Filed Aug. 25, 1977, Ser. No. 827,819
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



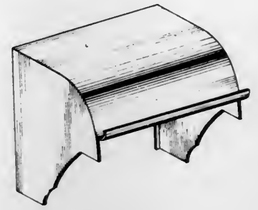
254,106
SEAT
Roland A. Benoit, 89 S. Main St., Danielson, Conn. 06239
Filed May 13, 1977, Ser. No. 796,798
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



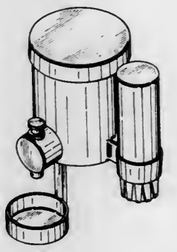
254,107
SEAT
Lester Beall, High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Mar. 29, 1977, Ser. No. 782,605
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



254,108
TOILET TISSUE COVER
Marlene Y. Chandler, 3174 Forest Manor, Indianapolis, Ind. 46218
Filed Oct. 18, 1978, Ser. No. 952,320
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



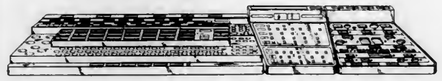
254,109
COMBINED LIQUID DISPENSER AND DISPOSABLE CUP HOLDER
Ronald L. Price, 401 W. Vineyard, Apt. 369, Oxnard, Calif. 93030
Filed Feb. 14, 1977, Ser. No. 768,556
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—91



254,110
SPEAKER STAND
Robert P. Stanley, P.O. Box 29722, Dallas, Tex. 75229
Filed Oct. 25, 1977, Ser. No. 844,699
Term of patent 7 years
Int. Cl. D6—*99*
U.S. Cl. D6—155



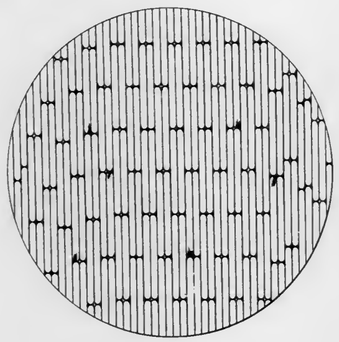
254,111
SET OF COSMETIC SELECTION AND DISPLAY UNITS
Dora Schaefer, New York, N.Y., assignor to Helena Rubinstein, Inc., New York, N.Y.
Filed Oct. 21, 1977, Ser. No. 844,512
Term of patent 14 years
Int. Cl. D20—*07*
U.S. Cl. D6—157



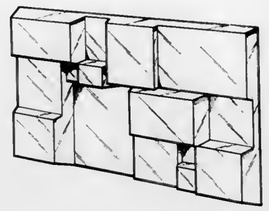
254,112
WORKBENCH
Milton E. Handler, 3330 Old Mill, Northbrook, Ill. 60062, and Richard Sylvan, 2731 Virginia La., Glenview, Ill. 60025
Filed Oct. 5, 1977, Ser. No. 839,511
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



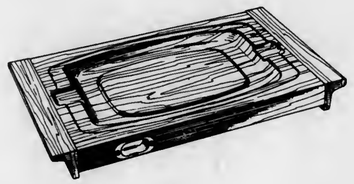
254,113
TABLE TOP
Carol A. Vroman, 1779 Tremainsville Rd., Apt. 232, Toledo, Ohio 43613
Continuation-in-part of Ser. No. 800,577, May 25, 1977, abandoned. This application Jan. 5, 1979, Ser. No. 1,271
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



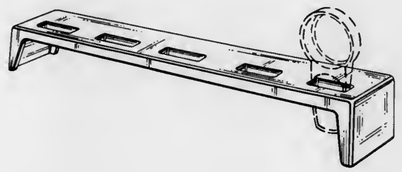
254,114
DISPLAY FOR PHOTOGRAPHS OR THE LIKE
George Lyman, Weston; Gregory Mathus, Sudbury, and Edward Yonkers, Newton, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.
Filed Sep. 28, 1977, Ser. No. 837,617
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



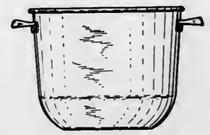
254,115
ELECTRICALLY HEATED CARVING TRAY
Kenneth J. McDonald, Strathfield, Australia, assignor to K-tel International (Aust.) Limited
Filed Aug. 3, 1977, Ser. No. 821,563
Claims priority, application Australia, Apr. 20, 1977, 71680
Term of patent 14 years
Int. Cl. D7—*99, 06*
U.S. Cl. D7—46

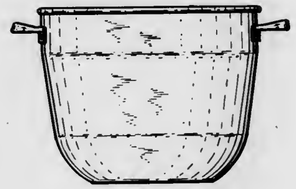


254,116
HOLDER FOR A MEASURING SPOON SET OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed Jan. 20, 1978, Ser. No. 871,060
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74



254,117
POT
Hyman Kramer, 50 Carter Dr., Stamford, Conn. 06902
Filed Dec. 11, 1975, Ser. No. 639,719
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—97



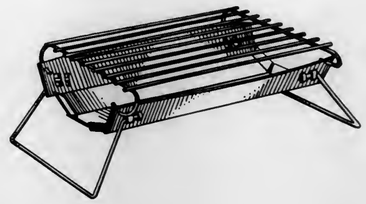


254,118
HEAVY DUTY OUTDOOR STOVE
Dwight C. Shaneour, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.
Filed Aug. 15, 1977, Ser. No. 824,568
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109

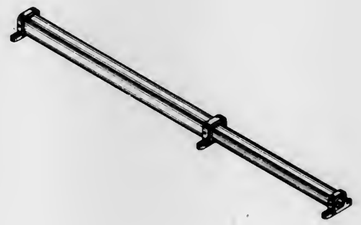




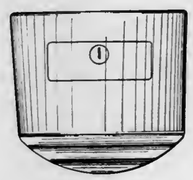
254,119
PORTABLE GRILL
Irving L. Mark, Chicago, Ill., assignor to Mark Design Ltd., Morton Grove, Ill.
Filed Nov. 25, 1977, Ser. No. 854,998
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



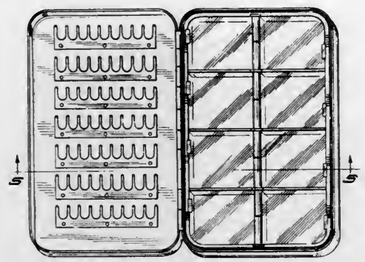
254,120
SAFETY RAIL FOR SLIDING PANELS
James L. Lang, Rt e, Box 3316, Selah, Wash. 98942
Filed Jun. 14, 1976, Ser. No. 695,866
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



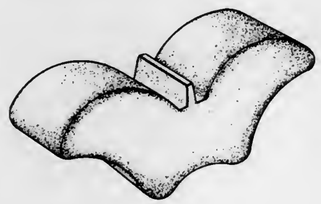
254,121
TRAILER KING PIN LOCK
Jerry D. Padgett, Jr., P.O. Box 1263, Lake Wales, Fla. 33853
Filed Sep. 26, 1977, Ser. No. 836,699
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



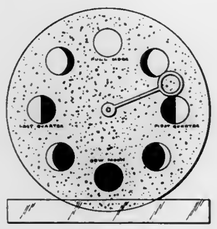
254,122
TACKLE BOX OR THE LIKE
Donald E. Wintz, St. Paul, Minn., assignor to Aladdin Manufacturing Company
Filed Feb. 22, 1977, Ser. No. 771,008
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184



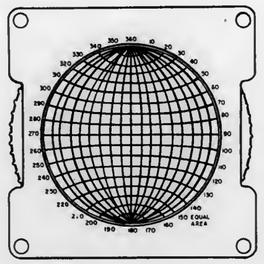
254,123
LOOSE FILL PACKAGING ELEMENT
Harry Bussey, Jr., P.O. Box 115, Serpentine Rd., Navesink, N.J. 07752
Filed Oct. 7, 1977, Ser. No. 840,294
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294



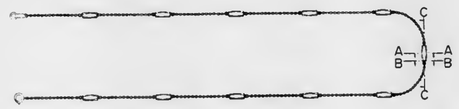
254,124
MOON CLOCK
Martin L. Greenfield, One Prospect St., Great Neck, N.Y. 11021
Filed Sep. 1, 1977, Ser. No. 829,819
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6



254,125
PLOTTING INSTRUMENT
Christopher M. Powell, 6, Elizabeth St., Ryde, New South Wales 2112, Australia
Filed Jun. 28, 1977, Ser. No. 811,001
Claims priority, application Australia, Feb. 3, 1977, 71120
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—61

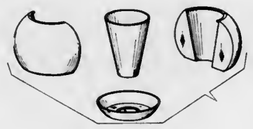


254,126
MAGNETIC NECKLACE
Masaaki Beniya, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1977, Ser. No. 808,251
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

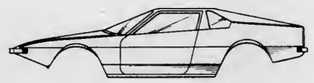


254,127
COMBINED FLOWERPOT TRAY, AND WATERING RESERVOIRS
Carlo M. Sgroi, Oceanside, N.Y., assignor to Pax Technology Ltd., Hicksville, N.Y.
Filed Aug. 30, 1978, Ser. No. 938,037
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—153





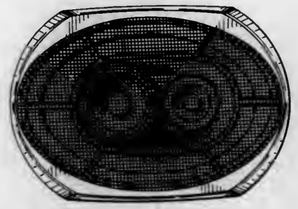
254,128
AUTOMOBILE BODY
Vito J. Carabetta, 124 West Ave. 42, Los Angeles, Calif. 90065
Filed Feb. 10, 1978, Ser. No. 876,854
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



254,129
COMBINED CAMPER SUPPORT AND JACK
Howard B. Johnson, 2133 W. Lodi Ave., Lodi, Calif. 95240
Filed Oct. 25, 1977, Ser. No. 845,243
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

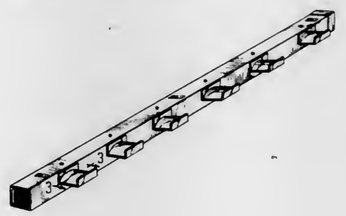


254,130
LOUDSPEAKER WITH GRILLE
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1978, Ser. No. 959,370
Claims priority, application Japan, May 10, 1978, 53-19180
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

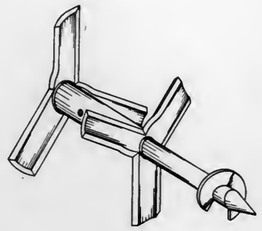




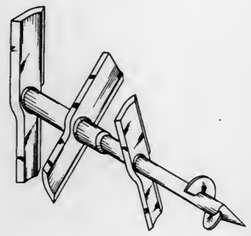
254,131
HEADPHONE DEMONSTRATION UNIT
Jeremy Prince 'Jeyshire', 17 Woodland Ave., Wokingham, Berkshire RA11 20K, England
Filed Dec. 6, 1978, Ser. No. 967,073
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—99



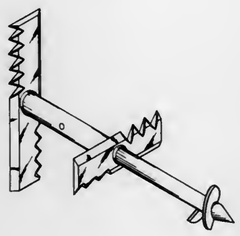
254,132
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,124
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



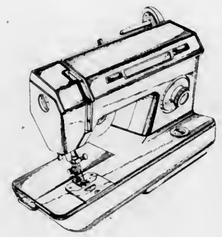
254,133
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,160
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



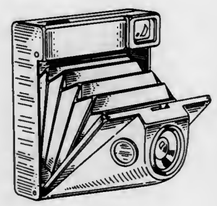
254,134
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,384
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



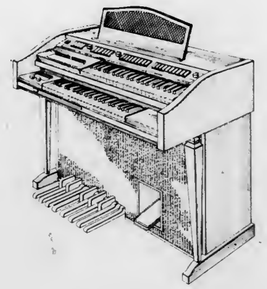
254,135
SEWING MACHINE
Cristian J. Felix, Flushing, N.Y., and Donald M. Genaro, Haworth, N.J., assignors to The Singer Company
Filed Aug. 23, 1977, Ser. No. 827,186
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



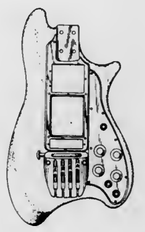
254,136
COLLAPSIBLE CAMERA
Otto Stemme, Munich, and Peter Lermann, Narring, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 2, 1976, Ser. No. 738,232
Claims priority, application Fed. Rep. of Germany, May 9, 1976, MR 479
The portion of the term of this patent subsequent to Oct. 23, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—21



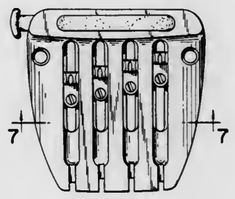
254,137
ORGAN CONSOLE
Thomas E. Kimble, Covington, Ky., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Jun. 27, 1977, Ser. No. 810,200
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—6



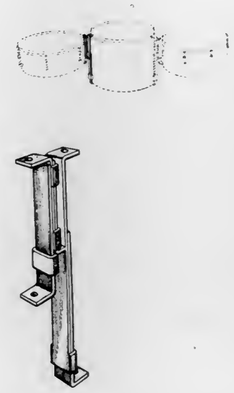
254,138
GUITAR BODY OR THE LIKE
James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.
Filed Jan. 19, 1977, Ser. No. 760,750
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



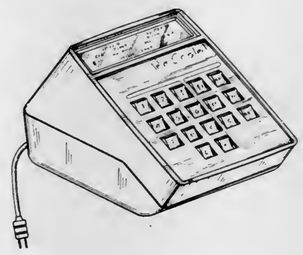
254,139
COMBINED TAILPIECE, BRIDGE AND MUTE UNIT FOR A GUITAR OR THE LIKE
James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.
Filed Jan. 19, 1977, Ser. No. 760,751
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



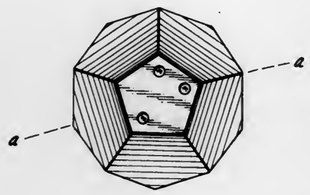
254,140
MULTIPLE DRUM BRACKET
Marvin V. Kuipers, 526 N. Peoria, Gilman, Ill. 60938
Filed Jul. 14, 1977, Ser. No. 815,516
Term of patent 14 years
Int. Cl. D17—*04*; D8—*08*
U.S. Cl. D17—22



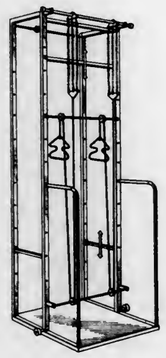
254,141
TELEPHONE CALL COST DETERMINING DEVICE
Robert J. De Masi, Massapequa, N.Y., assignor to Utility Verification Corp.
Filed Mar. 20, 1978, Ser. No. 888,034
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



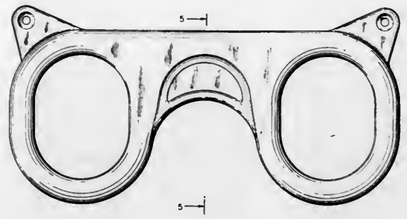
254,142
BOWLING GAME DIE OR SIMILAR ARTICLE
John Scherotto, 840 Roosevelt Ave., Secaucus, N.J. 07094
Filed Mar. 14, 1977, Ser. No. 777,529
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



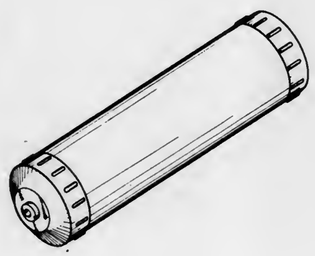
254,143
PHYSICAL EXERCISER
Johannes M. M. H. de Bock, Kasteel Exaetenstraat 1, Roermond, Netherlands
Filed May 2, 1978, Ser. No. 902,174
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, URA 1040
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



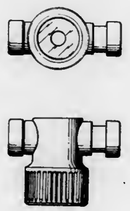
254,144
COMBINED TRAPEZE BAR AND HAND RINGS
Donal D. Hock, Herrin, Ill., assignor to Turco Manufacturing Company, Du Quoin, Ill.
Filed Apr. 12, 1978, Ser. No. 895,870
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—235



254,145
INLINE WATER FILTER
Anthony C. Wilcock, 75 E Palm Ave., Burbank, Calif. 91501
Filed Jun. 30, 1977, Ser. No. 812,001
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



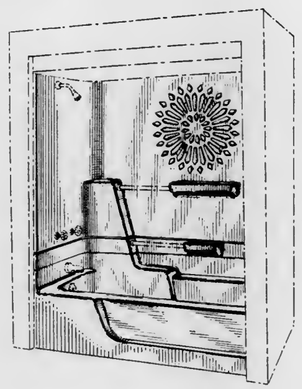
254,146
SHUT-OFF VALVE
Jerome Koenig, 3 Kadesh Barnea, Tel Aviv, Israel
Filed Jul. 29, 1977, Ser. No. 820,329
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



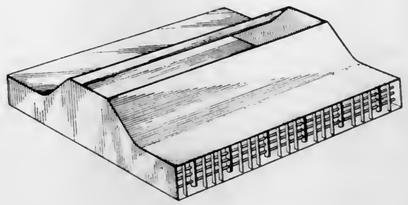
254,147
COMBINED WATER CONTROL LEVER AND COVER PLATE
Luigi Colani, Sassenberg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.
Filed Sep. 18, 1978, Ser. No. 943,177
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



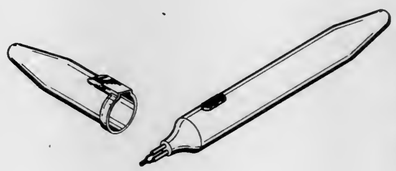
254,148
COMBINED BATHTUB AND SHOWER STALL
Fred C. Alexander, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.
Filed Aug. 2, 1978, Ser. No. 930,154
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



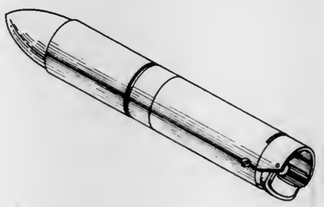
254,149
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,037
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



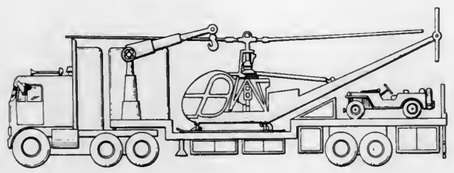
254,150
CAUTERY
Steven A. Barton, 401 S. Brazosport Blvd., Freeport, Tex. 77541, and David L. Gerard, 400 Flag Lake Dr., Lake Jackson, Tex. 77566
Filed Aug. 19, 1977, Ser. No. 826,239
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



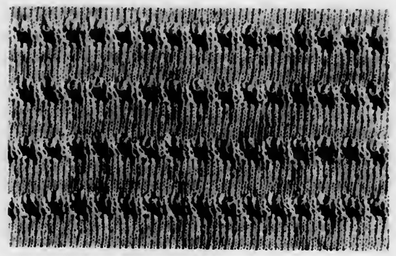
254,151
COMBINED LIPSTICK AND CIGARETTE LIGHTER
Henry Wolff, 406 Trailer Village, Oakdale Rd., Johnson City, N.Y. 13790
Filed Oct. 31, 1977, Ser. No. 847,320
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—77



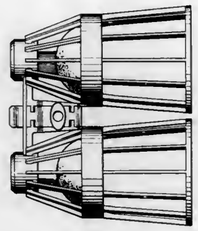
254,152
COMBINED TRACTOR, TRAILER, HELICOPTER AND VEHICLE TOY
Jay W. Marden, 18795 SW. 216th St., Miami, Fla. 33170
Filed Jul. 27, 1977, Ser. No. 819,586
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

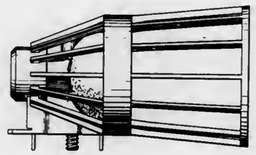


254,153
DOUBLE KNIT FABRIC
William O. Avins, Cleveland, Tenn., assignor to American Research and Knitting, Inc.
Filed May 27, 1977, Ser. No. 801,351
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—2

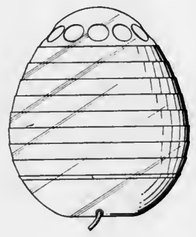


254,154
MOVIE LAMP OR SIMILAR ARTICLE
Warren H. Young, Marshfield; Nolan A. Drevitch, South Easton, and Anthony G. Rosati, Salem, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Nov. 1, 1977, Ser. No. 847,689
Term of patent 14 years
Int. Cl. D26—*05*; D16—*05*
U.S. Cl. D48—20 K





254,155
ELECTRIC LAMP
Wesley D. Allen, 1002 Rebecca, Austin, Tex. 78758
Filed Dec. 8, 1977, Ser. No. 858,722
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Borneman, Lawrence, 4,186,662, Cl. 101-218.000.
AB Westin & Backlund: *See—*
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Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,187,298, Cl. 424-180.000.
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Abthoff, Jorg; Fricker, Ludwig; and Lammer, Jurgen, to Daimler-Benz Aktiengesellschaft. Installation for the preheating of the suction mixture of a carburetor internal combustion engine. 4,186,705, Cl. 123-122.0AC.
Adams, Frederick J., to Cam Gears Limited. Steering gears. 4,186,615, Cl. 74-89.150.
Advanced Circuit Technology: *See—*
Roberts, Joseph A., 4,187,388, Cl. 174-68.500.
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Aeroquip Corporation: *See—*
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Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Muller, Jean-Claude; Ponpon, Jean-Pierre; Kurek, Joseph; and Siffert, Paul, 4,187,124, Cl. 148-1.500.
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AHI Operations Limited: *See—*
Zijlstra, Jan G. H., 4,186,770, Cl. 137-572.000.
Ahn, Kie Y.; Cohen, Mitchell S.; Powers, John V.; and Tao, Lung-jo, to International Business Machines Corporation. Pedestal bubble domain chip and processes for making same. 4,187,553, Cl. 365-8.000.
Ahrel, Bo, to ALF Societe Anonyme. Method of producing bleached mechanical pulp. 4,187,141, Cl. 162-23.000.
Aiba, Masahiko: *See—*
Matsunaga, Shoichi; Siozaki, Fumio; and Aiba, Masahiko, 4,187,512, Cl. 346-140.00R.
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Matsumoto, Jun, 4,187,402, Cl. 179-15.0BW.
Air Tech Industries Inc.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; and Matsumoto, Yasuhiro, 4,187,133, Cl. 156-166.000.
Ajar, Charles G. Frame positioning apparatus. 4,187,010, Cl. 352-162.000.
Akashi, Goro: *See—*
Suzuki, Masaaki; Suzuki, Osamu; and Akashi, Goro, 4,187,341, Cl. 428-213.000.
Akczinski, Joseph, Sr. Slicing machine cleaning guard. 4,186,634, Cl. 83-478.000.
Akeyoshi, Kazuyuki: *See—*
Oishi, Rokuji; Okajima, Yasuharu; Noguchi, Satoshi; and Akeyoshi, Kazuyuki, 4,187,340, Cl. 428-210.000.
Akiyama, Takashi; Tanji, Akinori; and Asano, Seiichi, to Toyobo Co., Ltd. Process for producing non-woven fabric. 4,187,343, Cl. 428-288.000.
Albany International Corp.: *See—*
Josef, Michael J.; and Romanski, Eric R., 4,186,780, Cl. 139-383.00A.
Albert, Kenneth J., to Inventor's Inc. Disposable drinking cup with valved lid. 4,186,842, Cl. 220-206.000.
Alexander, John T.; and Heppner, John D. Animal sling. 4,186,689, Cl. 119-102.000.
ALF Societe Anonyme: *See—*
Ahrel, Bo, 4,187,141, Cl. 162-23.000.
Alfred Hospital: *See—*
Burns, John E.; and Van Lith, Martin J., 4,186,453, Cl. 5-82.00R.
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Grun, Helmut, 4,186,974, Cl. 308-15.000.
Allan, David T., to John MacDonald & Company (Pneumatic Tools) Limited; and Allan, David Thomson. Fluid operated undercutter. 4,186,810, Cl. 175-96.000.
Allan, David Thomson: *See—*
Allan, David T., 4,186,810, Cl. 175-96.000.
Allen, Joseph C., to Texaco Inc. Process for recovering hydrocarbons. 4,186,800, Cl. 166-256.000.
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Means, Howard W.; and Allick, Edward, 4,186,576, Cl. 70-233.000.
Allied Chemical Corporation: *See—*
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Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., 4,187,386, Cl. 585-367.000.
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Allis-Chalmers Corporation: *See—*
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Alper, Yekutiel; and Margolin, Amikam, to State of Israel, Ministry of Agriculture, The. Low level cultivation tunnels. 4,186,520, Cl. 47-1.00R.
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Aluminum Industries, Inc.: *See—*
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Amelung, Robert J., to Aqua-Babe Corporation. Pediatric water mattress. 4,186,457, Cl. 5-452.000.
Amerace Corporation: *See—*
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American Solar: *See—*
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Harwood, Robert G.; and Bowen, Terry P., 4,186,999, Cl. 350-96.210.
Kobler, Robert J., 4,186,988, Cl. 339-176.0MP.
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Schumacher, William L., 4,186,997, Cl. 350-96.210.
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AMSTED Industries Incorporated: *See—*
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Anderson, John M.: *See—*
Stout, Virgil L.; and Anderson, John M., 4,187,447, Cl. 315-85.000.
Anderson, Kenneth W. Pipe end sealing system. 4,186,931, Cl. 277-207.00A.

Anderson, Robert L.: *See—*
Kaufman, Arnold S.; and Anderson, Robert L., 4,186,727, Cl. 126-299.00D.
Anderson, Robert V. Liquid level control valve assembly. 4,186,765, Cl. 137-414.000.
Anderson, Robert W.; Brock, Steven F.; and Gee, May L., to International Business Machines Corporation. Transaction execution system with secure encryption key storage and communications. 4,186,871, Cl. 235-380.000.
Anderson, William B.; and Markwald, David B., to United States of America, Navy. Reverberation backscatter measurement system. 4,187,488, Cl. 367-13.000.
Ando, Seigo: *See—*
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Angioletti, Attilio; and Citelli, Giosue, to Industrie Pirelli S.p.A. Device for safeguarding the respiratory organs. 4,186,736, Cl. 128-201.190.
Anshus, Byron E.; Katsumoto, Kiyoshi; and Serkes, Ira M., to Chevron Research Company. Polymerization and recovery of 2-pyrrolidone with acid treatment. 4,187,370, Cl. 528-312.000.
Ansul Company, The: *See—*
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Antonov, Vladimir A.: *See—*
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Aoki, Eiichiro; and Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,186,635, Cl. 84-1.010.
Aoki, Eiichiro: *See—*
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Aono, Toshiaki: *See—*
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Aoyama, Syunichi, to Nissan Motor Company, Limited. Engine exhaust gas recirculation control system. 4,186,698, Cl. 123-119.00A.
Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation system. 4,186,699, Cl. 123-119.00A.
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Appleby, Anthony J.; and Crepy, Gilles, to Compagnie Generale d'Electricite. Bipolar electrode for an electrolyser. 4,187,165, Cl. 204-254.000.
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Arai, Hajime; and Oonuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torque converter with narrowed flow passages. 4,186,557, Cl. 60-361.000.
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Arioli, Amedea; and Arioli, Lorenza. Steaming apparatus for printed fabrics. 4,186,572, Cl. 68-5.00C.
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Arnason, Sigurdur I., to General Tire & Rubber Company, The. Method for forming sheets having reduced surface imperfections. 4,187,274, Cl. 264-325.000.
Artman, J. Clyde. Sleeper box hinge. 4,186,460, Cl. 16-137.000.
Asahi Glass Company, Ltd.: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Ishii, Tadayoshi; Okura, Zenichi; and Machida, Takeshi, 4,187,020, Cl. 354-195.000.
Asai, Mitsuko: *See—*
Higashide, Eiji; Asai, Mitsuko; and Hasegawa, Toru, 4,187,292, Cl. 424-122.000.
Asai, Yasuhiko: *See—*
Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, 4,187,358, Cl. 525-132.000.
Asano, Masaharu: *See—*
Takase, Sadao; and Asano, Masaharu, 4,186,691, Cl. 123-32.0EL.
Asano, Seiichi: *See—*
Akiyama, Takashi; Tanji, Akinori; and Asano, Seiichi, 4,187,343, Cl. 428-288.000.
ASEA Aktiebolag: *See—*
Johannisson, Tom; Nilsson, Kai; Sjoblom, Rolf; and Widell, Marja, 4,186,582, Cl. 72-60.000.
Ashland Oil, Inc.: *See—*
Langer, Heimo J.; and McKillip, William J., 4,187,349, Cl. 428-395.000.
Asperger, Robert G.: *See—*
Jones, Giffin D.; and Asperger, Robert G., 4,187,256, Cl. 525-471.000.
Ast, Reinhold, to Siemens Aktiengesellschaft. Voice-protected, frequency-selective signal receiver. 4,187,403, Cl. 179-84.0VF.
Ateliers des Charmilles, S.A.: *See—*
Fauconnet, Michel, 4,186,555, Cl. 60-330.000.
Atherton, Henry. Power tool. 4,187,046, Cl. 409-180.000.
Atkins, Richard P.: *See—*
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., 4,187,348, Cl. 428-418.000.
Atlantic Container Corporation: *See—*
Stone, John T., 4,186,784, Cl. 144-253.00J.
Atsugi Motor Parts Co., Ltd.: *See—*
Kouda, Masanori, 4,186,652, Cl. 91-434.000.
Augat Inc.: *See—*
Bertoglio, Guido, 4,186,990, Cl. 339-258.00R.
Aumann, James T., to Christensen, Inc. Dual spring drill string shock absorber. 4,186,569, Cl. 64-23.000.
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., to BASF Wyandotte Corporation. Process for the preparation of polyurethane foams. 4,187,357, Cl. 521-159.000.
Automatic Systems Laboratories Limited: *See—*
Wolfendale, Peter C. F., 4,187,459, Cl. 324-60.00C.
Automation Industries, Inc.: *See—*
Zezza, Louis J., 4,187,433, Cl. 250-507.000.
Automobiles Peugeot: *See—*
Etienne, Michel, 4,187,436, Cl. 290-27.000.
Auxier, Thomas A.: *See—*
Landis, Delmer H., Jr.; Lozier, Paul W.; Lievestro, Louis; Auxier, Thomas A.; and Starkweather, John H., 4,187,054, Cl. 415-115.000.
AuYoung, David K. Y., to Lewis Refrigeration Co. Modified wire mesh conveyor belt for air fluidization type food freezers. 4,186,566, Cl. 62-380.000.
Avery, John R. Display marker device. 4,186,504, Cl. 40-359.000.
Avicola, Richard; and Tzakis, George J., to Zenith Radio Corporation. Full-wave rectifier. 4,187,537, Cl. 363-127.000.
Avramidis, Stellios A.; and Jones, Frederic L., to FMC Corporation. Rocker joint roller chain. 4,186,617, Cl. 74-245.00S.
Axen, Udo F., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-5,6-dihydro-proslacylin analogs. 4,187,224, Cl. 260-346.220.
Ayano, Yukihiko: *See—*
Yashiro, Kuniji; Ayano, Yukihiko; and Miyazaki, Yasushi, 4,187,127, Cl. 148-6.15R.
B. F. Goodrich Company, The: *See—*
Bartrum, David E., 4,187,270, Cl. 264-171.000.
B. J. Hughes Inc.: *See—*
Heffernan, James P.; Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,187,546, Cl. 364-565.000.
B.M.C.-Brevets-Marques-Chaussures S.A.: *See—*
Weber, Ida, 4,186,498, Cl. 36-32.00R.
B. V. Weverij Voorheen J. H. Meijerink & Zonen: *See—*
Dijk, Jan A.; and Hegeman, Everhardus J., 4,187,132, Cl. 156-88.000.
Babcock-Hitachi K.K.: *See—*
Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, 4,187,282, Cl. 423-244.000.
Bachschmid, Reiner; Gross, Gerlinde; and Strobel, Wolfgang, to Daimler-Benz Aktiengesellschaft. Installation for the preheating of the suction mixture of a carburetor internal combustion engine by means of the exhaust gases thereof. 4,186,704, Cl. 123-122.0AA.
Backhaus, Hans-Gerd: *See—*
Scholz, Hansjurgen; Brambilla, Luigi; and Backhaus, Hans-Gerd, 4,186,941, Cl. 280-743.000.
Bader, Henry; and Feingold, Michael H., to Polaroid Corporation. Novel synthesis of bis pyrazolone oxonol dyes. 4,187,225, Cl. 260-239.900.
Baermann, Max. Eddy-current device for measuring rotational speed. 4,186,609, Cl. 73-497.000.
Bainton, Donald J.; and Mascia, Carmen T., to Continental Group, Inc., The. Opener having seam gripping means. 4,186,485, Cl. 30-410.000.
Baker, David E.; and Baker, Kenneth D. Portable campfire grill. 4,186,716, Cl. 126-29.000.
Baker, Kenneth D.: *See—*
Baker, David E.; and Baker, Kenneth D., 4,186,716, Cl. 126-29.000.
Baker Perkins Holding Limited: *See—*
Johnson, Reginald F., 4,186,544, Cl. 53-537.000.
Baker, William G.: *See—*
Redwitz, Robert F.; and Baker, William G., 4,187,001, Cl. 350-202.000.
Ball, Donald H.; and Voelkers, James D., to Phillips Petroleum Company. Process control method and apparatus. 4,187,542, Cl. 364-502.000.
Ballard, Samuel S.; and White, Ronald P., to Sanders Associates, Inc. Range determining system. 4,187,490, Cl. 367-121.000.
Balser, John L. Adjustable flash bracket. 4,187,021, Cl. 354-293.000.
Ban, Itsuki; and Kanno, Hidenori, to Secoh Giken Inc. Magnetic tape player comprising electromagnetic latch device. 4,187,522, Cl. 360-137.000.
Banucci, Eugene G.; and Olander, Walter K., to General Electric Company. Method for preparing polyphenylene oxides with manganese-vinyl resin complexes. 4,187,361, Cl. 525-4.000.

Barbee, Gail G., to Caterpillar Tractor Co. Quick-disconnect mechanical coupling. 4,187,050, Cl. 414-723.000.
Barclay, Donald J., to International Business Machines Corporation. Electrolyte for electrochromic display device. 4,187,003, Cl. 350-357.000.
Barco Manufacturing Company: *See—*
Barton, Robert M., 4,186,968, Cl. 299-39.000.
Bariana, Dilbagh S.: *See—*
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, 4,187,307, Cl. 424-251.000.
Barnstead, John W., to Vernco Corporation. Flexible fan. 4,187,055, Cl. 416-132.00A.
Barth, Hans F.: *See—*
Becker, Gert; Schilp, Ulrich; and Barth, Hans F., 4,187,184, Cl. 252-8.800.
Bartha, Zoltan; Szor, Peter; and Haraszti, Jozsef, to Taurus Gumiipari Vallalat. Elastic pipe-connecting component for pipes or pipelines, or the like. 4,186,949, Cl. 285-226.000.
Bartley, John E.; Penrod, Orville R.; and Radosevich, Lawrence D. Terminal construction for electrical circuit device. 4,187,529, Cl. 361-404.000.
Barton, Robert M., to Barco Manufacturing Company. Roadway pavement planing machine. 4,186,968, Cl. 299-39.000.
Bartrum, David E., to B. F. Goodrich Company, The. Extrusion apparatus. 4,187,270, Cl. 264-171.000.
BASF Aktiengesellschaft: *See—*
Goetz, Norbert; Mangold, Dietrich; and Zeeh, Bernd, 4,187,227, Cl. 548-226.000.
Patsch, Manfred; and Hettche, Albert, 4,187,226, Cl. 260-239.800.
Platz, Rolf; Fuchs, Werner; and Vodrazka, Wolfgang, 4,187,384, Cl. 568-618.000.
Rotter, Gerhard; and Schomann, Klaus D., 4,187,521, Cl. 360-118.000.
Sander, Bruno; Scherling, Kurt; Steinberger, Rolf; and Ropte, Eckhard, 4,187,143, Cl. 162-157.00R.
BASF Wyandotte Corporation: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,187,357, Cl. 521-159.000.
Battard, Jean-Claude; and Buisson, Jean, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Glue for articles in the tobacco industry. 4,187,119, Cl. 106-126.000.
Battelle Memorial Institute: *See—*
Harmer, Alan L., 4,187,025, Cl. 356-133.000.
Bauer, Kurt; and Korber, Alfred, to Bayer Aktiengesellschaft. Process for the preparation of cyclopentadecanolide. 4,187,222, Cl. 260-343.000.
Bauer, Russell E. Air inlet for armored car. 4,186,817, Cl. 180-54.00A.
Baumann, Manfred; and Besserer, Walter, to Apura GmbH. Apparatus for dispensing sheets of web material of predetermined length. 4,186,633, Cl. 83-155.000.
Bausch & Lomb Incorporated: *See—*
Rosenberger, Harold E., 4,187,005, Cl. 351-38.000.
Bayer Aktiengeselleschaft: *See—*
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Bayer Aktiengesellschaft: *See—*
Bauer, Kurt; and Korber, Alfred, 4,187,222, Cl. 260-343.000.
Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,187,306, Cl. 424-251.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,100, Cl. 71-92.000.
Traubel, Harro; Dieterich, Dieter; and Heinze, Helga, 4,187,074, Cl. 8-94.190.
Wagner, Kuno, 4,187,354, Cl. 521-158.000.
Wagner, Kuno, 4,187,355, Cl. 521-158.000.
Wagner, Kuno, 4,187,356, Cl. 521-158.000.
Zecher, Wilfried; Clarenz, Werner; Dunwald, Willi; and Merten, Rudolf, 4,187,365, Cl. 528-45.000.
Bayerische Motoren Werke: *See—*
Gartner, Jurij; and Seidl, Jiri, 4,186,695, Cl. 123-52.00M.
BBC Brown, Boveri & Company, Ltd.: *See—*
Zimmermann, Andreas, 4,187,160, Cl. 204-180.00R.
Beauchamp, Ronald A., to Boise Cascade Corporation. Method for forming a composite container including a perforated label layer. 4,187,137, Cl. 156-195.000.
Bechtel International Corporation: *See—*
Chassagne, Pierre J., 4,187,044, Cl. 406-197.000.
Beck, Gunther: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,100, Cl. 71-92.000.
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,101, Cl. 71-92.000.
Becker, Gert; Schilp, Ulrich; and Barth, Hans F., to Lever Brothers Company. Softening composition. 4,187,184, Cl. 252-8.800.
Beckmann, Klaus, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mining machine. 4,186,969, Cl. 299-43.000.
Becton, Dickinson and Company: *See—*
Percarpio, Edward P., 4,186,840, Cl. 215-247.000.
Beduchaud, Michel; and de Loye, Martin, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Facsimile transmission installation in particular for copying forms. 4,187,520, Cl. 358-257.000.
Beecham Group Limited: *See—*
Cassidy, Frederick; and Lake, Antony W., 4,187,312, Cl. 424-274.000.
Luk, Kong, 4,187,228, Cl. 260-245.300.
Beisner, Klaus: *See—*
Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, 4,187,071, Cl. 432-106.000.
Bekbulatov, Ildgam A.; Mamatov, Juldash; Varlamov, Gennady D.; Madaliev, Shavkat; and Gaibov, Valery M. Process for producing power-like furan resin. 4,187,368, Cl. 525-503.000.
Beke, Zoltan; and Kukla, George W., to Dominion Engineering Works Limited. Web drier section. 4,186,496, Cl. 34-114.000.
Bell Telephone Laboratories, Incorporated: *See—*
Billings, Robert L.; Chen, Ho-Sou; Gyorgy, Ernst M.; and Sherwood, Richard C., 4,187,128, Cl. 148-121.000.
Bjorklund, Gary C.; and Storz, Ralph H., 4,187,027, Cl. 356-400.000.
Bobeck, Andrew H., 4,187,555, Cl. 365-19.000.
Chandross, Edwin A.; and Tomlinson, Walter J., III, 4,187,111, Cl. 430-2.000.
Denkin, Nathan M.; and Runge, Peter K., 4,186,994, Cl. 350-96.170.
Maxfield, Thomas G.; and Witmore, Ronald K., 4,187,399, Cl. 179-15.0BY.
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,187,530, Cl. 361-433.000.
Beltone Electronics Corporation: *See—*
Yum, Dooho, 4,187,472, Cl. 330-260.000.
Bendiksen, Leonard F.: *See—*
Bowen, Terry P.; and Bendiksen, Leonard F., 4,186,996, Cl. 350-96.200.
Bendix Corporation, The: *See—*
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Bourdon, Normand C.; and Sanford, Richard, 4,187,272, Cl. 264-318.000.
Kytta, Oswald O., 4,186,650, Cl. 91-369.00A.
Preston, Gary W.; Johannesen, Donald D.; and Kestermeier, William J., 4,186,824, Cl. 188-73.500.
Taig, Alistair G., 4,186,774, Cl. 137-625.230.
Bendix Westinghouse Limited: *See—*
Taig, Alistair G., 4,186,651, Cl. 91-375.00R.
Benkoe, Elisabeth, executrix for the estate of Erwin Benkoe: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Robinson, Don, 4,186,925, Cl. 273-389.000.
Benkoe, Erwin, deceased: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Robinson, Don, 4,186,925, Cl. 273-389.000.
Bentley, Stanley L., to Ransburg Corporation. Electrostatic coating system. 4,187,527, Cl. 361-235.000.
Berg, Fred W., to Shock-M-All, Inc. Electrified insect trap having short circuiting means. 4,186,512, Cl. 43-98.000.
Berger, Erich: *See—*
Binder Kriegelstein, Wolfgang; and Berger, Erich, 4,186,480, Cl. 29-603.000.
Berkenblit, Melvin; and Reisman, Arnold, to International Business Machines Corporation. Method for etching silicon and a residue and oxidation resistant etchant therefor. 4,187,140, Cl. 156-662.000.
Berkey-Colortran, Inc.: *See—*
Tichenor, Clyde L.; and LeVasseur, Craig, 4,187,534, Cl. 362-268.000.
Bernard Dalsin Manufacturing Company: *See—*
Dalsin, Bernard L., 4,186,719, Cl. 126-143.000.
Bernasconi, Raymond; and Ferrini, Pier G., to Ciba-Geigy Corporation. Alkanecarboxylic acid compounds which have benzofuranyl or benzothienyl substituents. 4,187,234, Cl. 260-346.220.
Bertoglio, Guido, to Augat Inc. Lead socket insert. 4,186,990, Cl. 339-258.00R.
Berven, Richard P.: *See—*
Durre, Reynold F.; and Berven, Richard P., 4,187,091, Cl. 55-499.000.
Besedina, Eleonora B.: *See—*
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., 4,186,791, Cl. 164-66.000.
Besserer, Walter: *See—*
Baumann, Manfred; and Besserer, Walter, 4,186,633, Cl. 83-155.000.
Bessho, Hironori: *See—*
Yasuda, Yushiro; and Bessho, Hironori, 4,186,697, Cl. 123-117.00A.
Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 4,186,462, Cl. 17-25.000.
Bettcher, Louis A., to Bettcher Industries, Inc. Tenderizer. 4,186,462, Cl. 17-25.000.
Beverly, Frank O.; and Nagel, Karl H. Swimming pool alarm system. 4,187,502, Cl. 340-566.000.
Bidon, Jacques. Tractor vehicle in particular for agricultural use. 4,186,811, Cl. 180-6.480.
Bielinski, Ralph F.: *See—*
Haker, Edwin J.; Riddle, Charles F.; and Bielinski, Ralph F., 4,187,036, Cl. 404-117.000.
Bihler, Otto. Drive arrangement for a tool carriage of a machine tool. 4,186,581, Cl. 72-26.000.
Billings Energy Corporation: *See—*
Woolley, Ronald L., 4,187,092, Cl. 62-48.000.
Billings, Robert L.; Chen, Ho-Sou; Gyorgy, Ernst M.; and Sherwood, Richard C., to Bell Telephone Laboratories, Incorporated. Magnetic devices including amorphous alloys. 4,187,128, Cl. 148-121.000.
Billingsley, Lloyd E.; and Latham, Raymond E., to Comex Marine Services, Inc. Coupling apparatus. 4,186,950, Cl. 285-270.000.
Bilsback, Malvin S. Self-storing bucksaw. 4,186,785, Cl. 145-32.00R.

Binder, Dieter: *See—*
Hromatka, Otto; Binder, Dieter; Zeller, Paul; and Pfister, Rudolf, 4,187,303, Cl. 424-246.000.

Binder Kriegelstein, Wolfgang; and Berger, Erich, to U.S. Philips Corporation. Method of manufacturing a rotatable magnetic head arrangement. 4,186,480, Cl. 29-603.000.

Biondetti, Mario, to Escher Wyss Limited. Support element for controlled deflection roll. 4,186,472, Cl. 29-113.0AD.

Biotherm: *See—*
Marissal, Janine, 4,187,291, Cl. 424-94.000.

Birkmeyer, William J.: *See—*
Erikson, J. Alden; Lewarchik, Ronald J.; and Birkmeyer, William J., 4,187,380, Cl. 548-310.000.

Bizzarro, Peter; and Warner, John L., to United Technologies Corporation. Heat exchanger water collection system. 4,187,090, Cl. 55-269.000.

BJ-Hughes Inc.: *See—*
Work, John T., 4,186,973, Cl. 308-3.900.

Bjorklund, Gary C.; and Storz, Ralph H., to Bell Telephone Laboratories, Incorporated. Servo-control alignment of nonlinear crystals. 4,187,027, Cl. 356-400.000.

Black, Robert D.; Hennen, John J.; and Krafka, Jerry L., to Deere & Company. Forage harvester recutter screen. 4,186,889, Cl. 241-89.200.

Blaine, Louis I.: *See—*
Kunin, Robert; and Blaine, Louis I., 4,187,120, Cl. 127-46.00A.

Blanchard, Robert R.: *See—*
Hutchinson, Loyd B.; and Blanchard, Robert R., 4,187,269, Cl. 264-171.000.

Bland, William M., Jr.; and Fields, Edison M. Alternate path cooling system for liquid cooled devices such as engines. 4,186,872, Cl. 236-34.500.

Blatter, Albert; and Miller, John, to Bendix Corporation, The. High response automotive mass air flow sensor. 4,186,602, Cl. 73-228.000.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
Eibe, Werner W., 4,186,579, Cl. 72-8.000.

Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger A., to Richardson-Merrell Inc. Substituted benzaldehyde hypolipidemic agents. 4,187,319, Cl. 424-333.000.

Blum, Seymour, to H-G Toys, Inc. Toy nursing bottle. 4,186,513, Cl. 46-1.00D.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Conductor access magnetic bubble memory arrangement. 4,187,555, Cl. 365-19.000.

Boeing Company, The: *See—*
Shorey, Thomas H., 4,186,901, Cl. 244-137.00R.

Boeing Construction Equipment Company: *See—*
Squifflet, Edmond C., Sr., 4,187,047, Cl. 414-332.000.

Boekhorst, Antonius, to U.S. Philips Corporation. Color picture display device with a circuit for generating a screen grid voltage. 4,187,451, Cl. 315-381.000.

Bohlmann, Orville R. Loading and unloading apparatus for a van. 4,187,048, Cl. 414-542.000.

Bohringer, Karl; Reichle, Peter; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Torque measuring arrangement. 4,186,596, Cl. 73-136.00C.

Boise Cascade Corporation: *See—*
Beauchamp, Ronald A., 4,187,137, Cl. 156-195.000.
Lindhag, Carl L., 4,186,630, Cl. 82-4.00C.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. 9-Substituted phenyl-3,7-dimethyl-nona 2,4,6,8-tetraene compounds. 4,187,247, Cl. 260-574.000.

Bollen, Manfred: *See—*
Brandenberger, Albert; and Bollen, Manfred, 4,186,896, Cl. 242-131.000.

Bolles, Charles P., to General Motors Corporation. Ignition distributor housing anti-rotational locking arrangement. 4,186,709, Cl. 123-146.50A.

Bollinger, Howard N.: *See—*
Kuhn, James O.; Wright, James J.; and Bollinger, Howard N., 4,186,517, Cl. 46-119.000.

Bolshakov, Anatoly I.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Boman, Per; and Broms, Bengt, to Linden-Alimak A.B. Method for consolidating a body of earth. 4,187,041, Cl. 405-263.000.

Bond, James W.; and Dressel, Gary A., to United States of America, Navy. Double precision residue combiners/coders. 4,187,549, Cl. 364-746.000.

Bonnice, Phillip E., to General Electric Company. Rotary drill bit and method for making same. 4,186,628, Cl. 76-108.00A.

Bootmakers of Sturgeon Bay, Inc., The: *See—*
Foster, Lloyd B., 4,186,502, Cl. 36-136.000.

Boratgis, James P.; and Pittman, Earle S. Refrigerator electronic temperature control and malfunction signal apparatus. 4,187,093, Cl. 62-126.000.

Borg-Textile Corporation: *See—*
Woythal, Gerald C., 4,186,892, Cl. 242-55.19R.

Borneman, Lawrence, to A. B. Dick Company. Duplexing copying system. 4,186,662, Cl. 101-218.000.

Bornengo, Giorgio: *See—*
Merlo, Fabrizio; Bornengo, Giorgio; and Paffoni, Camillo, 4,187,218, Cl. 260-158.000.

Bornsztein, Rene, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Process for forming a large sheet of natural tobacco for manufacturing particularly cigar wrappers. 4,186,757, Cl. 131-149.000.

Borroughs Tool & Equipment Corporation: *See—*
Okamuro, James A., 4,186,598, Cl. 73-144.000.

Bost, John J.; Cabeal, Jackie A.; and Rosenberg, Sanders D., to Aerojet-General Corporation. Gelled mechanically stable high energy fuel composition containing metal platelets. 4,187,129, Cl. 149-21.000.

Bourdon, Normand C.; and Sanford, Richard, to Bendix Corporation, The. Method of making molded electrical connector insert. 4,187,272, Cl. 264-318.000.

Bourigault, Raymond, to Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation. Set of thermocouples for measuring the average of several temperatures in a given space. 4,186,605, Cl. 73-341.000.

Bourns, Inc.: *See—*
Laube, David E.; and Simpson, Loran R., 4,186,483, Cl. 29-630.00B.

Boutmy, Patrick E.; and Camborde, Jean-Marc A., to Etat Francaise; and Societe Anonyme de Telecommunications. Remote locating system for transmission faults in data transmission line having regenerative repeaters. 4,187,415, Cl. 179-175.30F.

Boutros, Kamal S., to Bunker Ramo Corporation. EMI Filter connector having RF suppression characteristics. 4,187,481, Cl. 333-182.000.

Bouvard, Hans: *See—*
Immler, Rolf; and Bouvard, Hans, 4,187,304, Cl. 424-249.000.
Immler, Rolf; and Bouvard, Hans, 4,187,305, Cl. 424-249.000.

Bowen, John P.: *See—*
Westcott, Vernon C.; and Bowen, John P., 4,187,170, Cl. 209-1.000.

Bowen, Terry P.; and Bendiksen, Leonard F., to AMP Incorporated. Optic adaptor junction. 4,186,996, Cl. 350-96.200.

Bowen, Terry P.: *See—*
Harwood, Robert G.; and Bowen, Terry P., 4,186,999, Cl. 350-96.210.

Bowler, Lauren L., to General Motors Corporation. Fuel injection apparatus with wetting action. 4,186,708, Cl. 123-139.0AW.

Bracalielly, Albert J.; Kautz, Glenn E.; Lindner, Robert G.; and Davis, Bernard H., to H. H. Robertson Company. Method and apparatus for producing shaped glass fiber reinforced cementitious articles. 4,187,275, Cl. 264-511.000.

Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, to Klockner-Humboldt=Deutz Aktiengesellschaft. Method for the treatment of finely grained material, particularly for the precalcining of cement. 4,187,071, Cl. 432-106.000.

Braga, Luigi F., to Viscodynamics Corporation. Apparatus for melting and extruding thermofusible material. 4,186,852, Cl. 222-146.0HE.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions containing esters of benzotriazolecarboxylic acid. 4,187,186, Cl. 252-51.50R.

Brambilla, Luigi: *See—*
Scholz, Hansjurgen; Brambilla, Luigi; and Backhaus, Hans-Gerd, 4,186,941, Cl. 280-743.000.

Brandel, Kurt, to Standard Sichtgerate GmbH. Tab-strip for filing systems. 4,186,505, Cl. 40-360.000.

Brandenberger, Albert; and Bollen, Manfred, to Maschinenfabrik Benninger AG. Apparatus for balloon limiting at a bobbin creel. 4,186,896, Cl. 242-131.000.

Brandt, Michael W. Chemical injector. 4,186,783, Cl. 141-18.000.

Braun, Howard E.; Dollard, Walter J.; and Tower, Stephen N., to Westinghouse Electric Corp. Recirculation system for nuclear reactors. 4,187,147, Cl. 176-38.000.

Braun, Stephen A.: *See—*
Nowak, Klaus F.; and Braun, Stephen A., 4,186,819, Cl. 181-265.000.

Braunling, Hermann: *See—*
Deinhammer, Wolfgang; Kaufmann, Rudolf; Braunling, Hermann; and Haberle, Norman, 4,187,237, Cl. 260-347.300.

Brekke, John H. Device and method for treating and healing a newly created bone void. 4,186,448, Cl. 3-1.900.

Brenner, Douglas. Blend composition of an oil and a neutralized sulfonated elastomeric polymer. 4,187,206, Cl. 260-23.50A.

Brenner, Robert A.; and Cuthbert, Victor W., to Whirlpool Corporation. Rinse out centrifugally operated dispenser for automatic washer. 4,186,573, Cl. 68-12.00R.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Pneumatic projector game with central target. 4,186,927, Cl. 273-357.000.

Breslow, Jeffrey D.: *See—*
Kulesza, Ralph J.; and Breslow, Jeffrey D., 4,186,926, Cl. 273-340.000.

Brice, John C.; Hill, Owen F.; and Pratt, Ronald G., to U.S. Philips Corporation. Growth of single crystal bismuth silicon oxide. 4,187,139, Cl. 156-600.000.

Bridgman, Harold. Vehicle canopy. 4,186,758, Cl. 135-5.0AT.

Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., to Imperial Chemical Industries Limited. 1,2-Dihydro-2-oxoquinol-4-ylacetic acid derivatives and pharmaceutical compositions. 4,187,310, Cl. 424-258.000.

Britzman, Agnita. Disposable bib. 4,186,443, Cl. 2-49.00R.

Brock, Steven F.: *See—*
Anderson, Robert W.; Brock, Steven F.; and Gee, May L., 4,186,871, Cl. 235-380.000.

Broms, Bengt: *See—*
Boman, Per; and Broms, Bengt, 4,187,041, Cl. 405-263.000.

Brook, Richard L., to DeSoto, Inc. Encapsulated impregnated rovings. 4,187,347, Cl. 428-375.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,186,675, Cl. 112-158.00D.

Brown, Charles E. Mail box. 4,186,869, Cl. 232-17.000.

Brown, David S. Holder for filter screens. 4,187,178, Cl. 210-232.000.

Brown, Douglas B., to Stake Technology Ltd. Apparatus for conveying particulate material. 4,186,658, Cl. 100-148.000.

Brown, Edward D.: *See—*
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,187,310, Cl. 424-258.000.

Brown, Harold F.: *See—*
MacKendrick, William J.; and Brown, Harold F., 4,186,826, Cl. 192-13.00R.

Brown, Maurice H. Wire control mechanism. 4,186,897, Cl. 242-147.00R.

Brown, Robert W.: *See—*
Wellman, Russel E.; and Brown, Robert W., 4,187,194, Cl. 252-316.000.

Brown, Thomas, to Chinook Utility Products, Inc. Vehicle and process for retrieving flexible pipe. 4,186,894, Cl. 242-86.600.

Brown, Winthrop, to Texaco Inc. Torque meter means with reverse rotation detection. 4,186,597, Cl. 73-136.00A.

Brudy, Otto, to Dominion Auto Accessories Limited. Retractable truck mirror. 4,186,905, Cl. 248-478.000.

Brunberg, Ernst-Ake; and Olsson, Ray. Method and system for storing and extracting low-temperature heat energy. 4,186,794, Cl. 165-2.000.

Bruner, A. J.; Foster, Edward T.; and Kearns, Thomas N. Barrier. 4,186,913, Cl. 256-13.100.

Brunner, Rudolf: *See—*
Schausberger, Helmut; and Brunner, Rudolf, 4,187,023, Cl. 354-321.000.

Brunswick Corporation: *See—*
Fitzner, Arthur O.; and Hager, James R., 4,186,712, Cl. 123-148.0CB.

Brusasco, Enzo, to Roltra S.p.A. Screw-nut screw transmission coupling. 4,186,620, Cl. 74-424.80R.

Brusasco, Enzo, to Roltra S.p.A. Screw-nut screw transmission coupling. 4,186,621, Cl. 74-459.000.

Bryan, John F., III: *See—*
Slater, Norbert G., 4,187,409, Cl. 219-121.00P.

Bryce, Graham W.; and Hunter, Joseph J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Arc welding. 4,187,411, Cl. 219-137.200.

Bucalo, Louis. Methods for collecting body fluids. 4,186,730, Cl. 128-769.000.

Buckeye International Inc.: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan D., 4,186,961, Cl. 297-216.000.

Buckley, Albert P.; and Dill, Melville R., Jr., to United States of America, Boston. Pallet. 4,186,841, Cl. 220-6.000.

Buckley, Thomas F.; and Gleason, John G., to SmithKline Corporation. Process for preparing oxazine ring compounds. 4,187,375, Cl. 544-92.000.

Buisson, Jean: *See—*
Battard, Jean-Claude; and Buisson, Jean, 4,187,119, Cl. 106-126.000.

Bujadoux, Karel; Neyer, Jean-Marie; and Houzeaux, Jean-Pierre, to Societe Chimique des Charbonnages - CdF Chimie. Grignard reagents and processes for making them. 4,187,254, Cl. 260-665.00G.

Bulle, Marshall R. Trailer hitch ring lock. 4,186,575, Cl. 70-14.000.

Bunch, Jesse C.: *See—*
Cary, Susan E.; and Bunch, Jesse C., 4,186,477, Cl. 29-432.000.

Bunker Ramo Corporation: *See—*
Boutros, Kamal S., 4,187,481, Cl. 333-182.000.

Burakov, Savely L.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Burd, Dennis E.: *See—*
Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., 4,187,386, Cl. 585-367.000.

Burdick, Robert E., to Rolair Systems, Inc. Steerable drive unit for transporter. 4,186,813, Cl. 180-13.000.

Burghardt, Wilfried; Vogel, Rolf; and Zauser, Ludwig, to Hans Kolb GmbH & Co. Safety belt retractor. 4,186,895, Cl. 242-107.40B.

Burian, Milan: *See—*
Svub, Veroslav; Burian, Milan; Uruba, Vladimir; and Figalla, Zdenek, 4,187,134, Cl. 156-170.000.

Burk, Marvin C.: *See—*
Davis, Thomas T.; and Burk, Marvin C., 4,187,540, Cl. 364-200.000.

Burns, John E.; and Van Lith, Martin J., to Alfred Hospital. Restraint package. 4,186,453, Cl. 5-82.00R.

Burton, Geoffrey W.; and Morley, Edward G., to Plessey Handel und Investments AG. Hydraulic pump with an improved sealing arrangement. 4,186,929, Cl. 277-27.000.

Burton, James A., to Hydril Company. Pulsation dampener or surge absorber. 4,186,776, Cl. 138-30.000.

Burton, Perry E., to Opelika Manufacturing Corp. Sewing machine monitor. 4,186,672, Cl. 112-273.000.

Butler, Donald E., to Warner-Lambert Company. 3-Aryloxy-1-carboalkoxyethylpyridinium compounds and compositions. 4,187,311, Cl. 424-263.000.

Butler, Donald E., to Warner-Lambert Company. 3-Aryloxy-2-pyridinecarbonitrile 1-oxide compounds. 4,187,379, Cl. 546-288.000.

Buyce, Dwight D., to Chem-Trend, Inc. Liquid mixing and delivering aparatus. 4,186,769, Cl. 137-566.000.

Byler, William H., to William H. Byler and Thelma Byler, Trustees of William H. Byler Revocable Trust. Body warming device. 4,186,746, Cl. 128-403.000.

Byrd, Clyde L., Jr. Accident screen. 4,186,912, Cl. 256-1.000.

C.G.R. - MeV: *See—*
Levaillant, Claude, 4,187,176, Cl. 210-151.000.

Cabeal, Jackie A.: *See—*
Bost, John J.; Cabeal, Jackie A.; and Rosenberg, Sanders D., 4,187,129, Cl. 149-21.000.

Caffrey, Terence, to Davey Compressor Company. Bleed valve particularly for a multi-stage compressor. 4,186,767, Cl. 137-501.000.

California Institute of Technology: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,187,333, Cl. 427-230.000.

Calmes, Jean P.: *See—*
Passoni, Teresio; Calmes, Jean P.; Cattaneo, Filippo; and Nessi, Aurindo, 4,186,585, Cl. 72-208.000.

Cam Gears Limited: *See—*
Adams, Frederick J., 4,186,615, Cl. 74-89.150.

Camborde, Jean-Marc A.: *See—*
Boutmy, Patrick E.; and Camborde, Jean-Marc A., 4,187,415, Cl. 179-175.30F.

Campbell, Maury B., to Owl-Cam Inc. Waste matter removal implement and receptacle. 4,186,955, Cl. 294-1.00R.

Campbell, Robert W., to Phillips Petroleum Company. Formation of terephthalamide polymer of 5-methyl-1,9-nonanediamine. 4,187,371, Cl. 528-340.000.

Camrex Research and Development, Ltd.: *See—*
Robinson, Alan V.; and Chapman, John, 4,187,211, Cl. 260-42.440.

Camsco, Inc.: *See—*
Leslie, Elmer N.; Higgins, Bobby; and Huff, Joe T., 4,186,632, Cl. 83-13.000.

Camtron Electronics International Ltd.: *See—*
Katsof, Barry; and Matlin, Joel, 4,187,015, Cl. 354-109.000.

Canale, Albert S.: *See—*
Canale, Ralph D.; and Canale, Albert S., 4,187,029, Cl. 366-153.000.

Canale, Ralph D.; and Canale, Albert S. Apparatus and method for preparing lithographic fountain solution. 4,187,029, Cl. 366-153.000.

Canamero, Ernest: *See—*
Ernster, Peter J.; Canamero, Ernest; and Cockroft, James B., 4,187,412, Cl. 219-441.000.

Canon Kabushiki Kaisha: *See—*
Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, 4,187,019, Cl. 354-33.000.

Cantor, Burton M., to Personal Security Concepts, Inc. Non-lethal personal defense weapon. 4,186,851, Cl. 222-113.000.

Cantrell, Henry L., to Midland-Ross Corporation. Fault monitoring and indicator system. 4,187,504, Cl. 340-652.000.

Carey, Richard D., to Dayco Corporation. Hose construction having integral fire extinguishant and method of making same. 4,186,778, Cl. 138-103.000.

Carl M. Loeb Trust: *See—*
Loeb, Carl M., Jr., 4,186,900, Cl. 244-113.000.

Carl Still, Firma: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; and Wollenhaupt, Karl-Heinz, 4,187,079, Cl. 44-10.00C.

Carley, Jay L.: *See—*
Popiel, Stanley; DuBois, R. Clark; Carley, Jay L.; and Hamma, John C., 4,186,837, Cl. 209-565.000.

Carlson, Ronald H., to FMC Corporation. Removal of contaminants from cyanuric acid reaction product. 4,187,376, Cl. 544-192.000.

Carlson, William L., Jr., to General Signal Corporation. Mechanical movement. 4,186,613, Cl. 74-52.000.

Carney, Ronald E.; McAlpine, James B.; and Perun, Thomas J., to Abbott Laboratories. Seldomycin factor 5 derivative. 4,187,372, Cl. 536-17.00R.

Carnival Toys, Inc.: *See—*
Dorfman, Steven R., 4,186,641, Cl. 84-1.160.

Caro, Edward R., to United States of America, National Aeronautics and Space Administration. High power RF coaxial switch. 4,187,416, Cl. 200-153.00S.

Carrier Corporation: *See—*
Clark, William E.; Herb, Carl C.; and Greene, Reginald S., 4,186,876, Cl. 236-49.000.

Carvalho, Elmer R., to D G Shelter Products Company. Removable closure panel and releasable spring hinge means therefor. 4,186,525, Cl. 49-465.000.

Cary, Susan E.; and Bunch, Jesse C. Cash register bag sealing system and method. 4,186,477, Cl. 29-432.000.

Cassata, Antonio: *See—*
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,187,196, Cl. 252-429.00B.

Cassidy, Frederick; and Lake, Antony W., to Beecham Group Limited. 3-Hydroxy-4,4-dimethyl-5-pyrrolidone derivatives. 4,187,312, Cl. 424-274.000.

Caterpillar Tractor Co.: *See—*
Barbee, Gail G., 4,187,050, Cl. 414-723.000.
Chamberlain, Richard W., 4,186,626, Cl. 74-801.000.

Hart, Cullen P., 4,186,814, Cl. 180-24.000.
Hart, Cullen P., 4,186,815, Cl. 180-41.000.
Shulke, David D., 4,186,930, Cl. 277-166.000.
Sutton, Robert A., 4,186,812, Cl. 180-9.500.

Cattaneo, Filippo: *See—*
Passoni, Teresio; Calmes, Jean P.; Cattaneo, Filippo; and Nessi, Aurindo, 4,186,585, Cl. 72-208.000.

Caviglia, James P., III. Knockdown beehive frame. 4,186,458, Cl. 6-10.000.

Cayrol, Pierre-Henri. Printed circuits. 4,187,339, Cl. 428-208.000.

Celanese Corporation: *See—*
Yates, Derek N.; and Presta, John C., 4,187,135, Cl. 156-187.000.

Centre Electronique Horloger SA: *See—*
Martin, Jean-Claude; and Perotto, Jean F., 4,187,518, Cl. 358-93.000.

Centronics Data Computer Corp.: *See—*
Robinson, Prentice, 4,187,511, Cl. 346-75.000.

Cerny, Jacqueline; and Troncy, Robert, to Rhone-Poulenc Industries. Flameproofed polyamide containing red phosphorous. 4,187,207, Cl. 260-37.00N.

Cesaro, Giulio. Automatic injecting gun for remote controlled vaccination of cattle, pigs, and animals in general. 4,186,741, Cl. 128-218.00P.

Cessna Aircraft Company, The: *See—*
Vesel, Andrew M., 4,187,439, Cl. 307-271.000.

Chalk, Alan J., to General Electric Company. Catalytic aromatic carbonate process. 4,187,242, Cl. 260-463.000.

Chamberlain, Alan H. Reversible transmission. 4,186,625, Cl. 74-780.000.

Chamberlain, Richard W., to Caterpillar Tractor Co. Wheel final drive assembly. 4,186,626, Cl. 74-801.000.

Chambers, William L., to Minnesota Mining and Manufacturing Company. Treated photoconductive titanium dioxide sheet. 4,187,103, Cl. 430-40.000.

Chambley, Phillip W.; and Norris, Alan H., to WWG Industries, Inc. Packaging of self-twist yarns. 4,186,549, Cl. 57-293.000.

Champion International Corporation: *See—*
Vincent, David N.; and Chang, Cheng-Hsiung, 4,187,193, Cl. 252-316.000.

Chandross, Edwin A.; and Tomlinson, Walter J., III, to Bell Telephone Laboratories, Incorporated. Sensitized porous bodies useful for producing thick refractive index recordings. 4,187,111, Cl. 430-2.000.

Chang, Cheng-Hsiung: *See—*
Vincent, David N.; and Chang, Cheng-Hsiung, 4,187,193, Cl. 252-316.000.

Chapman, John: *See—*
Robinson, Alan V.; and Chapman, John, 4,187,211, Cl. 260-42.440.

Charles, Distel: *See—*
Nissen, Alex; and Charles, Distel, 4,186,619, Cl. 74-414.000.

Chase, Jay V.: *See—*
Lindstrum, Alan L.; and Chase, Jay V., 4,187,491, Cl. 367-125.000.

Chassagne, Pierre J., to Bechtel International Corporation. Coal slurry pipelining. 4,187,044, Cl. 406-197.000.

Chatterley, Samuel: *See—*
Levitt, Charlie M.; and Chatterley, Samuel, 4,186,838, Cl. 209-581.000.

Chem-Trend, Inc.: *See—*
Buyce, Dwight D., 4,186,769, Cl. 137-566.000.

Chen, DeYu, to General Electric Company. High frequency ballast transformer. 4,187,450, Cl. 315-278.000.

Chen, Ho-Sou: *See—*
Billings, Robert L.; Chen, Ho-Sou; Gyorgy, Ernst M.; and Sherwood, Richard C., 4,187,128, Cl. 148-121.000.

Chenel, Pierre; and Moncheaux, Michel, to Saint-Gobain Industries. Apparatus for applying a thick seal to a glass sheet. 4,186,685, Cl. 118-410.000.

Chevron Research Company: *See—*
Anshus, Byron E.; Katsumoto, Kiyoshi; and Serkes, Ira M., 4,187,370, Cl. 528-312.000.
Csicsery, Sigmund M., 4,187,199, Cl. 252-455.00Z.
Katsumoto, Kiyoshi; and Marquis, David M., 4,187,235, Cl. 260-346.750.

Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-i, to American Cyanamid Company. Novel dihydrobenzanthracene derivatives. 4,187,373, Cl. 542-402.000.

Children's Hospital Medical Center: *See—*
Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,187,252, Cl. 260-653.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.

Chinook Utility Products, Inc.: *See—*
Brown, Thomas, 4,186,894, Cl. 242-86.600.

Chipens, Gunar I.; Mutulis, Felix K.; and Misinya, Inta P. Bradykinin cyclic analog-cyclo-[(N^{ϵ}-1-L-lysine, 6-glycine)-bradykinin]. 4,187,217, Cl. 260-112.50R.

Choulet, Richard J.; and Mehlman, Stewart K., to Union Carbide Corporation. Method for controlling the temperature of the melt during pneumatic refining of steel. 4,187,102, Cl. 75-60.000.

Christensen, Inc.: *See—*
Aumann, James T., 4,186,569, Cl. 64-23.000.
Jurgens, Rainer, 4,187,061, Cl. 418-48.000.

Christian, Paul T. Truck mountable roadside spray device. 4,186,885, Cl. 239-654.000.

Christoffel, William D., to American Hospital Supply Corporation. Method and apparatus for pulsing a blood flow stimulator. 4,186,732, Cl. 128-24.00R.

Ciba-Geigy Corporation: *See—*
Bernasconi, Raymond; and Ferrini, Pier G., 4,187,234, Cl. 260-346.220.
Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, 4,187,364, Cl. 526-259.000.
Eckhardt, Claude, 4,187,289, Cl. 424-70.000.
Gschwend, Heinz W.; and Huebner, Charles F., 4,187,313, Cl. 424-278.000.
Immler, Rolf; and Bouvard, Hans, 4,187,304, Cl. 424-249.000.
Immler, Rolf; and Bouvard, Hans, 4,187,305, Cl. 424-249.000.
Karlen, Urs, 4,187,238, Cl. 260-376.000.
Petitpierre, Jean C., 4,187,233, Cl. 260-345.200.
Spivack, John D.; and Dexter, Martin, 4,187,246, Cl. 260-559.00R.
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,187,212, Cl. 260-45.8NT.

Cich, Frank A.: *See—*
Marshall, Richard A.; Smith, Edwin S.; and Cich, Frank A., 4,187,363, Cl. 526-208.000.

Cimon, Denis G.: *See—*
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, 4,187,307, Cl. 424-251.000.

Citelli, Giosue: *See—*
Angioletti, Attilio; and Citelli, Giosue, 4,186,736, Cl. 128-201.190.

Citizen Watch Co., Ltd.: *See—*
Ishigaki, Hisao; Tanaka, Ryuzo; and Nakamima, Koichi, 4,186,552, Cl. 58-88.00W.
Nakayama, Yasuaki, 4,186,551, Cl. 58-23.00R.

Clarenz, Werner: *See—*
Zecher, Wilfried; Clarenz, Werner; Dunwald, Willi; and Merten, Rudolf, 4,187,365, Cl. 528-45.000.

Clark, Leland C., Jr.: *See—*
Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,187,252, Cl. 260-653.000.

Clark, William E.; Herb, Carl C.; and Greene, Reginald S., to Carrier Corporation. System powered damper blade assembly for use in an air conditioning system. 4,186,876, Cl. 236-49.000.

Clark, William T., III. Topical Thermograph. 4,186,731, Cl. 128-736.000.

Clausen, Carol W.; and Davis, Eugene J. Armor comprising ballistic fabric and particulate material in a resin matrix. 4,186,648, Cl. 89-36.00A.

Clauss, Robert C.: *See—*
United States of America, National Aeronautics and Space Administration; Clauss, Robert C.; and Quinn, Rex B., 4,187,470, Cl. 330-4.000.

Clifford, Michael L., to Imperial Chemical Industries Limited. Polymerization process. 4,187,278, Cl. 422-132.000.

Coach & Car Equipment Corporation: *See—*
Harder, Arthur J., Jr., 4,186,966, Cl. 297-452.000.

Coal Industry (Patents) Limited: *See—*
Fitchett, Kevin, 4,186,553, Cl. 59-78.100.
Gray, George W., 4,187,523, Cl. 361-30.000.

Coats & Clark, Inc.: *See—*
Schleifstein, Robert, 4,186,466, Cl. 24-205.13C.

Cobaugh, Robert F.; and Coller, James R., to AMP Incorporated. Contact with split portion for engagement with substrate. 4,186,982, Cl. 339-17.00C.

Cobb, Raymond L., to Phillips Petroleum Company. Cyanide-catalyzed isomerization and deuterium exchange with alpha- and beta-sulfolenes. 4,187,231, Cl. 260-332.100.

Cochran, Michael J., to Texas Instruments Incorporated. Electronic phase locked loop circuit. 4,187,473, Cl. 331-8.000.

Cockroft, James B.: *See—*
Ernster, Peter J.; Canamero, Ernest; and Cockroft, James B., 4,187,412, Cl. 219-441.000.

Cohen, Mitchell S.: *See—*
Ahn, Kie Y.; Cohen, Mitchell S.; Powers, John V.; and Tao, Lungjo, 4,187,553, Cl. 365-8.000.

Colburn, Edward N. Keeper pin system for shovel teeth. 4,187,035, Cl. 403-318.000.

Coleman Company, Inc., The: *See—*
Hastings, Thomas C., 4,186,760, Cl. 137-244.000.

Coleman, James P.; and Wagenknecht, John H., to Monsanto Company. Preparation of dihydroaromatic hydrocarbons. 4,187,156, Cl. 204-73.00R.

Coleman, John D. Specialty envelope. 4,186,868, Cl. 229-92.100.

Colgate Palmolive Company: *See—*
Cordon, Martin; and Norfleet, James, 4,187,288, Cl. 424-49.000.
Schreiber, Ronald S.; and Principe, Joseph R., 4,187,287, Cl. 424-49.000.

Colkhi, Inc.: *See—*
Jacobi, Edgar F.; and Madden, Mark R., 4,186,880, Cl. 239-177.000.

Coll, Emory E.: *See—*
Stanonis, David J.; King, Walter D.; and Coll, Emory E., 4,186,608, Cl. 73-437.000.

Coller, James R.: *See—*
Cobaugh, Robert F.; and Coller, James R., 4,186,982, Cl. 339-17.00C.

Collings, Thomas J. Scooter vehicle. 4,186,934, Cl. 280-221.000.

Collum, Paulette: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,187,297, Cl. 424-180.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,187,298, Cl. 424-180.000.

Combustion Engineering, Inc.: *See—*
Noyes, Richard C.; and Zaman, Shakir U., 4,187,145, Cl. 176-36.00R.

Comex Marine Services, Inc.: *See—*
Billingsley, Lloyd E.; and Latham, Raymond E., 4,186,950, Cl. 285-270.000.

Compagnie Generale d'Electricite: *See—*
Appleby, Anthony J.; and Crepy, Gilles, 4,187,165, Cl. 204-254.000.

Compagnie Generale des Etablissements Michelin: *See—*
Pommier, Jean, 4,186,788, Cl. 152-209.00B.
Verdier, Henri, 4,186,789, Cl. 152-354.00R.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Beduchaud, Michel; and de Loye, Martin, 4,187,520, Cl. 358-257.000.

Cone, Richard E. Portable playpen. 4,186,454, Cl. 5-99.00R.

Cone, Richard E., II: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan D., 4,186,961, Cl. 297-216.000.

Congoleum Corporation: *See—*
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,187,131, Cl. 156-79.000.

Conner, William R., Jr., to Stahl-Urban Company. Apparatus for guiding work through a sewing machine or the like. 4,186,674, Cl. 112-153.000.

Connlab Holdings Limited: *See—*
Micetich, Ronald G.; Fortier, Robert A.; Shaw, Chia C.; and Merlo, Werner O., 4,187,221, Cl. 260-239.00A.

Conoco, Inc.: *See—*
Dodd, John R., 4,187,255, Cl. 585-467.000.
Mack, Mark P., 4,187,158, Cl. 204-159.200.
Radd, Fred J.; Oertle, Don H.; and McKinney, Charles N., 4,187,126, Cl. 148-1.500.

Conquest Manufacturing Co., Inc.: *See—*
Hernandez, Silverio, 4,186,686, Cl. 119-1.000.

Conrad, Sherman E.: *See—*
Wilcox, Richard L.; and Conrad, Sherman E., 4,186,877, Cl. 239-124.000.

Consortium for Elektrochemische Industrie GmbH: *See—*
Deinhammer, Wolfgang; Kaufmann, Rudolf; Braunling, Hermann; and Haberle, Norman, 4,187,237, Cl. 260-347.300.

Constant, James N. Addressable optical computer and filter. 4,187,000, Cl. 350-162.0SF.

Container Corporation of America: *See—*
Zicko, James A., 4,186,866, Cl. 229-17.00B.

Continental Group, Inc., The: *See—*
Bainton, Donald J.; and Mascia, Carmen T., 4,186,485, Cl. 30-410.000.
Walter, John, 4,186,848, Cl. 222-23.000.

Control Data Corporation: *See—*
Kammann, Clarence H., 4,187,554, Cl. 365-15.000.

Coombe, John R.: *See—*
Shen, Ti-Ke; and Coombe, John R., 4,187,146, Cl. 176-37.000.

Cooper, Dean E., to United Technologies Corporation. Redundant flight control system. 4,186,622, Cl. 74-501.00R.

Coppola, Frank T.; Lentz, William P.; and VanDewoestine, Robert V., to Corning Glass Works. Contoured insulation window for evacuated solar collector. 4,186,723, Cl. 126-443.000.

Cordon, Martin; and Norfleet, James, to Colgate Palmolive Company. Modified abrasive system for dentifrices. 4,187,288, Cl. 424-49.000.

Corey, Robert L.; and Ullman, Frederick E., to Unarco Industries, Inc. Roller assembly for package flow systems. 4,186,830, Cl. 193-35.00R.

Cornelius Company, The: *See—*
Fessler, Herman S.; and Tracy, Gene A., 4,187,262, Cl. 261-50.00B.

Corning Glass Works: *See—*
Coppola, Frank T.; Lentz, William P.; and VanDewoestine, Robert V., 4,186,723, Cl. 126-443.000.
Lu, Kun-Er; and Tarcza, Walter H., 4,187,094, Cl. 65-30.00R.
Reade, Richard F., 4,187,115, Cl. 106-39.800.

Cosman, Dieter; and Ruppel, Kathleen C., to Ruppel, Henry W. Boarding ladder and straps. 4,186,820, Cl. 182-93.000.

Costes, Claude, to Union Siderurgique de Nord et du l'est de la France. Device for untightening and tightening nuts. 4,186,629, Cl. 81-53.00R.

Courtois, Alain: *See—*
Huet, Jean P.; and Courtois, Alain, 4,186,911, Cl. 254-93.00R.

Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., to Eastman Kodak Company. Container with article positioning element for dispensing reagent coated slides to an automated analyzer. 4,187,077, Cl. 422-63.000.

Covington, Wayne F.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.

Cowan, Frederick C.; and Cowan, Thomas L. Coal burning process. 4,186,669, Cl. 110-347.000.

Cowan, Thomas L.: *See—*
Cowan, Frederick C.; and Cowan, Thomas L., 4,186,669, Cl. 110-347.000.

Cowherd, Frank G., III; and Theiling, Louis F., Jr., to Union Carbide Corporation. Process for producing low color residue acrylate ester monomers. 4,187,382, Cl. 560-185.000.

Cowherd, Frank G., III; and Theiling, Louis F., Jr., to Union Carbide Corporation. Process for producing low color residue acrylate esters. 4,187,383, Cl. 560-224.000.

Cox, Kenneth C. Earth boring machine with crushing rollers. 4,186,808, Cl. 175-334.000.

Cox, Philip P., to Dranetz Engineering Laboratories, Inc. Dynamic threshold impulse directivity indicator. 4,187,461, Cl. 324-102.000.

CPC International Inc.: *See—*
Maher, Thomas K., 4,187,219, Cl. 260-17.4ST.

CPG Products Corp.: *See—*
Kuhn, James O.; Wright, James J.; and Bollinger, Howard N., 4,186,517, Cl. 46-119.000.

CPS, Inc.: *See—*
Wigley, Patrick A.; Dana, Edwin L.; and Pletz, Alfred, Jr., 4,187,535, Cl. 363-16.000.

Cragoe, Edward J., Jr.; Novello, Frederick C.; and Saari, Walfred S., to Merck & Co., Inc. N-alkyl(and cycloalkyl)oxamic acid and derivatives as inhibitors of glycolic acid oxidase. 4,187,315, Cl. 424-305.000.

Crane, Patrick E.; Lazarchik, Robert E.; and Schaufelberger, Arthur H., deceased (by Schaufelberger, Ruth L., administratrix), to Sperry Rand Corporation. Multiple beam antenna array. 4,187,507, Cl. 343-754.000.

Credit Industry Associates, Inc.: *See—*
Jarm, Robert L., 4,186,577, Cl. 70-394.000.

Creekmore, Robert V., to 1st National Bank. Check verification system. 4,187,498, Cl. 340-149.00A.

Crepy, Gilles: *See—*
Appleby, Anthony J.; and Crepy, Gilles, 4,187,165, Cl. 204-254.000.

Criblez, Roger, to Hatebur Umformmaschinen AG. Apparatus for feeding workpieces in a multi-station cross-fed press. 4,186,589, Cl. 72-405.000.

Cronk, Allan D. Pipe joint clamp. 4,186,948, Cl. 285-177.000.

Crooks, Walter, to International Business Machines Corporation. Electrophotographic developing process and compositions for use therein. 4,187,329, Cl. 430-110.000.

Cross, Kenneth R.; and Ewing, Bruce A., to General Motors Corporation. Turbine rotor fabrication by thermal methods. 4,186,473, Cl. 29-156.80R.

Crouzet: *See—*
Jouret, Edouard, 4,186,550, Cl. 58-21.130.

Crown Zellerbach Corporation: *See—*
Reba, Imants, 4,186,860, Cl. 226-91.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Modena, Giulio; Sandri, Stefano; and Scagliola, Carlo, 4,187,397, Cl. 179-1.0SG.

Csicsery, Sigmund M., to Chevron Research Company. Hydrocarbon conversion catalyst. 4,187,199, Cl. 252-455.00Z.

Cummings, Forest M., to Rockwell International Corporation. Grounded RF power amplifier circuit apparatus. 4,187,467, Cl. 325-133.000.

Curtis, Westley F. Transformer movable along power cable. 4,186,663, Cl. 102-18.0MS.

Cusano, Dominic A., to General Electric Company. Structure for collimated scintillation detectors useful in tomography. 4,187,427, Cl. 250-366.000.

Cuthbert, Victor W.: *See—*
Brenner, Robert A.; and Cuthbert, Victor W., 4,186,573, Cl. 68-12.00R.

Cutler, Clifford P.: *See—*
Longsdorf, Ronald W.; and Cutler, Clifford P., 4,186,682, Cl. 116-171.000.

D G Shelter Products Company: *See—*
Carvalho, Elmer R., 4,186,525, Cl. 49-465.000.

Dagani, Michael J.: *See—*
Wiegand, Karl E.; Kao, James T. F.; and Dagani, Michael J., 4,187,230, Cl. 260-326.470.

Dageforde, Allen F., to Rosemount Inc. Electrochemical cell. 4,187,162, Cl. 204-195.00P.

Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Fricker, Ludwig; and Lammer, Jurgen, 4,186,705, Cl. 123-122.0AC.
Bachschmid, Reiner; Gross, Gerlinde; and Strobel, Wolfgang, 4,186,704, Cl. 123-122.0AA.
Bohringer, Karl; Reichle, Peter; and Schwerdt, Paul, 4,186,596, Cl. 73-136.00C.
Lutze, Hans; Weidemann, Dieter; and Weisshappel, Helmut, 4,186,957, Cl. 296-188.000.
Scholz, Hansjurgen; Brambilla, Luigi; and Backhaus, Hans-Gerd, 4,186,941, Cl. 280-743.000.

Dalsin, Bernard L., to Bernard Dalsin Manufacturing Company. Air supply device for fireplaces. 4,186,719, Cl. 126-143.000.

D'Amato, Ralph J.; and Nolan, Richard A., to RCA Corporation. Color picture tube having improved corrugated apertured mask and method of making same. 4,187,443, Cl. 313-402.000.

D'Amico, John J., to Monsanto Company. N-hydrazides of 2-benzothiazolinone as plant growth regulants. 4,187,097, Cl. 71-90.000.

Dana, Edwin L.: *See—*
Wigley, Patrick A.; Dana, Edwin L.; and Pletz, Alfred, Jr., 4,187,535, Cl. 363-16.000.

Danckert, Hermann; Willmann, Michael; and Wundrak, Egon, to Volkswagenwerk Aktiengesellschaft. Sound insulated internal combustion engine. 4,186,714, Cl. 123-195.00C.

Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, to Ciba-Geigy Corporation. Crosslinkable polymers of unsaturated imides. 4,187,364, Cl. 526-259.000.

Datsenko, Nikolai M.; Pushanko, Nikolai N.; and Yarmilko, Vladimir G. Apparatus for the separation of trash from less heavy firm articles in a flow of liquid. 4,187,172, Cl. 209-44.300.

Dauge, Gilbert V.; and Langlais, Jacques F., to Testut Aequitas. Capacitance measuring by comparison to reference capacitance. 4,187,460, Cl. 324-60.0CD.

d'Auria, Luigi: *See—*
Deman, Pierre; and d'Auria, Luigi, 4,187,404, Cl. 179-100.00R.

Davey Compressor Company: *See—*
Caffrey, Terence, 4,186,767, Cl. 137-501.000.

Davis, Bernard H.: *See—*
Bracalielly, Albert J.; Kautz, Glenn E.; Lindner, Robert G.; and Davis, Bernard H., 4,187,275, Cl. 264-511.000.

Davis, Eugene J.: *See—*
Clausen, Carol W.; and Davis, Eugene J., 4,186,648, Cl. 89-36.00A.

Davis, Thomas T.; and Burk, Marvin C., to Phillips Petroleum Company. Control panel self-test. 4,187,540, Cl. 364-200.000.

Day, Edward G.; and Hollis, Thomas J., Jr., to General Motors Corporation. Exhaust gas recirculation control. 4,186,702, Cl. 123-119.00A.

Dayco Corporation: *See—*
Carey, Richard D., 4,186,778, Cl. 138-103.000.
Massok, Anthony J., Jr.; and Nolan, James P., 4,186,499, Cl. 36-44.000.
Wagner, William T., 4,186,779, Cl. 138-121.000.
White, Jack D., Jr., 4,186,823, Cl. 188-32.000.

Dean, Bob W.: *See—*
Mallory, Lewis B.; and Dean, Bob W., 4,186,655, Cl. 98-1.000.

Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., to General Motors Corporation. Thermoset imidazole cured epoxy-polysulfide rubber automotive body solder. 4,187,348, Cl. 428-418.000.

Decker, Bert J., deceased; and by Decker, Jean S., executrix. Heat pipe-turbine. 4,186,559, Cl. 60-531.000.

Decker, Jean S., executrix: *See—*
Decker, Bert J., deceased; and Decker, Jean S., executrix, 4,186,559, Cl. 60-531.000.

Deere & Company: *See—*
Black, Robert D.; Hennen, John J.; and Krafka, Jerry L., 4,186,889, Cl. 241-89.200.
Klope, Lawrence R.; and Haight, Robert E., 4,186,777, Cl. 138-31.000.
Nowak, Klaus F.; and Braun, Stephen A., 4,186,819, Cl. 181-265.000.
Pfundstein, Donald K., 4,186,816, Cl. 180-243.000.

Deinhammer, Wolfgang; Kaufmann, Rudolf; Braunling, Hermann; and Haberle, Norman, to Consortium for Elektrochemische Industrie GmbH. Process for the manufacture of a furancarboxylic acid anilide. 4,187,237, Cl. 260-347.300.

DeJackome, Gene E.: *See—*
Kruse, Robert L.; and DeJackome, Gene E., 4,187,260, Cl. 525-263.000.

de Jong, Hendrikus; and Welboren, Joseph A., to Hoogovens Ijmuiden, B. V. Locomotive engine housing arrangement. 4,186,665, Cl. 105-456.000.

Delavan Manufacturing Company: *See—*
Wilcox, Richard L.; and Conrad, Sherman E., 4,186,877, Cl. 239-124.000.

Delignieres, Robert, to Institut Francais du Petrole. Device for determining the relative position of elongate members towed behind a ship. 4,187,492, Cl. 367-127.000.

de Loye, Martin: *See—*
Beduchaud, Michel; and de Loye, Martin, 4,187,520, Cl. 358-257.000.

Deman, Pierre; and d'Auria, Luigi, to Thomson-CSF. Telephone set for optical fibers lines. 4,187,404, Cl. 179-100.00R.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakagawa, Koji; and Watanabe, Yoshiharu, 4,187,118, Cl. 106-89.000.

Denkin, Nathan M.; and Runge, Peter K., to Bell Telephone Laboratories, Incorporated. Arrangement for coupling between an electrooptic device and an optical fiber. 4,186,994, Cl. 350-96.170.

de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, to Diamond Shamrock Technologies S.A. Molten salt electrolysis. 4,187,155, Cl. 204-67.000.

Derbyshire, George C., to Jacobs Manufacturing Co., Ltd., The. Keys for drill chucks. 4,186,933, Cl. 279-1.00K.

Deresh, Ilya A.: *See—*
Shikhirev, Boris N.; Matrosov, Evgeny A.; and Deresh, Ilya A., 4,187,081, Cl. 51-23.000.

DeSoto, Inc.: *See—*
Brook, Richard L., 4,187,347, Cl. 428-375.000.
McLaughlin, Robert L.; and Wood, Donald C., 4,187,190, Cl. 252-99.000.
Murphy, Edward J., 4,187,203, Cl. 260-18.00N.

Detlefs, Harry. Lock strike plate assembly. 4,186,954, Cl. 292-340.000.

Deutsch Company Electronic Components Division, The: *See—*
Holzman, Melvyn A., 4,186,998, Cl. 350-96.210.

Deverell, Christopher: *See—*
Mathews, Carl F.; Deverell, Christopher; Pears, Gordon E. A.; and Knowles, Peter G., 4,187,113, Cl. 430-533.000.

Dewallens, Leon, to Fabrication Belge de Disques "Fabeldis". Method for manufacturing substantially flat dies. 4,187,154, Cl. 204-5.000.

DeWeese, Eugene R., Jr.; and Marsh, Lynn W., Jr. Key generator. 4,187,393, Cl. 178-22.000.

Dexter, Martin: *See—*
Spivack, John D.; and Dexter, Martin, 4,187,246, Cl. 260-559.00R.

Diamond Shamrock Technologies S.A.: *See—*
de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, 4,187,155, Cl. 204-67.000.

Dickinson, Richard M.: *See—*
United States of America, National Aeronautics and Space Administration; and Dickinson, Richard M., 4,187,506, Cl. 343-100.00R.

Diener, Rudolf. Carburetor for an internal combustion engine. 4,187,264, Cl. 261-84.000.

Dieterich, Dieter: *See—*
Traubel, Harro; Dieterich, Dieter; and Heinze, Helga, 4,187,074, Cl. 8-94.190.

Dietrich, Ralph N.: *See—*
Robinson, John W.; and Dietrich, Ralph N., 4,186,639, Cl. 84-1.030.

Diggs, Richard E. Directionally controlled array of solar power units. 4,187,123, Cl. 136-206.000.

Dijk, Jan A.; and Hegeman, Everhardus J., to B. V. Weverij Voorheen J. H. Meijerink & Zonen. Method for transversely cutting and hemming a web of fabric. 4,187,132, Cl. 156-88.000.

Dill, Melville R., Jr.: *See—*
Buckley, Albert P.; and Dill, Melville R., Jr., 4,186,841, Cl. 220-6.000.

Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, to Solid Photography Inc. Arrangement for applying coded illuminated patterns to an object. 4,187,011, Cl. 353-122.000.

Dirsking, Robert S., to Procter & Gamble Company, The. Self-priming passive dosing dispenser. 4,186,856, Cl. 222-424.500.

Dodd, John R., to Conoco, Inc. Process for methylating naphthalene. 4,187,255, Cl. 585-467.000.

Dodt, Jurgen: *See—*
Plevak, Lubomir; and Dodt, Jurgen, 4,187,042, Cl. 405-291.000.

Dold, Berthold, to Kienzle Apparate GmbH. Device for recording vehicle speeds. 4,187,510, Cl. 346-21.000.

Dolezal, Ladislav; Weiss, Frantisek; Stanek, Petr; and Lorenc, Miroslav, to Vyzkumny ustav 070. Apparatus for evaluating deformation characteristics of mechanically tested materials. 4,186,610, Cl. 73-805.000.

Dollard, Walter J.: *See—*
Braun, Howard E.; Dollard, Walter J.; and Tower, Stephen N., 4,187,147, Cl. 176-38.000.

Dominion Auto Accessories Limited: *See—*
Brudy, Otto, 4,186,905, Cl. 248-478.000.

Dominion Engineering Works Limited: *See—*
Beke, Zoltan; and Kukla, George W., 4,186,496, Cl. 34-114.000.

Dominion Tool & Die Company, Inc.: *See—*
Domitter, Erich, 4,186,595, Cl. 73-132.000.

Domitter, Erich, to Dominion Tool & Die Company, Inc. Brake testing apparatus. 4,186,595, Cl. 73-132.000.

Donald Enterprises, Inc.: *See—*
Donald, Jack W., 4,186,742, Cl. 128-270.000.

Donald, Jack W., to Donald Enterprises, Inc. Contraceptive-antivenereal disease tampon. 4,186,742, Cl. 128-270.000.

Donald L. Morton & Associates: *See—*
Harrison, William H., 4,186,729, Cl. 128-1.300.

Donaldson Company, Inc.: *See—*
Durre, Reynold F.; and Berven, Richard P., 4,187,091, Cl. 55-499.000.

Donan, David C., Jr., to Waiamea Company, Inc. Mine roof bolt spike chemical dispenser assembly. 4,187,040, Cl. 405-259.000.

Dorfman, Steven R., to Carnival Toys, Inc. Wireless toy musical instrument. 4,186,641, Cl. 84-1.160.

Dotzauer, Ewald: *See—*
Fahrenschon, Franz; Huettl, Heinz; and Dotzauer, Ewald, 4,187,414, Cl. 179-175.30S.

Douglas, George H.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,187,317, Cl. 424-309.000.

Douglas, Robert H.; and Phinney, Thomas L., to Honeywell Inc. Read request selection system for redundant storage. 4,187,538, Cl. 364-200.000.

Dow Chemical Company, The: *See—*
Hutchinson, Loyd B.; and Blanchard, Robert R., 4,187,269, Cl. 264-171.000.
Jones, Giffin D.; and Asperger, Robert G., 4,187,256, Cl. 525-471.000.
McIntyre, James A.; and Phillips, Robert F., 4,187,350, Cl. 429-45.000.
Miller, Dennis P., 4,187,188, Cl. 252-65.000.
Nielsen, Robert C., 4,187,257, Cl. 525-445.000.
Pickelman, Dale M.; Foster, William A.; and Wessling, Ritchie A., 4,187,142, Cl. 162-146.000.

Dow Corning Limited: *See—*
Winnan, Hewart W., 4,187,208, Cl. 260-37.0SB.

Downen, Jim L.: *See—*
Sutliff, Wayne N.; and Downen, Jim L., 4,186,807, Cl. 175-302.000.

Dranetz Engineering Laboratories, Inc.: *See—*
Cox, Philip P., 4,187,461, Cl. 324-102.000.

Dreikorn, Barry A., to Eli Lilly and Company. Rodenticidal N-alkyldiphenylamines. 4,187,318, Cl. 424-330.000.

Drennan, Denis B.: *See—*
Schleicher, Thomas R.; Maylahn, Donald J.; and Drennan, Denis B., 4,186,738, Cl. 128-153.000.

Dressel, Gary A.: *See—*
Bond, James W.; and Dressel, Gary A., 4,187,549, Cl. 364-746.000.

Dresser Industries, Inc.: *See—*
Mercurio, Richard N.; and Graham, Richard B., 4,186,831, Cl. 198-501.000.

Mitchell, Howard E., 4,186,809, Cl. 175-334.000.
Parker, Curtis J.; and McGill, Kenneth H., 4,187,059, Cl. 417-454.000.

Driggers, Vernon J. Fuel economizer system for internal combustion engines. 4,186,707, Cl. 123-139.0AV.

Drkal, Jan: *See—*
Kovar, Jan; Drkal, Jan; Zalesak, Jan; and Hladky, Vaclav, 4,186,583, Cl. 72-108.000.

Du Bae, Hyung, to International Telephone and Telegraph Corporation. Turbine flowmeter. 4,186,603, Cl. 73-231.00R.

DuBois, R. Clark: *See—*
Popiel, Stanley; DuBois, R. Clark; Carley, Jay L.; and Hamma, John C., 4,186,837, Cl. 209-565.000.

Dufaylite Developments Ltd.: *See—*
Thwaites, Peter J.; and Thornton, John N., 4,187,138, Cl. 156-512.000.

Dujardin, Claude: *See—*
Euzen, Jean-Paul; Vuillemot, Daniel; and Dujardin, Claude, 4,187,169, Cl. 208-157.000.

Dungs, Horst: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; and Wollenhaupt, Karl-Heinz, 4,187,079, Cl. 44-10.00C.

Dunn, Phillip D.: *See—*
Hug, William F.; Hamerdinger, Randolph W.; Dunn, Phillip D.; and McQuillan, Robert C., 4,187,474, Cl. 331-94.50D.

Dunwald, Willi: *See—*
Zecher, Wilfried; Clarenz, Werner; Dunwald, Willi; and Merten, Rudolf, 4,187,365, Cl. 528-45.000.

Du Pont de Nemours, E. I., and Company: *See—*
Howard, Edward G., Jr., 4,187,210, Cl. 260-42.140.

Durango Systems, Inc.: *See—*
Verstegen, Brian P., 4,187,552, Cl. 364-900.000.

Durre, Reynold F.; and Berven, Richard P., to Donaldson Company, Inc. Pleated paper filter cartridge. 4,187,091, Cl. 55-499.000.

Dworkin, Robert D., to M&T Chemicals Inc. Method for preparing organotin compounds. 4,187,239, Cl. 260-410.600.

Dynex/Rivett, Inc.: *See—*
Patel, Kishor, 4,186,909, Cl. 251-31.000.

Dziewolski, Richard. Rigid joint assembly. 4,187,034, Cl. 403-217.000.

E. R. Squibb & Sons, Inc.: *See—*
Meeks, Marion; and Narra, R. K., 4,187,285, Cl. 424-1.000.
Sprague, Peter W., 4,187,236, Cl. 260-346.220.

Eastman Kodak Company: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,187,077, Cl. 422-63.000.
Gardner, Sylvia A.; and Gysling, Henry J., 4,187,240, Cl. 260-429.00R.
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,187,213, Cl. 252-402.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,187,229, Cl. 548-260.000.
Willis, Roland G., 4,187,108, Cl. 430-203.000.

Eaton Corporation: *See—*
Holton, Robert J., 4,186,981, Cl. 339-14.00R.
Piber, Earl T., 4,187,420, Cl. 200-321.000.
Richards, Elmer A., 4,186,618, Cl. 74-339.000.
Snow, John P., 4,186,946, Cl. 285-94.000.
Southey, Robert G., 4,186,924, Cl. 273-81.400.
Spellman, Gordon B., 4,187,513, Cl. 357-1.000.

Eaton, John R., to International Computers Limited. Pipelined data processing system with centralized microprogram control. 4,187,539, Cl. 364-200.000.

Eckhardt, Claude, to Ciba-Geigy Corporation. Softening agents containing diester/amine adducts and quaternary ammonium salts, valuable for use as after-rinse softeners and after-shampoo hair conditioners. 4,187,289, Cl. 424-70.000.

Eckhoff, Stephen A.: *See—*
Phoenix, Lancelot; and Eckhoff, Stephen A., 4,186,713, Cl. 123-148.00E.

Ecodyne Corporation: *See—*
Kunin, Robert; and Blaine, Louis I., 4,187,120, Cl. 127-46.00A.
Schwinn, Joseph M.; and Maynard, Tony E., 4,187,056, Cl. 416-207.000.

Edman, Walter W.; and Farer, Irving L., to Zotos International, Inc. Spray pump actuating and bottle holding device. 4,186,855, Cl. 222-321.000.

Edwards, John A., to Syntex (U.S.A.) Inc. 17 Beta-thiocarboxylic acid esters of 6 alpha, 6 beta-difluoro-3-oxoandrost-4-enes. 4,187,301, Cl. 424-241.000.

Efimov, Leonid A., deceased: *See—*
Gorlitsyn, Sergei N.; Kavitsky, Mikhail R.; Koires, Vladimir I.; Efimov, Leonid A., deceased; and Gebler, Iraida I., administratrix, 4,186,588, Cl. 72-394.000.

Egorov, Alexandr F.; Ryzhnev, Vadim J.; Simonovsky, Dmitry K.; and Sokolov, Valery A. Method of determining the quantitative content of gaseous or vaporous impurity in a gas mixture and a device for accomplishing same. 4,186,590, Cl. 73-23.000.

Ehrhardt, Henry B., to Petersen, Larry C.; and Smith, Stanley M. Article for measuring lower extremities comprising laminae of both PVC and acrylic. 4,187,423, Cl. 250-312.000.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Rolling mill gauge and flatness calibration system. 4,186,579, Cl. 72-8.000.

Eirich, Hubert; Eirich, Walter; Eirich, Paul; Hasenhundl, Josef; and Spengler, Adolf. Method of measuring the moisture content in flowable materials and apparatus for carrying out the method. 4,186,592, Cl. 73-73.000.

Eirich, Paul: *See—*
Eirich, Hubert; Eirich, Walter; Eirich, Paul; Hasenhundl, Josef; and Spengler, Adolf, 4,186,592, Cl. 73-73.000.

Eirich, Walter: *See—*
Eirich, Hubert; Eirich, Walter; Eirich, Paul; Hasenhundl, Josef; and Spengler, Adolf, 4,186,592, Cl. 73-73.000.

Eizumi, Hideo: *See—*
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,187,484, Cl. 335-75.000.

Electro Mag Sales: *See—*
Johnson, Joseph R., 4,186,891, Cl. 242-55.19R.

Electro Materials Corporation of America: *See—*
Hilson, David G.; and Tulipan, Peter A., 4,187,201, Cl. 252-512.000.

Eli Lilly and Company: *See—*
Dreikorn, Barry A., 4,187,318, Cl. 424-330.000.

Ellcon-National, Inc.: *See—*
O'Connor, Daniel P., 4,186,953, Cl. 292-210.000.

Ellies, Alan D.: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan D., 4,186,961, Cl. 297-216.000.

Ellis, Arthur J.; and Howarth, Alan, to Lucas Industries Limited. Liquid fuel injection pumps. 4,187,060, Cl. 417-490.000.

Elsohly, Mahmoud A.; and Turner, Carlton E., to University of Mississippi, The. Paraquat detection method. 4,187,076, Cl. 23-230.0PC.

Emhardt, Roland; and Wachter, Erich, to Sulzer Brothers Limited. Resilient sealing ring. 4,186,932, Cl. 277-207.00A.

EMI Limited: *See—*
Pearce, Ralph R., 4,186,944, Cl. 283-8.00R.

Emsig Manufacturing Corp.: *See—*
Fischler, Daniel A., 4,187,265, Cl. 264-22.000.

Endo, Syokichi: *See—*
Fujimura, Takasi; and Endo, Syokichi, 4,187,013, Cl. 354-1.000.

Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, to Tokyo Shibaura Electric Co., Ltd. Noise reduction system. 4,187,477, Cl. 333-14.000.

Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, to Tokyo Shibaura Electric Co., Ltd. Noise reduction system having specific encoder circuitry. 4,187,478, Cl. 333-14.000.

Ensmann, Burt, to Ideal Toy Corporation. Posable doll. 4,186,516, Cl. 46-107.000.

Entech Corporation: *See—*
McConnellogue, Neal J., 4,186,678, Cl. 113-121.00C.

Erdman, John F. Coat sleeve form. 4,186,444, Cl. 223-72.000.

Erikson, J. Alden; Lewarchik, Ronald J.; and Birkmeyer, William J., to PPG Industries, Inc. Esters of imidazolidinedione-based triepoxides. 4,187,380, Cl. 548-310.000.

Ernster, Peter J.; Canamero, Ernest; and Cockroft, James B., to Sunbeam Corporation. Automatic control for electric heating device. 4,187,412, Cl. 219-441.000.

Eroshkin, Nikolai A.; Ivannikov, Alfred V.; Matveev, Vyacheslav N.; and Sergienko, Anatoly I., to Vsesojuzny Nauchno-Issledovatelsky, Proektno-Konstruktorsky i Tekhnologichesky Institut Elektrosvarochnogo Oborudova. Method of multi-pass narrow groove arc welding. 4,187,410, Cl. 219-137.200.

Escher Wyss Limited: *See—*
Biondetti, Mario, 4,186,472, Cl. 29-113.0AD.

Essex Group, Inc.: *See—*
Robling, Marc E., 4,186,883, Cl. 239-491.000.

Etablissements Zelant, Gazuit, Societe Anonyme: *See—*
Harmant, Michel, 4,186,526, Cl. 51-33.00R.

Etat Francaise: *See—*
Boutmy, Patrick E.; and Camborde, Jean-Marc A., 4,187,415, Cl. 179-175.30F.

Ethyl Corporation: *See—*
Wiegand, Karl E.; Kao, James T. F.; and Dagani, Michael J., 4,187,230, Cl. 260-326.470.

Etienne, Michel, to Automobiles Peugeot. Device for regulating the source of electric energy on a hybrid electric vehicle. 4,187,436, Cl. 290-27.000.

Etoh, Kuniomi; Nanpei, Masaru; and Miyagi, Morio, to Toyobo Co., Ltd. Photosensitive plate containing nitrogen containing condensation type polyesters. 4,187,112, Cl. 430-285.000.

Eue, Ludwig: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,100, Cl. 71-92.000.
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,101, Cl. 71-92.000.

Euzen, Jean-Paul; Vuillemot, Daniel; and Dujardin, Claude, to Institut Francais du Petrol. Process and apparatus for effecting three-phase catalytic reactions. 4,187,169, Cl. 208-157.000.

Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., to Lilly Industries Limited. Acylamino derivatives. 4,187,232, Cl. 549-69.000.

Evans, Gary E., to Westinghouse Electric Corp. Reflector antenna with plural feeds at focal zone. 4,187,508, Cl. 343-770.000.

Ewing, Bruce A.: *See—*
Cross, Kenneth R.; and Ewing, Bruce A., 4,186,473, Cl. 29-156.80R.

Exxon Production Research Company: *See—*
Jahns, Hans O.; and Maer, Newton K., Jr., 4,187,039, Cl. 405-217.000.

Exxon Research & Engineering Co.: *See—*
Linsenmann, Don R., 4,186,696, Cl. 123-90.610.
McVicker, Gary B., 4,187,168, Cl. 208-139.000.

Fabrication Belge de Disques "Fabeldis": *See*—
Dewallens, Leon, 4,187,154, Cl. 204-5.000.
Fabula, Andrew G.; Green, James H.; and Madison, William F., to United States of America, Navy. Torpedo drag reduction employing polymer ejection. 4,186,679, Cl. 114-20.00R.
Fachbach, Heinz: *See*—
Thien, Gerhard; and Fachbach, Heinz, 4,186,693, Cl. 123-41.120.
Fahrenschon, Franz; Huettl, Heinz; and Dotzauer, Ewald, to Siemens Aktiengesellschaft. Circuit arrangement for an interference data alarm system in communication facilities, particularly in telephone equipment. 4,187,414, Cl. 179-175.30S.
Fahrni, Peter, Dr.: *See*—
Wirz, Walter, 4,186,847, Cl. 222-1.000.
Fainzilberg, Leonid S.: *See*—
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,187,541, Cl. 364-497.000.
Fairchild Industries, Inc.: *See*—
Marrujo, Ralph G.; and Hire, Thomas D., 4,186,964, Cl. 297-422.000.
Falk Corporation, The: *See*—
Pokrandt, Glenn C., 4,186,570, Cl. 64-28.00R.
Farago, Katalin: *See*—
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.
Farbshtein, Jury G.: *See*—
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L., 4,187,369, Cl. 528-137.000.
Farer, Irving L.: *See*—
Edman, Walter W.; and Farer, Irving L., 4,186,855, Cl. 222-321.000.
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan D., to Buckeye International Inc. Child car seating apparatus and method for assembling the same. 4,186,961, Cl. 297-216.000.
Fauconnet, Michel, to Ateliers des Charmilles, S.A. Hydraulic machine. 4,186,555, Cl. 60-330.000.
Favre, John A.: *See*—
Schaffer, Arnold M.; and Favre, John A., 4,187,026, Cl. 356-326.000.
Fazakerley, Herbert M. Painter's fixture. 4,186,903, Cl. 248-210.000.
Feder, Joseph: *See*—
Tolbert, William R.; and Feder, Joseph, 4,187,149, Cl. 195-104.000.
Feingold, Michael H.: *See*—
Bader, Henry; and Feingold, Michael H., 4,187,225, Cl. 260-239.900.
Feist, Wolfgang M., to Raytheon Company. Method for manufacturing semiconductor structures by anisotropic and isotropic etching. 4,187,125, Cl. 148-1.500.
Fencl, Vernon R.; and Tan, Aujit, to Grotnes Machine Works, Inc. Machine for welding seams in automotive wheel rim blanks. 4,187,406, Cl. 219-59.100.
Ferguson, George R.; and Freeman, Eric D. Irrigation system. 4,186,763, Cl. 137-344.000.
Ferm, Morgan H. O.: *See*—
Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., 4,186,450, Cl. 4-6.000.
Fernandez, Julio A., to National Starch and Chemical Corporation. Gelled nonpigmented wood stains. 4,187,072, Cl. 8-6.500.
Ferranti Limited: *See*—
Nutter, Geoffrey; and McGibbon, William, 4,187,551, Cl. 364-900.000.
Ferrieu, Gilbert M. M., to Telecommunications Radioelectriques et Telephoniques TRT. Time-division multiplex communication system for connecting two-wire line circuits in time-division multiplex. 4,187,400, Cl. 179-15.0AA.
Ferrini, Pier G.: *See*—
Bernasconi, Raymond; and Ferrini, Pier G., 4,187,234, Cl. 260-346.220.
Fessett, Donald J., to Western Gear Corporation. Sequential drive mechanism. 4,186,624, Cl. 74-679.000.
Fessler, Herman S.; and Tracy, Gene A., to Cornelius Company, The. Carbonator and liquid level control. 4,187,262, Cl. 261-50.00B.
Ficker, Walter W.; Lonser, David E.; Rance, William G.; Stricker, Alfred A.; and von Kaenel, Walter, to International Business Machines Corporation. Method and apparatus for locating and aligning flimsy sheets. 4,186,918, Cl. 271-232.000.
Fields, Edison M.: *See*—
Bland, William M., Jr.; and Fields, Edison M., 4,186,872, Cl. 236-34.500.
Figalla, Zdenek: *See*—
Svub, Veroslav; Burian, Milan; Uruba, Vladimir; and Figalla, Zdenek, 4,187,134, Cl. 156-170.000.
Fiore, Russell D.; and Fiore, Russell D. Exerciser for lower leg, ankle, and foot muscles. 4,186,920, Cl. 272-96.000.
Fiore, Russell D.: *See*—
Fiore, Russell D.; and Fiore, Russell D., 4,186,920, Cl. 272-96.000.
Fischer, Artur. Drilling assembly and a drilling tool thereof. 4,187,045, Cl. 408-240.000.
Fischer & Porter Co.: *See*—
Appel, Eggert; Gehrke, Herbert; and Kiene, Wilfried, 4,186,600, Cl. 73-194.0EM.
Fischer, Wilhelm: *See*—
Holst, Arno; Lask, Helmut; Nischwitz, Ehrenfried; and Fischer, Wilhelm, 4,187,342, Cl. 428-283.000.
Fischer, Wulf, to Garching Instrumente. Electrical element of construction. 4,187,161, Cl. 204-195.00S.
Fischler, Daniel A., to Emsig Manufacturing Corp. Method of making ornamental plastic product. 4,187,265, Cl. 264-22.000.
Fish, Darrell D., to Universal Security Instruments, Inc. Portable air compressor. 4,187,058, Cl. 417-234.000.
Fisher, Philip H.; and Ninneman, Lawrence D., to Owens-Illinois, Inc. Laser safety system. 4,187,267, Cl. 264-40.100.
Fitchett, Kevin, to Coal Industry (Patents) Limited. Cable protection equipment. 4,186,553, Cl. 59-78.100.
Fitzner, Arthur O.; and Hager, James R., to Brunswick Corporation. RFI-suppressing ignition system for an internal combustion engine. 4,186,712, Cl. 123-148.0CB.
Fleischmann, Lewis, to Hittman Corporation. Non-invasive, pressure sensor apparatus for communicating pressure inside a body to the exterior thereof. 4,186,751, Cl. 128-748.000.
Flood, Michael G.: *See*—
Henneman, John W.; and Flood, Michael G., 4,186,735, Cl. 128-201.250.
Flynn, Dennis E. Log carrier. 4,186,956, Cl. 294-16.000.
Flynn, Derek J., to Lucas Industries Limited. Control valves for fluids. 4,186,773, Cl. 137-625.300.
FMC Corporation: *See*—
Avramidis, Stellios A.; and Jones, Frederic L., 4,186,617, Cl. 74-245.00S.
Carlson, Ronald H., 4,187,376, Cl. 544-192.000.
Vieau, William J., 4,186,661, Cl. 101-178.000.
Fomichev, Alexandr V.: *See*—
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.
Fontana, Paul. Greeting card display assembly and method. 4,186,503, Cl. 40-124.400.
Foote, George A.; Lindamood, Mason M.; and Fulcomer, Robert D., to Sola Basic Industries, Inc. Shielded electrical conductor terminations and methods of making same. 4,187,389, Cl. 174-73.00R.
Ford Motor Company: *See*—
Stewart, George W., Jr., 4,186,899, Cl. 244-3.130.
Fortier, Robert A.: *See*—
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Foster, Edward T.: *See*—
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Foster, Lloyd B., to Bootmakers of Sturgeon Bay, Inc., The. Scent dispersing boot. 4,186,502, Cl. 36-136.000.
Foster Wheeler Limited: *See*—
Nickerson, James H. D.; and Steel, Robert R., 4,186,799, Cl. 165-176.000.
Foster, William A.: *See*—
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Fouche, Glynn E., Jr., to M. Lowenstein & Sons, Inc. Process for producing light-reflective fabrics. 4,187,332, Cl. 427-47.000.
Fox, Dana G.: *See*—
Fox, Moroni, Jr.; Fox, Moroni, Sr.; and Fox, Dana G., 4,186,455, Cl. 5-451.000.
Fox, Daniel W. Method of making a tethered ball apparatus. 4,186,921, Cl. 273-26.00E.
Fox, Moroni, Jr.; Fox, Moroni, Sr.; and Fox, Dana G. Composite water bed mattress. 4,186,455, Cl. 5-451.000.
Fox, Moroni, Sr.: *See*—
Fox, Moroni, Jr.; Fox, Moroni, Sr.; and Fox, Dana G., 4,186,455, Cl. 5-451.000.
Foxboro/Trans-Sonics, Inc.: *See*—
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Fraioli, Donato M., to Air Tech Industries Inc. Triple wall panel unit for air supported structure. 4,186,530, Cl. 52-2.000.
Franchenko, Nina A.: *See*—
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Frank Hamachek Machine Company: *See*—
Wallace, John M.; and Pitner, Gerald A., 4,187,545, Cl. 364-559.000.
Frank, Robert G., to PPG Industries, Inc. Method and apparatus for handling glass sheets during shaping and cooling. 4,187,095, Cl. 65-104.000.
Frankfort, Roberta L.; and Madonna, Donna L. Convertible bag apparatus. 4,186,859, Cl. 224-205.000.
Frankl, George, to Lucas Industries Limited. Internal combustion engines. 4,186,560, Cl. 60-599.000.
Franz, John E.; and Howe, Robert K., to Monsanto Company. 3-Aryl-4-isothiazolecarboxylic acid and 3-aryl-4-isoxazolecarboxylic acid derivatives and their use as herbicides. 4,187,099, Cl. 71-90.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H: *See*—
Theurer, Josef; and Fulser, Karl, 4,186,804, Cl. 171-16.000.
Franzone, Jose S.; and Tamietto, Teresio, to Istituto Biologico Chemioterapico "ABC" S.p.A. Pharmaceutical composition with anti-bronchospasmodic and anti-tussive activity. 4,187,308, Cl. 424-253.000.
Frazita, Richard F., to Hazeltine Corporation. Microstrip network having phase adjustment. 4,187,480, Cl. 333-161.000.
Fredriksson, John I., to Norton Company. Protective silicon nitride or silicon oxynitride coating for porous refractories. 4,187,344, Cl. 428-304.000.

Freeman, Eric D.: *See*—
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Frick, Roger L., to Rosemount Inc. Vortex shedding flowmeter assembly. 4,186,599, Cl. 73-194.0VS.
Fricker, Ludwig: *See*—
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Fridman, Viktor M.: *See*—
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Hoffmann, Reinhard; Hoffmann, Jurgen; and Hoffmann, Norbert, 4,187,171, Cl. 209-383.000.
Friedericy, Johan A.; Moeller, Dale O.; and Towgood, Dennis A., to Garrett Corporation, The. Multi-rim flywheel attachment. 4,186,623, Cl. 74-572.000.
Friedlander, Charles B.; and McMullen, John C., to PPG Industries, Inc. Amide-modified urethane acrylate radiation curable compounds derived from condensation reaction products of carboxyl and isocyanato groups. 4,187,366, Cl. 528-75.000.
Frischmann, Werner: *See*—
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Frommlet, Hubert: *See*—
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Fryer, Thomas B., to United States of America, National Aeronautics and Space Administration. Induction powered biological radiosonde. 4,186,749, Cl. 128-748.000.
Fuchs, Werner: *See*—
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Fuji Kuuki Kabushiki Kaisha: *See*—
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Yagihara, Morio; Tanaka, Mitsugu; Hirose, Takeshi; and Aono, Toshiaki, 4,187,110, Cl. 430-544.000.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Takayama, Satoru, 4,187,345, Cl. 428-337.000.
Fujimura, Takasi; and Endo, Syokichi, to Hitachi, Ltd. Phosphor screen exposure apparatus. 4,187,013, Cl. 354-1.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,187,374, Cl. 544-28.000.
Fujitsu Limited: *See*—
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Fulser, Karl: *See*—
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Fung, Anthony: *See*—
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Gaibov, Valery M.: *See*—
Bekbulatov, Ildgam A.; Mamatov, Juldash; Varlamov, Gennady D.; Madaliev, Shavkat; and Gaibov, Valery M., 4,187,368, Cl. 525-503.000.
Gaitan, Edward W. Restraining device for cattle. 4,186,688, Cl. 119-96.000.
GALA, narodni podnik: *See*—
Svub, Veroslav; Burian, Milan; Uruba, Vladimir; and Figalla, Zdenek, 4,187,134, Cl. 156-170.000.
Galanty, William B. Comminutor for sewage flowing in liquids. 4,186,888, Cl. 241-46.060.
Games, John E.: *See*—
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Garbrecht, Kurt; and Hildebrandt, Bernhard, to Siemens Aktiengesellschaft. Device for protection against transmission errors in an information transmission system. 4,187,465, Cl. 325-31.000.
Garching Instrumente: *See*—
Fischer, Wulf, 4,187,161, Cl. 204-195.00S.
Garcia Ramos, Jose J., to Investigacion y Desarrollo de Nuevas Technicas para Automatismo, S.A. (I.D.T.A., S.A.). Multiple parameter processing and programming system. 4,187,550, Cl. 364-900.000.
Gardner, Sylvia A.; and Gysling, Henry J., to Eastman Kodak Company. Process for preparing tellurium(II) materials. 4,187,240, Cl. 260-429.00R.
Garner, Arthur W. B.; and Newbery, John L., to Garner, Arthur Winston Buckton. Cricket bat. 4,186,923, Cl. 273-67.00D.
Garner, Arthur Winston Buckton: *See*—
Garner, Arthur W. B.; and Newbery, John L., 4,186,923, Cl. 273-67.00D.
Garrett Corporation, The: *See*—
Friedericy, Johan A.; Moeller, Dale O.; and Towgood, Dennis A., 4,186,623, Cl. 74-572.000.
Gartner, Jurij; and Seidl, Jiri, to Bayerische Motoren Werke. Intake-tube arrangement for internal combustion engines. 4,186,695, Cl. 123-52.00M.
Gattesco, Giovanni, to Tesa, S.A. Dial measurement gauge. 4,186,492, Cl. 33-147.00T.
Gebetsroither, Wolfgang; and Zitz, Alfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Device for cooling cutting teeth of cutter heads of cutting machines. 4,186,971, Cl. 299-64.000.
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Gehrke, Herbert: *See*—
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Geisler, Russel W.: *See*—
Geisler, Russell W.; and Geisler, Walter H., 4,186,873, Cl. 236-44.00A.
Geisler, Russell W.; and Geisler, Walter H., to Geisler, Russel W.; and Pansing, Joseph C. Humidity control system and circuitry. 4,186,873, Cl. 236-44.00A.
Geisler, Walter H.: *See*—
Geisler, Russell W.; and Geisler, Walter H., 4,186,873, Cl. 236-44.00A.
General Dynamics Corporation: *See*—
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General Electric Company: *See*—
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Bonnice, Phillip E., 4,186,628, Cl. 76-108.00A.
Chalk, Alan J., 4,187,242, Cl. 260-463.000.
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Greskovich, Charles D.; Klug, Frederic J.; and Pasco, Wayne D., 4,187,266, Cl. 264-43.000.
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Oney, Wilford R., 4,187,441, Cl. 310-112.000.
Schulze, James L., Sr., 4,186,563, Cl. 62-126.000.
Stout, Virgil L.; and Anderson, John M., 4,187,447, Cl. 315-85.000.
Walmet, Gunnar E.; and Matson, Stephen L., 4,187,086, Cl. 55-16.000.
General Foods Corporation: *See*—
Serafino, James M.; Yadlowsky, Slawko; and Witzeman, John S., 4,187,326, Cl. 426-590.000.
General Instrument Corporation: *See*—
Welch, Robert F.; and Stamm, Russell D., 4,186,612, Cl. 74-10.800.
General Motors Corporation: *See*—
Bolles, Charles P., 4,186,709, Cl. 123-146.50A.
Bowler, Lauren L., 4,186,708, Cl. 123-139.0AW.
Cross, Kenneth R.; and Ewing, Bruce A., 4,186,473, Cl. 29-156.80R.
Day, Edward G.; and Hollis, Thomas J., Jr., 4,186,702, Cl. 123-119.00A.
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., 4,187,348, Cl. 428-418.000.
Haka, Raymond J.; and Stoltman, Donald D., 4,186,703, Cl. 123-119.00A.
Khuntia, Natabara; and Rader, Charles W., 4,186,822, Cl. 188-1.00A.
Mair, Alex C.; and Mair, Stephen A., 4,186,476, Cl. 29-407.000.
Marko, John J., Jr., 4,187,407, Cl. 219-91.200.
Patel, Chimanbhai M., 4,186,942, Cl. 280-804.000.
Pearce, Warren, Jr.; and Ramsey, Charles W., 4,186,987, Cl. 339-116.00C.
Pelchat, Paul F., 4,186,524, Cl. 49-324.000.
Rodondi, Andrew F.; and Rossi, Alfred V., 4,186,989, Cl. 339-258.00R.
Simpson, George W., Jr., 4,187,191, Cl. 252-143.000.
Zaydel, Wieslaw S., 4,186,645, Cl. 85-83.000.
Zeller, Gary P.; and Landwehr, DeWayne A., 4,186,915, Cl. 267-140.000.
General Signal Corporation: *See*—
Carlson, William L., Jr., 4,186,613, Cl. 74-52.000.
General Tire & Rubber Company, The: *See*—
Arnason, Sigurdur I., 4,187,274, Cl. 264-325.000.

Geo. A. Hormel & Company: *See—*
Leining, Lyndon R., 4,186,461, Cl. 17-21.000.
Gerard, William A., to Varian Associates, Inc. Open-circuit magnet structure for cross-field tubes and the like. 4,187,444, Cl. 315-39.710.
Gewerkschaft Eisenhutte Westfalia: *See—*
Beckmann, Klaus, 4,186,969, Cl. 299-43.000.
Plevak, Lubomir; and Dodt, Jurgen, 4,187,042, Cl. 405-291.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montedison S.p.A. Process for the stereoregular polymerization of alpha-olefins. 4,187,196, Cl. 252-429.00B.
Gidlow, Rolf G. Colored whey. 4,187,323, Cl. 426-250.000.
Gilovich, Paul A.; and Lynott, John J., to International Business Machines Corporation. Self-locking depository container. 4,186,977, Cl. 312-215.000.
Gilpatric, Donald S. Method for growing oysters and other molluscs. 4,186,687, Cl. 119-4.000.
Gish, Oliver H., to United States of America, Navy. Protection against influence mines. 4,186,681, Cl. 114-240.00R.
Givaudan Corporation: *See—*
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,187,243, Cl. 260-464.000.
Gladden, James W., to United States of America, Army. Process for making phase holograms. 4,187,106, Cl. 430-1.000.
Glass, Dwight W., to Keystone Consolidated Industries, Inc. Turn button latch. 4,186,952, Cl. 292-202.000.
Gleason, John G.: *See—*
Buckley, Thomas F.; and Gleason, John G., 4,187,375, Cl. 544-92.000.
Globe-Union Inc.: *See—*
Zehel, Joseph J.; and Kreis, Joseph W., 4,187,417, Cl. 200-254.000.
Godley, William P., to Pitney-Bowes, Inc. Mixer-auger mechanism for xerographic developer compositions. 4,187,030, Cl. 366-319.000.
Goetz, Norbert; Mangold, Dietrich; and Zeeh, Bernd, to BASF Aktiengesellschaft. Manufacture of 2,4-dioxo-oxazolidines. 4,187,227, Cl. 548-226.000.
Goldberg, Leonard J., to United States of America, Navy. Carrier and dispersal mechanism for a microorganic larvicide. 4,187,290, Cl. 424-93.000.
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Robinson, Don, to Goldfarb, Adolph E.; and Benkoe, Elisabeth, executrix for the estate of Erwin Benkoe. Competitive toss game. 4,186,925, Cl. 273-389.000.
Goodwin, Paul O. Stoves. 4,186,718, Cl. 126-67.000.
Goodyear Aerospace Corporation: *See—*
Milliken, Paul E., 4,186,825, Cl. 188-196.00R.
Goodyear Tire & Rubber Company, The: *See—*
Marshall, Richard A.; Smith, Edwin S.; and Cich, Frank A., 4,187,363, Cl. 526-208.000.
Gordon, Maurice. Dental prosthesis. 4,186,486, Cl. 433-201.000.
Gordon, Roy G. Non-iridescent glass structures. 4,187,336, Cl. 428-34.000.
Gore, Robert W., to W. L. Gore & Associates, Inc. Porous products and process therefor. 4,187,390, Cl. 174-102.00R.
Gorlitsyn, Sergei N.; Kavitsky, Mikhail R.; Koires, Vladimir I.; Efimov, Leonid A., deceased; and by Gebler, Iraida I., administratrix. Device for feeding auxiliary tools into working zone of press. 4,186,588, Cl. 72-394.000.
Gorman, Ralph: *See—*
Intrater, Joseph; and Gorman, Ralph, 4,186,684, Cl. 118-725.000.
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased (by nova, Anastasia I-vanovna Roma, administratrix), to Vsesojuzny Nauchno-Issledovatelsky I Experimentalny Institut Po Pererabotke Khimicheskikh Volokon. Device for lubrication of roller seal. 4,186,571, Cl. 68-5.00E.
Goswami, Jagadish C.; and Yu, Arthur J., to Stauffer Chemical Company. Process for forming a crosslinked polyvinyl chloride foam and product thereof by means of radiation crosslinking. 4,187,159, Cl. 204-159.170.
Gould Inc.: *See—*
Kruper, Wayne A., 4,187,166, Cl. 204-43.00S.
Govaert, George A.; Nijholt, Meinardus A. G.; and Rodenburg, Lammert, to U.S. Philips Corporation. Device for energizing a D.C. motor, comprising an accumulator battery. 4,187,536, Cl. 363-21.000.
Governor and Company of the Bank of England, The: *See—*
Lee, Peter D., 4,186,943, Cl. 283-7.000.
Graham, Alan A.: *See—*
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,187,131, Cl. 156-79.000.
Graham, Martin H.: *See—*
Kasson, James M.; and Graham, Martin H., 4,187,466, Cl. 325-42.000.
Graham, Richard B.: *See—*
Mercurio, Richard N.; and Graham, Richard B., 4,186,831, Cl. 198-501.000.
Gray, George W., to Coal Industry (Patents) Limited. Detecting a short circuit fault in a dynamo electric machine. 4,187,523, Cl. 361-30.000.
Gray, Richard K.: *See—*
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., 4,187,348, Cl. 428-418.000.
Green, James H.: *See—*
Fabula, Andrew G.; Green, James H.; and Madison, William F., 4,186,679, Cl. 114-20.00R.
Greene, Reginald S.: *See—*
Clark, William E.; Herb, Carl C.; and Greene, Reginald S., 4,186,876, Cl. 236-49.000.
Greer, Everett: *See—*
Slater, Norbert G., 4,187,409, Cl. 219-121.00P.
Grefco, Inc.: *See—*
Nielsen, Richard B.; and Vogelsang, Charles J., 4,187,174, Cl. 210-32.000.
Greskovich, Charles D.; Klug, Frederic J.; and Pasco, Wayne D., to General Electric Company. Process for making a ceramic article having a dense integral outer barrier layer and a high degree of porosity and crushability characteristics. 4,187,266, Cl. 264-43.000.
Grider, James D. Threading apparatus for a standard engine lathe. 4,186,631, Cl. 82-5.000.
Griffin, Ray D.: *See—*
Needham, Donald G.; and Griffin, Ray D., 4,187,214, Cl. 260-45.9KA.
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Kuznetsov, German N.; and Franchenko, Nina A. Forging press. 4,186,587, Cl. 72-354.000.
Grisar, J. Martin: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger A., 4,187,319, Cl. 424-333.000.
Gritsuk, Lev D.: *See—*
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.
Grodau, Dieter: *See—*
Herold, Claus-Peter; Grodau, Dieter; and Altenschopfer, Theodor, 4,187,121, Cl. 134-26.000.
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., to Mobil Oil Corporation. Simulation of catalytic cracking process. 4,187,548, Cl. 364-578.000.
Gross, Gerlinde: *See—*
Bachschmid, Reiner; Gross, Gerlinde; and Strobel, Wolfgang, 4,186,704, Cl. 123-122.0AA.
Gross, Glenn, to Norlin Industries, Inc. Programmable circuits for electronic musical instruments. 4,186,642, Cl. 84-1.240.
Gross, Leo; and Skeist, Merrill S. Screw-in fluorescent lamp with magnetic arc spreading. 4,187,446, Cl. 315-58.000.
Grotnes Machine Works, Inc.: *See—*
Fencl, Vernon R.; and Tan, Aujit, 4,187,406, Cl. 219-59.100.
Grun, Helmut, to Alkem GmbH. Device for introducing a force-transmitting machine element into a vessel. 4,186,974, Cl. 308-15.000.
Gschwend, Heinz W.; and Huebner, Charles F., to Ciba-Geigy Corporation. 2-Aminoethyl-1,4-benzodioxans. 4,187,313, Cl. 424-278.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,186,482, Cl. 29-622.000.
GTE Sylvania Far East Limited: *See—*
Kao, Lin, 4,187,468, Cl. 325-396.000.
Guarnieri, Carmine. Quick-release system for mounting a faucet assembly. 4,186,761, Cl. 137-315.000.
Gueguin, Michel, to Quebec Iron and Titanium Corporation - fer et Titane du Quebec, Inc. Titanium slag-coke granules suitable for fluid bed chlorination. 4,187,117, Cl. 106-56.000.
Guerra, Humberto R. Dental finishing strips. 4,187,082, Cl. 51-295.000.
Guerra, Luis A. Device for taking blood and for injecting medication. 4,186,752, Cl. 128-766.000.
Guerra, Romeo E. Method and apparatus for regulating intravenous flow of a liquid. 4,186,740, Cl. 128-214.00R.
Gulf Oil Corporation: *See—*
Patel, Natu R., 4,187,098, Cl. 71-90.000.
Gulf Research and Development Company: *See—*
Madgavkar, Ajay M.; Vogel, Roger F.; and Swift, Harold E., 4,186,801, Cl. 166-256.000.
Gulf & Western Manufacturing Company: *See—*
Spanke, Edwin A., 4,186,827, Cl. 192-18.00A.
Gutris, Giorgio. Process for manufacturing rotors for in-out electric motors. 4,186,479, Cl. 29-598.000.
Guttinger, Manfred; and Schermutzki, Konrad, to Sandco Limited. Dual-belt cooling system. 4,186,797, Cl. 165-120.000.
Gyorgy, Ernst M.: *See—*
Billings, Robert L.; Chen, Ho-Sou; Gyorgy, Ernst M.; and Sherwood, Richard C., 4,187,128, Cl. 148-121.000.
Gysling, Henry J.: *See—*
Gardner, Sylvia A.; and Gysling, Henry J., 4,187,240, Cl. 260-429.00R.
H-G Toys, Inc.: *See—*
Blum, Seymour, 4,186,513, Cl. 46-1.00D.
H. H. Robertson Company: *See—*
Bracalielly, Albert J.; Kautz, Glenn E.; Lindner, Robert G.; and Davis, Bernard H., 4,187,275, Cl. 264-511.000.
Kautz, Glenn E., 4,187,130, Cl. 156-42.000.
H & S Industries, Inc.: *See—*
Hobson, John A.; and Schilling, Paul K., 4,187,066, Cl. 425-327.000.
Haberle, Norman: *See—*
Deinhammer, Wolfgang; Kaufmann, Rudolf; Braunling, Hermann; and Haberle, Norman, 4,187,237, Cl. 260-347.300.
Hafke, Carl; Weber, Roland; and Kohlen, Rudolf, to Metallgesellschaft Aktiengesellschaft. Treating condensate from gasification of coal. 4,187,080, Cl. 48-202.000.
Hagen, Magnus F. Linearly movable stabilizer for slidable structures. 4,186,972, Cl. 308-3.800.
Hager, James R.: *See—*
Fitzner, Arthur O.; and Hager, James R., 4,186,712, Cl. 123-148.0CB.
Hagner, Mats. Method and apparatus for sowing forest seeds in the humus layer. 4,186,670, Cl. 111-1.000.

Hahn, Thomas M., to General Electric Company. Transition sleeve for a cabinet or the like. 4,186,945, Cl. 285-19.000.
Haight, Robert E.: *See—*
Klope, Lawrence R.; and Haight, Robert E., 4,186,777, Cl. 138-31.000.
Haka, Raymond J.; and Stoltman, Donald D., to General Motors Corporation. Exhaust gas recirculation control. 4,186,703, Cl. 123-119.00A.
Haker, Edwin J.; Riddle, Charles F.; and Bielinski, Ralph F., to Rexnord Inc. Vibration control for asphalt roadway compactor. 4,187,036, Cl. 404-117.000.
Haker, Rolf; Schrader, Klaus; and Thiery, Joachim, to Labora Mannheim GmbH fur Labortechnik. Electronic system for determining blood sedimentation rate using a continually retuned resonant circuit. 4,187,462, Cl. 324-204.000.
Halcon Research & Development Corporation: *See—*
Peltzman, Alan; and Yang, Charles C., 4,187,153, Cl. 203-81.000.
Hall, Bradley G.: *See—*
Hall, Gwendolyn L.; and Hall, Bradley G., 4,186,739, Cl. 128-158.000.
Hall, Gwendolyn L.; and Hall, Bradley G. Athletic garment. 4,186,739, Cl. 128-158.000.
Halliburton Company: *See—*
Scott, David G., 4,186,654, Cl. 92-78.000.
Hallmark Cards, Incorporated: *See—*
Longsdorf, Ronald W.; and Cutler, Clifford P., 4,186,682, Cl. 116-171.000.
Hamane, Tokuhito; Kinoshita Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing stators for electrical machines or the like and apparatus employed therefor. 4,186,478, Cl. 29-596.000.
Hamerdinger, Randolph W.: *See—*
Hug, William F.; Hamerdinger, Randolph W.; Dunn, Phillip D.; and McQuillan, Robert C., 4,187,474, Cl. 331-94.50D.
Hamlin, Fred A. Force and distance multiplying oblique leverage transmission. 4,186,614, Cl. 74-63.000.
Hamma, John C.: *See—*
Popiel, Stanley; DuBois, R. Clark; Carley, Jay L.; and Hamma, John C., 4,186,837, Cl. 209-565.000.
Hampton, William C. Submersible fishing lamp assembly. 4,187,533, Cl. 362-257.000.
Hanazono Kogu Kabushiki Kaisha: *See—*
Tanaka, Minoru, 4,186,484, Cl. 30-92.000.
Handleman, Avrom R. Eductor-mixer system. 4,186,772, Cl. 137-604.000.
Hanning, Bernard W. Apparatus for producing sweet water. 4,187,151, Cl. 202-185.00R.
Hans Kolb GmbH & Co.: *See—*
Burghardt, Wilfried; Vogel, Rolf; and Zauser, Ludwig, 4,186,895, Cl. 242-107.40B.
Harada, Hideki; and Yamashita, Keitarou, to Hitachi Metals, Ltd. Electrostatic developing method and apparatus using conductive magnetic toner. 4,187,330, Cl. 430-103.000.
Haraszti, Jozsef: *See—*
Bartha, Zoltan; Szor, Peter; and Haraszti, Jozsef, 4,186,949, Cl. 285-226.000.
Harder, Arthur J., Jr., to Coach & Car Equipment Corporation. Metal seat frame with adhesively secured exterior plastic parts. 4,186,966, Cl. 297-452.000.
Hardin, George T., to Robertshaw Controls Company. Control device mounting means and parts therefor. 4,186,762, Cl. 137-343.000.
Hardtmann, Goetz E., to Sandoz, Inc. 4-Hydroxy-2-quinolinone-3-carboxylic acids and salts thereof. 4,187,309, Cl. 424-258.000.
Harless, Orville F.: *See—*
Howell, Steven G.; and Harless, Orville F., 4,187,497, Cl. 340-65.000.
Harmant, Michel, to Etablissements Zelant, Gazuit, Societe Anonyme, 20 Robert Osann World Trade Center Ste. 9768 New York, N. Y. 10048. High-sensitivity control-system for ironwork grinders. 4,186,526, Cl. 51-33.00R.
Harmer, Alan L., to Battelle Memorial Institute. Device for producing a light signal corresponding to the refractive index of a fluid. 4,187,025, Cl. 356-133.000.
Harmon, William M.; Holtzmeier, Lindell R.; and Yamamoto, Toshiaki, to United McGill Corporation. Interlocking modular building panel with sealing strip. 4,186,539, Cl. 52-580.000.
Harms, John F. Electrically grounded filter plate. 4,187,179, Cl. 210-238.000.
Harpole, George B. Sail assembly. 4,186,680, Cl. 114-103.000.
Harris Corporation: *See—*
Luhowy, Gabriel J., 4,187,396, Cl. 179-1.0SC.
Palmatier, Roland T.; and Sciulli, Francis J., 4,187,435, Cl. 250-559.000.
Harris, Richard C. Combination pedestrian sign and push button. 4,187,418, Cl. 200-295.000.
Harrison, William H., to Donald L. Morton & Associates. Deep heating electrode. 4,186,729, Cl. 128-1.300.
Hart, Cullen P., to Caterpillar Tractor Co. Motor grader roadwheel arrangement. 4,186,814, Cl. 180-24.000.
Hart, Cullen P., to Caterpillar Tractor Co. Suspension and drive for tandem wheel vehicle. 4,186,815, Cl. 180-41.000.
Hartman, Robert J.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,187,357, Cl. 521-159.000.
Harwood, Robert G.; and Bowen, Terry P., to AMP Incorporated. Connector ferrule for terminating optical fiber cables. 4,186,999, Cl. 350-96.210.
Hasegawa, Toru: *See—*
Higashide, Eiji; Asai, Mitsuko; and Hasegawa, Toru, 4,187,292, Cl. 424-122.000.
Hasenhundl, Josef: *See—*
Eirich, Hubert; Eirich, Walter; Eirich, Paul; Hasenhundl, Josef; and Spengler, Adolf, 4,186,592, Cl. 73-73.000.
Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., to Hoffmann-La Roche Inc. Dipeptide derivatives. 4,187,216, Cl. 260-112.50R.
Hastings, Thomas C., to Coleman Company, Inc., The. Fuel control assembly for burners. 4,186,760, Cl. 137-244.000.
Hata, Yoshitaka: *See—*
Suzuki, Suzuo; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,186,701, Cl. 123-119.00A.
Hatae, Masataka: *See—*
Takamura, Masayuki; Shinoda, Norio; Kurahashi, Kazuo; and Hatae, Masataka, 4,186,586, Cl. 72-264.000.
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. Radiation-sensitive composition. 4,187,205, Cl. 260-30.40A.
Hatch, Gary L., to Aqua-Chem, Inc. Mixed-form polyhalide resins for disinfecting water. 4,187,183, Cl. 210-501.000.
Hatebur Umformmaschinen AG: *See—*
Criblez, Roger, 4,186,589, Cl. 72-405.000.
Hauni-Werke Korber & Co. KG: *See—*
Schmidt, Herbert, 4,186,755, Cl. 131-135.000.
Hauser, Raimund: *See—*
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Hausermann Abrading Process Company: *See—*
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Hausermann, Elmer P.: *See—*
Hausermann, Marten C.; and Hausermann, Elmer P., 4,186,527, Cl. 51-58.000.
Hausermann, Marten C.; and Hausermann, Elmer P., to Hausermann Abrading Process Company. Apparatus for shaping electrodes. 4,186,527, Cl. 51-58.000.
Havlik, Jaroslav; and Hodges, William E. Method and apparatus for the extraction and recovery of hydrocarbons from petroleum bearing materials. 4,187,167, Cl. 208-8.00R.
Hazeltine Corporation: *See—*
Frazita, Richard F., 4,187,480, Cl. 333-161.000.
Healey, David M.; and Games, John E., to United Technologies Corporation. Temperature control of chill water and steam in heating, ventilation, air conditioning (HVAC) systems. 4,187,543, Cl. 364-505.000.
Heffernan, James P.; Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., to B. J. Hughes Inc. Computer-controlled oil drilling rig having drawworks motor and brake control arrangement. 4,187,546, Cl. 364-565.000.
Hegeman, Everhardus J.: *See—*
Dijk, Jan A.; and Hegeman, Everhardus J., 4,187,132, Cl. 156-88.000.
Heile, Robert F., to Union Carbide Corporation. Method for laser seam welding of moving workpieces. 4,187,408, Cl. 219-121.0LM.
Heinze, Helga: *See—*
Traubel, Harro; Dieterich, Dieter; and Heinze, Helga, 4,187,074, Cl. 8-94.190.
Heinze, Klaus D.; and Lange, Gerhard, to Siemens Aktiengesellschaft. Gas-Discharge surge arrester with concentric electrodes. 4,187,526, Cl. 361-120.000.
Heise, Arend: *See—*
Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,187,306, Cl. 424-251.000.
Heitzer, Helmut: *See—*
Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,187,306, Cl. 424-251.000.
Helms, Walter C., Jr. Collapsible coat hanger. 4,186,857, Cl. 223-94.000.
Henkel Kommanditgesellschaft auf Atkien: *See—*
Herold, Claus-Peter; Grodau, Dieter; and Altenschopfer, Theodor, 4,187,121, Cl. 134-26.000.
Henneman, John W.; and Flood, Michael G. Breathing apparatus. 4,186,735, Cl. 128-201.250.
Hennen, John J.: *See—*
Black, Robert D.; Hennen, John J.; and Krafka, Jerry L., 4,186,889, Cl. 241-89.200.
Henry Ford Hospital: *See—*
Toledo-Pereyra, Luis H., 4,186,565, Cl. 62-306.000.
Heppner, John D.: *See—*
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Hepworth, Paul; and Ripley, Ian S., to Imperial Chemical Industries Limited. Synthetic resins derived from petroleum. 4,187,362, Cl. 526-73.000.
Hepworth, Walter: *See—*
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Herb, Carl C.: *See—*
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Herchenbach, Horst: *See—*
Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, 4,187,071, Cl. 432-106.000.

Hercules Incorporated: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,186,781, Cl. 139-420.00R.

Hergeth, Herbert, to Hergeth KG. Maschinenfabrik und Apparatebau. Method of opening bales. 4,187,052, Cl. 414-786.000.

Hergeth KG. Maschinenfabrik und Apparatebau: *See—*
Hergeth, Herbert, 4,187,052, Cl. 414-786.000.

Hernandez, Silverio, to Conquest Manufacturing Co., Inc. Prosthetic spur for fighting cocks. 4,186,686, Cl. 119-1.000.

Herold, Claus-Peter; Grodau, Dieter; and Altenschopfer, Theodor, to Henkel Kommanditgesellschaft auf Atkien. Clear-rinse agent for mechanical dishwashers. 4,187,121, Cl. 134-26.000.

Heruth, Kenneth T.: *See—*
Valenta, James D.; and Heruth, Kenneth T., 4,186,737, Cl. 128-203.280.

Hettche, Albert: *See—*
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Hewlett-Packard Company: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.

Hewson, Robert G., Jr. Stereo sound recording and reproduction apparatus. 4,187,395, Cl. 179-1.0GA.

Higami, Masanobu. Hose connecting mouthpiece. 4,186,910, Cl. 251-149.600.

Higashide, Eiji; Asai, Mitsuko; and Hasegawa, Toru, to Takeda Chemical Industries, Ltd. Antibiotics produced from the microorganism nocardice. 4,187,292, Cl. 424-122.000.

Higgins, Bobby: *See—*
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Hildebrandt, Bernhard: *See—*
Garbrecht, Kurt; and Hildebrandt, Bernhard, 4,187,465, Cl. 325-31.000.

Hill, Owen F.: *See—*
Brice, John C.; Hill, Owen F.; and Pratt, Ronald G., 4,187,139, Cl. 156-600.000.

Hilson, David G.; and Tulipan, Peter A., to Electro Materials Corporation of America. Thick film conductors. 4,187,201, Cl. 252-512.000.

Hine, Louis P., to Westinghouse Electric Corp. Method of making heat exchanger coil. 4,186,474, Cl. 29-157.30A.

Hire, Thomas D.: *See—*
Marrujo, Ralph G.; and Hire, Thomas D., 4,186,964, Cl. 297-422.000.

Hirose, Takeshi: *See—*
Yagihara, Morio; Tanaka, Mitsugu; Hirose, Takeshi; and Aono, Toshiaki, 4,187,110, Cl. 430-544.000.

Hishida, Tadanori: *See—*
Yano, Kohzo; Hishida, Tadanori; Inami, Yasuhiko; and Wada, Tomio, 4,187,004, Cl. 350-357.000.

Hitachi, Ltd.: *See—*
Fujimura, Takasi; and Endo, Syokichi, 4,187,013, Cl. 354-1.000.
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, 4,187,205, Cl. 260-30.40A.
Ishimaru, Yasuo; Kobayashi, Hiroshi; and Tamura, Junji, 4,186,864, Cl. 228-226.000.
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, 4,187,479, Cl. 333-28.00R.
Kanemaru, Kenji; and Iwasaki, Takashiroh, 4,187,018, Cl. 354-266.000.
Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, 4,187,282, Cl. 423-244.000.
Megumi, Koichi; Kozuka, Hirotsugu; Kobayashi, Masayoshi; and Furuhata, Yoshio, 4,187,109, Cl. 430-2.000.
Noguchi, Takaharu; Ketori, Takao; Tamura, Kohji; Oi, Tetsu; and Miyoshi, Yutaka, 4,186,481, Cl. 29-603.000.
Shinkawa, Keiro; Shoyama, Hiroji; and Sodeyama, Chuichi, 4,187,476, Cl. 331-117.00D.
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,187,012, Cl. 354-1.000.

Hitachi Medical Corporation: *See—*
Tomita, Chuji; and Abe, Hiroshi, 4,187,429, Cl. 250-445.00T.

Hitachi Metals, Ltd.: *See—*
Harada, Hideki; and Yamashita, Keitarou, 4,187,330, Cl. 430-103.000.
Monden, Souhei; and Takimoto, Sadaharu, 4,186,567, Cl. 63-14.00R.

Hitachi Zosen Kabushiki Kaisha: *See—*
Yoshida, Dan; Onaka, Tatsumi; and Horiuchi, Yasuhiro, 4,187,063, Cl. 418-90.000.

Hittman Corporation: *See—*
Fleischmann, Lewis, 4,186,751, Cl. 128-748.000.

Hiyoshi, Teruo; Nakada, Akira; Uchiyama, Yasuji; Yamaga, Eiichi; and Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,186,640, Cl. 84-1.030.

Hladky, Vaclav: *See—*
Kovar, Jan; Drkal, Jan; Zalesak, Jan; and Hladky, Vaclav, 4,186,583, Cl. 72-108.000.

Hobbs, Walter V., to Ranco Incorporated. Bellows assembly and method of making the same. 4,186,653, Cl. 92-34.000.

Hobson, John A.; and Schilling, Paul K., to H & S Industries, Inc. Apparatus for the preparation of display blocks of urea formaldehyde foam. 4,187,066, Cl. 425-327.000.

Hodges, Joseph L.: *See—*
Wassmer, Norman B.; and Hodges, Joseph L., 4,186,836, Cl. 209-565.000.

Hodges, William E.: *See—*
Havlik, Jaroslav; and Hodges, William E., 4,187,167, Cl. 208-8.00R.

Hodgson, Robert A., to Maloney-Crawford Corporation. Down flow centrifugal separator. 4,187,088, Cl. 55-169.000.

Hodgson, Robert A., to Maloney-Crawford Tank Corporation. Horizontal vapor-liquid separator. 4,187,089, Cl. 55-219.000.

Hoechst Aktiengesellschaft: *See—*
Holst, Arno; Lask, Helmut; Nischwitz, Ehrenfried; and Fischer, Wilhelm, 4,187,342, Cl. 428-283.000.
Puschner, Herbert A.; and Lembens, Helmut, 4,187,405, Cl. 219-10.55A.

Hofer, Otto, to Interondo AG. Box for ampoules having a packaging insert that provides a closure arrangement and reinforcement. 4,186,835, Cl. 206-443.000.

Hoffman-La Roche Inc.: *See—*
Townsend, John M.; and Valentine, Donald H., Jr., 4,187,241, Cl. 260-438.100.

Hoffmann, Jurgen: *See—*
Hoffmann, Reinhard; Hoffmann, Jurgen; and Hoffmann, Norbert, 4,187,171, Cl. 209-383.000.

Hoffmann-La Roche Inc.: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,187,247, Cl. 260-574.000.
Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., 4,187,216, Cl. 260-112.50R.
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,187,381, Cl. 560-121.000.
Hromatka, Otto; Binder, Dieter; Zeller, Paul; and Pfister, Rudolf, 4,187,303, Cl. 424-246.000.
Josse, Rene; and Klaui, Heinrich, 4,187,322, Cl. 426-72.000.

Hoffmann, Norbert: *See—*
Hoffmann, Reinhard; Hoffmann, Jurgen; and Hoffmann, Norbert, 4,187,171, Cl. 209-383.000.

Hoffmann, Reinhard; Hoffmann, Jurgen; and Hoffmann, Norbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Sifting machine. 4,187,171, Cl. 209-383.000.

Hoffmeister, Friedrich: *See—*
Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,187,306, Cl. 424-251.000.

Hoge, Henry H.: *See—*
Kovens, Michael L.; and Hoge, Henry H., 4,187,496, Cl. 340-63.000.

Hohnjec, Marijan; and Japelj, Miha, to KRKA, Farmaceutika, Kemija, Kozmetika, zdravilisca in gostinstuo, Novo mesto, n.sd.o. Process for the resolution of racemic alpha-aminonitriles. 4,187,244, Cl. 260-465.00E.

Holden, Kenneth G.; and Yim, Nelson C., to SmithKline Corporation. Substituted furyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds and pharmaceutical use. 4,187,314, Cl. 424-282.000.

Holland, George W.; Jernow, Jane L.; and Rosen, Perry, to Hoffmann-La Roche Inc. 16-Substituted prostaglandins. 4,187,381, Cl. 560-121.000.

Hollis, Thomas J., Jr.: *See—*
Day, Edward G.; and Hollis, Thomas J., Jr., 4,186,702, Cl. 123-119.00A.

Holmes, Roy L.: *See—*
Yiu, Joseph T.; Lea, Jeffrey G.; and Holmes, Roy L., 4,187,464, Cl. 325-470.000.

Holst, Arno; Lask, Helmut; Nischwitz, Ehrenfried; and Fischer, Wilhelm, to Hoechst Aktiengesellschaft. Bonded fiber web, which is capable of absorbing water vapor comprising a swellable cellulose ether in fiber form. 4,187,342, Cl. 428-283.000.

Holton, Robert J., to Eaton Corporation. Grounding device. 4,186,981, Cl. 339-14.00R.

Holtzmeier, Lindell R.: *See—*
Harmon, William M.; Holtzmeier, Lindell R.; and Yamamoto, Toshiaki, 4,186,539, Cl. 52-580.000.

Holzman, Melvyn A., to Deutsch Company Electronic Components Division, The. Optical interconnecting device having tapered surfaces. 4,186,998, Cl. 350-96.210.

Homan, Virginia L. Gift wrapping storage container. 4,186,833, Cl. 206-225.000.

Home Craftsman Company, Inc.: *See—*
Hooks, Jimmy W., 4,186,522, Cl. 49-63.000.

Homma, Kenichiro, legal representative: *See—*
Homma, Kokichi, deceased; and Kameyama, Yoshio, 4,187,107, Cl. 430-252.000.

Homma, Kokichi, deceased (by Homma, Kenichiro, legal representative); and Kameyama, Yoshio, to Toppan Printing Co., Ltd. Making gravure plate with tint screen. 4,187,107, Cl. 430-252.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Omori, Yoshitaka, 4,186,843, Cl. 220-210.000.

Honeywell Inc.: *See—*
Douglas, Robert H.; and Phinney, Thomas L., 4,187,538, Cl. 364-200.000.

Honickman, Reuben. Wall unit. 4,186,666, Cl. 108-29.000.

Hoogovens Ijmuiden, B. V.: *See—*
de Jong, Hendrikus; and Welboren, Joseph A., 4,186,665, Cl. 105-456.000.

Hooker Chemicals & Plastics Corp.: *See—*
Salee, Gideon, 4,187,259, Cl. 525-219.000.

Hooks, Jimmy W., to Home Craftsman Company, Inc. Storm window frame. 4,186,522, Cl. 49-63.000.

Hoover Universal, Inc.: *See—*
Mizelle, Ned W., 4,186,960, Cl. 297-63.000.

Horie, Kunihiro: *See—*
Mizuno, Haruyuki; Idemoto, Atsushi; and Horie, Kunihiro, 4,187,067, Cl. 425-313.000.

Horigome, Shinkichi: *See—*
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, 4,187,205, Cl. 260-30.40A.

Horiuchi, Yasuhiro: *See—*
Yoshida, Dan; Onaka, Tatsumi; and Horiuchi, Yasuhiro, 4,187,063, Cl. 418-90.000.

Horizons Research Incorporated: *See—*
Wainer, Eugene; and Lewis, James M., 4,187,105, Cl. 430-336.000.

Horvath, Eduard, to Otto Bock Orthopadische Industrie KG. Swivel joint. 4,186,449, Cl. 3-2.000.

Houston, John M., to General Electric Company. Solenoidal electric field lamp with reduced electromagnetic interference. 4,187,445, Cl. 315-54.000.

Houze, Michel: *See—*
Offenstadt, Eric; and Houze, Michel, 4,186,936, Cl. 280-277.000.

Houzeaux, Jean-Pierre: *See—*
Bujadoux, Karel; Neyer, Jean-Marie; and Houzeaux, Jean-Pierre, 4,187,254, Cl. 260-665.00G.

Howald, Arthur M., to Shakespeare Company. Line guide for fishing rod. 4,186,508, Cl. 43-24.000.

Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Homogeneous, highly-filled, polyolefin composites. 4,187,210, Cl. 260-42.140.

Howard, Jerald D., to Pactra Industries, Inc. Water-restricted, water-soluble paint. 4,187,204, Cl. 260-22.0CB.

Howarth, Alan: *See—*
Ellis, Arthur J.; and Howarth, Alan, 4,187,060, Cl. 417-490.000.

Howe, Robert K.: *See—*
Franz, John E.; and Howe, Robert K., 4,187,099, Cl. 71-90.000.

Howell, Steven G.; and Harless, Orville F. Portable vehicle alarm system. 4,187,497, Cl. 340-65.000.

Hromatka, Otto; Binder, Dieter; Zeller, Paul; and Pfister, Rudolf, to Hoffmann-La Roche Inc. Thiazine derivatives. 4,187,303, Cl. 424-246.000.

Hsioh-Lien Ma, William, to International Business Machines Corp. Fluorine plasma resist image hardening. 4,187,331, Cl. 430-328.000.

Huang, Barney K. Fluid injection soil opener for planters. 4,186,671, Cl. 111-2.000.

Huber, Paul; Schiessl, Alois; and Krone, Hartmut. Smoke projectile charge and process for its manufacture. 4,186,664, Cl. 102-66.000.

Huebner, Charles F.: *See—*
Gschwend, Heinz W.; and Huebner, Charles F., 4,187,313, Cl. 424-278.000.

Huempfner, David F., to American Hospital Supply Corporation. Rail system for bed or stretcher. 4,186,456, Cl. 5-428.000.

Hueschen, Robert E.; and Jens, Richard A., to General Electric Company. Rotating anode X-ray tube with improved thermal capacity. 4,187,442, Cl. 313-60.000.

Huet, Jean P.; and Courtois, Alain. Jack with translation and rotation movements. 4,186,911, Cl. 254-93.00R.

Huettl, Heinz: *See—*
Fahrenschon, Franz; Huettl, Heinz; and Dotzauer, Ewald, 4,187,414, Cl. 179-175.30S.

Huff, Joe T.: *See—*
Leslie, Elmer N.; Higgins, Bobby; and Huff, Joe T., 4,186,632, Cl. 83-13.000.

Huffman, Stanley E., to S. E. Huffman Corporation. Programmably controlled method for grinding end cutting tools and the like. 4,186,529, Cl. 51-288.000.

Hug, William F.; Hamerdinger, Randolph W.; Dunn, Phillip D.; and McQuillan, Robert C., to Xerox Corporation. Metal vapor laser discharge tube. 4,187,474, Cl. 331-94.50D.

Hundt, Eckart, to Siemens Aktiengesellschaft. Method for the adjustment of a semiconductor disc relative to a radiation mask in X-ray photolithography. 4,187,431, Cl. 250-492.00A.

Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,187,223, Cl. 260-343.30R.

Hunt, C. D., Jr., to Tinker, Inc. Basketball game. 4,186,928, Cl. 273-244.000.

Hunt Electronics, Inc.: *See—*
Morriss, James W., 4,187,528, Cl. 361-399.000.

Hunter, Joseph J.: *See—*
Bryce, Graham W.; and Hunter, Joseph J., 4,187,411, Cl. 219-137.200.

Hunter, Lee. Safety gate for vehicle wheel alignment pit installations. 4,186,521, Cl. 49-30.000.

Hunter, Walter D.: *See—*
Park, Jack H.; and Hunter, Walter D., 4,187,185, Cl. 252-8.55D.

Husain, Ahmed, to Amerace Corporation. Floating anchor nut assembly and basket member component. 4,186,787, Cl. 151-41.730.

Hutchinson, Loyd B.; and Blanchard, Robert R., to Dow Chemical Company, The. Extrusion process for reducing melt fracture. 4,187,269, Cl. 264-171.000.

Hutchison, Marion E. Clutch-brake mechanism. 4,186,545, Cl. 56-113.000.

Hy-Gain de Puerto Rico, Inc.: *See—*
Yiu, Joseph T.; Lea, Jeffrey G.; and Holmes, Roy L., 4,187,464, Cl. 325-470.000.

Hydril Company: *See—*
Burton, James A., 4,186,776, Cl. 138-30.000.

Ideal Toy Corporation: *See—*
Ensmann, Burt, 4,186,516, Cl. 46-107.000.

Idemoto, Atsushi: *See—*
Mizuno, Haruyuki; Idemoto, Atsushi; and Horie, Kunihiro, 4,187,067, Cl. 425-313.000.

IFO Sanitar AB: *See—*
Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., 4,186,450, Cl. 4-6.000.

Igarashi, Taizo: *See—*
Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, 4,187,078, Cl. 44-51.000.

Iijima, Masakatu, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard device for an electronic musical instrument. 4,186,638, Cl. 84-1.010.

Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic diagnosing apparatus. 4,186,747, Cl. 128-660.000.

Iizuka, Haruhiko; and Marumo, Nagayuki, to Nissan Motor Company Limited. Split engine operation of closed loop controlled multi-cylinder internal combustion engine. 4,186,715, Cl. 123-198.00F.

Ikeda, Junichi: *See—*
Ito, Yoshimasa; and Ikeda, Junichi, 4,187,454, Cl. 318-568.000.

Ikura, Katsuyata; Katsuura, Kiyoshi; and Kataoka, Masaaki, to Nippon Soda Company, Ltd. 1-[N-(4-chloro-2-trifluoromethylphenyl)-phenylacetimidoyl]imidazole, metal complexes thereof, and fungicidal compositions. 4,187,302, Cl. 424-245.000.

Immler, Rolf; and Bouvard, Hans, to Ciba-Geigy Corporation. Procedure for treating mammals to control parasitic diptera larvae. 4,187,304, Cl. 424-249.000.

Immler, Rolf; and Bouvard, Hans, to Ciba-Geigy Corporation. Procedure for treating mammals to control parasitic diptera larvae. 4,187,305, Cl. 424-249.000.

Imperial Chemical Industries Limited: *See—*
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,187,310, Cl. 424-258.000.
Clifford, Michael L., 4,187,278, Cl. 422-132.000.
Hepworth, Paul; and Ripley, Ian S., 4,187,362, Cl. 526-73.000.
Mathews, Carl F.; Deverell, Christopher; Pears, Gordon E. A.; and Knowles, Peter G., 4,187,113, Cl. 430-533.000.

Inami, Yasuhiko: *See—*
Yano, Kohzo; Hishida, Tadanori; Inami, Yasuhiko; and Wada, Tomio, 4,187,004, Cl. 350-357.000.

Industrie Pirelli S.p.A.: *See—*
Angioletti, Attilio; and Citelli, Giosue, 4,186,736, Cl. 128-201.190.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Miller, Harry B., 4,186,890, Cl. 242-18.00A.

Inland Container Corporation: *See—*
Krack, George W., 4,186,834, Cl. 206-320.000.

Innocenti Santeustacchio S.p.A.: *See—*
Passoni, Teresio; Calmes, Jean P.; Cattaneo, Filippo; and Nessi, Aurindo, 4,186,585, Cl. 72-208.000.

Inoue, Eiichi; and Yamaguchi, Takashi, to Fuji Photo Film Co., Ltd. Radioelectrophotography process. 4,187,424, Cl. 250-315.100.

Institut Francais du Petrol: *See—*
Euzen, Jean-Paul; Vuillemot, Daniel; and Dujardin, Claude, 4,187,169, Cl. 208-157.000.

Institut Francais du Petrole: *See—*
Delignieres, Robert, 4,187,492, Cl. 367-127.000.

Institut Kibernetiki Akademii Nauk Ukrainskoi SSR: *See—*
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,187,541, Cl. 364-497.000.

InstytutBadan Jadrowych: *See—*
Pochwalski, Krzysztof K.; and Radoszewski, Tomasz E., 4,187,428, Cl. 250-366.000.

Insul Company, Inc.: *See—*
La Bate, Micheal D.; and Perri, Joseph A., 4,186,908, Cl. 249-197.000.

International Business Machines Corporation: *See—*
Ahn, Kie Y.; Cohen, Mitchell S.; Powers, John V.; and Tao, Lungjo, 4,187,553, Cl. 365-8.000.
Anderson, Robert W.; Brock, Steven F.; and Gee, May L., 4,186,871, Cl. 235-380.000.
Barclay, Donald J., 4,187,003, Cl. 350-357.000.
Berkenblit, Melvin; and Reisman, Arnold, 4,187,140, Cl. 156-662.000.
Crooks, Walter, 4,187,329, Cl. 430-110.000.
Ficker, Walter W.; Lonser, David E.; Rance, William G.; Stricker, Alfred A.; and von Kaenel, Walter, 4,186,918, Cl. 271-232.000.
Gilovich, Paul A.; and Lynott, John J., 4,186,977, Cl. 312-215.000.
Hsioh-Lien Ma, William, 4,187,331, Cl. 430-328.000.
Knappe, LaVerne F.; Peterson, Roger H.; and Stroebel, Gary J., 4,187,452, Cl. 318-128.000.

International Computers Limited: *See—*
Eaton, John R., 4,187,539, Cl. 364-200.000.

International Drum Corporation: *See—*
McConnel, Tim, 4,186,865, Cl. 229-5.700.

International Harvester Company: *See—*
Ward, Gerald G., 4,186,806, Cl. 172-283.000.

International Solar Technologies, Inc.: *See—*
Muessig, Charles E., 4,186,722, Cl. 126-270.000.

International Telephone and Telegraph Corporation: *See—*
Du Bae, Hyung, 4,186,603, Cl. 73-231.00R.

Interondo AG: *See*—
Hofer, Otto, 4,186,835, Cl. 206-443.000.
Intrater, Joseph; and Gorman, Ralph. Apparatus for vapor deposition of materials. 4,186,684, Cl. 118-725.000.
Inventor's Inc.: *See*—
Albert, Kenneth J., 4,186,842, Cl. 220-206.000.
Investigacion y Desarrollo de Nuevas Technicas para Automatismo, S.A. (I.D.T.A., S.A.): *See*—
Garcia Ramos, Jose J., 4,187,550, Cl. 364-900.000.
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., to Eastman Kodak Company. Multiheterocyclic ultraviolet stabilizers and their use in organic compositions. 4,187,213, Cl. 252-402.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bis-benzotriazole compounds. 4,187,229, Cl. 548-260.000.
Ishigaki, Hisao; Tanaka, Ryuzo; and Nakamima, Koichi, to Citizen Watch Co., Ltd. Wristwatch case. 4,186,552, Cl. 58-88.00W.
Ishii, Tadayoshi; Okura, Zenichi; and Machida, Takeshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Tripod rack and pinion focussing mechanism rotatable relative to lens. 4,187,020, Cl. 354-195.000.
Ishikawa, Tadashi; and Kamimae, Hiroshi, to Nihon Nousan Kougyou Co., Ltd. Method for producing eggs containing a high amount of iodinated amino acids. 4,187,294, Cl. 424-150.000.
Ishikawa, Yasuaki: *See*—
Shibuya, Teiji; Ishikawa, Yasuaki; Saito, Masayuki; and Ueda, Kiyoharu, 4,187,085, Cl. 55-4.000.
Ishikura, Tadashi: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, 4,187,358, Cl. 525-132.000.
Ishimaru, Yasuo; Kobayashi, Hiroshi; and Tamura, Junji, to Hitachi, Ltd. Method for producing a welded joint. 4,186,864, Cl. 228-226.000.
Ishizaka, Sunao, to Nippon Kogaku K.K. Viewfinder focusing screen supporting apparatus for single-lens reflex camera. 4,187,016, Cl. 354-152.000.
Ishizaki, Takaharu: *See*—
Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, 4,187,078, Cl. 44-51.000.
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, to Hitachi, Ltd. Variable equalizer. 4,187,479, Cl. 333-28.00R.
Istituto Biologico Chemioterapico "ABC" S.p.A.: *See*—
Franzone, Jose S.; and Tamietto, Teresio, 4,187,308, Cl. 424-253.000.
Isuzu Motors Limited: *See*—
Kawamura, Hideo; Kubota, Kimi; and Ohta, Hideo, 4,186,692, Cl. 123-32.00L.
Ithaca Textiles, Inc.: *See*—
Wehrmann, Nicholas; and Williams, Charlie L., 4,186,471, Cl. 28-154.000.
Ito, Akira: *See*—
Iwao, Tetsuya; Sasaki, Heizo; Ito, Akira; and Kono, Masahiro, 4,187,385, Cl. 526-128.000.
Ito, Yoshimasa; and Ikeda, Junichi, to Tokico Ltd. Industrial robot. 4,187,454, Cl. 318-568.000.
Itoki Kosakusho Co., Ltd.: *See*—
Okada, Akihiro, 4,186,976, Cl. 312-194.000.
Ivannikov, Alfred V.: *See*—
Eroshkin, Nikolai A.; Ivannikov, Alfred V.; Matveev, Vyacheslav N.; and Sergienko, Anatoly I., 4,187,410, Cl. 219-137.200.
Ivanyatov, Jury E.: *See*—
Kolosov, Ivan A.; Ivanyatov, Jury E.; and Pevnev, Vladimir N., 4,186,893, Cl. 242-56.900.
Iwao, Tetsuya; Sasaki, Heizo; Ito, Akira; and Kono, Masahiro, to Mitsui Toatsu Chemical, Inc. Process for the polymerization of ethylene or alpha-olefins and catalyst therefor. 4,187,385, Cl. 526-128.000.
Iwasaki, Takashiroh: *See*—
Kanemaru, Kenji; and Iwasaki, Takashiroh, 4,187,018, Cl. 354-266.000.
Jablonsky, Erich, to Zahnradfabrik Friedrichshafen AG. Auxiliary power steering for motor vehicles. 4,186,818, Cl. 180-133.000.
Jacalone, Richard P.; and Poggiali, Lewis D., to Olinkraft, Inc. Bulk material container. 4,186,846, Cl. 220-468.000.
Jacob, Solomon M.: *See*—
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., 4,187,548, Cl. 364-578.000.
Jacobi, Edgar F.; and Madden, Mark R., to Colkhi, Inc. Program control for center post irrigation system. 4,186,880, Cl. 239-177.000.
Jacobs Manufacturing Co., Ltd., The: *See*—
Derbyshire, George C., 4,186,933, Cl. 279-1.00K.
Jahns, Hans O.; and Maer, Newton K., Jr., to Exxon Production Research Company. Method and apparatus for constructing and maintaining an offshore ice island. 4,187,039, Cl. 405-217.000.
Jameel, Khaja M.: *See*—
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,186,482, Cl. 29-622.000.
James, Rex L.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.
James, Roland J. E. Machine for harvesting soft fruit. 4,186,547, Cl. 56-330.000.
Japan Steel Works, Ltd., The: *See*—
Mizuno, Haruyuki; Idemoto, Atsushi; and Horie, Kunihiro, 4,187,067, Cl. 425-313.000.
Japan Tobacco & Salt Public Corporation, The: *See*—
Takemoto, Nagaaki; Sakurai, Teruo; Mashiko, Kimio; and Tomari, Harumatsu, 4,186,756, Cl. 131-140.00C.
Japelj, Miha: *See*—
Hohnjec, Marijan; and Japelj, Miha, 4,187,244, Cl. 260-465.00E.
Jarm, Robert L., to Credit Industry Associates, Inc. Lock opening device. 4,186,577, Cl. 70-394.000.
Jarrett, George W., to Shelby-Williams Industries, Inc. Controlled permeation process for fireproofing wood. 4,187,346, Cl. 428-342.000.
Jaworski, Eugene: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,186,927, Cl. 273-357.000.
Jenkin, William C. Method of making a supported porous metal catalyst. 4,187,200, Cl. 252-472.000.
Jens, Richard A.: *See*—
Hueschen, Robert E.; and Jens, Richard A., 4,187,442, Cl. 313-60.000.
Jensen, David C. Modular building structure. 4,186,533, Cl. 52-184.000.
Jensen, Ronald N. Targeting thermostat. 4,186,874, Cl. 236-46.00R.
Jernow, Jane L.: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,187,381, Cl. 560-121.000.
Jessee, John W. Vehicle guidance device. 4,187,494, Cl. 340-52.00R.
Joerg, Manfred, to Mueller, Helga. Ignition device with speed limitation for internal combustion engines. 4,186,711, Cl. 123-148.0CC.
Joh, Yasushi, to Nippon Zeon Co. Ltd. Hollow-fiber permeability apparatus. 4,187,180, Cl. 210-321.00R.
Johannesen, Donald D.: *See*—
Preston, Gary W.; Johannesen, Donald D.; and Kestermeier, William J., 4,186,824, Cl. 188-73.500.
Johannisson, Tom; Nilsson, Kai; Sjoblom, Rolf; and Widell, Marja, to ASEA Aktiebolag. Press for hydrostatic extrusion of tubes and profiles. 4,186,582, Cl. 72-60.000.
John MacDonald & Company (Pneumatic Tools) Limited: *See*—
Allan, David T., 4,186,810, Cl. 175-96.000.
Johnson & Johnson: *See*—
Ness, Irving S., 4,186,744, Cl. 128-287.000.
Johnson, Joseph R., to Electro Mag Sales. Endless tape winding device. 4,186,891, Cl. 242-55.19R.
Johnson, Reginald F., to Baker Perkins Holding Limited. Wrapping machines. 4,186,544, Cl. 53-537.000.
Johnson, William H.: *See*—
Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., 4,187,216, Cl. 260-112.50R.
Jolley, Michael R. J.: *See*—
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,187,232, Cl. 549-69.000.
Jones, Charles H., to United States of America, Navy. Electro-acoustic transducer with line focus. 4,187,556, Cl. 367-155.000.
Jones, Fred E. Gathering blade apparatus for assisting in loading the bucket on a front-end loader. 4,187,049, Cl. 414-704.000.
Jones, Frederic L.: *See*—
Avramidis, Stellios A.; and Jones, Frederic L., 4,186,617, Cl. 74-245.00S.
Jones, Gerald P.: *See*—
Searfoss, William H.; and Jones, Gerald P., 4,187,209, Cl. 260-38.000.
Jones, Giffin D.; and Asperger, Robert G., to Dow Chemical Company, The. Polyalkylenimine-alkylene sulfide graft copolymer and method of making same. 4,187,256, Cl. 525-471.000.
Jonsson, Arne, to NYBY Bruk AB. Method and means for rapid replacement of damaged pipe sections. 4,186,475, Cl. 138-97.000.
Jordan, Pierre. Liquid scintillation spectrometry process and apparatus. 4,187,426, Cl. 250-364.000.
Josef, Michael J.; and Romanski, Eric R., to Albany International Corp. Seam construction for multi-layer felts. 4,186,780, Cl. 139-383.00A.
Josse, Rene; and Klaui, Heinrich, to Hoffmann-La Roche Inc. Powder compositions containing vitamin C active component. 4,187,322, Cl. 426-72.000.
Jouret, Edouard, to Crouzet. Programmer for electric household appliances. 4,186,550, Cl. 58-21.130.
Jumel, Yves, to Saft-Societe des Accumulateurs Fixes et de Traction. Method of preparing positive active material for electric primary cells. 4,187,328, Cl. 427-8.000.
Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,187,316, Cl. 424-305.000.
Jurgens, Rainer, to Christensen, Inc. Rotary helical fluid motor with deformable sleeve for deep drilling tool. 4,187,061, Cl. 418-48.000.
Kabanov, Viktor A.; Martynova, Marina A.; Pluzhnov, Stanislav K.; and Smetanjuk, Vladimir I. Catalyst for the dimerization of olefins. 4,187,197, Cl. 252-431.00P.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Nishibe, Kouji; and Kondo, Nobuaki, 4,186,643, Cl. 84-1.240.
Kabushiki Kaisha Meidensha: *See*—
Watanabe, Youichi, 4,186,593, Cl. 73-117.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
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Kabushiki Kaisha Yakult Honsha: *See*—
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,187,321, Cl. 426-43.000.
Kahn, Morris S. Underwater observatory. 4,186,532, Cl. 52-169.100.
Kamakura, Ichiro. Binocular with an arrangement for adjusting the distance between two telescopes. 4,186,992, Cl. 350-36.000.

Kameyama, Yoshio: *See*—
Homma, Kokichi, deceased; and Kameyama, Yoshio, 4,187,107, Cl. 430-252.000.
Kamimae, Hiroshi: *See*—
Ishikawa, Tadashi; and Kamimae, Hiroshi, 4,187,294, Cl. 424-150.000.
Kammann, Clarence H., to Control Data Corporation. Fault tolerant bubble memory with redundancy using a stationary register on a single chip. 4,187,554, Cl. 365-15.000.
Kamyr, Inc.: *See*—
Kindersley, Peter G., 4,187,043, Cl. 406-105.000.
Kaneko, Tamaki: *See*—
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,187,024, Cl. 355-14.00R.
Kanemaru, Kenji; and Iwasaki, Takashiroh, to Hitachi, Ltd. Automatic control circuit system for cameras provided with a focal-plane shutter having front and rear screens. 4,187,018, Cl. 354-266.000.
Kanno, Hidenori: *See*—
Ban, Itsuki; and Kanno, Hidenori, 4,187,522, Cl. 360-137.000.
Kao, James T. F.: *See*—
Wiegand, Karl E.; Kao, James T. F.; and Dagani, Michael J., 4,187,230, Cl. 260-326.470.
Kao, Lin, to GTE Sylvania Far East Limited. Electronic clock radio having nap/sleep feature. 4,187,468, Cl. 325-396.000.
Kapusnik, Joseph M.: *See*—
Pater, Frank R., Jr.; and Kapusnik, Joseph M., 4,187,434, Cl. 250-515.000.
Karlen, Urs, to Ciba-Geigy Corporation. Anthraquinone disperse dyes. 4,187,238, Cl. 260-376.000.
Karoly, Gabriel, to M&T Chemicals Inc. Novel trifunctional aromatic amines. 4,187,250, Cl. 260-578.000.
Kasson, James M.; and Graham, Martin H., to Rolm Corporation. Signal injection technique. 4,187,466, Cl. 325-42.000.
Kataoka, Masaaki: *See*—
Ikura, Katsuyata; Katsuura, Kiyoshi; and Kataoka, Masaaki, 4,187,302, Cl. 424-245.000.
Kato, Akira: *See*—
Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, 4,187,282, Cl. 423-244.000.
Kato, Sadao: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, 4,187,358, Cl. 525-132.000.
Kato, Yasuo; and Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye fundus camera. 4,187,014, Cl. 354-62.000.
Katsenelenbogen, Leonid B.: *See*—
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.
Katsof, Barry; and Matlin, Joel, to Camtron Electronics International Ltd. Camera system. 4,187,015, Cl. 354-109.000.
Katsumoto, Kiyoshi; and Marquis, David M., to Chevron Research Company. Method for preparing maleic anhydride. 4,187,235, Cl. 260-346.750.
Katsumoto, Kiyoshi: *See*—
Anshus, Byron E.; Katsumoto, Kiyoshi; and Serkes, Ira M., 4,187,370, Cl. 528-312.000.
Katsuura, Kiyoshi: *See*—
Ikura, Katsuyata; Katsuura, Kiyoshi; and Kataoka, Masaaki, 4,187,302, Cl. 424-245.000.
Katz, Amnon. Tunable link. 4,186,568, Cl. 64-1.00V.
Kaufman, Arnold S.; and Anderson, Robert L., to National Food Service Equipment Fabricators, Inc. Air ventilation and washing system. 4,186,727, Cl. 126-299.00D.
Kaufmann, Rudolf: *See*—
Deinhammer, Wolfgang; Kaufmann, Rudolf; Braunling, Hermann; and Haberle, Norman, 4,187,237, Cl. 260-347.300.
Kautz, Glenn E., to H. H. Robertson Company. Method for producing shaped glass fiber reinforced gypsum articles. 4,187,130, Cl. 156-42.000.
Kautz, Glenn E.: *See*—
Bracalielly, Albert J.; Kautz, Glenn E.; Lindner, Robert G.; and Davis, Bernard H., 4,187,275, Cl. 264-511.000.
Kauzlarich, James J.: *See*—
Lewis, David W.; and Kauzlarich, James J., 4,186,745, Cl. 128-349.00R.
Kavitsky, Mikhail R.: *See*—
Gorlitsyn, Sergei N.; Kavitsky, Mikhail R.; Koires, Vladimir I.; Efimov, Leonid A., deceased; and Gebler, Iraida I., administratrix, 4,186,588, Cl. 72-394.000.
Kawahara, Hiroshi: *See*—
Narisawa, Shigeyuki; Yoshida, Shohei; and Kawahara, Hiroshi, 4,187,377, Cl. 544-219.000.
Kawamura, Hideo; Kubota, Kimi; and Ohta, Hideo, to Isuzu Motors Limited. Compression ignition internal combustion engine with auxiliary swirl combustion chamber. 4,186,692, Cl. 123-32.00L.
Kaye, Gordon E., to P. R. Mallory & Co. Inc. Battery connector. 4,186,983, Cl. 339-91.00R.
Kazda, Stanislav: *See*—
Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,187,306, Cl. 424-251.000.
KBS Enterprises: *See*—
King, John M., 4,186,717, Cl. 126-66.000.
Kearns, Thomas N.: *See*—
Bruner, A. J.; Foster, Edward T.; and Kearns, Thomas N., 4,186,913, Cl. 256-13.100.
Keefer, Bowie G. Reverse osmosis method and apparatus. 4,187,173, Cl. 210-23.00H.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Reinmoller, Adolf; Voss, Hans W.; and Kluting, Bernd, 4,186,904, Cl. 248-395.000.
Keller, Douglas V., Jr.; and Rainis, Andrew, to Otisca Industries, Ltd. Processes for recovering coal. 4,186,887, Cl. 241-20.000.
Kelley, Hugh D. Conveyor for handling free-flowing material. 4,186,832, Cl. 198-861.000.
Kelly, Charles A.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,187,229, Cl. 548-260.000.
Kendall Company, The: *See*—
Marshall, Preston F., 4,186,463, Cl. 19-304.000.
Patel, Bhupendra C., 4,186,750, Cl. 128-748.000.
Kennedy, Sterling R. Method for reactivating carbon. 4,187,195, Cl. 252-412.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Morschl, Paul; and Zimmer, Erich, 4,187,280, Cl. 423-15.000.
Kerstein, Irving J.: *See*—
Schenker, M. Allan; and Kerstein, Irving J., 4,186,790, Cl. 160-329.000.
Kestermeier, William J.: *See*—
Preston, Gary W.; Johannesen, Donald D.; and Kestermeier, William J., 4,186,824, Cl. 188-73.500.
Ketchum, John L. Football offensive player training apparatus. 4,186,922, Cl. 273-55.00R.
Ketori, Takao: *See*—
Noguchi, Takaharu; Ketori, Takao; Tamura, Kohji; Oi, Tetsu; and Miyoshi, Yutaka, 4,186,481, Cl. 29-603.000.
Key, John W. Screen-printing frame with plastic side bars bondable to fabric by surface-softening. 4,186,660, Cl. 101-128.100.
Key, Paul F.; and Lazzara, Anthony R., to Scientific Technology Inc. Optical relay. 4,187,421, Cl. 250-199.000.
Keystone Consolidated Industries, Inc.: *See*—
Glass, Dwight W., 4,186,952, Cl. 292-202.000.
Keznickl, Eduard, to Vockenhuber, Karl; and Hauser, Raimund. Photographing or playback-device. 4,187,008, Cl. 352-108.000.
Khalemsky, Samuil F.: *See*—
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., 4,186,791, Cl. 164-66.000.
Khan, Amir U.; Khan, Habib U.; and Amid, Ahamed A. Telescoping carpenter's scale. 4,186,493, Cl. 33-161.000.
Khan, Habib U.: *See*—
Khan, Amir U.; Khan, Habib U.; and Amid, Ahamed A., 4,186,493, Cl. 33-161.000.
Kholopov, Vladimir P.: *See*—
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.
Khomich, Nikolai S.; Sakulevich, Faddei J.; Putimtsev, Boris N.; and Silaev, Vladimir A. Ferromagnetic abrasive material and method for preparing the same. 4,187,084, Cl. 51-308.000.
Khuntia, Natabara; and Rader, Charles W., to General Motors Corporation. Disc brake pack wear indicator. 4,186,822, Cl. 188-1.00A.
Kiene, Wilfried: *See*—
Appel, Eggert; Gehrke, Herbert; and Kiene, Wilfried, 4,186,600, Cl. 73-194.0EM.
Kienzle Apparate GmbH: *See*—
Dold, Berthold, 4,187,510, Cl. 346-21.000.
Kihira, Masafumi: *See*—
Hamane, Tokuhito; Kinoshita Toshio; and Kihira, Masafumi, 4,186,478, Cl. 29-596.000.
Kilgore, James W. Hairdresser's hand protector. 4,186,442, Cl. 2-20.000.
Kilgore, Woodson B. Vehicle digital anti-theft system. 4,186,710, Cl. 123-146.50B.
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, to Hercules Incorporated. Network structures and methods of making same. 4,186,781, Cl. 139-420.00R.
Kimball International, Inc.: *See*—
Robinson, John W.; and Dietrich, Ralph N., 4,186,639, Cl. 84-1.030.
Kimerer, Neil B., Jr. Flat-bodied nymph hook. 4,186,510, Cl. 43-42.250.
Kinder, Leon. Drift free spraying apparatus. 4,186,879, Cl. 239-172.000.
Kindersley, Peter G., to Kamyr, Inc. Method and apparatus for boosting pressure in a coal pipeline. 4,187,043, Cl. 406-105.000.
King, John M., to KBS Enterprises. Stove structure. 4,186,717, Cl. 126-66.000.
King, Walter D.: *See*—
Stanonis, David J.; King, Walter D.; and Coll, Emory E., 4,186,608, Cl. 73-437.000.
Kinnamon, Kenneth E., to United States of America, Army. Use of phosphonium salts in treatment of African trypanosomiasis. 4,187,300, Cl. 424-198.000.
Kinoshita Toshio: *See*—
Hamane, Tokuhito; Kinoshita Toshio; and Kihira, Masafumi, 4,186,478, Cl. 29-596.000.
Kira, Hideshi: *See*—
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,477, Cl. 333-14.000.
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,478, Cl. 333-14.000.
Kirkpatrick, George F., to Union Carbide Corporation. Colored interlocking closure strips for a container. 4,186,786, Cl. 150-3.000.

Kirsch, Jerry; and Kirsch, Kerry F. Rotary video article centering, orienting and transfer device for computerized electronic operating systems. 4,187,051, Cl. 414-744.000.

Kirsch, Kerry F.: *See—*
Kirsch, Jerry; and Kirsch, Kerry F., 4,187,051, Cl. 414-744.000.

Kiss nee Ajzert, Ilona: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.

Kita, Yasuhiro: *See—*
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, 4,187,479, Cl. 333-28.00R.

Kitagawa, Kazuo: *See—*
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,477, Cl. 333-14.000.
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,478, Cl. 333-14.000.

Kivenson, Gilbert. Counterfeit detector for paper currency. 4,187,463, Cl. 324-228.000.

Klaui, Heinrich: *See—*
Josse, Rene; and Klaui, Heinrich, 4,187,322, Cl. 426-72.000.

Klaus, Arthur, to Signode Corporation. Debris collecting mechanism for pneumatic driving tools. 4,186,862, Cl. 227-130.000.

Klein, Elias: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,187,333, Cl. 427-230.000.

Klipinitser, Iosif L.: *See—*
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L., 4,187,369, Cl. 528-137.000.

Klobbie, Eduard J. G., to Lankhorst Touwfabrieken B.V. Method and apparatus for producing synthetic plastics products, and product produced thereby. 4,187,352, Cl. 521-79.000.

Klockner-Humboldt=Deutz Aktiengesellschaft: *See—*
Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, 4,187,071, Cl. 432-106.000.

Klope, Lawrence R.; and Haight, Robert E., to Deere & Company. Pressure vessel retained energy measurement system. 4,186,777, Cl. 138-31.000.

Klug, Frederic J.: *See—*
Greskovich, Charles D.; Klug, Frederic J.; and Pasco, Wayne D., 4,187,266, Cl. 264-43.000.

Kluting, Bernd: *See—*
Reinmoller, Adolf; Voss, Hans W.; and Kluting, Bernd, 4,186,904, Cl. 248-395.000.

Knappe, LaVerne F.; Peterson, Roger H.; and Stroebel, Gary J., to International Business Machines Corporation. Electromechanical torsional oscillator with resonant frequency and amplitude control. 4,187,452, Cl. 318-128.000.

Knoble, David W., to General Electric Company. Discharge lamp operating circuit. 4,187,449, Cl. 315-205.000.

Knogo Corporation: *See—*
Weiner, Arnold, 4,187,509, Cl. 343-873.000.

Knowles, Peter G.: *See—*
Mathews, Carl F.; Deverell, Christopher; Pears, Gordon E. A.; and Knowles, Peter G., 4,187,113, Cl. 430-533.000.

Kobayashi, Hiroshi: *See—*
Ishimaru, Yasuo; Kobayashi, Hiroshi; and Tamura, Junji, 4,186,864, Cl. 228-226.000.

Kobayashi, Masayoshi: *See—*
Megumi, Koichi; Kozuka, Hirotsugu; Kobayashi, Masayoshi; and Furuhata, Yoshio, 4,187,109, Cl. 430-2.000.

Kobler, Robert J., to AMP Incorporated. Electrical connector receptacles. 4,186,988, Cl. 339-176.0MP.

Koch, Edwin R.; Abbazia, Leonard P.; and Puglia, Wayne J., to Warner-Lambert Company. Process for preparing chewing gum base using solid elastomer. 4,187,320, Cl. 426-3.000.

Koga, Noboru. Concrete mold fastening device and tool for said device. 4,186,906, Cl. 249-41.000.

Kohlen, Rudolf: *See—*
Hafke, Carl; Weber, Roland; and Kohlen, Rudolf, 4,187,080, Cl. 48-202.000.

Kohler, Werner: *See—*
Muller, Bruno; and Kohler, Werner, 4,187,437, Cl. 307-147.000.

Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, to Ricoh Co., Ltd. Angularly rotatable mirror apparatus. 4,186,991, Cl. 350-6.910.

Koires, Vladimir I.: *See—*
Gorlitsyn, Sergei N.; Kavitsky, Mikhail R.; Koires, Vladimir I.; Efimov, Leonid A., deceased; and Gebler, Iraida I., administratrix, 4,186,588, Cl. 72-394.000.

Koizumi, Yutaka: *See—*
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Kokelenberg, Hendrik E.; Sels, Francis J.; and Van Veelen, George F., to AGFA-Gevaert N.V. Hardening proteinaceous materials. 4,187,114, Cl. 430-510.000.

Kokotailo, George T.; and Sawruk, Stephen, to Mobil Oil Corporation. Method for improving organic cation-containing zeolites. 4,187,283, Cl. 423-328.000.

Kolienko, Lidia P.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Kollar, Bela: *See—*
Morley, Colin A.; Thomas, Richard N.; and Kollar, Bela, 4,187,505, Cl. 340-753.000.

Kollmorgen Technologies Corp.: *See—*
Zeblisky, Rudolph J., 4,187,198, Cl. 252-434.000.

Kolosov, Ivan A.; Ivanyatov, Jury E.; and Pevnev, Vladimir N. Apparatus for winding strips. 4,186,893, Cl. 242-56.900.

Koma, Toshio: *See—*
Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, 4,187,078, Cl. 44-51.000.

Kominiak, Andrew A.: *See—*
Stepniak, Frank M.; and Kominiak, Andrew A., 4,186,985, Cl. 339-111.000.

Kondo, Masatsune; and Tanoue, Akira, to Sumitomo Chemical Company. Process for preparing polymer resins of high impact resistance. 4,187,202, Cl. 260-4.00R.

Kondo, Nobuaki: *See—*
Nishibe, Kouji; and Kondo, Nobuaki, 4,186,643, Cl. 84-1.240.

Kondo, Shigeki, to Tokyo Juki Kogyo Kabushiki Kaisha. Apparatus for fulling fabric. 4,186,469, Cl. 26-19.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,186,606, Cl. 73-351.000.

Kono, Masahiro: *See—*
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Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, to GTE Automatic Electric Laboratories Incorporated. Tool and method for installing flexible tubing in a multi-capsule reed relay switching assembly. 4,186,482, Cl. 29-622.000.

Korber, Alfred: *See—*
Bauer, Kurt; and Korber, Alfred, 4,187,222, Cl. 260-343.000.

Kornilov, Anatoly A.; Petrushkin, Viktor D.; Stetsko, Viktor N.; and Fridman, Viktor M. Apparatus for classifying liquid mixture in accordance with molecular weight. 4,187,181, Cl. 210-332.000.

Kortusov, Leonid I.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Kuznetsov, German N.; and Franchenko, Nina A., 4,186,587, Cl. 72-354.000.

Koseki, Shyushi, to Nissan Motor Company, Limited. Temperature control system of an engine exhaust gas component sensor. 4,186,694, Cl. 123-41.310.

Kosobutsky, Alexandr A.: *See—*
Yascheritsyn, Petr I.; Sakulevich, Faddei J.; Olender, Leonty A.; and Kosobutsky, Alexandr A., 4,186,528, Cl. 51-161.000.

Kosup, Russell R., to Unicorn Industries. Multiple capacity circuit breaker. 4,187,482, Cl. 335-12.000.

Kouda, Masanori, to Atsugi Motor Parts Co., Ltd. Servo valve for power steering booster. 4,186,652, Cl. 91-434.000.

Koutsky, L. John, to Sears Manufacturing Company. Upright vehicle seat support. 4,186,963, Cl. 297-308.000.

Kovar, Jan; Drkal, Jan; Zalesak, Jan; and Hladky, Vaclav, to Vyzkumny ustav tvarecich stroju a technologie tvareni. Apparatus for cross wedge rolling. 4,186,583, Cl. 72-108.000.

Kovar, Jan: *See—*
Zalesak, Jan; and Kovar, Jan, 4,186,580, Cl. 72-14.000.

Kovens, Michael L.; and Hoge, Henry H., to Universal Security Instruments, Inc. Keyless vehicle intrusion alarm. 4,187,496, Cl. 340-63.000.

Kozlov, Mikhail D.: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased, 4,186,571, Cl. 68-5.00E.

Kozuka, Hirotsugu: *See—*
Megumi, Koichi; Kozuka, Hirotsugu; Kobayashi, Masayoshi; and Furuhata, Yoshio, 4,187,109, Cl. 430-2.000.

Krack, George W., to Inland Container Corporation. Shipping and storage container. 4,186,834, Cl. 206-320.000.

Krafka, Jerry L.: *See—*
Black, Robert D.; Hennen, John J.; and Krafka, Jerry L., 4,186,889, Cl. 241-89.200.

Kraftwerk Union Aktiengesellschaft: *See—*
Stehle, Heinz, 4,187,157, Cl. 204-157.10R.

Kreis, Joseph W.: *See—*
Zehel, Joseph J.; and Kreis, Joseph W., 4,187,417, Cl. 200-254.000.

KRKA, Farmaceutika, Kemija, Kozmetika, zdravilisca in gostinstuo, Novo mesto, n.sd.o.: *See—*
Hohnjec, Marijan; and Japelj, Miha, 4,187,244, Cl. 260-465.00E.

Krone, Hartmut: *See—*
Huber, Paul; Schiessl, Alois; and Krone, Hartmut, 4,186,664, Cl. 102-66.000.

Kruglikov, Anatoly A.: *See—*
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L., 4,187,369, Cl. 528-137.000.

Kruper, Wayne A., to Gould Inc. Method of removing copper ions from a bath containing same. 4,187,166, Cl. 204-43.00S.

Kruse, Robert L.; and DeJackome, Gene E., to Monsanto Company. Mass polymerization process for polyblends. 4,187,260, Cl. 525-263.000.

Kubik, Charles K.: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,186,482, Cl. 29-622.000.

Kubota, Kimi: *See—*
Kawamura, Hideo; Kubota, Kimi; and Ohta, Hideo, 4,186,692, Cl. 123-32.00L.

Kuester, Donald W., to United States of America, Navy. Pressure sensitive hydraulic valve. 4,186,768, Cl. 137-516.250.

Kuhmonen, Charles D. Ice removing machine. 4,186,967, Cl. 299-25.000.

Kuhn, James O.; Wright, James J.; and Bollinger, Howard N., to CPG Products Corp. Doll with arm-actuated fingers. 4,186,517, Cl. 46-119.000.

Kukla, George W.: *See—*
Beke, Zoltan; and Kukla, George W., 4,186,496, Cl. 34-114.000.

Kulesza, Ralph J.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Game with upstanding transparent enclosure and movable firing means. 4,186,926, Cl. 273-340.000.

KUNDO - Kieninger & Obergfell: *See—*
Scheer, Erich, 4,187,499, Cl. 340-309.100.

Kunin, Robert; and Blaine, Louis I., to Ecodyne Corporation. Method for purification of polyhydric alcohols. 4,187,120, Cl. 127-46.00A.

Kuo, Sheafen F. Thermal conversion engine. 4,186,558, Cl. 60-527.000.

Kupferdraht-Isolierwerk Ag Wildegg: *See—*
Voser, Othmar, 4,187,391, Cl. 174-106.00R.

Kurahashi, Kazuo: *See—*
Takamura, Masayuki; Shinoda, Norio; Kurahashi, Kazuo; and Hatae, Masataka, 4,186,586, Cl. 72-264.000.

Kuramochi, Koujiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control means for an automatic transmission. 4,186,627, Cl. 74-869.000.

Kurek, Joseph: *See—*
Muller, Jean-Claude; Ponpon, Jean-Pierre; Kurek, Joseph; and Siffert, Paul, 4,187,124, Cl. 148-1.500.

Kurita, Masaru: *See—*
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,187,374, Cl. 544-28.000.

Kuroi, Hisashi; Miyajima, Masayoshi; and Matoba, Takao, to Kuroi Kosan Co., Ltd. Discharge lamp lighting device. 4,187,448, Cl. 315-176.000.

Kuroi Kosan Co., Ltd.: *See—*
Kuroi, Hisashi; Miyajima, Masayoshi; and Matoba, Takao, 4,187,448, Cl. 315-176.000.

Kurosaki, Makoto, to Nippon Gakki Seizo Kabushiki Kaisha. Foot pedal assembly for drums. 4,186,644, Cl. 84-422.00R.

Kurtz, Bruce E., to Allied Chemical Corporation. Process and apparatus for isothermal chlorination of hydrocarbons. 4,187,253, Cl. 260-662.00R.

Kusama, Takeo: *See—*
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, 4,187,479, Cl. 333-28.00R.

Kutsykovich, Dorina B.: *See—*
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.

Kuzmina, Vera I.: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased, 4,186,571, Cl. 68-5.00E.

Kuznetsov, German N.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Kuznetsov, German N.; and Franchenko, Nina A., 4,186,587, Cl. 72-354.000.

Kvita, Vratislav: *See—*
Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, 4,187,364, Cl. 526-259.000.

Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, to Unitika Ltd. Resin composition. 4,187,358, Cl. 525-132.000.

Kytta, Oswald O., to Bendix Corporation, The. Internal force multiplier for a servomotor. 4,186,650, Cl. 91-369.00A.

L. B. (Plastics) Limited: *See—*
Litchfield, Leon G., 4,186,979, Cl. 312-333.000.

LaBate, Michael D. Process and material for treating steel walls and fans in electrical precipitation installations with micron colloidal graphite particles. 4,187,334, Cl. 427-236.000.

La Bate, Michael D. Process for treating coke oven doors and jambs to prevent the build up of tar thereon. 4,187,335, Cl. 427-318.000.

La Bate, Micheal D.; and Perri, Joseph A., to Insul Company, Inc. Expandable hot top for ingot moulds. 4,186,908, Cl. 249-197.000.

Labbe, Francis A. M., to Molins Limited. Cigarette manufacture. 4,186,754, Cl. 131-23.00A.

Labora Mannheim GmbH fur Labortechnik: *See—*
Haker, Rolf; Schrader, Klaus; and Thiery, Joachim, 4,187,462, Cl. 324-204.000.

Labortechnik M. R. Walter: *See—*
Walter, Karl, 4,187,022, Cl. 354-318.000.

Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., to Suntech, Inc.; and Children's Hospital Medical Center. Tetramethylpentane blood substitutes. 4,187,252, Cl. 260-653.000.

Lake, Antony W.: *See—*
Cassidy, Frederick; and Lake, Antony W., 4,187,312, Cl. 424-274.000.

Lammer, Jurgen: *See—*
Abthoff, Jorg; Fricker, Ludwig; and Lammer, Jurgen, 4,186,705, Cl. 123-122.0AC.

Landis, Delmer H., Jr.; Lozier, Paul W.; Lievestro, Louis; Auxier, Thomas A.; and Starkweather, John H., to General Electric Company. Turbine band cooling system. 4,187,054, Cl. 415-115.000.

Landwehr, DeWayne A.: *See—*
Zeller, Gary P.; and Landwehr, DeWayne A., 4,186,915, Cl. 267-140.000.

Lanfermann, Willy: *See—*
Minke, Otto; and Lanfermann, Willy, 4,186,970, Cl. 299-43.000.

Lang, Stanley A., Jr.: *See—*
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-i, 4,187,373, Cl. 542-402.000.

Lange, Frederick F., to Westinghouse Electric Corp. Silicon nitride-silicon carbide composite material. 4,187,116, Cl. 106-44.000.

Lange, Gerhard: *See—*
Heinze, Klaus D.; and Lange, Gerhard, 4,187,526, Cl. 361-120.000.

Langer, Heimo J.; and McKillip, William J., to Ashland Oil, Inc. Bonding of rubber to reinforcing elements. 4,187,349, Cl. 428-395.000.

Langlais, Jacques F.: *See—*
Dauge, Gilbert V.; and Langlais, Jacques F., 4,187,460, Cl. 324-60.0CD.

Lankhorst Touwfabrieken B.V.: *See—*
Klobbie, Eduard J. G., 4,187,352, Cl. 521-79.000.

Lankro Chemicals Ltd.: *See—*
Sheridan, Geoffrey P., 4,187,192, Cl. 252-313.00R.

Lapp, John; and Willy, John R., to McGraw-Edison Company. Method of processing an electrical apparatus. 4,187,327, Cl. 427-8.000.

Larner, Michael W., to Rubinson & Friends, Inc. Automated mixing system with display/data entry subsystem. 4,187,544, Cl. 364-514.000.

Larson, Ivar W.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.

Lask, Helmut: *See—*
Holst, Arno; Lask, Helmut; Nischwitz, Ehrenfried; and Fischer, Wilhelm, 4,187,342, Cl. 428-283.000.

Latham, Raymond E.: *See—*
Billingsley, Lloyd E.; and Latham, Raymond E., 4,186,950, Cl. 285-270.000.

Laube, David E.; and Simpson, Loran R., to Bourns, Inc. Potentiometer contact and rotor assembly. 4,186,483, Cl. 29-630.00B.

Lauffer, John R., to Martin-Copeland Company. Eyeglass construction. 4,187,007, Cl. 351-108.000.

Lawrence, Charles T., to Textron, Inc. Welded thermoplastic stringer for slide fastener and method of manufacture. 4,186,467, Cl. 24-205.16R.

Lazarchik, Robert E.: *See—*
Crane, Patrick E.; Lazarchik, Robert E.; and Schaufelberger, Arthur H., deceased, 4,187,507, Cl. 343-754.000.

Lazzara, Anthony R.: *See—*
Key, Paul F.; and Lazzara, Anthony R., 4,187,421, Cl. 250-199.000.

Lea, Jeffrey G.: *See—*
Yiu, Joseph T.; Lea, Jeffrey G.; and Holmes, Roy L., 4,187,464, Cl. 325-470.000.

Le Coze, Rene-Jean M. Partition wall capable of being dismantled. 4,186,534, Cl. 52-241.000.

Lee, Peter D., to Governor and Company of the Bank of England, The. Security devices. 4,186,943, Cl. 283-7.000.

Lee, Ving J.: *See—*
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-i, 4,187,373, Cl. 542-402.000.

Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., to Raytheon Company. Semiconductor integrated circuits. 4,187,516, Cl. 357-60.000.

Legoria, Bernadette C. Assembly for facilitating teaching reading. 4,186,497, Cl. 35-35.00R.

Leining, Lyndon R., to Geo. A. Hormel & Company. Hand supported skinning device. 4,186,461, Cl. 17-21.000.

Lembens, Helmut: *See—*
Puschner, Herbert A.; and Lembens, Helmut, 4,187,405, Cl. 219-10.55A.

Len, George: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,186,482, Cl. 29-622.000.

Lentz, William P.: *See—*
Coppola, Frank T.; Lentz, William P.; and VanDewoestine, Robert V., 4,186,723, Cl. 126-443.000.

LeRoy, Edward W. Book mark-page line-reader. 4,186,683, Cl. 116-235.000.

Leslie, Elmer N.; Higgins, Bobby; and Huff, Joe T., to Camsco, Inc. Cutting system for slab-type materials. 4,186,632, Cl. 83-13.000.

Lestradet, Maurice C. J. System for positioning the spray boom of agricultural sprayers. 4,186,878, Cl. 239-160.000.

Levaillant, Claude, to C.G.R. - MeV. Heavy metal separation from wastes employing irradiation. 4,187,176, Cl. 210-151.000.

LeVasseur, Craig: *See—*
Tichenor, Clyde L.; and LeVasseur, Craig, 4,187,534, Cl. 362-268.000.

Lever Brothers Company: *See—*
Becker, Gert; Schilp, Ulrich; and Barth, Hans F., 4,187,184, Cl. 252-8.800.

Levis, William W., Jr.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,187,357, Cl. 521-159.000.

Levitt, Charlie M.; and Chatterley, Samuel. Measurement of optical properties. 4,186,838, Cl. 209-581.000.

Lewarchik, Ronald J.: *See—*
Erikson, J. Alden; Lewarchik, Ronald J.; and Birkmeyer, William J., 4,187,380, Cl. 548-310.000.

Lewis, David W.; and Kauzlarich, James J. Porous catheters. 4,186,745, Cl. 128-349.00R.

Lewis, James M.: *See—*
Wainer, Eugene; and Lewis, James M., 4,187,105, Cl. 430-336.000.

Lewis, Jay L., to Robertshaw Controls Company. Two-temperature pneumatic thermostat control system and unit therefor. 4,186,875, Cl. 236-47.000.

Lewis Refrigeration Co.: *See—*
AuYoung, David K. Y., 4,186,566, Cl. 62-380.000.

Lievestro, Louis: *See—*
Landis, Delmer H., Jr.; Lozier, Paul W.; Lievestro, Louis; Auxier, Thomas A.; and Starkweather, John H., 4,187,054, Cl. 415-115.000.

Lilly Industries Limited: *See—*
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,187,232, Cl. 549-69.000.

Lin, Yang-i: *See—*
Child, Ralph G.; Lang, Stanley A., Jr.; Lee, Ving J.; and Lin, Yang-i, 4,187,373, Cl. 542-402.000.

Lindamood, Mason M.: *See—*
Foote, George A.; Lindamood, Mason M.; and Fulcomer, Robert D., 4,187,389, Cl. 174-73.00R.

Linden-Alimak A.B.: *See—*
Boman, Per; and Broms, Bengt, 4,187,041, Cl. 405-263.000.

Lindhag, Carl L., to Boise Cascade Corporation. Facing and journal turning machine. 4,186,630, Cl. 82-4.00C.

Lindner, Robert G.: *See—*
Bracalielly, Albert J.; Kautz, Glenn E.; Lindner, Robert G.; and Davis, Bernard H., 4,187,275, Cl. 264-511.000.

Lindstrum, Alan L.; and Chase, Jay V., to United States of America, Navy. Doppler compensated PSK signal processor. 4,187,491, Cl. 367-125.000.

Linhart, Helmut: *See—*
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,187,212, Cl. 260-45.8NT.

Linsenmann, Don R., to Exxon Research & Engineering Co. Push rods and the like. 4,186,696, Cl. 123-90.610.

Lipe-Rollway Corporation: *See—*
MacKendrick, William J.; and Brown, Harold F., 4,186,826, Cl. 192-13.00R.

Lipert, Peter, to Aero-Hydraulics Corporation. Liquid circulating device. 4,187,263, Cl. 261-77.000.

List, Hans: *See—*
Thien, Gerhard; and Fachbach, Heinz, 4,186,693, Cl. 123-41.120.

Litchfield, Leon G., to L. B. (Plastics) Limited. Drawers. 4,186,979, Cl. 312-333.000.

Literati, Peter N.: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.

Liu, Chia-Seng: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,186,781, Cl. 139-420.00R.

Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., to Allied Chemical Corporation. Cyclization of 1,5-hexadiene to cyclohexene. 4,187,386, Cl. 585-367.000.

Loeb, Carl M., Jr., to Carl M. Loeb Trust. Disintegratable aerodynamic brake. 4,186,900, Cl. 244-113.000.

London Concrete Machinery Co.: *See—*
Pawley, Jess W., 4,187,028, Cl. 366-44.000.

Long Mfg. N. C., Inc.: *See—*
Long, William R., 4,186,881, Cl. 239-198.000.

Long, William R., to Long Mfg. N. C., Inc. Irrigation machine. 4,186,881, Cl. 239-198.000.

Longi, Paolo: *See—*
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,187,196, Cl. 252-429.00B.

Longsdorf, Ronald W.; and Cutler, Clifford P., to Hallmark Cards, Incorporated. Bell and clapper assembly. 4,186,682, Cl. 116-171.000.

Lonseal Corporation: *See—*
Miura, Nobuo, 4,187,338, Cl. 428-159.000.

Lonser, David E.: *See—*
Ficker, Walter W.; Lonser, David E.; Rance, William G.; Stricker, Alfred A.; and von Kaenel, Walter, 4,186,918, Cl. 271-232.000.

Lorenc, Miroslav: *See—*
Dolezal, Ladislav; Weiss, Frantisek; Stanek, Petr; and Lorenc, Miroslav, 4,186,610, Cl. 73-805.000.

Lorenz, Hans J.: *See—*
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,187,212, Cl. 260-45.8NT.

Lorenz, Kurt: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; and Wollenhaupt, Karl-Heinz, 4,187,079, Cl. 44-10.00C.

Lowell, Ross; and Seligman, Marvin H. Lighting arrangement for photographic work including combined spot and flood light luminaire. 4,187,531, Cl. 362-17.000.

Lowry, William C.; and Phipps, William L., to General Electric Company. Compressor bleed biased accelerdtion schedule. 4,186,556, Cl. 60-39.030.

Lozier, Paul W.: *See—*
Landis, Delmer H., Jr.; Lozier, Paul W.; Lievestro, Louis; Auxier, Thomas A.; and Starkweather, John H., 4,187,054, Cl. 415-115.000.

Lu, Kun-Er; and Tarcza, Walter H., to Corning Glass Works. Method for improving the durability of spontaneous NaF opal glassware. 4,187,094, Cl. 65-30.00R.

Lucarelli, Michael A.: *See—*
Picklesimer, Lewellyn G.; Lucarelli, Michael A.; and Reinhart, Theodore J., Jr., 4,187,359, Cl. 525-6.000.

Lucas Industries Limited: *See—*
Ellis, Arthur J.; and Howarth, Alan, 4,187,060, Cl. 417-490.000.
Flynn, Derek J., 4,186,773, Cl. 137-625.300.
Frankl, George, 4,186,560, Cl. 60-599.000.
Mowbray, Dorian F., 4,186,884, Cl. 239-533.800.
Phoenix, Lancelot; and Eckhoff, Stephen A., 4,186,713, Cl. 123-148.00E.
Sharpe, Raymond, 4,186,616, Cl. 74-200.000.
Warren, John, 4,187,419, Cl. 200-308.000.

Luhowy, Gabriel J., to Harris Corporation. Voice detector circuit. 4,187,396, Cl. 179-1.0SC.

Luk, Kong, to Beecham Group Limited. Antibacterial agents 5R, 2S-hydroxymethyl-3Z (2-hydroxy- or 2-alkoxyethylidene-1-aza-4-oxabicyclo[3,2,0]heptanone. 4,187,228, Cl. 260-245.300.

Luke, Patrick, to Mego Corporation. Kicking doll with detachable trigger means. 4,186,518, Cl. 46-128.000.

Lussi, Andre: *See—*
Rais, Arnold; and Lussi, Andre, 4,186,917, Cl. 269-325.000.

Lutze, Hans; Weidemann, Dieter; and Weisshappel, Helmut, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer supported at forward end wall of self-supporting motor vehicle body. 4,186,957, Cl. 296-188.000.

Luzhetsky, Vladimir A.: *See—*
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.

Lyell, Charlie D., to Lyell, Sharon N., a part interest. Food processor. 4,186,543, Cl. 53-515.000.

Lyell, Sharon N.: *See—*
Lyell, Charlie D., 4,186,543, Cl. 53-515.000.

Lynott, John J.: *See—*
Gilovich, Paul A.; and Lynott, John J., 4,186,977, Cl. 312-215.000.

M. Lowenstein & Sons, Inc.: *See—*
Fouche, Glynn E., Jr., 4,187,332, Cl. 427-47.000.

M. Schaerer A.G.: *See—*
Rais, Arnold; and Lussi, Andre, 4,186,917, Cl. 269-325.000.

M&T Chemicals Inc.: *See—*
Dworkin, Robert D., 4,187,239, Cl. 260-410.600.
Karoly, Gabriel, 4,187,250, Cl. 260-578.000.

MacDuff, Richard: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,186,781, Cl. 139-420.00R.

Machado, Manuel; and Spector, George. Disposable bag mounting for a lawn mower. 4,186,546, Cl. 56-202.000.

Machida, Takeshi: *See—*
Ishii, Tadayoshi; Okura, Zenichi; and Machida, Takeshi, 4,187,020, Cl. 354-195.000.

Machii, Tetsuo; and Sugioka, Shuji, to Tokyo Shibaura Electric Co., Ltd. Semiconductor controlled rectifier. 4,187,515, Cl. 357-39.000.

Machinefabriek W. Hubert & Co. B.V.: *See—*
Sinnema, Hendrik, 4,187,268, Cl. 264-151.000.

Mack, Mark P., to Conoco, Inc. Rapid phase transformation for polybutene-1. 4,187,158, Cl. 204-159.200.

MacKendrick, William J.; and Brown, Harold F., to Lipe-Rollway Corporation. Torque limiting clutch brake. 4,186,826, Cl. 192-13.00R.

Mada, Mitsuo: *See—*
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,187,321, Cl. 426-43.000.

Madaliev, Shavkat: *See—*
Bekbulatov, Ildgam A.; Mamatov, Juldash; Varlamov, Gennady D.; Madaliev, Shavkat; and Gaibov, Valery M., 4,187,368, Cl. 525-503.000.

Madden, Mark R.: *See—*
Jacobi, Edgar F.; and Madden, Mark R., 4,186,880, Cl. 239-177.000.

Madgavkar, Ajay M.; Vogel, Roger F.; and Swift, Harold E., to Gulf Research and Development Company. In situ combustion process for the recovery of liquid carbonaceous fuels from subterranean formations. 4,186,801, Cl. 166-256.000.

Madison, William F.: *See—*
Fabula, Andrew G.; Green, James H.; and Madison, William F., 4,186,679, Cl. 114-20.00R.

Madonna, Donna L.: *See—*
Frankfort, Roberta L.; and Madonna, Donna L., 4,186,859, Cl. 224-205.000.

Maender, Otto W.; and Wilder, Gene R., to Monsanto Company. Promoting the reaction of sodium salts of formyl derivatives of aromatic amines to form nitrodiarylamines. 4,187,249, Cl. 260-576.000.

Maer, Newton K., Jr.: *See—*
Jahns, Hans O.; and Maer, Newton K., Jr., 4,187,039, Cl. 405-217.000.

Mahar, Joseph A., to Mahar & Parsons. Gasoline pump assembly and lock arrangement especially suitable for use therewith. 4,186,850, Cl. 222-28.000.

Mahar & Parsons: *See—*
Mahar, Joseph A., 4,186,850, Cl. 222-28.000.

Maher, Thomas K., to CPC International Inc. Starch coating pigment for paper. 4,187,219, Cl. 260-17.4ST.

Mair, Alex C.; and Mair, Stephen A., to General Motors Corporation. Method for precise fitting of motor vehicle front end sheet metal. 4,186,476, Cl. 29-407.000.

Mair, Stephen A.: *See—*
Mair, Alex C.; and Mair, Stephen A., 4,186,476, Cl. 29-407.000.

Majors, Vence V. Crane for handling fireplace or wood stove logs. 4,186,839, Cl. 212-135.000.

Mallory, Lewis B.; and Dean, Bob W. Method and apparatus for controlling forced air heating and/or cooling. 4,186,655, Cl. 98-1.000.

Maloney-Crawford Corporation: *See—*
Hodgson, Robert A., 4,187,088, Cl. 55-169.000.

Maloney-Crawford Tank Corporation: *See—*
Hodgson, Robert A., 4,187,089, Cl. 55-219.000.

Maloney, Willard S. Expandable fish lure. 4,186,509, Cl. 43-36.000.

Mamatov, Juldash: *See—*
Bekbulatov, Ildgam A.; Mamatov, Juldash; Varlamov, Gennady D.; Madaliev, Shavkat; and Gaibov, Valery M., 4,187,368, Cl. 525-503.000.

Man Design Co., Ltd.: *See—*
Mogaki, Tadahisa, 4,186,733, Cl. 128-32.000.

Maney, Thomas P. Adjustable paper cap. 4,186,446, Cl. 2-197.000.

Mangold, Dietrich: *See—*
Goetz, Norbert; Mangold, Dietrich; and Zeeh, Bernd, 4,187,227, Cl. 548-226.000.

Manning, Jim L. Safety lock. 4,186,465, Cl. 24-201.0HH.

Marcum, Maxie G., Jr., to Aluminum Industries, Inc. Panel of siding. 4,186,538, Cl. 52-521.000.

Marcus, Bertram J., to G&W Laboratories, Inc. Contraceptive suppository. 4,187,286, Cl. 424-44.000.

Margolin, Amikam: *See—*
Alper, Yekutiel; and Margolin, Amikam, 4,186,520, Cl. 47-1.00R.

Marissal, Janine, to Biotherm. Cosmetic composition for the skin. 4,187,291, Cl. 424-94.000.

Marko, John J., Jr., to General Motors Corporation. Welded lap joint and method of making the same. 4,187,407, Cl. 219-91.200.

Markwald, David B.: *See—*
Anderson, William B.; and Markwald, David B., 4,187,488, Cl. 367-13.000.

Marquis, David M.: *See—*
Katsumoto, Kiyoshi; and Marquis, David M., 4,187,235, Cl. 260-346.750.

Marrujo, Ralph G.; and Hire, Thomas D., to Fairchild Industries, Inc. Seat armrest. 4,186,964, Cl. 297-422.000.

Marsh, Lynn W., Jr.: *See—*
DeWeese, Eugene R., Jr.; and Marsh, Lynn W., Jr., 4,187,393, Cl. 178-22.000.

Marshall, Preston F., to Kendall Company, The. Apparatus for making biaxially oriented nonwoven fabrics and method of making same. 4,186,463, Cl. 19-304.000.

Marshall, Richard A.; Smith, Edwin S.; and Cich, Frank A., to Goodyear Tire & Rubber Company, The. Vinyl chloride polymerization method. 4,187,363, Cl. 526-208.000.

Marston Excelsior Limited: *See—*
Warne, Michael A., 4,187,164, Cl. 204-196.000.

Martin, Anthony N., to United Technologies Corporation. Stepper motor feedback in position servo loop. 4,187,455, Cl. 318-594.000.

Martin, Carl D. Adjustable charging bar. 4,186,646, Cl. 86-29.000.

Martin-Copeland Company: *See—*
Lauffer, John R., 4,187,007, Cl. 351-108.000.

Martin, James C.: *See—*
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,187,229, Cl. 548-260.000.

Martin, Jean-Claude; and Perotto, Jean F., to Centre Electronique Horloger SA. Timing device. 4,187,518, Cl. 358-93.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. 3-De-O-methyl-2-N-acyl and alkyl fortimicins A and B. 4,187,297, Cl. 424-180.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. 2'N-acyl and alkyl fortimicin B and derivatives, 4,2'-N,N'diacyl and dialkyl fortimicin B derivatives 4-N-acyl-2'-N-alkyl and 4-N-alkyl-2'-N-acyl fortimicin B derivatives. 4,187,298, Cl. 424-180.000.

Martin, Jerry R.: *See—*
Tadanier, John S.; and Martin, Jerry R., 4,187,296, Cl. 424-180.000.

Martin, Merritt W., Jr., to Roman Machine Co. Blow molding machine. 4,187,070, Cl. 425-525.000.

Martynova, Marina A.: *See—*
Kabanov, Viktor A.; Martynova, Marina A.; Pluzhnov, Stanislav K.; and Smetanjuk, Vladimir I., 4,187,197, Cl. 252-431.00P.

Marumo, Nagayuki: *See—*
Iizuka, Haruhiko; and Marumo, Nagayuki, 4,186,715, Cl. 123-198.00F.

Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Mass flow measuring apparatus. 4,186,601, Cl. 73-194.00F.

Marvin Glass & Associates: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,186,927, Cl. 273-357.000.
Kulesza, Ralph J.; and Breslow, Jeffrey D., 4,186,926, Cl. 273-340.000.

Maschinenfabrik Benninger AG: *See—*
Brandenberger, Albert; and Bollen, Manfred, 4,186,896, Cl. 242-131.000.

Mascia, Carmen T.: *See—*
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Mashiko, Kimio: *See—*
Takemoto, Nagaaki; Sakurai, Teruo; Mashiko, Kimio; and Tomari, Harumatsu, 4,186,756, Cl. 131-140.00C.

Mashimo, Yukio: *See—*
Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, 4,187,019, Cl. 354-33.000.

Maso-Therm Corporation: *See—*
Piazza, Matthew R., 4,186,536, Cl. 52-309.120.

Massok, Anthony J., Jr.; and Nolan, James P., to Dayco Corporation. Construction for absorbing odors caused by perspiration and method of making same. 4,186,499, Cl. 36-44.000.

Master Addresser Company: *See—*
Rogers, Ronald A.; Wright, Ansel J.; and Wright, William H., 4,186,659, Cl. 101-47.000.

Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation: *See—*
Bourigault, Raymond, 4,186,605, Cl. 73-341.000.

Mathews, Carl F.; Deverell, Christopher; Pears, Gordon E. A.; and Knowles, Peter G., to Imperial Chemical Industries Limited. Voided films of polyester with polyolefin particles. 4,187,113, Cl. 430-533.000.

Matlin, Joel: *See—*
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Matoba, Takao: *See—*
Kuroi, Hisashi; Miyajima, Masayoshi; and Matoba, Takao, 4,187,448, Cl. 315-176.000.

Matrosov, Evgeny A.: *See—*
Shikhirev, Boris N.; Matrosov, Evgeny A.; and Deresh, Ilya A., 4,187,081, Cl. 51-23.000.

Matson, Stephen L.: *See—*
Walmet, Gunnar E.; and Matson, Stephen L., 4,187,086, Cl. 55-16.000.

Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, to Babcock-Hitachi K.K.; and Hitachi, Ltd. Process for treating a waste gas containing sulfur oxides. 4,187,282, Cl. 423-244.000.

Matsumoto, Hiromitsu, to Yamaha Hatsukoki Kabushiki Kaisha. Induction system for internal combustion engine. 4,186,706, Cl. 123-127.000.

Matsumoto, Jun, to Aiphone Co., Ltd. Method of controlling channel assignment in a time division multiplexing network. 4,187,401, Cl. 179-15.0BW.

Matsumoto, Jun, to Aiphone Co., Ltd. Method of controlling channel assignment in a time division multiplexing network. 4,187,402, Cl. 179-15.0BW.

Matsumoto, Kazumasa, to Sanyo Kiki Kabushiki Kaisha. Hydraulic control apparatus. 4,186,771, Cl. 137-596.170.

Matsumoto, Yasuhiro: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; and Matsumoto, Yasuhiro, 4,187,133, Cl. 156-166.000.

Matsunaga, Shoichi; Siozaki, Fumio; and Aiba, Masahiko, to Sharp Kabushiki Kaisha. Ink liquid supply system for an ink jet system printer. 4,187,512, Cl. 346-140.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hamane, Tokuhito; Kinoshita Toshio; and Kihira, Masafumi, 4,186,478, Cl. 29-596.000.

Mattila, Alvin J. Electronic dipstick. 4,186,604, Cl. 73-295.000.

Matveev, Vyacheslav N.: *See—*
Eroshkin, Nikolai A.; Ivannikov, Alfred V.; Matveev, Vyacheslav N.; and Sergienko, Anatoly I., 4,187,410, Cl. 219-137.200.

Mautz, Karlheinz: *See—*
Schwarz, Alois; Mautz, Karlheinz; and Frommlet, Hubert, 4,186,975, Cl. 308-187.000.

Maxfield, Thomas G.; and Witmore, Ronald K., to Bell Telephone Laboratories, Incorporated. Call state processor for a time division switching system. 4,187,399, Cl. 179-15.0BY.

Mayer, Karl H.; Heitzer, Helmut; Hoffmeister, Friedrich; Heise, Arend; and Kazda, Stanislav, to Bayer Aktiengesellschaft. Benzodiazepinediones, a process for their production and their use as medicaments. 4,187,306, Cl. 424-251.000.

Maylahn, Donald J.: *See—*
Schleicher, Thomas R.; Maylahn, Donald J.; and Drennan, Denis B., 4,186,738, Cl. 128-153.000.

Maynard, Tony E.: *See—*
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Mazzocchi, Romano: *See—*
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,187,196, Cl. 252-429.00B.

McAlpine, James B.: *See—*
Carney, Ronald E.; McAlpine, James B.; and Perun, Thomas J., 4,187,372, Cl. 536-17.00R.

McConnel, Tim, to International Drum Corporation. Means for securing the bottom closure of a polygonal container. 4,186,865, Cl. 229-5.700.

McConnellogue, Neal J., to Entech Corporation. Method of making easy-open, push-tab end for metal containers. 4,186,678, Cl. 113-121.00C.

McGibbon, William: *See—*
Nutter, Geoffrey; and McGibbon, William, 4,187,551, Cl. 364-900.000.

McGill, Kenneth H.: *See—*
Parker, Curtis J.; and McGill, Kenneth H., 4,187,059, Cl. 417-454.000.

McGraw-Edison Company: *See—*
Lapp, John; and Willy, John R., 4,187,327, Cl. 427-8.000.

McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Porous catalyzed electrode provision and technique. 4,187,350, Cl. 429-45.000.

McKillip, William J.: *See—*
Langer, Heimo J.; and McKillip, William J., 4,187,349, Cl. 428-395.000.
McKinney, Charles N.: *See—*
Radd, Fred J.; Oertle, Don H.; and McKinney, Charles N., 4,187,126, Cl. 148-1.500.
McKnight, Robert J. Remote control TV channel selector. 4,186,611, Cl. 74-10.00A.
McLaughlin, Robert L.; and Wood, Donald C., to DeSoto, Inc. Low phosphate content dishwashing detergent. 4,187,190, Cl. 252-99.000.
McMullen, John C.: *See—*
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McNeill Corporation: *See—*
Wegmann, Jerome B., 4,186,821, Cl. 184-7.00D.
McQuillan, Robert C.: *See—*
Hug, William F.; Hamerdinger, Randolph W.; Dunn, Phillip D.; and McQuillan, Robert C., 4,187,474, Cl. 331-94.50D.
McVicker, Gary B., to Exxon Research & Engineering Co. Hydrocarbon conversion processes utilizing supported heteronuclear cluster complex catalysts. 4,187,168, Cl. 208-139.000.
Mead Corporation, The: *See—*
Wood, Prentice J., 4,186,867, Cl. 229-40.000.
Means, Howard W.; and Allick, Edward. Vehicle locking device. 4,186,576, Cl. 70-233.000.
Meeker, Paul K. Car seat support and restraining stand. 4,186,962, Cl. 297-250.000.
Meeks, Marion; and Narra, R. K., to E. R. Squibb & Sons, Inc. Microaggregated albumin. 4,187,285, Cl. 424-1.000.
Mego Corporation: *See—*
Luke, Patrick, 4,186,518, Cl. 46-128.000.
Megumi, Koichi; Kozuka, Hirotsugu; Kobayashi, Masayoshi; and Furuhata, Yoshio, to Hitachi, Ltd. Strontium barium niobate single crystal doped with Ce. 4,187,109, Cl. 430-2.000.
Mehlman, Stewart K.: *See—*
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Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Novello, Frederick C.; and Saari, Walfred S., 4,187,315, Cl. 424-305.000.
Rolleston, Richard E.; and Nadeau, Jacques A., 4,187,284, Cl. 424-1.000.
Mercurio, Richard N.; and Graham, Richard B., to Dresser Industries, Inc. Connector for catenary conveyor belt idler rolls. 4,186,831, Cl. 198-501.000.
Merlo, Fabrizio; Bornengo, Giorgio; and Paffoni, Camillo, to Montedison S.p.A. Water-soluble acid azo dye. 4,187,218, Cl. 260-158.000.
Merlo, Werner O.: *See—*
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Merrell Toraude et Compagnie: *See—*
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Merten, Helmut L.; and Wilder, Gene R., to Monsanto Company. Making a nitrodiarylamine by reacting an alkali metal salt of a formamide with a nitrohaloarene. 4,187,248, Cl. 260-576.000.
Merten, Rudolf: *See—*
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Messerschmitt-Boelkow-Blohm GmbH: *See—*
Schwarz, Alois; Mautz, Karlheinz; and Frommlet, Hubert, 4,186,975, Cl. 308-187.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Hafke, Carl; Weber, Roland; and Kohlen, Rudolf, 4,187,080, Cl. 48-202.000.
Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. Substituted 1,5-cyclohexadiene carboxylic acid derivatives. 4,187,316, Cl. 424-305.000.
Metz, Curtis F., III: *See—*
Weil, Bradley S.; and Metz, Curtis F., III, 4,186,657, Cl. 100-39.000.
Micetich, Ronald G.; Fortier, Robert A.; Shaw, Chia C.; and Merlo, Werner O., to Connlab Holdings Limited. Process for preparing azetidinones. 4,187,221, Cl. 260-239.00A.
Michaels of Oregon Co.: *See—*
Pawlak, Daniel E., deceased; and Pawlak, Catherine J., personal representative, 4,186,506, Cl. 42-83.000.
Miciukiewicz, Joseph F., to Pitney-Bowes Inc. Document handling apparatus. 4,186,919, Cl. 271-267.000.
Midland-Ross Corporation: *See—*
Cantrell, Henry L., 4,187,504, Cl. 340-652.000.
Milberger, Walter E.; and Wright, Larry G., to United States of America, Army. Constant power regenerative magnetic switching regulator. 4,187,458, Cl. 323-17.000.
Mileham, Jay R., to NRD, Division of Mark IV Industries, Inc. Source holder for mounting radioactive foil and holder-foil assembly. 4,187,432, Cl. 250-493.000.
Miller, Charles H.: *See—*
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,187,131, Cl. 156-79.000.
Miller, Dennis P., to Dow Chemical Company, The. Electrical device containing a halogenated alkanoate dielectric fluid. 4,187,188, Cl. 252-65.000.
Miller, Harry B., to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Mechanism and method for transferring yarn from a full package to an empty bobbin. 4,186,890, Cl. 242-18.00A.
Miller, John: *See—*
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Miller, Stephen H.: *See—*
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Milliken, Paul E., to Goodyear Aerospace Corporation. Brake adjuster having reshapable member drawn through a die. 4,186,825, Cl. 188-196.00R.
Minke, Otto; and Lanfermann, Willy, to Ruhrkohle, A.G. Sectional conveyor with sectional rack fixed on the conveyor at only a single location. 4,186,970, Cl. 299-43.000.
Minnesota Mining and Manufacturing Company: *See—*
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Misinya, Inta P.: *See—*
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Mitani, Tatsuro: *See—*
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Mitchell, Howard E., to Dresser Industries, Inc. Steep angle raise bit. 4,186,809, Cl. 175-334.000.
Mitchell, Walter A. Low tire pressure warning system. 4,187,495, Cl. 340-58.000.
Mitchell, William E. Portable spring tester. 4,186,594, Cl. 73-118.000.
Mitsui Toatsu Chemical, Inc.: *See—*
Iwao, Tetsuya; Sasaki, Heizo; Ito, Akira; and Kono, Masahiro, 4,187,385, Cl. 526-128.000.
Miura, Nobuo, to Lonseal Corporation. Method for producing a foamed body having chemically embossed patterns. 4,187,338, Cl. 428-159.000.
Miyagi, Morio: *See—*
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Miyajima, Masayoshi: *See—*
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Miyoshi, Yutaka: *See—*
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Mizelle, Ned W., to Hoover Universal, Inc. Convertible vehicle seat. 4,186,960, Cl. 297-63.000.
Mizui, Kiyoshi: *See—*
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Mizuno, Haruyuki; Idemoto, Atsushi; and Horie, Kunihiro, to Japan Steel Works, Ltd., The. Die for producing plastic resin pellets. 4,187,067, Cl. 425-313.000.
Mizuno, Masao: *See—*
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Mobil Oil Corporation: *See—*
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Moehling, Charles: *See—*
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Moeller, Dale O.: *See—*
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Mogaki, Tadahisa, to Man Design Co., Ltd. Pneumatic massage machine. 4,186,733, Cl. 128-32.000.
Molded Materials Company, Div. Carlisle Corporation: *See—*
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Molins Limited: *See—*
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Monden, Souhei; and Takimoto, Sadaharu, to Hitachi Metals, Ltd. Ornament utilizing rare earth-cobalt magnet. 4,186,567, Cl. 63-14.00R.
Mondshine, Thomas C., to Texas Brine Corporation. Well completion and work over method. 4,186,803, Cl. 166-292.000.
Monsanto Company: *See—*
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D'Amico, John J., 4,187,097, Cl. 71-90.000.
Franz, John E.; and Howe, Robert K., 4,187,099, Cl. 71-90.000.
Kruse, Robert L.; and DeJackome, Gene E., 4,187,260, Cl. 525-263.000.
Maender, Otto W.; and Wilder, Gene R., 4,187,249, Cl. 260-576.000.
Merten, Helmut L.; and Wilder, Gene R., 4,187,248, Cl. 260-576.000.

Nelson, G. Douglas, 4,187,293, Cl. 424-149.000.
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Morgan Trailer Mfg.: *See—*
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Morley, Colin A.; Thomas, Richard N.; and Kollar, Bela, to Smiths Industries Limited. Display apparatus. 4,187,505, Cl. 340-753.000.
Morley, Edward G.: *See—*
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Moroz, Jury A.: *See—*
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Morriss, James W., to Hunt Electronics, Inc. Power control unit. 4,187,528, Cl. 361-399.000.
Morschl, Paul; and Zimmer, Erich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for recovering useable products from by-product ammonium nitrate formed in the manufacture of nuclear reactor fuels or breeder materials. 4,187,280, Cl. 423-15.000.
Morton, Virgil R., to Verco Manufacturing, Inc. Shear load resistant structure. 4,186,535, Cl. 52-250.000.
Moser, Ludwig M., to Siemens Aktiengesellschaft. Hearing aid with digital processing for: correlation of signals from plural microphones, dynamic range control, or filtering using an erasable memory. 4,187,413, Cl. 179-107.0FD.
Motorola, Inc.: *See—*
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Mountz, Elton E., to Morgan Trailer Mfg. Transverse interlock floors for trucks and the like. 4,186,537, Cl. 52-483.000.
Mowbray, Dorian F., to Lucas Industries Limited. Liquid fuel injection nozzles. 4,186,884, Cl. 239-533.800.
Mueller, Helga: *See—*
Joerg, Manfred, 4,186,711, Cl. 123-148.0CC.
Mueller, Norman P.; and Mutafelija, Boris A., to Westinghouse Electric Corp. Nuclear reactor power supply. 4,187,144, Cl. 176-24.000.
Mueller, Werner, to Siemens Aktiengesellschaft. Circuit arrangement for unilaterally scanning distorted teletype characters. 4,187,438, Cl. 307-268.000.
Muessig, Charles E., to International Solar Technologies, Inc. Solar energy collector. 4,186,722, Cl. 126-270.000.
Muller, Bruno; and Kohler, Werner, to Siemens Aktiengesellschaft. Switching apparatus for medium-voltage cable networks. 4,187,437, Cl. 307-147.000.
Muller, Jean-Claude; Ponpon, Jean-Pierre; Kurek, Joseph; and Siffert, Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for doping semiconductors. 4,187,124, Cl. 148-1.500.
Mullins, Wayne L. Interlocking cementitious building blocks. 4,186,540, Cl. 52-593.000.
Mullins, Wayne L. Combination die and pallet assembly. 4,187,069, Cl. 425-470.000.
Murakami, Katsuhiko: *See—*
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Muroi, Sankichi, to Tozen Sangyo Co., Ltd. Water hammer shock absorber. 4,186,775, Cl. 138-30.000.
Murphy, Edward J., to DeSoto, Inc. Polyamine-chromic acid ionic polymers and aqueous cationic electrocoat systems containing the same. 4,187,203, Cl. 260-18.00N.
Mutafelija, Boris A.: *See—*
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Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, to Kabushiki Kaisha Yakult Honsha. Method for producing foods and drinks containing bifidobacteria. 4,187,321, Cl. 426-43.000.
Mutulis, Felix K.: *See—*
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Myers, Melvin. Air ventilation system. 4,186,564, Cl. 62-180.000.
Mystic Color Lab, Inc.: *See—*
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Nace, Donald M.: *See—*
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Nadeau, Jacques A.: *See—*
Rolleston, Richard E.; and Nadeau, Jacques A., 4,187,284, Cl. 424-1.000.
Naffier, Vernon H. Electronic candle. 4,187,532, Cl. 362-186.000.
Nagel, Karl H.: *See—*
Beverly, Frank O.; and Nagel, Karl H., 4,187,502, Cl. 340-566.000.
Nagoya, Yoshinori: *See—*
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, 4,187,479, Cl. 333-28.00R.
Nagura, Yukihiro; and Toda, Yoshihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Ground fault protective apparatus of field windings. 4,187,525, Cl. 361-42.000.
Nakada, Akira: *See—*
Aoki, Eiichiro; and Nakada, Akira, 4,186,635, Cl. 84-1.010.
Hiyoshi, Teruo; Nakada, Akira; Uchiyama, Yasuji; Yamaga, Eiichi; and Aoki, Eiichiro, 4,186,640, Cl. 84-1.030.
Nakagawa, Koji; and Watanabe, Yoshiharu, to Denki Kagaku Kogyo Kabushiki Kaisha. Concrete composition for making concrete moldings and method for making such concrete moldings. 4,187,118, Cl. 106-89.000.
Nakajima, Fumito: *See—*
Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, 4,187,282, Cl. 423-244.000.
Nakamima, Koichi: *See—*
Ishigaki, Hisao; Tanaka, Ryuzo; and Nakamima, Koichi, 4,186,552, Cl. 58-88.00W.
Nakamura, Isao: *See—*
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,187,024, Cl. 355-14.00R.
Nakamura, Zenzo: *See—*
Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, 4,187,019, Cl. 354-33.000.
Nakayama, Yasuaki, to Citizen Watch Co., Ltd. Electronic timepiece structure. 4,186,551, Cl. 58-23.00R.
Nanpei, Masaru: *See—*
Etoh, Kuniomi; Nanpei, Masaru; and Miyagi, Morio, 4,187,112, Cl. 430-285.000.
Narisawa, Shigeyuki; Yoshida, Shohei; and Kawahara, Hiroshi, to Asahi Glass Company, Ltd. Halogen-containing s-triazine compound. 4,187,377, Cl. 544-219.000.
Narra, R. K.: *See—*
Meeks, Marion; and Narra, R. K., 4,187,285, Cl. 424-1.000.
National Food Service Equipment Fabricators, Inc.: *See—*
Kaufman, Arnold S.; and Anderson, Robert L., 4,186,727, Cl. 126-299.00D.
National Starch and Chemical Corporation: *See—*
Fernandez, Julio A., 4,187,072, Cl. 8-6.500.
Nauchno Proizvodstvennoe: *See—*
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., 4,186,791, Cl. 164-66.000.
NDT Systems, Inc.: *See—*
Thompson, Carroll R., 4,187,425, Cl. 250-358.00P.
Needham, Donald G.; and Griffin, Ray D., to Phillips Petroleum Company. Fire retardant adhesive polyolefin compositions. 4,187,214, Cl. 260-45.9KA.
Neidell, Saul, to Premier Athletic Products Corp. Flip-down sunglasses. 4,187,006, Cl. 351-44.000.
Nelson, David H., to American Solar. Solar energy collector. 4,186,724, Cl. 126-443.000.
Nelson, G. Douglas, to Monsanto Company. Stabilization of solutions containing active chlorine. 4,187,293, Cl. 424-149.000.
Nelson Industries, Inc.: *See—*
Nostrand, William G., 4,187,136, Cl. 156-192.000.
Ness, Irving S., to Johnson & Johnson. Separability member to allow disposable diaper openings and re-fastenings. 4,186,744, Cl. 128-287.000.
Nessi, Aurindo: *See—*
Passoni, Teresio; Calmes, Jean P.; Cattaneo, Filippo; and Nessi, Aurindo, 4,186,585, Cl. 72-208.000.
Neuspiel, Peter J.: *See—*
Roberts, Charles V.; Sarra, William F.; and Neuspiel, Peter J., 4,187,175, Cl. 210-80.000.
Newbery, John L.: *See—*
Garner, Arthur W. B.; and Newbery, John L., 4,186,923, Cl. 273-67.00D.
Neyer, Jean-Marie: *See—*
Bujadoux, Karel; Neyer, Jean-Marie; and Houzeaux, Jean-Pierre, 4,187,254, Cl. 260-665.00G.
Ni-Tec, Inc.: *See—*
Wolski, Adolph, 4,186,980, Cl. 316-19.000.
Nickell, Larry C.: *See—*
Wilson, Marlin V.; Nickell, Lawrence C.; and Nickell, Larry C., 4,186,898, Cl. 242-152.100.
Nickell, Lawrence C.: *See—*
Wilson, Marlin V.; Nickell, Lawrence C.; and Nickell, Larry C., 4,186,898, Cl. 242-152.100.
Nickerson, James H. D.; and Steel, Robert R., to Foster Wheeler Limited. Slab header. 4,186,799, Cl. 165-176.000.
Nidola, Antonio: *See—*
de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, 4,187,155, Cl. 204-67.000.
Nielsen, Richard B.; and Vogelsang, Charles J., to Grefco, Inc. Diatomaceous earth filteraid and method for its manufacture. 4,187,174, Cl. 210-32.000.
Nielsen, Robert C., to Dow Chemical Company, The. Radiation curable vinyl ester resin. 4,187,257, Cl. 525-445.000.
Nihon Nousan Kougyou Co., Ltd.: *See—*
Ishikawa, Tadashi; and Kamimae, Hiroshi, 4,187,294, Cl. 424-150.000.

Nihon Parkerizing Co., Ltd.: *See—*
Yashiro, Kuniji; Ayano, Yukihiko; and Miyazaki, Yasushi, 4,187,127, Cl. 148-6.15R.
Nijholt, Meinardus A. G.: *See—*
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Nilsson, Kai: *See—*
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Ninneman, Lawrence D.: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aoki, Eiichiro; and Nakada, Akira, 4,186,635, Cl. 84-1.010.
Hiyoshi, Teruo; Nakada, Akira; Uchiyama, Yasuji; Yamaga, Eiichi; and Aoki, Eiichiro, 4,186,640, Cl. 84-1.030.
Iijima, Masakatu, 4,186,638, Cl. 84-1.010.
Kurosaki, Makoto, 4,186,644, Cl. 84-422.00R.
Takamura, Masayuki; Shinoda, Norio; Kurahashi, Kazuo; and Hatae, Masataka, 4,186,586, Cl. 72-264.000.
Nippon Kogaku K.K.: *See—*
Ishizaka, Sunao, 4,187,016, Cl. 354-152.000.
Shimizu, Yoshiyuki; and Sudo, Takeshi, 4,186,993, Cl. 350-91.000.
Watanabe, Sakuji, 4,187,017, Cl. 354-173.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Shibuya, Teiji; Ishikawa, Yasuaki; Saito, Masayuki; and Ueda, Kiyoharu, 4,187,085, Cl. 55-4.000.
Yamada, Takeo; Ando, Seigo; Miyashita, Yoshio; Murakami, Katsuhiko; Tate, Masahisa; and Mizui, Kiyoshi, 4,186,792, Cl. 164-150.000.
Nippon Oil and Fats Company, Limited: *See—*
Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, 4,187,078, Cl. 44-51.000.
Nippon Soda Company, Ltd.: *See—*
Ikura, Katsuyata; Katsuura, Kiyoshi; and Kataoka, Masaaki, 4,187,302, Cl. 424-245.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, 4,187,205, Cl. 260-30.40A.
Nippon Zeon Co. Ltd.: *See—*
Joh, Yasushi, 4,187,180, Cl. 210-321.00R.
Nischwitz, Ehrenfried: *See—*
Holst, Arno; Lask, Helmut; Nischwitz, Ehrenfried; and Fischer, Wilhelm, 4,187,342, Cl. 428-283.000.
Nishibe, Kouji; and Kondo, Nobuaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Apparatus for chorus effect in electronic musical instruments. 4,186,643, Cl. 84-1.240.
Nishiwaki, Osamu: *See—*
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,187,374, Cl. 544-28.000.
Nishizawa, Masahiro: *See—*
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Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,186,698, Cl. 123-119.00A.
Aoyama, Syunichi, 4,186,699, Cl. 123-119.00A.
Iizuka, Haruhiko; and Marumo, Nagayuki, 4,186,715, Cl. 123-198.00F.
Koseki, Shyushi, 4,186,694, Cl. 123-41.310.
Maruoka, Hiroyuki, 4,186,601, Cl. 73-194.00F.
Suzuki, Suzuo; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,186,701, Cl. 123-119.00A.
Takase, Sadao; and Asano, Masaharu, 4,186,691, Cl. 123-32.0EL.
Nissen, Alex; and Charles, Distel, to Videon, S.A. Winding device. 4,186,619, Cl. 74-414.000.
Nixon, Larry R., to Aeroquip Corporation. Radial compression gasket. 4,186,947, Cl. 285-112.000.
Noguchi, Satoshi: *See—*
Oishi, Rokuji; Okajima, Yasuharu; Noguchi, Satoshi; and Akeyoshi, Kazuyuki, 4,187,340, Cl. 428-210.000.
Noguchi, Takaharu; Ketori, Takao; Tamura, Kohji; Oi, Tetsu; and Miyoshi, Yutaka, to Hitachi, Ltd. Method for fabrication of rear chip for hall effect magnetic head. 4,186,481, Cl. 29-603.000.
Nolan, James P.: *See—*
Massok, Anthony J., Jr.; and Nolan, James P., 4,186,499, Cl. 36-44.000.
Nolan, Richard A.: *See—*
D'Amato, Ralph J.; and Nolan, Richard A., 4,187,443, Cl. 313-402.000.
Noller, Hans G. Method of analyzing biological, liquid specimens for antigens or antibodies. 4,187,075, Cl. 23-230.00B.
Nonogaki, Saburo: *See—*
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, 4,187,205, Cl. 260-30.40A.
Norfleet, James: *See—*
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Norlin Industries, Inc.: *See—*
Gross, Glenn, 4,186,642, Cl. 84-1.240.
Swain, Richard S.; and Moore, Douglas R., 4,186,637, Cl. 84-1.010.
Norris, Alan H.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,186,549, Cl. 57-293.000.
Norton Company: *See—*
Fredriksson, John I., 4,187,344, Cl. 428-304.000.
Nostrand, William G., to Nelson Industries, Inc. Method of making a graduated density liquid filter element. 4,187,136, Cl. 156-192.000.
Novgorodtsev, Anastasia I-vanovna Roma, administratrix: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased, 4,186,571, Cl. 68-5.00E.
Novello, Frederick C.: *See—*
Cragoe, Edward J., Jr.; Novello, Frederick C.; and Saari, Walfred S., 4,187,315, Cl. 424-305.000.
Nowak, Klaus F.; and Braun, Stephen A., to Deere & Company. Exhaust system for a two-stroke engine. 4,186,819, Cl. 181-265.000.
Noyes, Richard C.; and Zaman, Shakir U., to Combustion Engineering, Inc. Hydraulic latch scram release mechanism. 4,187,145, Cl. 176-36.00R.
NRD, Division of Mark IV Industries, Inc.: *See—*
Mileham, Jay R., 4,187,432, Cl. 250-493.000.
Numata, Hiroshi; Otani, Akihiko; and Mizuno, Masao, to Omron Tateisi Electronics Co. Moving object detection system. 4,187,487, Cl. 367-93.000.
Nunokawa, Kazuo: *See—*
Kato, Yasuo; and Nunokawa, Kazuo, 4,187,014, Cl. 354-62.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Sunscreen and erythema treating with N-benzylidene anilenes. 4,187,317, Cl. 424-309.000.
Nutter, Geoffrey; and McGibbon, William, to Ferranti Limited. Apparatus for writing data in unique order into and retrieving same from memory. 4,187,551, Cl. 364-900.000.
NYBY Bruk AB: *See—*
Jonsson, Arne, 4,186,475, Cl. 138-97.000.
O'Connor, Daniel P., to Ellcon-National, Inc. Closure latch mechanism with closing pressure cam. 4,186,953, Cl. 292-210.000.
Oertle, Don H.: *See—*
Radd, Fred J.; Oertle, Don H.; and McKinney, Charles N., 4,187,126, Cl. 148-1.500.
Offenstadt, Eric; and Houze, Michel. Front suspension, in particular for a vehicle having two wheels and vehicle provided with said suspension. 4,186,936, Cl. 280-277.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Toy horse vehicle. 4,186,515, Cl. 46-22.000.
Ogura, Iwao: *See—*
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,187,012, Cl. 354-1.000.
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, to Omron Tateisi Electronics Co. Timing device utilizing a unique clutch assembly. 4,187,484, Cl. 335-75.000.
Ohkawa, Motokazu: *See—*
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,477, Cl. 333-14.000.
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,478, Cl. 333-14.000.
Ohnishi, Akihiro: *See—*
Suzuki, Suzuo; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,186,701, Cl. 123-119.00A.
Ohta, Hideo: *See—*
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Ohtaki, Shyohei: *See—*
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Oi, Tetsu: *See—*
Noguchi, Takaharu; Ketori, Takao; Tamura, Kohji; Oi, Tetsu; and Miyoshi, Yutaka, 4,186,481, Cl. 29-603.000.
Oishi, Rokuji; Okajima, Yasuharu; Noguchi, Satoshi; and Akeyoshi, Kazuyuki, to Asahi Glass Company, Ltd. Method of forming patterned transparent electro-conductive film on the substrate of liquid crystal display. 4,187,340, Cl. 428-210.000.
Okada, Akihiro, to Itoki Kosakusho Co., Ltd. Fabricated desk. 4,186,976, Cl. 312-194.000.
Okajima, Yasuharu: *See—*
Oishi, Rokuji; Okajima, Yasuharu; Noguchi, Satoshi; and Akeyoshi, Kazuyuki, 4,187,340, Cl. 428-210.000.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Belt tension gauge. 4,186,598, Cl. 73-144.000.
Okolischan, Anton. Fascia-protecting drip-diverting device. 4,186,531, Cl. 52-11.000.
Okura, Zenichi: *See—*
Ishii, Tadayoshi; Okura, Zenichi; and Machida, Takeshi, 4,187,020, Cl. 354-195.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including means for controllably introducing blank lines on a printed record during program execution. 4,187,547, Cl. 364-710.000.
Olander, Walter K.: *See—*
Banucci, Eugene G.; and Olander, Walter K., 4,187,361, Cl. 525-4.000.
Ole Gunnar Selvaag: *See—*
Ottersen, Odd; Solvang, Egil S.; and Rosjo, Endre, 4,186,764, Cl. 137-414.000.
Olender, Leonty A.: *See—*
Yascheritsyn, Petr I.; Sakulevich, Faddei J.; Olender, Leonty A.; and Kosobutsky, Alexandr A., 4,186,528, Cl. 51-161.000.
Olesch, Reinhard G.; and Rittenbach, Otto E., to United States of America, Army. Electronic intruder detection system. 4,187,501, Cl. 340-554.000.

Olinkraft, Inc.: *See—*
Jacalone, Richard P.; and Poggiali, Lewis D., 4,186,846, Cl. 220-468.000.
Olsson, Ray: *See—*
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Omori, Yoshitaka, to Honda Giken Kogyo Kabushiki Kaisha. Closure cap device for a fuel tank of a motorcycle. 4,186,843, Cl. 220-210.000.
Omron Tateisi Electronics Co.: *See—*
Numata, Hiroshi; Otani, Akihiko; and Mizuno, Masao, 4,187,487, Cl. 367-93.000.
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,187,484, Cl. 335-75.000.
Onaka, Tatsumi: *See—*
Yoshida, Dan; Onaka, Tatsumi; and Horiuchi, Yasuhiro, 4,187,063, Cl. 418-90.000.
Oney, Wilford R., to General Electric Company. High power density brushless dc motor. 4,187,441, Cl. 310-112.000.
Oonuma, Kiyoshi: *See—*
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Opelika Manufacturing Corp.: *See—*
Burton, Perry E., 4,186,672, Cl. 112-273.000.
Oquita, Ramiro. Slip-knot pinata. 4,186,514, Cl. 46-11.000.
Ore-Ida Foods, Inc.: *See—*
Wassmer, Norman B.; and Hodges, Joseph L., 4,186,836, Cl. 209-565.000.
Orion Machinery and Engineering Corporation: *See—*
Steinhilber, Wilhelm A., 4,186,861, Cl. 226-118.000.
Otani, Akihiko: *See—*
Numata, Hiroshi; Otani, Akihiko; and Mizuno, Masao, 4,187,487, Cl. 367-93.000.
Otisca Industries, Ltd.: *See—*
Keller, Douglas V., Jr.; and Rainis, Andrew, 4,186,887, Cl. 241-20.000.
Ottersen, Odd; Solvang, Egil S.; and Rosjo, Endre, to Ole Gunnar Selvaag. Valve for controlling liquid flow. 4,186,764, Cl. 137-414.000.
Otto Bock Orthopadische Industrie KG: *See—*
Horvath, Eduard, 4,186,449, Cl. 3-2.000.
Ovodenko, Alexandr V.: *See—*
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Owens-Corning Fiberglas Corporation: *See—*
Rolston, J. Albert; and Philipps, Thomas E., 4,187,271, Cl. 264-258.000.
Owens-Illinois, Inc.: *See—*
Amberg, Stephen W., 4,187,276, Cl. 264-515.000.
Fisher, Philip H.; and Ninneman, Lawrence D., 4,187,267, Cl. 264-40.100.
Owl-Cam Inc.: *See—*
Campbell, Maury B., 4,186,955, Cl. 294-1.00R.
Ownby, James C.: *See—*
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,187,213, Cl. 252-402.000.
OY Tampella AB: *See—*
Rimpi, Pertti K., 4,187,279, Cl. 422-185.000.
Oyagi, Kenzi, to Takeda Chemical Industries, Ltd. Apparatus for vacuum-sealing a vial. 4,186,542, Cl. 53-88.000.
P. R. Mallory & Co. Inc.: *See—*
Kaye, Gordon E., 4,186,983, Cl. 339-91.00R.
Pactra Industries, Inc.: *See—*
Howard, Jerald D., 4,187,204, Cl. 260-22.0CB.
Paffoni, Camillo: *See—*
Merlo, Fabrizio; Bornengo, Giorgio; and Paffoni, Camillo, 4,187,218, Cl. 260-158.000.
Pall Corporation: *See—*
Rosenberg, David J., 4,187,182, Cl. 210-445.000.
Palmaer, Tore G. Ear protector attachment for a helmet. 4,186,447, Cl. 2-423.000.
Palmaer, Tore G. Skylight operating means. 4,186,523, Cl. 49-209.000.
Palmatier, Roland T.; and Sciulli, Francis J., to Harris Corporation. Apparatus for determining image areas for printing with correction for extraneous matter. 4,187,435, Cl. 250-559.000.
Pansing, Joseph C.: *See—*
Geisler, Russell W.; and Geisler, Walter H., 4,186,873, Cl. 236-44.00A.
Papst-Motoren KG: *See—*
von der Heide, Johann, 4,187,456, Cl. 318-616.000.
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, to Abbott Laboratories. Diuretics. 4,187,307, Cl. 424-251.000.
Park, Jack H.; and Hunter, Walter D., to Texaco Development Corporation. Oil recovery process using oxyalkylated additives. 4,187,185, Cl. 252-8.55D.
Parker, Curtis J.; and McGill, Kenneth H., to Dresser Industries, Inc. Valve guide for poppet valve. 4,187,059, Cl. 417-454.000.
Parker, Roger A.: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger A., 4,187,319, Cl. 424-333.000.
Parmer, Jerome F., to General Dynamics Corporation. Electrical lead for cryogenic devices. 4,187,387, Cl. 174-15.0CA.
Pasco, Wayne D.: *See—*
Greskovich, Charles D.; Klug, Frederic J.; and Pasco, Wayne D., 4,187,266, Cl. 264-43.000.
Passoni, Teresio; Calmes, Jean P.; Cattaneo, Filippo; and Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Device for controlling the speed of a mandrel in continuous retained-mandrel rolling mills. 4,186,585, Cl. 72-208.000.
Patel, Bhupendra C., to Kendall Company, The. Position testing device. 4,186,750, Cl. 128-748.000.
Patel, Chimanbhai M., to General Motors Corporation. Passive shoulder belt. 4,186,942, Cl. 280-804.000.
Patel, Kishor, to Dynex/Rivett, Inc. Fail-to-neutral module. 4,186,909, Cl. 251-31.000.
Patel, Natu R., to Gulf Oil Corporation. Selectively herbicidal N-(5-substituted-2-thiadiazolyl)-thiocarboxamides. 4,187,098, Cl. 71-90.000.
Pater, Frank R., Jr.; and Kapusnik, Joseph M., to PPG Industries, Inc. Long life radiation shield for gas temperature measurement. 4,187,434, Cl. 250-515.000.
Patsch, Manfred; and Hettche, Albert, to BASF Aktiengesellschaft. Pyrazoline compounds. 4,187,226, Cl. 260-239.800.
Patterson, John D., to Texas Instruments Incorporated. Frequency multiplexed seismic cable. 4,187,493, Cl. 367-135.000.
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L. Process for producing hydrocarbon-phenol-formaldehyde resin. 4,187,369, Cl. 528-137.000.
Pawlak, Catherine J., personal representative: *See—*
Pawlak, Daniel E., deceased; and Pawlak, Catherine J., personal representative, 4,186,506, Cl. 42-83.000.
Pawlak, Daniel E., deceased; and by Pawlak, Catherine J., personal representative, to Michaels of Oregon Co. Percussion cap nipple. 4,186,506, Cl. 42-83.000.
Pawley, Jess W., to London Concrete Machinery Co. Mixing blade for concrete mixer. 4,187,028, Cl. 366-44.000.
Pearce, Ralph R., to EMI Limited. Security document. 4,186,944, Cl. 283-8.00R.
Pearce, Warren, Jr.; and Ramsey, Charles W., to General Motors Corporation. Electrical socket connector and terminal therefor. 4,186,987, Cl. 339-116.00C.
Pears, Gordon E. A.: *See—*
Mathews, Carl F.; Deverell, Christopher; Pears, Gordon E. A.; and Knowles, Peter G., 4,187,113, Cl. 430-533.000.
Pekarsky, Mark M.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.
Pelchat, Paul F., to General Motors Corporation. Power actuator for pivotable window. 4,186,524, Cl. 49-324.000.
Pelligrino, Paul A.: *See—*
Schneider, Raymond C.; and Pelligrino, Paul A., 4,186,829, Cl. 192-109.00F.
Peltzman, Alan; and Yang, Charles C., to Halcon Research & Development Corporation. Production of alkylene glycols. 4,187,153, Cl. 203-81.000.
Penny, Anthony L.: *See—*
Wedlake, Roger J.; and Penny, Anthony L., 4,187,083, Cl. 51-307.000.
Penrod, Orville R.: *See—*
Bartley, John E.; Penrod, Orville R.; and Radosevich, Lawrence D., 4,187,529, Cl. 361-404.000.
Percarpio, Edward P., to Becton, Dickinson and Company. Cannulapierceable, self-sealing closure. 4,186,840, Cl. 215-247.000.
Perez, Julio C., to Roman Machine Co. Blow molding machine. 4,187,065, Cl. 425-136.000.
Perlman, William. Fracing process. 4,186,802, Cl. 166-280 000.
Perotto, Jean F.: *See—*
Martin, Jean-Claude; and Perotto, Jean F., 4,187,518, Cl. 358-93.000.
Perri, Joseph A.: *See—*
La Bate, Micheal D.; and Perri, Joseph A., 4,186,908, Cl. 249-197.000.
Personal Products Company: *See—*
Steiger, Fred H., 4,186,743, Cl. 128-284.000.
Personal Security Concepts, Inc.: *See—*
Cantor, Burton M., 4,186,851, Cl. 222-113.000.
Peruchon Edouard; and Rabischong, Pierre, to Societe Nationale Elf Aquitaine (Production). Device for accurate measurement of the shape of a substantially cylindrical surface. 4,186,494, Cl. 33-178.00E.
Perun, Thomas J.: *See—*
Carney, Ronald E.; McAlpine, James B.; and Perun, Thomas J., 4,187,372, Cl. 536-17.00R.
Peters, Thomas A., to Phillips Petroleum Company. Heat-shrinkable or heat-expandable products from hydrogenated polybutadiene. 4,187,360, Cl. 525-339.000.
Petersen, Larry C.: *See—*
Ehrhardt, Henry B., 4,187,423, Cl. 250-312.000.
Peterson, Charles A., to Westinghouse Electric Corp. Series capacitor protection equpment with extended range dual sparkover feature. 4,187,524, Cl. 361-16.000.
Peterson, Roger H.: *See—*
Knappe, LaVerne F.; Peterson, Roger H.; and Stroebel, Gary J., 4,187,452, Cl. 318-128.000.
Petitpierre, Jean C., to Ciba-Geigy Corporation. Pressure-sensitive or heat-sensitive recording material and novel 2,2-diarylchromeno compounds used therein. 4,187,233, Cl. 260-345.200.
Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,187,277, Cl. 422-16.000.

Redmore, Derek; and Welge, Frederick T., 4,187,245, Cl. 260-502.500.
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Petrushkin, Viktor D.: *See—*
Kornilov, Anatoly A.; Petrushkin, Viktor D.; Stetsko, Viktor N.; and Fridman, Viktor M., 4,187,181, Cl. 210-332.000.
Pevnev, Vladimir N.: *See—*
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Pfeifer, Josef: *See—*
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Pfister, Rudolf: *See—*
Hromatka, Otto; Binder, Dieter; Zeller, Paul; and Pfister, Rudolf, 4,187,303, Cl. 424-246.000.
Pfundstein, Donald K., to Deere & Company. Supplementary hydrostatic drive electronic control. 4,186,816, Cl. 180-243.000.
Philipps, Thomas E.: *See—*
Rolston, J. Albert; and Philipps, Thomas E., 4,187,271, Cl. 264-258.000.
Phillips Petroleum Company: *See—*
Ball, Donald H.; and Voelkers, James D., 4,187,542, Cl. 364-502.000.
Campbell, Robert W., 4,187,371, Cl. 528-340.000.
Cobb, Raymond L., 4,187,231, Cl. 260-332.100.
Davis, Thomas T.; and Burk, Marvin C., 4,187,540, Cl. 364-200.000.
Needham, Donald G.; and Griffin, Ray D., 4,187,214, Cl. 260-45.9KA.
Peters, Thomas A., 4,187,360, Cl. 525-339.000.
Porter, Grady T.; Fuller, Edward N.; and Roof, Lewis B., 4,186,607, Cl. 73-422.0GC.
Schaffer, Arnold M.; and Favre, John A., 4,187,026, Cl. 356-326.000.
Stoller, Frederick L., 4,186,470, Cl. 28-112.000.
Phillips, Robert F.: *See—*
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Phinney, Thomas L.: *See—*
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Phipps, William L.: *See—*
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Phoenix, Lancelot; and Eckhoff, Stephen A., to Lucas Industries Limited. Ignition systems for internal combustion engine. 4,186,713, Cl. 123-148.00E.
Piazza, Matthew R., to Maso-Therm Corporation. Composite building module and method for making same. 4,186,536, Cl. 52-309.120.
Piber, Earl T., to Eaton Corporation. Rocker switch with selective lockout means shiftable transversely of the pivotal axis. 4,187,420, Cl. 200-321.000.
Pickelman, Dale M.; Foster, William A.; and Wessling, Ritchie A., to Dow Chemical Company, The. Method for forming high strength composites. 4,187,142, Cl. 162-146.000.
Picklesimer, Lewellyn G.; Lucarelli, Michael A.; and Reinhart, Theodore J., Jr. Acetylene-terminated polyimide compositions. 4,187,359, Cl. 525-6.000.
Piesik, Edward T., to General Dynamics Corporation, Pomona Division. Multiple area rear launch tube cover. 4,186,647, Cl. 89-1.800.
Pillars, Arthur W. Locking-ball for trailer hitch. 4,186,940, Cl. 280-507.000.
Pitner, Gerald A.: *See—*
Wallace, John M.; and Pitner, Gerald A., 4,187,545, Cl. 364-559.000.
Pitney-Bowes, Inc.: *See—*
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Miciukiewicz, Joseph F., 4,186,919, Cl. 271-267.000.
Pittman, Earle S.: *See—*
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Platell, Ove B. Heat-exchanger. 4,186,795, Cl. 165-53.000.
Plätz, Rolf; Fuchs, Werner; and Vodrazka, Wolfgang, to BASF Aktiengesellschaft. Preparation of mono- and poly-ethylene glycol dialkyl ethers. 4,187,384, Cl. 568-618.000.
Platzoder, Karl, to Siemens Aktiengesellschaft. Semiconductor component. 4,187,517, Cl. 357-64.000.
Pless, Janos; and Sandrin, Edmond, to Sandoz Ltd. Organic compounds. 4,187,295, Cl. 424-177.000.
Plessey Handel und Investments AG: *See—*
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Pletz, Alfred, Jr.: *See—*
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Plevak, Lubomir; and Dodt, Jurgen, to Gewerkschaft Eisenhutte Westfalia. Advance mechanism for a mine roof support unit. 4,187,042, Cl. 405-291.000.
Pluzhnov, Stanislav K.: *See—*
Kabanov, Viktor A.; Martynova, Marina A.; Pluzhnov, Stanislav K.; and Smetanjuk, Vladimir I., 4,187,197, Cl. 252-431.00P.
Pochwalski, Krzysztof K.; and Radoszewski, Tomasz E., to InstytutBadan Jadrowych. Method and apparatus for absolute activity determination of radionuclides. 4,187,428, Cl. 250-366.000.
Podd, Victor T. Container liner. 4,186,845, Cl. 220-461.000.
Poggiali, Lewis D.: *See—*
Jacalone, Richard P.; and Poggiali, Lewis D., 4,186,846, Cl. 220-468.000.
Pokrandt, Glenn C., to Falk Corporation, The. Shear pin coupling. 4,186,570, Cl. 64-28.00R.
Polaroid Corporation: *See—*
Bader, Henry; and Feingold, Michael H., 4,187,225, Cl. 260-239.900.
Stella, Joseph A., 4,187,009, Cl. 352-130.000.
Pommier, Jean, to Compagnie Generale des Etablissements Michelin. Pneumatic tire. 4,186,788, Cl. 152-209.00B.
Ponpon, Jean-Pierre: *See—*
Muller, Jean-Claude; Ponpon, Jean-Pierre; Kurek, Joseph; and Siffert, Paul, 4,187,124, Cl. 148-1.500.
Popiel, Stanley; DuBois, R. Clark; Carley, Jay L.; and Hamma, John C., to Mystic Color Lab, Inc. Automated film cartridge and mailer sorting and correlating apparatus. 4,186,837, Cl. 209-565.000.
Porter, Grady T.; Fuller, Edward N.; and Roof, Lewis B., to Phillips Petroleum Company. Liquid sample dilution system. 4,186,607, Cl. 73-422.0GC.
Possell, Clarence R. Power producing constant speed turbine. 4,186,554, Cl. 60-39.370.
Post, Gerald G., to Abbott Laboratories. Fortimicin E. 4,187,299, Cl. 424-181.000.
Powers, Edmund M., to United States of America, Army. IMViC test method. 4,187,351, Cl. 435-38.000.
Powers, John V.: *See—*
Ahn, Kie Y.; Cohen, Mitchell S.; Powers, John V.; and Tao, Lungjo, 4,187,553, Cl. 365-8.000.
PPG Industries, Inc.: *See—*
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Frank, Robert G., 4,187,095, Cl. 65-104.000.
Friedlander, Charles B.; and McMullen, John C., 4,187,366, Cl. 528-75.000.
Pater, Frank R., Jr.; and Kapusnik, Joseph M., 4,187,434, Cl. 250-515.000.
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Simon, Martin J., 4,187,258, Cl. 525-157.000.
Pratt, Ronald G.: *See—*
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Premier Athletic Products Corp.: *See—*
Neidell, Saul, 4,187,006, Cl. 351-44.000.
Presta, John C.: *See—*
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Preston, Gary W.; Johannesen, Donald D.; and Kestermeier, William J., to Bendix Corporation, The. Anti-rattle spring for disc brake. 4,186,824, Cl. 188-73.500.
Principe, Joseph R.: *See—*
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Procter & Gamble Company, The: *See—*
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Puglia, Wayne J.: *See—*
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Purzycki, Kenneth L.: *See—*
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,187,243, Cl. 260-464.000.
Puschner, Herbert A.; and Lembens, Helmut, to Hoechst Aktiengesellschaft. Device for fusing and fixing a toner image on a carrier. 4,187,405, Cl. 219-10.55A.
Pushanko, Nikolai N.: *See—*
Datsenko, Nikolai M.; Pushanko, Nikolai N.; and Yarmilko, Vladimir G., 4,187,172, Cl. 209-44.300.
Pusnes Mek, Verksted A/S: *See—*
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Khomich, Nikolai S.; Sakulevich, Faddei J.; Putimtsev, Boris N.; and Silaev, Vladimir A., 4,187,084, Cl. 51-308.000.
Quebec Iron and Titanium Corporation - fer et Titane du Quebec, Inc.: *See—*
Gueguin, Michel, 4,187,117, Cl. 106-56.000.
Quenot, Michel C. A., to Stanley-Mabo. Tape-type linear measuring instrument. 4,186,490, Cl. 33-139.000.
Query, Grady W. Dishwashing apparatus. 4,187,122, Cl. 134-95.000.
Quinlan, Patrick M., to Petrolite Corporation. Process of inhibiting corrosion with quaternaries of halogen derivatives of alkynoxymethyl amines. 4,187,277, Cl. 422-16.000.
Quinn, Rex B.: *See—*
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Rabischong, Pierre: *See—*
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Radd, Fred J.; Oertle, Don H.; and McKinney, Charles N., to Conoco, Inc. Growth-orientation of crystals by raster scanning electron beam. 4,187,126, Cl. 148-1.500.
Rader, Charles W.: *See—*
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Radice, Angelo: *See—*
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Radosevich, Lawrence D.: *See—*
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Radwill, Robert P.; and Moehling, Charles, to AMSTED Industries Incorporated. Dual rate spring device for railroad car trucks. 4,186,914, Cl. 267-4.000.
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Keller, Douglas V., Jr.; and Rainis, Andrew, 4,186,887, Cl. 241-20.000.
Rais, Arnold; and Lussi, Andre, to M. Schaerer A.G. Operating table for medical purposes. 4,186,917, Cl. 269-325.000.
Ramesohl, Hubert: *See—*
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Rance, William G.: *See—*
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Ranco Incorporated: *See—*
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Rasheed, Khalid; and Warkentin, James D., to Ansul Company, The. Biocidally-active 1,3-benzodithiole-2-thione compounds. 4,187,096, Cl. 71-90.000.
Raytheon Company: *See—*
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RCA Corporation: *See—*
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Reade, Richard F., to Corning Glass Works. Anorthite glass-ceramics. 4,187,115, Cl. 106-39.800.
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; and Vachhani, Vasantrai A., to AMP Incorporated. Strain relief cover for a barrel terminal. 4,186,984, Cl. 339-103.00R.
Reba, Imants, to Crown Zellerbach Corporation. Web threading system. 4,186,860, Cl. 226-91.000.
Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Hydroxypropylene-amino-phosphonic-sulfonic acids. 4,187,245, Cl. 260-502.500.
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Redwitz Baker Incorporated: *See—*
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Redwitz, Robert F.; and Baker, William G., to Redwitz Baker Incorporated. View expanding apparatus. 4,187,001, Cl. 350-202.000.
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Reinmoller, Adolf; Voss, Hans W.; and Kluting, Bernd, to Keiper Automobiltechnik GmbH & Co. KG. Adjustable motor vehicle seat. 4,186,904, Cl. 248-395.000.
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Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, to California Institute of Technology. Ion-exchange hollow fibers. 4,187,333, Cl. 427-230.000.
Remberg, Horst; and Frischmann, Werner. Apparatus for freeze drying of gas, especially compressed air. 4,186,495, Cl. 34-92.000.
Renaud, Pierre J., to Societe Anonyme Francaise du Ferodo. Clutch release bearings. 4,186,828, Cl. 192-98.000.
Repka, David F. CB vehicle toy. 4,186,519, Cl. 46-202.000.
Repski, Pete. Ground working implement. 4,186,805, Cl. 172-248.000.
Rexnord Inc.: *See—*
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Rhone-Poulenc Industries: *See—*
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Rich, Jay. Distilled water apparatus. 4,187,150, Cl. 202-182.000.
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Richardson-Merrell Inc.: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger A., 4,187,319, Cl. 424-333.000.
Ricoh Co., Ltd.: *See—*
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,186,991, Cl. 350-6.910.
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Rimpi, Pertti K., to OY Tampella AB. Device for recovering sodium chemicals from green liquor and flue gases. 4,187,279, Cl. 422-185.000.
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Roberts, Charles V.; Sarra, William F.; and Neuspiel, Peter J., to Robert Filter Manufacturing Company. Treatment facility with backwash control system. 4,187,175, Cl. 210-80.000.
Roberts, Joseph A., to Advanced Circuit Technology. Circuit board with self-locking terminals. 4,187,388, Cl. 174-68.500.
Roberts, Noel A.: *See—*
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Roberts, Patrick S., to Thomas International Corporation. Digital chord generation for electronic musical instruments. 4,186,636, Cl. 84-1.010.
Robertshaw Controls Company: *See—*
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Robinson, Alan V.; and Chapman, John, to Camrex Research and Development, Ltd. Formulation and manufacture of antifouling compositions. 4,187,211, Cl. 260-42.440.
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Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Robinson, Don, 4,186,925, Cl. 273-389.000.
Robinson, John W.; and Dietrich, Ralph N., to Kimball International, Inc. Rhythm generator for electronic organ. 4,186,639, Cl. 84-1.030.
Robinson, Prentice, to Centronics Data Computer Corp. Method and apparatus for filling the movable reservoir of an inkjet printer. 4,187,511, Cl. 346-75.000.
Robling, Marc E., to Essex Group, Inc. Electromagnetic fuel injection valve with swirl means. 4,186,883, Cl. 239-491.000.
Rockwell International Corporation: *See—*
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Rockwell-Rimoldi, S.p.A.: *See—*
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Rohm GmbH: *See—*
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Rolair Systems, Inc.: *See—*
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Rolleston, Richard E.; and Nadeau, Jacques A., to Merck & Co., Inc. Skeletal imaging kit utilizing triethylene tetramine hexa (methylene phosphonic acid). 4,187,284, Cl. 424-1.000.
Rolm Corporation: *See—*
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Rolston, J. Albert; and Philipps, Thomas E., to Owens-Corning Fiberglas Corporation. Method of making same. 4,187,271, Cl. 264-258.000.
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Romanov, Nikolai T., deceased: *See—*
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Roof, Lewis B.: *See—*
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Ropte, Eckhard: *See—*
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Rosen, Perry: *See—*
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Rosenberg, David J., to Pall Corporation. Box filter. 4,187,182, Cl. 210-445.000.

Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., to IFO Sanitar AB. Bidet arrangement. 4,186,450, Cl. 4-6.000.

Rosenberg, Sanders D.: *See—*
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Rosenberger, Harold E., to Bausch & Lomb Incorporated. Microscope support system for use in examining eyes in vivo and enucleated. 4,187,005, Cl. 351-38.000.

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Ross, Joseph A.: *See—*
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Ross, William J.: *See—*
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Rossi, Alfred V.: *See—*
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Roth, David W. H., Jr.; and Zudkevitch, David, to Allied Chemical Corporation. Extractive distillation for separating ketones and/or alcohols from phenol and/or cresol. 4,187,152, Cl. 203-62.000.

Rotter, Gerhard; and Schomann, Klaus D., to BASF Aktiengesellschaft. DC erase head. 4,187,521, Cl. 360-118.000.

Rough, J. Kirkwood H., to Zegeer, Jim, a part interest. Electric motor drive system. 4,187,453, Cl. 318-135.000.

Roziere, Guy, to Thomson-CSF. Film for correcting spatial irregularity in the gain of optical images of intensifier tubes. 4,187,002, Cl. 350-314.000.

Rubinson & Friends, Inc.: *See—*
Larner, Michael W., 4,187,544, Cl. 364-514.000.

Rudolf Seiz: *See—*
Seiz, Rudolf; and Sebastian, Lothar, 4,187,037, Cl. 405-150.000.

Rudwick, Lawrence A. Three-wheeled vehicle. 4,186,935, Cl. 280-269.000.

Ruegg, Rudolf: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,187,247, Cl. 260-574.000.

Ruhrkohle, A.G.: *See—*
Minke, Otto; and Lanfermann, Willy, 4,186,970, Cl. 299-43.000.

Runge, Peter K.: *See—*
Denkin, Nathan M.; and Runge, Peter K., 4,186,994, Cl. 350-96.170.

Ruo, Chen-Min. Plastic sanitary pump. 4,186,451, Cl. 4-255.000.

Ruppel, Henry W.: *See—*
Cosman, Dieter; and Ruppel, Kathleen C., 4,186,820, Cl. 182-93.000.

Ruppel, Kathleen C.: *See—*
Cosman, Dieter; and Ruppel, Kathleen C., 4,186,820, Cl. 182-93.000.

Russell, Homer C.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.

Ryser, Gottlieb: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,187,247, Cl. 260-574.000.

Ryvkis, Yakov M.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Ryzhnev, Vadim J.: *See—*
Egorov, Alexandr F.; Ryzhnev, Vadim J.; Simonovsky, Dmitry K.; and Sokolov, Valery A., 4,186,590, Cl. 73-23.000.

S. E. Huffman Corporation: *See—*
Huffman, Stanley E., 4,186,529, Cl. 51-288.000.

Saari, Walfred S.: *See—*
Cragoe, Edward J., Jr.; Novello, Frederick C.; and Saari, Walfred S., 4,187,315, Cl. 424-305.000.

Sacchetti, Alfred D. Automatic color bobbin changer. 4,186,677, Cl. 112-186.000.

Safford, Laurance F., to American Standard Inc. Synchronous universal binary scrambler. 4,187,392, Cl. 178-22.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Jumel, Yves, 4,187,328, Cl. 427-8.000.

Saint-Gobain Industries: *See—*
Chenel, Pierre; and Moncheaux, Michel, 4,186,685, Cl. 118-410.000.

Saito, Masayuki: *See—*
Shibuya, Teiji; Ishikawa, Yasuaki; Saito, Masayuki; and Ueda, Kiyoharu, 4,187,085, Cl. 55-4.000.

Sakabe, Toshiaki: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; and Matsumoto, Yasuhiro, 4,187,133, Cl. 156-166.000.

Sakaguchi, Hirofumi: *See—*
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,186,606, Cl. 73-351.000.

Sakulevich, Faddei J.: *See—*
Khomich, Nikolai S.; Sakulevich, Faddei J.; Putimtsev, Boris N.; and Silaev, Vladimir A., 4,187,084, Cl. 51-308.000.
Yascheritsyn, Petr I.; Sakulevich, Faddei J.; Olender, Leonty A.; and Kosobutsky, Alexandr A., 4,186,528, Cl. 51-161.000.

Sakurai, Teruo: *See—*
Takemoto, Nagaaki; Sakurai, Teruo; Mashiko, Kimio; and Tomari, Harumatsu, 4,186,756, Cl. 131-140.00C.

Salee, Gideon, to Hooker Chemicals & Plastics Corp. Polymer blends with improved hydrolytic stability comprising a linear aromatic polyester and a methacrylate cross-linked acrylate copolymer. 4,187,259, Cl. 525-219.000.

Salisbury Special Tool: *See—*
Varga, Paul, 4,186,916, Cl. 269-303.000.

Salomon, Georges P. J., to S.A. Etablissements Francois Salomon & Fils. Ski boot. 4,186,501, Cl. 36-121.000.

Salzman, Otto, to Tyrol Shoe Co. Ltd. Molded cross-country ski boot. 4,186,500, Cl. 36-117.000.

Sandco Limited: *See—*
Guttinger, Manfred; and Schermutzki, Konrad, 4,186,797, Cl. 165-120.000.

Sander, Bruno; Scherling, Kurt; Steinberger, Rolf; and Ropte, Eckhard, to BASF Aktiengesellschaft. Manufacture of fibrids from poly(amide-imide) resins. 4,187,143, Cl. 162-157.00R.

Sanders Associates, Inc.: *See—*
Ballard, Samuel S.; and White, Ronald P., 4,187,490, Cl. 367-121.000.

Sandoy, Harry S., to Pusnes Mek, Verksted A/S. Chain stopper. 4,186,464, Cl. 24-116.00R.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 4,187,309, Cl. 424-258.000.

Sandoz Ltd.: *See—*
Pless, Janos; and Sandrin, Edmond, 4,187,295, Cl. 424-177.000.

Sandri, Stefano: *See—*
Modena, Giulio; Sandri, Stefano; and Scagliola, Carlo, 4,187,397, Cl. 179-1.0SG.

Sandrin, Edmond: *See—*
Pless, Janos; and Sandrin, Edmond, 4,187,295, Cl. 424-177.000.

Sanford, Richard: *See—*
Bourdon, Normand C.; and Sanford, Richard, 4,187,272, Cl. 264-318.000.

Santora, Norman J.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,187,317, Cl. 424-309.000.

Sanyo Kiki Kabushiki Kaisha: *See—*
Matsumoto, Kazumasa, 4,186,771, Cl. 137-596.170.

Sarra, William F.: *See—*
Roberts, Charles V.; Sarra, William F.; and Neuspiel, Peter J., 4,187,175, Cl. 210-80.000.

Sasaki, Heizo: *See—*
Iwao, Tetsuya; Sasaki, Heizo; Ito, Akira; and Kono, Masahiro, 4,187,385, Cl. 526-128.000.

Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters and their use as herbicides. 4,187,100, Cl. 71-92.000.

Sasse, Klaus: *See—*
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,101, Cl. 71-92.000.

Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, to Ricoh Company, Ltd. Electrostatic copying machine. 4,187,024, Cl. 355-14.00R.

Sawruk, Stephen: *See—*
Kokotailo, George T.; and Sawruk, Stephen, 4,187,283, Cl. 423-328.000.

Scagliola, Carlo: *See—*
Modena, Giulio; Sandri, Stefano; and Scagliola, Carlo, 4,187,397, Cl. 179-1.0SG.

Schaffer, Arnold M.; and Favre, John A., to Phillips Petroleum Company. Photoacoustic method and apparatus for measuring intensity of electromagnetic radiation. 4,187,026, Cl. 356-326.000.

Scharf, Lou. Portable arrangement for and method of transferring materials between open-mouthed containers. 4,186,782, Cl. 141-7.000.

Schaufelberger, Arthur H., deceased: *See—*
Crane, Patrick E.; Lazarchik, Robert E.; and Schaufelberger, Arthur H., deceased, 4,187,507, Cl. 343-754.000.

Schaufelberger, Ruth L., administratrix: *See—*
Crane, Patrick E.; Lazarchik, Robert E.; and Schaufelberger, Arthur H., deceased, 4,187,507, Cl. 343-754.000.

Schausberger, Helmut; and Brunner, Rudolf, to AGFA-Gevaert, A.G. Apparatus for wet treatment of running webs of photographic material. 4,187,023, Cl. 354-321.000.

Scheer, Erich, to KUNDO - Kieninger & Obergfell. Electrical programmer for the automatic control of a household appliance. 4,187,499, Cl. 340-309.100.

Schekin, Nikolai G.: *See—*
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.

Schenker, M. Allan; and Kerstein, Irving J. Access shield for uncovered refrigerated units. 4,186,790, Cl. 160-329.000.

Scherling, Kurt: *See—*
Sander, Bruno; Scherling, Kurt; Steinberger, Rolf; and Ropte, Eckhard, 4,187,143, Cl. 162-157.00R.

Schermutzki, Konrad: *See—*
Guttinger, Manfred; and Schermutzki, Konrad, 4,186,797, Cl. 165-120.000.

Schiessl, Alois: *See—*
Huber, Paul; Schiessl, Alois; and Krone, Hartmut, 4,186,664, Cl. 102-66.000.

Schievelbein, Vernon H., to Texaco Inc. Surfactant flooding oil recovery process. 4,187,073, Cl. 252-8.55D.

Schilling, Paul K.: *See—*
Hobson, John A.; and Schilling, Paul K., 4,187,066, Cl. 425-327.000.

Schilp, Ulrich: *See—*
Becker, Gert; Schilp, Ulrich; and Barth, Hans F., 4,187,184, Cl. 252-8.800.

Schlager, Kenneth J. Thermographic apparatus for physical examination of patients. 4,186,748, Cl. 128-736.000.

Schleicher, Thomas R.; Maylahn, Donald J.; and Drennan, Denis B. Heel supporting boot for bed patients. 4,186,738, Cl. 128-153.000.

Schleifstein, Robert, to Coats & Clark, Inc. Method for making flame retardant-water repellent coil zipper. 4,186,466, Cl. 24-205.13C.

Schleppnik, Alfred A. Malodor counteractants. 4,187,251, Cl. 260-586.00R.

Schmauder, Robert W., Jr.: *See—*
Schmauder, Robert W., Sr.; and Schmauder, Robert W., Jr., 4,186,720, Cl. 126-445.000.

Schmauder, Robert W., Sr.; and Schmauder, Robert W., Jr., to Solar Shelter Engineering Inc. Solar heating panel. 4,186,720, Cl. 126-445.000.

Schmidt, Herbert, to Hauni-Werke Korber & Co. KG. Tobacco drying apparatus. 4,186,755, Cl. 131-135.000.

Schmidt, Martin, to Siemens Aktiengesellschaft. Tomograph for the production of transverse layer images. 4,187,430, Cl. 250-445.00T.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. 3-[4-(Disubstituted-amino)phenyl]-3-(diphenylamino)phthalides. 4,187,223, Cl. 260-343.30R.

Schmidt, Robert R.: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,100, Cl. 71-92.000.
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,187,101, Cl. 71-92.000.

Schneider, Raymond C.; and Pelligrino, Paul A., to Twin Disc, Incorporated. Modulatable power transmission clutch. 4,186,829, Cl. 192-109.00F.

Scholz, Hansjurgen; Brambilla, Luigi; and Backhaus, Hans-Gerd, to Daimler-Benz Aktiengesellschaft. Inflatable impact protection cushion. 4,186,941, Cl. 280-743.000.

Schomann, Klaus D.: *See—*
Rotter, Gerhard; and Schomann, Klaus D., 4,187,521, Cl. 360-118.000.

Schott, Donald E., to Thomas C. Wilson, Inc. Tube expander. 4,186,584, Cl. 72-122.000.

Schrader, Klaus: *See—*
Haker, Rolf; Schrader, Klaus; and Thiery, Joachim, 4,187,462, Cl. 324-204.000.

Schreiber, Ronald S.; and Principe, Joseph R., to Colgate Palmolive Company. Warm two tone flavored dentifrice. 4,187,287, Cl. 424-49.000.

Schroeder, Guenter, to Rohm GmbH. Foamable polymer material. 4,187,353, Cl. 521-149.000.

Schucker, Thomas R., to Allis-Chalmers Corporation. Hydraulic prestressing device for shear lever bolts. 4,187,032, Cl. 403-15.000.

Schultz, Sargent B. Motorcycle backrest device. 4,186,937, Cl. 280-289.00E.

Schulze, James L., Sr., to General Electric Company. Cooling efficiency meter circuit for an air conditioner. 4,186,563, Cl. 62-126.000.

Schumacher, William L., to AMP Incorporated. Light device, lens, and fiber optic package. 4,186,995, Cl. 350-96.200.

Schumacher, William L., to AMP Incorporated. Overlap type waveguide connector assembly and method. 4,186,997, Cl. 350-96.210.

Schwartz, David M. Solar energy collector. 4,186,725, Cl. 126-443.000.

Schwarz, Alois; Mautz, Karlheinz; and Frommlet, Hubert, to Messerschmitt-Boelkow-Blohm GmbH. Bearing seal and lubricating device. 4,186,975, Cl. 308-187.000.

Schwerdt, Paul: *See—*
Bohringer, Karl; Reichle, Peter; and Schwerdt, Paul, 4,186,596, Cl. 73-136.00C.

Schwinn, Joseph M.; and Maynard, Tony E., to Ecodyne Corporation. Fan blade assembly and coupling. 4,187,056, Cl. 416-207.000.

Scientific Technology Inc.: *See—*
Key, Paul F.; and Lazzara, Anthony R., 4,187,421, Cl. 250-199.000.

Sciulli, Francis J.: *See—*
Palmatier, Roland T.; and Sciulli, Francis J., 4,187,435, Cl. 250-559.000.

Scott, David G., to Halliburton Company. Recirculating lubrication system. 4,186,654, Cl. 92-78.000.

Seabrook, Terence D. Multi-purpose pallet. 4,186,667, Cl. 108-53.500.

Searfoss, William H.; and Jones, Gerald P., to Molded Materials Company, Div. Carlisle Corporation. Brake block material. 4,187,209, Cl. 260-38.000.

Sears Manufacturing Company: *See—*
Koutsky, L. John, 4,186,963, Cl. 297-308.000.

Sebastian, Lothar: *See—*
Seiz, Rudolf; and Sebastian, Lothar, 4,187,037, Cl. 405-150.000.

Secoh Giken Inc.: *See—*
Ban, Itsuki; and Kanno, Hidenori, 4,187,522, Cl. 360-137.000.

Seidl, Jiri: *See—*
Gartner, Jurij; and Seidl, Jiri, 4,186,695, Cl. 123-52.00M.

Seiler, John J. Animal grooming tethering device. 4,186,690, Cl. 119-110.000.

Seiz, Rudolf; and Sebastian, Lothar, to Rudolf Seiz. Wall supporting arrangement, especially for supporting mine gallery walls. 4,187,037, Cl. 405-150.000.

Seligman, Marvin H.: *See—*
Lowell, Ross; and Seligman, Marvin H., 4,187,531, Cl. 362-17.000.

Sels, Francis J.: *See—*
Kokelenberg, Hendrik E.; Sels, Francis J.; and Van Veelen, George F., 4,187,114, Cl. 430-510.000.

Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 1-Acyloxymethyl-4,5-dichloro-imidazole derivatives and their use as herbicides. 4,187,101, Cl. 71-92.000.

Serafino, James M.; Yadlowsky, Slawko; and Witzeman, John S., to General Foods Corporation. Dry beverage mix containing a clouding agent. 4,187,326, Cl. 426-590.000.

Serebro, Vladimir S.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Sergienko, Anatoly I.: *See—*
Eroshkin, Nikolai A.; Ivannikov, Alfred V.; Matveev, Vyacheslav N.; and Sergienko, Anatoly I., 4,187,410, Cl. 219-137.200.

Serkes, Ira M.: *See—*
Anshus, Byron E.; Katsumoto, Kiyoshi; and Serkes, Ira M., 4,187,370, Cl. 528-312.000.

Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Battard, Jean-Claude; and Buisson, Jean, 4,187,119, Cl. 106-126.000.
Bornsztein, Rene, 4,186,757, Cl. 131-149.000.

Shabelnikova, Ljudmila A.: *See—*
Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B., 4,186,798, Cl. 165-147.000.

Shaffer, Gary W.; and Purzycki, Kenneth L., to Givaudan Corporation. Novel 2-(2-cyanoethylidene)-bicyclo[2.2.1]hept-5-enes and hydrogenated derivatives thereof. 4,187,243, Cl. 260-464.000.

Shakespeare Company: *See—*
Howald, Arthur M., 4,186,508, Cl. 43-24.000.

Shapiro, Moisei S.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Sharp Kabushiki Kaisha: *See—*
Matsunaga, Shoichi; Siozaki, Fumio; and Aiba, Masahiko, 4,187,512, Cl. 346-140.00R.
Yano, Kohzo; Hishida, Tadanori; Inami, Yasuhiko; and Wada, Tomio, 4,187,004, Cl. 350-357.000.

Sharpe, Raymond, to Lucas Industries Limited. Variable speed transmission systems. 4,186,616, Cl. 74-200.000.

Shatagin, Oleg A.: *See—*
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., 4,186,791, Cl. 164-66.000.

Shaw, Chia C.: *See—*
Micetich, Ronald G.; Fortier, Robert A.; Shaw, Chia C.; and Merlo, Werner O., 4,187,221, Cl. 260-239.00A.

Shawke, Jerome R., to Warner & Swasey Company, The. Gauge assembly. 4,186,491, Cl. 33-143.00L.

Shelby-Williams Industries, Inc.: *See—*
Jarrett, George W., 4,187,346, Cl. 428-342.000.

Sheldon, Loren B.: *See—*
Heffernan, James P.; Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,187,546, Cl. 364-565.000.

Shen, Ti-Ke; and Coombe, John R., to Westinghouse Electric Corp. Reduction of radioactive emissions from nuclear-reactor plant. 4,187,146, Cl. 176-37.000.

Sheridan, Geoffrey P., to Lankro Chemicals Ltd. Talc dispersions. 4,187,192, Cl. 252-313.00R.

Sherwood, Richard C.: *See—*
Billings, Robert L.; Chen, Ho-Sou; Gyorgy, Ernst M.; and Sherwood, Richard C., 4,187,128, Cl. 148-121.000.

Shibuya, Teiji; Ishikawa, Yasuaki; Saito, Masayuki; and Ueda, Kiyoharu, to Nippon Kokan Kabushiki Kaisha. Treating facility for sintering waste gas. 4,187,085, Cl. 55-4.000.

Shikhirev, Boris N.; Matrosov, Evgeny A.; and Deresh, Ilya A. Apparatus for treatment of sheet material with the use of ferromagnetic powder. 4,187,081, Cl. 51-23.000.

Shimada, Kiyohiro: *See—*
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,187,321, Cl. 426-43.000.

Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, to Nippon Oil and Fats Company, Limited. Coal dispersing oil. 4,187,078, Cl. 44-51.000.

Shimizu, Yoshiyuki; and Sudo, Takeshi, to Nippon Kogaku K.K. Epidark illumination system. 4,186,993, Cl. 350-91.000.

Shimoji, Yutaka; and Arai, Youichi, to Fujitsu Limited. Bias circuit. 4,187,471, Cl. 330-277.000.

Shimp, Lawrence A.: *See—*
Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,187,252, Cl. 260-653.000.

Shinkawa, Keiro; Shoyama, Hiroji; and Sodeyama, Chuichi, to Hitachi, Ltd. SHF band oscillator circuit using FET. 4,187,476, Cl. 331-117.00D.

Shinoda, Norio: *See—*
Takamura, Masayuki; Shinoda, Norio; Kurahashi, Kazuo; and Hatae, Masataka, 4,186,586, Cl. 72-264.000.
Shirbroun, Darrell B. Soybean beverage. 4,187,324, Cl. 426-460.000.
Shock-M-All, Inc.: *See—*
Berg, Fred W., 4,186,512, Cl. 43-98.000.
Shoemaker, John R., to AMP Incorporated. Sealed splice. 4,186,986, Cl. 339-114.000.
Shorey, Thomas H., to Boeing Company, The. Cargo ramp hoist mechanism. 4,186,901, Cl. 244-137.00R.
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., to Congoleum Corporation. Resinous polymer sheet materials having selective, surface decorative effects and methods of making the same. 4,187,131, Cl. 156-79.000.
Shorygina, Natalya V.: *See—*
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L., 4,187,369, Cl. 528-137.000.
Shoyama, Hiroji: *See—*
Shinkawa, Keiro; Shoyama, Hiroji; and Sodeyama, Chuichi, 4,187,476, Cl. 331-117.00D.
Shulke, David D., to Caterpillar Tractor Co. Vibration and dust isolation system. 4,186,930, Cl. 277-166.000.
Sickles, James E., to PPG Industries, Inc. Adapting means providing detachable mounting of an induction-charging adapter head on a spray device. 4,186,886, Cl. 239-691.000.
Siemens Aktiengesellschaft: *See—*
Ast, Reinhold, 4,187,403, Cl. 179-84.0VF.
Fahrenschon, Franz; Huettl, Heinz; and Dotzauer, Ewald, 4,187,414, Cl. 179-175.30S.
Garbrecht, Kurt; and Hildebrandt, Bernhard, 4,187,465, Cl. 325-31.000.
Heinze, Klaus D.; and Lange, Gerhard, 4,187,526, Cl. 361-120.000.
Hundt, Eckart, 4,187,431, Cl. 250-492.00A.
Moser, Ludwig M., 4,187,413, Cl. 179-107.0FD.
Mueller, Werner, 4,187,438, Cl. 307-268.000.
Muller, Bruno; and Kohler, Werner, 4,187,437, Cl. 307-147.000.
Platzoder, Karl, 4,187,517, Cl. 357-64.000.
Schmidt, Martin, 4,187,430, Cl. 250-445.00T.
Stark, Anselm, 4,187,398, Cl. 179-2.0EB.
Sievers, Michael W., to United States of America, National Aeronautics and Space Administration. High-speed data link for moderate distances and noisy environments. 4,187,394, Cl. 178-58.00R.
Siffert, Paul: *See—*
Muller, Jean-Claude; Ponpon, Jean-Pierre; Kurek, Joseph; and Siffert, Paul, 4,187,124, Cl. 148-1.500.
Signode Corporation: *See—*
Klaus, Arthur, 4,186,862, Cl. 227-130.000.
Silaev, Vladimir A.: *See—*
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Silberg, Paul A. Method and apparatus for propagating electrical signals through a conducting dielectric fluid. 4,187,489, Cl. 340-852.000.
Simay, Antal: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.
Simon, Martin J., to PPG Industries, Inc. Sealerless primers. 4,187,258, Cl. 525-157.000.
Simonovsky, Dmitry K.: *See—*
Egorov, Alexandr F.; Ryzhnev, Vadim J.; Simonovsky, Dmitry K.; and Sokolov, Valery A., 4,186,590, Cl. 73-23.000.
Simons, Craig W., to Amerace Corporation. Snap-lock terminator mounting bracket assembly. 4,186,902, Cl. 248-73.000.
Simpson, George W., Jr., to General Motors Corporation. Photoresist stripper with dodecylsulfonic acid and chlorinated solvents. 4,187,191, Cl. 252-143.000.
Simpson, Loran R.: *See—*
Laube, David E.; and Simpson, Loran R., 4,186,483, Cl. 29-630.00B.
Singer Company, The: *See—*
Zoltan, Bart J., 4,187,422, Cl. 250-203.00R.
Singer Company, The: *See—*
Vartoukian, Artin G., 4,186,673, Cl. 112-121.150.
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., to Bell Telephone Laboratories, Incorporated. Structure for solid state switch. 4,187,530, Cl. 361-433.000.
Sinnema, Hendrik, to Machinefabriek W. Hubert & Co. B.V. Method of manufacturing molded articles from a kneadable material, e.g., clay. 4,187,268, Cl. 264-151.000.
Siozaki, Fumio: *See—*
Matsunaga, Shoichi; Siozaki, Fumio; and Aiba, Masahiko, 4,187,512, Cl. 346-140.00R.
Sivachenko, Eugene W. High strength corrugated metal plate and method of fabricating same. 4,186,541, Cl. 52-630.000.
Sjoblom, Rolf: *See—*
Johannisson, Tom; Nilsson, Kai; Sjoblom, Rolf; and Widell, Marja, 4,186,582, Cl. 72-60.000.
Skeist, Merrill S.: *See—*
Gross, Leo; and Skeist, Merrill S., 4,187,446, Cl. 315-58.000.
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., to Institut Kibernetiki Akademii Nauk Ukrainskoi SSR. Digital analyzer for determining liquidus temperature of metals and alloys. 4,187,541, Cl. 364-497.000.
Slacter, Alan W. Fish lure holder. 4,186,511, Cl. 43-57.50R.
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., to Ukrainsky Nauchno; and Nauchno Proizvodstvennoe. Process and apparatus for horizontal continuous casting of metal. 4,186,791, Cl. 164-66.000.
Slama, Francis J., to Standard Oil Company (Indiana). Vinyl aromatic polymerization process. 4,187,261, Cl. 525-243.000.
Slater, Norbert G.; and Dexter, Martin, to Ciba-Geigy Corporation. Amides of 2,4,6-trialkyl-3-hydroxyphenylalkanoic acids. 4,187,246, Cl. 260-559.00R.
Smetanjuk, Vladimir I.: *See—*
Kabanov, Viktor A.; Martynova, Marina A.; Pluzhnov, Stanislav K.; and Smetanjuk, Vladimir I., 4,187,197, Cl. 252-431.00P.
Smith, Edwin S.: *See—*
Marshall, Richard A.; Smith, Edwin S.; and Cich, Frank A., 4,187,363, Cl. 526-208.000.
Smith, Stanley M.: *See—*
Ehrhardt, Henry B., 4,187,423, Cl. 250-312.000.
SmithKline Corporation: *See—*
Buckley, Thomas F.; and Gleason, John G., 4,187,375, Cl. 544-92.000.
Holden, Kenneth G.; and Yim, Nelson C., 4,187,314, Cl. 424-282.000.
Smiths Industries Limited: *See—*
Morley, Colin A.; Thomas, Richard N.; and Kollar, Bela, 4,187,505, Cl. 340-753.000.
Snezhnoi, Rostislav L.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.
Snodgrass, Bert L. Non-weight fishing bait caster. 4,186,907, Cl. 249-94.000.
Snow, John P., to Eaton Corporation. Rotatable hose or tube coupling. 4,186,946, Cl. 285-94.000.
Snyder, David E., to U.S. Industries, Inc. Flow line control system. 4,186,766, Cl. 137-458.000.
Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick E.; and Camborde, Jean-Marc A., 4,187,415, Cl. 179-175.30F.
S.A. Etablissements Francois Salomon & Fils: *See—*
Salomon, Georges P. J., 4,186,501, Cl. 36-121.000.
Societe Anonyme Francaise du Ferodo: *See—*
Renaud, Pierre J., 4,186,828, Cl. 192-98.000.
Societe Chimique des Charbonnages - CdF Chimie: *See—*
Bujadoux, Karel; Neyer, Jean-Marie; and Houzeaux, Jean-Pierre, 4,187,254, Cl. 260-665.00G.
Societe Nationale Elf Aquitaine (Production): *See—*
Peruchon Edouard; and Rabischong, Pierre, 4,186,494, Cl. 33-178.00E.
Soderstrom, Melvin A.: *See—*
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; and Vachhani, Vasantrai A., 4,186,984, Cl. 339-103.00R.
Sodeyama, Chuichi: *See—*
Shinkawa, Keiro; Shoyama, Hiroji; and Sodeyama, Chuichi, 4,187,476, Cl. 331-117.00D.
Sokolov, Valery A.: *See—*
Egorov, Alexandr F.; Ryzhnev, Vadim J.; Simonovsky, Dmitry K.; and Sokolov, Valery A., 4,186,590, Cl. 73-23.000.
Sola Basic Industries, Inc.: *See—*
Foote, George A.; Lindamood, Mason M.; and Fulcomer, Robert D., 4,187,389, Cl. 174-73.00R.
Solar Shelter Engineering Inc.: *See—*
Schmauder, Robert W., Sr.; and Schmauder, Robert W., Jr., 4,186,720, Cl. 126-445.000.
Solid Photography Inc.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, 4,187,011, Cl. 353-122.000.
Solvang, Egil S.: *See—*
Ottersen, Odd; Solvang, Egil S.; and Rosjo, Endre, 4,186,764, Cl. 137-414.000.
Solyanichenko, Nikolai A.: *See—*
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.
Sommer, Frederick A. Tamper preventing lock. 4,186,578, Cl. 70-419.000.
Southey, Robert G., to Eaton Corporation. Arthritic golf club grip. 4,186,924, Cl. 273-81.400.
Spangler, Searle T. Control circuit for automatically monitoring, dispensing, and filling a liquid in a container. 4,186,849, Cl. 222-25.000.
Spanke, Edwin A., to Gulf & Western Manufacturing Company. Fluid operated clutch and brake. 4,186,827, Cl. 192-18.00A.
Spaziante, Placido M.: *See—*
de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, 4,187,155, Cl. 204-67.000.
Spector, George: *See—*
Machado, Manuel; and Spector, George, 4,186,546, Cl. 56-202.000.
Spellman, Gordon B., to Eaton Corporation. Solid state current limiter. 4,187,513, Cl. 357-1.000.
Spencer, Donald L., to University of Iowa Research Foundation, The. Apparatus and method for collecting solar energy. 4,186,726, Cl. 126-444.000.
Spengler, Adolf: *See—*
Eirich, Hubert; Eirich, Walter; Eirich, Paul; Hasenhundl, Josef; and Spengler, Adolf, 4,186,592, Cl. 73-73.000.

Sperry Rand Corporation: *See—*
Crane, Patrick E.; Lazarchik, Robert E.; and Schaufelberger, Arthur H., deceased, 4,187,507, Cl. 343-754.000.
Todd, Robert R., 4,186,753, Cl. 130-27.00T.
Spivack, John D.; and Dexter, Martin, to Ciba-Geigy Corporation. Amides of 2,4,6-trialkyl-3-hydroxyphenylalkanoic acids. 4,187,246, Cl. 260-559.00R.
Sprague, Peter W., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane compounds. 4,187,236, Cl. 260-346.220.
Squifflet, Edmond C., Sr., to Boeing Construction Equipment Company. System and apparatus for erecting a portable silo and elevator structure. 4,187,047, Cl. 414-332.000.
Stacey, Gilbert J.: *See—*
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,187,310, Cl. 424-258.000.
Stager, Phyllis H. Disposable cosmetic glove. 4,186,445, Cl. 2-164.000.
Stahl, Kurt-Wilhelm. Column for high pressure liquid chromatography. 4,187,177, Cl. 210-198.00C.
Stahl-Urban Company: *See—*
Conner, William R., Jr., 4,186,674, Cl. 112-153.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Bearing for the spinning rotor of an open-end spinning assembly. 4,186,548, Cl. 57-58.890.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,186,548, Cl. 57-58.890.
Stake Technology Ltd.: *See—*
Brown, Douglas B., 4,186,658, Cl. 100-148.000.
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., to Taganrogsky Radiotekhnichesky Institut, USSR, Taganrog; and Vinnitsky Politekhnichesky Institut, USSR, Vinnitsa. Method and device for reduction of Fibonacci p-codes to minimal form. 4,187,500, Cl. 340-347.0DD.
Stamm, Russell D.: *See—*
Welch, Robert F.; and Stamm, Russell D., 4,186,612, Cl. 74-10.800.
Standard Oil Company (Indiana): *See—*
Slama, Francis J., 4,187,261, Cl. 525-243.000.
Standard Sichtgerate GmbH: *See—*
Brandel, Kurt, 4,186,505, Cl. 40-360.000.
Stanek, Petr: *See—*
Dolezal, Ladislav; Weiss, Frantisek; Stanek, Petr; and Lorenc, Miroslav, 4,186,610, Cl. 73-805.000.
Stanley-Mabo: *See—*
Quenot, Michel C. A., 4,186,490, Cl. 33-139.000.
Stanonis, David J.; King, Walter D.; and Coll, Emory E., to United States of America, Agriculture. Method and apparatus for verifying declared contents of contents of certain solids. 4,186,608, Cl. 73-437.000.
Stark, Anselm, to Siemens Aktiengesellschaft. Telephone and data network for mobile subscribers. 4,187,398, Cl. 179-2.0EB.
Starkweather, John H.: *See—*
Landis, Delmer H., Jr.; Lozier, Paul W.; Lievestro, Louis; Auxier, Thomas A.; and Starkweather, John H., 4,187,054, Cl. 415-115.000.
State of Israel, Ministry of Agriculture, The: *See—*
Alper, Yekutiel; and Margolin, Amikam, 4,186,520, Cl. 47-1.00R.
Stauffer Chemical Company: *See—*
Goswami, Jagadish C.; and Yu, Arthur J., 4,187,159, Cl. 204-159.170.
Stauter, John C., to UOP Inc. Hydrometallurgical recovery of cobalt and nickel. 4,187,281, Cl. 423-150.000.
Steel, Robert R.: *See—*
Nickerson, James H. D.; and Steel, Robert R., 4,186,799, Cl. 165-176.000.
Stehle, Heinz, to Kraftwerk Union Aktiengesellschaft. Method and apparatus for isotope concentration. 4,187,157, Cl. 204-157.10R.
Steiger, Fred H., to Personal Products Company. Perfuming self-adhering napkins. 4,186,743, Cl. 128-284.000.
Steinberger, Rolf: *See—*
Sander, Bruno; Scherling, Kurt; Steinberger, Rolf; and Ropte, Eckhard, 4,187,143, Cl. 162-157.00R.
Steinhilber, Wilhelm A., to Orion Machinery and Engineering Corporation. Wire accumulator tower. 4,186,861, Cl. 226-118.000.
Steinke, Leo; and Weyl, Helmut, to Robert Bosch GmbH. Electrochemical exhaust gas oxygen sensor construction. 4,187,163, Cl. 204-195.00S.
Stella, Joseph A., to Polaroid Corporation. Slide valve displacing arrangement for multipurpose cassette. 4,187,009, Cl. 352-130.000.
Stephenson, Richard. Macrame loom. 4,186,951, Cl. 289-16.500.
Stepniak, Frank M.; and Kominiak, Andrew A., to Amerace Corporation. Electrical connector. 4,186,985, Cl. 339-111.000.
Sterling Drug Inc.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,187,223, Cl. 260-343.30R.
Stern, Howard K.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, 4,187,011, Cl. 353-122.000.
Stetsko, Viktor N.: *See—*
Kornilov, Anatoly A.; Petrushkin, Viktor D.; Stetsko, Viktor N.; and Fridman, Viktor M., 4,187,181, Cl. 210-332.000.
Stevenson, James S.; and Rodriques, John J., to Terminator Products, Inc. Closed system quick coupling head assembly. 4,186,759, Cl. 137-240.000.
Stewart, George W., Jr., to Ford Motor Company. Controlled beam projector. 4,186,899, Cl. 244-3.130.
Stewart-Naumann Laboratories, Inc.: *See—*
Xanthopoulos, Piritheous, 4,187,057, Cl. 417-63.000.
Stinnett, Arvil L. Portable duck blind. 4,186,507, Cl. 43-1.000.
Stoian, Liviu, to Motorola, Inc. Low leakage integrator for carburetor control. 4,186,700, Cl. 123-119.0EE.
Stoller, Frederick L., to Phillips Petroleum Company. Apparatus useful in control of edge uniformity in nonwoven fabrics. 4,186,470, Cl. 28-112.000.
Stoltman, Donald D.: *See—*
Haka, Raymond J.; and Stoltman, Donald D., 4,186,703, Cl. 123-119.00A.
Stone, John T., to Atlantic Container Corporation. Tool table construction. 4,186,784, Cl. 144-253.00J.
Storz, Ralph H.: *See—*
Bjorklund, Gary C.; and Storz, Ralph H., 4,187,027, Cl. 356-400.000.
Stout, Virgil L.; and Anderson, John M., to General Electric Company. Electrodeless fluorescent lamp with reduced spurious electromagnetic radiation. 4,187,447, Cl. 315-85.000.
Stratis, Melvin A. Method of preforming a one-piece wall covering. 4,187,273, Cl. 264-322.000.
Stratton, John M. Inflatable seat unit. 4,186,734, Cl. 128-33.000.
Stricker, Alfred A.: *See—*
Ficker, Walter W.; Lonser, David E.; Rance, William G.; Stricker, Alfred A.; and von Kaenel, Walter, 4,186,918, Cl. 271-232.000.
Strobel, Wolfgang: *See—*
Bachschmid, Reiner; Gross, Gerlinde; and Strobel, Wolfgang, 4,186,704, Cl. 123-122.0AA.
Stroebel, Gary J.: *See—*
Knappe, LaVerne F.; Peterson, Roger H.; and Stroebel, Gary J., 4,187,452, Cl. 318-128.000.
Strupinsky, Vladimir A.: *See—*
Pavlikov, Rudolf Z.; Shorygina, Natalya V.; Strupinsky, Vladimir A.; Kruglikov, Anatoly A.; Farbshtein, Jury G.; and Klipinitser, Iosif L., 4,187,369, Cl. 528-137.000.
Sudo, Takeshi: *See—*
Shimizu, Yoshiyuki; and Sudo, Takeshi, 4,186,993, Cl. 350-91.000.
Sugawara, Hiroshi: *See—*
Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, 4,187,358, Cl. 525-132.000.
Sugawara, Shungo: *See—*
Hatano, Yoshio; Nonogaki, Saburo; Horigome, Shinkichi; and Sugawara, Shungo, 4,187,205, Cl. 260-30.40A.
Sugaya, Takao: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,186,675, Cl. 112-158.00D.
Sugioka, Shuji: *See—*
Machii, Tetsuo; and Sugioka, Shuji, 4,187,515, Cl. 357-39.000.
Sukornick, Bernard: *See—*
Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., 4,187,386, Cl. 585-367.000.
Sulzer Brothers Limited: *See—*
Emhardt, Roland; and Wachter, Erich, 4,186,932, Cl. 277-207.00A.
Sumitomo Chemical Company: *See—*
Kondo, Masatsune; and Tanoue, Akira, 4,187,202, Cl. 260-4.00R.
Summit Packaging Systems, Inc.: *See—*
White, Barry F., 4,186,853, Cl. 222-182.000.
Sunbeam Corporation: *See—*
Ernster, Peter J.; Canamero, Ernest; and Cockroft, James B., 4,187,412, Cl. 219-441.000.
Sundstrom, John A., to White Consolidated Industries, Inc. Fabric softener dispenser for vertical agitator. 4,186,574, Cl. 68-17.00A.
Sundstrom, Nils E., to AB Westin & Backlund. Regulators. 4,186,649, Cl. 91-170.00R.
Suntech, Inc.: *See—*
Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,187,252, Cl. 260-653.000.
Sutliff, Wayne N.; and Downen, Jim L. Optional up-blow, down-blow jar tool. 4,186,807, Cl. 175-302.000.
Sutton, Robert A., to Caterpillar Tractor Co. Equalizer bar support assembly. 4,186,812, Cl. 180-9.500.
Suzuki, Masaaki; Suzuki, Osamu; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording tape. 4,187,341, Cl. 428-213.000.
Suzuki, Osamu: *See—*
Suzuki, Masaaki; Suzuki, Osamu; and Akashi, Goro, 4,187,341, Cl. 428-213.000.
Suzuki, Suzuo; Hata, Yoshitaka; and Ohnishi, Akihiro, to Nissan Motor Company Limited. Feedback control of exhaust gas recirculation based on combustion condition. 4,186,701, Cl. 123-119.00A.
Svub, Veroslav; Burian, Milan; Uruba, Vladimir; and Figalla, Zdenek, to GALA, narodni podnik. Process for making a game ball. 4,187,134, Cl. 156-170.000.
Swain, Richard S.; and Moore, Douglas R., to Norlin Industries, Inc. Tone generating system for electronic musical instrument. 4,186,637, Cl. 84-1.010.
Swann, Brian P.: *See—*
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,187,232, Cl. 549-69.000.
Swanson, Raymond. Easy opening trash bin lid. 4,186,844, Cl. 220-333.000.
Sweeney, Richard F.: *See—*
Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., 4,187,386, Cl. 585-367.000.

Swift, Harold E.: *See—*
Madgavkar, Ajay M.; Vogel, Roger F.; and Swift, Harold E., 4,186,801, Cl. 166-256.000.

Syntex (U.S.A.) Inc.: *See—*
Edwards, John A., 4,187,301, Cl. 424-241.000.

Szczepanski, Harry. Atomizing liquid dispenser. 4,186,882, Cl. 239-327.000.

Szentivanyi, Matyas: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.

Szor, Peter: *See—*
Bartha, Zoltan; Szor, Peter; and Haraszti, Jozsef, 4,186,949, Cl. 285-226.000.

Tabata, Yasuhiro: *See—*
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,187,024, Cl. 355-14.00R.

Tabel, Rene. System for the pyrolytic combustion of ligneous and other wastes. 4,186,668, Cl. 110-213.000.

Tadanier, John S.; and Martin, Jerry R., to Abbott Laboratories. 2-N-acyl and alkyl 6-epi-fortimicin B and derivatives. 4,187,296, Cl. 424-180.000.

Tadanier, John S.: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,187,297, Cl. 424-180.000.
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,187,298, Cl. 424-180.000.

Taft, Keith G.: *See—*
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., 4,187,516, Cl. 357-60.000.

Taganrogsky Radiotekhnichesky Institut, USSR, Taganrog: *See—*
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.

Taig, Alistair G., to Bendix Westinghouse Limited. Hydraulic power-assisted actuating arrangements. 4,186,651, Cl. 91-375.00R.

Taig, Alistair G., to Bendix Corporation, The. Hydraulic control device. 4,186,774, Cl. 137-625.230.

Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. New O-(3-amino-2-hydroxy-propyl)-amidoxime derivatives, process for the preparation thereof and pharmaceutical compositions containing same. 4,187,220, Cl. 260-239.00B.

Takahashi, Hideaki; and Takeuchi, Takashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Oxygen concentration detecting element and method of producing the same. 4,187,486, Cl. 338-34.000.

Takahashi, Hideki: *See—*
Shimizu, Hirozumi; Igarashi, Taizo; Ishizaki, Takaharu; Koma, Toshio; and Takahashi, Hideki, 4,187,078, Cl. 44-51.000.

Takamura, Masayuki; Shinoda, Norio; Kurahashi, Kazuo; and Hatae, Masataka, to Nippon Gakki Seizo Kabushiki Kaisha. Billet and process for producing a tubular body by forced plastic deformation. 4,186,586, Cl. 72-264.000.

Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,186,515, Cl. 46-22.000.

Takasaki, Yoshitaka: *See—*
Ishizuka, Kohei; Takasaki, Yoshitaka; Kita, Yasuhiro; Nagoya, Yoshinori; and Kusama, Takeo, 4,187,479, Cl. 333-28.00R.

Takase, Sadao; and Asano, Masaharu, to Nissan Motor Company, Limited. Delayed response disabling circuit for closed loop controlled internal combustion engines. 4,186,691, Cl. 123-32.0EL.

Takayama, Satoru: *See—*
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Takayama, Satoru, 4,187,345, Cl. 428-337.000.

Takeda Chemical Industries, Ltd.: *See—*
Higashide, Eiji; Asai, Mitsuko; and Hasegawa, Toru, 4,187,292, Cl. 424-122.000.
Oyagi, Kenzi, 4,186,542, Cl. 53-88.000.

Takemoto, Nagaaki; Sakurai, Teruo; Mashiko, Kimio; and Tomari, Harumatsu, to Japan Tobacco & Salt Public Corporation, The. Method of processing smoking composition. 4,186,756, Cl. 131-140.00C.

Takeuchi, Takashi: *See—*
Takahashi, Hideaki; and Takeuchi, Takashi, 4,187,486, Cl. 338-34.000.

Takimoto, Sadaharu: *See—*
Monden, Souhei; and Takimoto, Sadaharu, 4,186,567, Cl. 63-14.00R.

Tamietto, Teresio: *See—*
Franzone, Jose S.; and Tamietto, Teresio, 4,187,308, Cl. 424-253.000.

Tamura, Junji: *See—*
Ishimaru, Yasuo; Kobayashi, Hiroshi; and Tamura, Junji, 4,186,864, Cl. 228-226.000.

Tamura, Kohji: *See—*
Noguchi, Takaharu; Ketori, Takao; Tamura, Kohji; Oi, Tetsu; and Miyoshi, Yutaka, 4,186,481, Cl. 29-603.000.

Tan, Aujit: *See—*
Fencl, Vernon R.; and Tan, Aujit, 4,187,406, Cl. 219-59.100.

Tanaka, Akio, to Zenith Radio Corporation. Limited channel television receiver with organized memory. 4,187,469, Cl. 325-464.000.

Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, to Fujisawa Pharmaceutical Co., Ltd. 7-(β-Aminoacylamino)-3-substituted-3-cephem-4-carboxylic acid derivatives and preparation thereof. 4,187,374, Cl. 544-28.000.

Tanaka, Minoru, to Hanazono Kogu Kabushiki Kaisha. Cutting hand tool. 4,186,484, Cl. 30-92.000.

Tanaka, Mitsugu: *See—*
Yagihara, Morio; Tanaka, Mitsugu; Hirose, Takeshi; and Aono, Toshiaki, 4,187,110, Cl. 430-544.000.

Tanaka, Ryuzo: *See—*
Ishigaki, Hisao; Tanaka, Ryuzo; and Nakamima, Koichi, 4,186,552, Cl. 58-88.00W.

Tanji, Akinori: *See—*
Akiyama, Takashi; Tanji, Akinori; and Asano, Seiichi, 4,187,343, Cl. 428-288.000.

Tanoue, Akira: *See—*
Kondo, Masatsune; and Tanoue, Akira, 4,187,202, Cl. 260-4.00R.

Tao, Lung-jo: *See—*
Ahn, Kie Y.; Cohen, Mitchell S.; Powers, John V.; and Tao, Lung-jo, 4,187,553, Cl. 365-8.000.

Tarcza, Walter H.: *See—*
Lu, Kun-Er; and Tarcza, Walter H., 4,187,094, Cl. 65-30.00R.

Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, to Konishiroku Photo Industry Co., Ltd. Apparatus for measuring temperature. 4,186,606, Cl. 73-351.000.

Tate, Masahisa: *See—*
Yamada, Takeo; Ando, Seigo; Miyashita, Yoshio; Murakami, Katsuhiko; Tate, Masahisa; and Mizui, Kiyoshi, 4,186,792, Cl. 164-150.000.

Tatematsu, Shunji. Foldable hanger. 4,186,858, Cl. 223-94.000.

Taurus Gumiipari Vallalat: *See—*
Bartha, Zoltan; Szor, Peter; and Haraszti, Jozsef, 4,186,949, Cl. 285-226.000.

Taylor, Reginald S., to Taylor Woodrow Construction Limited. Equipment for extracting oil or gas from under the sea bed and method of installing such equipment. 4,187,038, Cl. 405-204.000.

Taylor Woodrow Construction Limited: *See—*
Taylor, Reginald S., 4,187,038, Cl. 405-204.000.

Telecommunications Radioelectriques et Telephoniques TRT: *See—*
Ferrieu, Gilbert M. M., 4,187,400, Cl. 179-15.0AA.

Telkes, Maria, to American Technological University. Phase change thermal storage materials with crust forming stabilizers. 4,187,189, Cl. 252-70.000.

Tenmyo, Shigemoto: *See—*
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,186,991, Cl. 350-6.910.

Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M. Automatic line for coated metal mould casting. 4,186,793, Cl. 164-158.000.

Terminator Products, Inc.: *See—*
Stevenson, James S.; and Rodriques, John J., 4,186,759, Cl. 137-240.000.

Tesa, S.A.: *See—*
Gattesco, Giovanni, 4,186,492, Cl. 33-147.00T.

Teske, Lothar. Gate for storage-tank outlet. 4,186,854, Cl. 222-185.000.

Testut Aequitas: *See—*
Dauge, Gilbert V.; and Langlais, Jacques F., 4,187,460, Cl. 324-60.0CD.

Texaco Development Corporation: *See—*
Park, Jack H.; and Hunter, Walter D., 4,187,185, Cl. 252-8.55D.
Waddill, Harold G., 4,187,367, Cl. 528-94.000.

Texaco Inc.: *See—*
Allen, Joseph C., 4,186,800, Cl. 166-256.000.
Brown, Winthrop, 4,186,597, Cl. 73-136.00A.
Schievelbein, Vernon H., 4,187,073, Cl. 252-8.55D.

Texas Brine Corporation: *See—*
Mondshine, Thomas C., 4,186,803, Cl. 166-292.000.

Texas Instruments Incorporated: *See—*
Cochran, Michael J., 4,187,473, Cl. 331-8.000.
Patterson, John D., 4,187,493, Cl. 367-135.000.

Textron, Inc.: *See—*
Lawrence, Charles T., 4,186,467, Cl. 24-205.16R.

Thebaud, Sacha. Foldable chair. 4,186,959, Cl. 297-16.000.

Theiling, Louis F., Jr.: *See—*
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,187,382, Cl. 560-185.000.
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,187,383, Cl. 560-224.000.

Theurer, Josef; and Fulser, Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast excavating chain arrangement. 4,186,804, Cl. 171-16.000.

Thien, Gerhard; and Fachbach, Heinz, to List, Hans. Water-cooled internal combustion engine for motor vehicles, particularly a diesel engine. 4,186,693, Cl. 123-41.120.

Thiery, Joachim: *See—*
Haker, Rolf; Schrader, Klaus; and Thiery, Joachim, 4,187,462, Cl. 324-204.000.

Thomas C. Wilson, Inc.: *See—*
Schott, Donald E., 4,186,584, Cl. 72-122.000.

Thomas International Corporation: *See—*
Roberts, Patrick S., 4,186,636, Cl. 84-1.010.

Thomas, Richard N.: *See—*
Morley, Colin A.; Thomas, Richard N.; and Kollar, Bela, 4,187,505, Cl. 340-753.000.

Thompson, Carroll R., to NDT Systems, Inc. Pipe inspection systems. 4,187,425, Cl. 250-358.00P.

Thomson-CSF: *See—*
Deman, Pierre; and d'Auria, Luigi, 4,187,404, Cl. 179-100.00R.
Roziere, Guy, 4,187,002, Cl. 350-314.000.

Thomson, Eugene F., to Whirlpool Corporation. Tilt down receptacle for refrigerator door. 4,186,978, Cl. 312-138.00A.

Thornton, John N.: *See—*
Thwaites, Peter J.; and Thornton, John N., 4,187,138, Cl. 156-512.000.

Thwaites, Peter J.; and Thornton, John N., to Dufaylite Developments Ltd. Slicing web material. 4,187,138, Cl. 156-512.000.

Tichenor, Clyde L.; and LeVasseur, Craig, to Berkey-Colortran, Inc. Universal lens mounting for selective spotlight beam spread. 4,187,534, Cl. 362-268.000.

Tiefert, Karl H.: *See—*
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., 4,187,516, Cl. 357-60.000.

Tinker, Inc.: *See—*
Hunt, C. D., Jr., 4,186,928, Cl. 273-244.000.

Toda, Yoshihiko: *See—*
Nagura, Yukihiro; and Toda, Yoshihiko, 4,187,525, Cl. 361-42.000.

Todd, Robert R., to Sperry Rand Corporation. Material flow retarders. 4,186,753, Cl. 130-27.00T.

Tokico Ltd.: *See—*
Ito, Yoshimasa; and Ikeda, Junichi, 4,187,454, Cl. 318-568.000.

Tokyo Juki Kogyo Kabushiki Kaisha: *See—*
Kondo, Shigeki, 4,186,469, Cl. 26-19.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Kato, Yasuo; and Nunokawa, Kazuo, 4,187,014, Cl. 354-62.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Nagura, Yukihiro; and Toda, Yoshihiko, 4,187,525, Cl. 361-42.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,477, Cl. 333-14.000.
Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,187,478, Cl. 333-14.000.
Iinuma, Kazuhiro, 4,186,747, Cl. 128-660.000.
Machii, Tetsuo; and Sugioka, Shuji, 4,187,515, Cl. 357-39.000.
Tomisawa, Yutaka; and Mitani, Tatsuro, 4,187,514, Cl. 357-22.000.

Tolbert, William R.; and Feder, Joseph, to Monsanto Company. Cell culture sampling system. 4,187,149, Cl. 195-104.000.

Toledo-Pereyra, Luis H., to Henry Ford Hospital. Perfusion system for organ preservation. 4,186,565, Cl. 62-306.000.

Tomari, Harumatsu: *See—*
Takemoto, Nagaaki; Sakurai, Teruo; Mashiko, Kimio; and Tomari, Harumatsu, 4,186,756, Cl. 131-140.00C.

Tomashek, James R.: *See—*
Heffernan, James P.; Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,187,546, Cl. 364-565.000.

Tomikawa, Ryoichi: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; and Matsumoto, Yasuhiro, 4,187,133, Cl. 156-166.000.

Tomisawa, Yutaka; and Mitani, Tatsuro, to Tokyo Shibaura Electric Co., Ltd. Junction type field effect transistor. 4,187,514, Cl. 357-22.000.

Tomita, Chuji; and Abe, Hiroshi, to Hitachi Medical Corporation. Scanning apparatus for cross-sectional inspection equipment. 4,187,429, Cl. 250-445.00T.

Tomlinson, Walter J., III: *See—*
Chandross, Edwin A.; and Tomlinson, Walter J., III, 4,187,111, Cl. 430-2.000.

Toppan Printing Co., Ltd.: *See—*
Homma, Kokichi, deceased; and Kameyama, Yoshio, 4,187,107, Cl. 430-252.000.

Tower, Stephen N.: *See—*
Braun, Howard E.; Dollard, Walter J.; and Tower, Stephen N., 4,187,147, Cl. 176-38.000.

Towgood, Dennis A.: *See—*
Friedericy, Johan A.; Moeller, Dale O.; and Towgood, Dennis A., 4,186,623, Cl. 74-572.000.

Townsend, John M.; and Valentine, Donald H., Jr., to Hoffman-La Roche Inc. Metal phosphine complex. 4,187,241, Cl. 260-438.100.

Toyobo Co., Ltd.: *See—*
Akiyama, Takashi; Tanji, Akinori; and Asano, Seiichi, 4,187,343, Cl. 428-288.000.
Etoh, Kuniomi; Nanpei, Masaru; and Miyagi, Morio, 4,187,112, Cl. 430-285.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hajime; and Oonuma, Kiyoshi, 4,186,557, Cl. 60-361.000.
Kuramochi, Koujiro, 4,186,627, Cl. 74-869.000.
Yasuda, Yushiro; and Bessho, Hironori, 4,186,697, Cl. 123-117.00A.

Tozen Sangyo Co., Ltd.: *See—*
Muroi, Sankichi, 4,186,775, Cl. 138-30.000.

Tracy, Gene A.: *See—*
Fessler, Herman S.; and Tracy, Gene A., 4,187,262, Cl. 261-50.00B.

Traubel, Harro; Dieterich, Dieter; and Heinze, Helga, to Bayer Aktiengesellschaft. Water-soluble cationic oligourethane resins and the use thereof for the treatment of pelts or leather. 4,187,074, Cl. 8-94.190.

Traut, Earl W. Bypass rotary gas expansion motor. 4,187,062, Cl. 418-61.00B.

Troncy, Robert: *See—*
Cerny, Jacqueline; and Troncy, Robert, 4,187,207, Cl. 260-37.00N.

TRW Inc.: *See—*
Zukowski, Leonard J., 4,187,033, Cl. 403-137.000.

Tsaizer, Gerbert G.: *See—*
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.

Tseluiko, Jury I.; Kutsykovich, Dorina B.; Shabelnikova, Ljudmila A.; Kholopov, Vladimir P.; Schekin, Nikolai G.; Gritsuk, Lev D.; and Katsenelenbogen, Leonid B. Tubular cooled members of metallurgical furnace. 4,186,798, Cl. 165-147.000.

Tsunekawa, Tokuichi: *See—*
Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, 4,187,019, Cl. 354-33.000.

Tucker, Archie J.: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,187,077, Cl. 422-63.000.

Tulipan, Peter A.: *See—*
Hilson, David G.; and Tulipan, Peter A., 4,187,201, Cl. 252-512.000.

Tunze, Norbert. Centrifugal pump. 4,187,053, Cl. 415-111.000.

Turbeville, Joseph E. Method and apparatus for pollutant spill control. 4,187,187, Cl. 252-62.540.

Turner, Carlton E.: *See—*
Elsohly, Mahmoud A.; and Turner, Carlton E., 4,187,076, Cl. 23-230.0PC.

Tutihasi, Simpei, to Xerox Corporation. Electrophotographic photoreceptor with composite interlayer and method of making. 4,187,104, Cl. 430-57.000.

Twin Disc, Incorporated: *See—*
Schneider, Raymond C.; and Pelligrino, Paul A., 4,186,829, Cl. 192-109.00F.

Tyree, Lewis, Jr. Cryogenic refrigeration for vehicles. 4,186,562, Cl. 62-62.000.

Tyree, Lewis, Jr. Steam cooking with direct contact CO_2 cooling. 4,187,325, Cl. 426-510.000.

Tyrol Shoe Co. Ltd.: *See—*
Salzman, Otto, 4,186,500, Cl. 36-117.000.

Tzakis, George J.: *See—*
Avicola, Richard; and Tzakis, George J., 4,187,537, Cl. 363-127.000.

Uchidoi, Masanori: *See—*
Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, 4,187,019, Cl. 354-33.000.

Uchiyama, Takashi; Nakamura, Zenzo; Tsunekawa, Tokuichi; Uchidoi, Masanori; Mashimo, Yukio; and Ohtaki, Shyohei, to Canon Kabushiki Kaisha. Flash light photographic systems. 4,187,019, Cl. 354-33.000.

Uchiyama, Yasuji: *See—*
Hiyoshi, Teruo; Nakada, Akira; Uchiyama, Yasuji; Yamaga, Eiichi; and Aoki, Eiichiro, 4,186,640, Cl. 84-1.030.

Ueda, Kiyoharu: *See—*
Shibuya, Teiji; Ishikawa, Yasuaki; Saito, Masayuki; and Ueda, Kiyoharu, 4,187,085, Cl. 55-4.000.

Ueno, Kenji: *See—*
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,186,606, Cl. 73-351.000.

Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, to Hitachi, Ltd. Method and apparatus for exposure of phosphor screen. 4,187,012, Cl. 354-1.000.

Ukrainsky Nauchno: *See—*
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; and Besedina, Eleonora B., 4,186,791, Cl. 164-66.000.

Ullman, Frederick E.: *See—*
Corey, Robert L.; and Ullman, Frederick E., 4,186,830, Cl. 193-35.00R.

Ulmer, Harry E.: *See—*
Lockyer, George D., Jr.; Burd, Dennis E.; Sweeney, Richard F.; Sukornick, Bernard; and Ulmer, Harry E., 4,187,386, Cl. 585-367.000.

Ulmer, Jamie F. Electromagnetic engine. 4,187,440, Cl. 310-24.000.

Unarco Industries, Inc.: *See—*
Corey, Robert L.; and Ullman, Frederick E., 4,186,830, Cl. 193-35.00R.

Underwood, Ronald. Adjustable bed support pedestal. 4,186,452, Cl. 5-58.000.

Unicorn Industries: *See—*
Kosup, Russell R., 4,187,482, Cl. 335-12.000.

Union Carbide Corporation: *See—*
Choulet, Richard J.; and Mehlman, Stewart K., 4,187,102, Cl. 75-60.000.
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,187,382, Cl. 560-185.000.
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,187,383, Cl. 560-224.000.
Heile, Robert F., 4,187,408, Cl. 219-121.0LM.
Kirkpatrick, George F., 4,186,786, Cl. 150-3.000.

Union Oil Company of California: *See—*
Whitescarver, Olin D., 4,187,087, Cl. 55-43.000.

Union Siderurgique de Nord et du l'est de la France: *See—*
Costes, Claude, 4,186,629, Cl. 81-53.00R.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Bryce, Graham W.; and Hunter, Joseph J., 4,187,411, Cl. 219-137.200.

United McGill Corporation: *See—*
Harmon, William M.; Holtzmeier, Lindell R.; and Yamamoto, Toshiaki, 4,186,539, Cl. 52-580.000.

U.S. Industries, Inc.: *See—*
Snyder, David E., 4,186,766, Cl. 137-458.000.
United States of America
Agriculture: *See—*
Stanonis, David J.; King, Walter D.; and Coll, Emory E., 4,186,608, Cl. 73-437.000.
Army: *See—*
Gladden, James W., 4,187,106, Cl. 430-1.000.
Kinnamon, Kenneth E., 4,187,300, Cl. 424-198.000.
Milberger, Walter E.; and Wright, Larry G., 4,187,458, Cl. 323-17.000.
Olesch, Reinhard G.; and Rittenbach, Otto E., 4,187,501, Cl. 340-554.000.
Powers, Edmund M., 4,187,351, Cl. 435-38.000.
Boston: *See—*
Buckley, Albert P.; and Dill, Melville R., Jr., 4,186,841, Cl. 220-6.000.
Energy: *See—*
Weil, Bradley S.; and Metz, Curtis F., III, 4,186,657, Cl. 100-39.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Clauss, Robert C.; and Quinn, Rex B. Dielectric-loaded waveguide circulator for cryogenically cooled and cascaded maser waveguide structures. 4,187,470, Cl. 330-4.000.
Dickinson, Richard M. Microwave power transmission beam safety system. 4,187,506, Cl. 343-100.00R.
National Aeronautics and Space Administration: *See—*
Caro, Edward R., 4,187,416, Cl. 200-153.00S.
Fryer, Thomas B., 4,186,749, Cl. 128-748.000.
Sievers, Michael W., 4,187,394, Cl. 178-58.00R.
Navy: *See—*
Anderson, William B.; and Markwald, David B., 4,187,488, Cl. 367-13.000.
Bond, James W.; and Dressel, Gary A., 4,187,549, Cl. 364-746.000.
Fabula, Andrew G.; Green, James H.; and Madison, William F., 4,186,679, Cl. 114-20.00R.
Gish, Oliver H., 4,186,681, Cl. 114-240.00R.
Goldberg, Leonard J., 4,187,290, Cl. 424-93.000.
Jones, Charles H., 4,187,556, Cl. 367-155.000.
Kuester, Donald W., 4,186,768, Cl. 137-516.250.
Lindstrum, Alan L.; and Chase, Jay V., 4,187,491, Cl. 367-125.000.
U.S. Philips Corporation: *See—*
Binder Kriegelstein, Wolfgang; and Berger, Erich, 4,186,480, Cl. 29-603.000.
Boekhorst, Antonius, 4,187,451, Cl. 315-381.000.
Brice, John C.; Hill, Owen F.; and Pratt, Ronald G., 4,187,139, Cl. 156-600.000.
Govaert, George A.; Nijholt, Meinardus A. G.; and Rodenburg, Lammert, 4,187,536, Cl. 363-21.000.
van Lotringen, Antonius L. M., 4,186,728, Cl. 128-1.00R.
United Technologies Corporation: *See—*
Bizzarro, Peter; and Warner, John L., 4,187,090, Cl. 55-269.000.
Cooper, Dean E., 4,186,622, Cl. 74-501.00R.
Healey, David M.; and Games, John E., 4,187,543, Cl. 364-505.000.
Martin, Anthony N., 4,187,455, Cl. 318-594.000.
Unitika Ltd.: *See—*
Kyo, Kayomon; Asai, Yasuhiko; Kato, Sadao; Ishikura, Tadashi; and Sugawara, Hiroshi, 4,187,358, Cl. 525-132.000.
Universal Security Instruments, Inc.: *See—*
Fish, Darrell D., 4,187,058, Cl. 417-234.000.
Kovens, Michael L.; and Hoge, Henry H., 4,187,496, Cl. 340-63.000.
University of Iowa Research Foundation, The: *See—*
Spencer, Donald L., 4,186,726, Cl. 126-444.000.
University of Mississippi, The: *See—*
Elsohly, Mahmoud A.; and Turner, Carlton E., 4,187,076, Cl. 23-230.0PC.
Uno, Shigeo: *See—*
Matsuda, Shimpei; Kato, Akira; Uno, Shigeo; and Nakajima, Fumito, 4,187,282, Cl. 423-244.000.
UOP Inc.: *See—*
Stauter, John C., 4,187,281, Cl. 423-150.000.
Upjohn Company, The: *See—*
Axen, Udo F., 4,187,224, Cl. 260-346.220.
Uruba, Vladimir: *See—*
Svub, Veroslav; Burian, Milan; Uruba, Vladimir; and Figalla, Zdenek, 4,187,134, Cl. 156-170.000.
USUI International Industry, Ltd.: *See—*
Usui, Masayoshi, 4,186,796, Cl. 165-105.000.
Usui, Masayoshi, to USUI International Industry, Ltd. Heat pipe element. 4,186,796, Cl. 165-105.000.
Vachhani, Vasantrai A.: *See—*
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; and Vachhani, Vasantrai A., 4,186,984, Cl. 339-103.00R.
Valenta, James D.; and Heruth, Kenneth T., to Airco, Inc. Drug nebulizing system for medical ventilators of the volume-limited type. 4,186,737, Cl. 128-203.280.
Valentine, Donald H., Jr.: *See—*
Townsend, John M.; and Valentine, Donald H., Jr., 4,187,241, Cl. 260-438.100.
VanDewoestine, Robert V.: *See—*
Coppola, Frank T.; Lentz, William P.; and VanDewoestine, Robert V., 4,186,723, Cl. 126-443.000.
Van Lith, Martin J.: *See—*
Burns, John E.; and Van Lith, Martin J., 4,186,453, Cl. 5-82.00R.
van Lotringen, Antonius L. M., to U.S. Philips Corporation. Apparatus for adapting a skull for the application of a pressure transducer. 4,186,728, Cl. 128-1.00R.
Van Peski, Christopher: *See—*
Woods, Leslie A.; and Van Peski, Christopher, 4,186,939, Cl. 280-477.000.
Van Uitert, LeGrand G.: *See—*
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,187,530, Cl. 361-433.000.
Van Veelen, George F.: *See—*
Kokelenberg, Hendrik E.; Sels, Francis J.; and Van Veelen, George F., 4,187,114, Cl. 430-510.000.
Varga, Paul, to Salisbury Special Tool. Precision workpiece positioning means for machine tools. 4,186,916, Cl. 269-303.000.
Varian Associates, Inc.: *See—*
Gerard, William A., 4,187,444, Cl. 315-39.710.
Varlamov, Gennady D.: *See—*
Bekbulatov, Ildgam A.; Mamatov, Juldash; Varlamov, Gennady D.; Madaliev, Shavkat; and Gaibov, Valery M., 4,187,368, Cl. 525-503.000.
Vartoukian, Artin G., to Singer Company, The. Material feed mechanism for sewing machines. 4,186,673, Cl. 112-121.150.
Vasilieva, Raisa V.: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased, 4,186,571, Cl. 68-5.00E.
Vassar, Clyde W., to W. James Kemerer, a part interest. Variable profile extrusion apparatus. 4,187,068, Cl. 425-381.000.
Verco Manufacturing, Inc.: *See—*
Morton, Virgil R., 4,186,535, Cl. 52-250.000.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin. Heavy-duty radial tire with ply of oblique elastic cords radially inward of the carcass. 4,186,789, Cl. 152-354.00R.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Gebetsroither, Wolfgang; and Zitz, Alfred, 4,186,971, Cl. 299-64.000.
Vernco Corporation: *See—*
Barnstead, John W., 4,187,055, Cl. 416-132.00A.
Verstegen, Brian P., to Durango Systems, Inc. Read only memory character generator system. 4,187,552, Cl. 364-900.000.
Vesel, Andrew M., to Cessna Aircraft Company, The. Analog control of pulse rates. 4,187,439, Cl. 307-271.000.
Vicesuinci, Louise V.: *See—*
Vigilante, Adele; and Vicesuinci, Louise V., 4,186,489, Cl. 33-2.00H.
Videon, S.A.: *See—*
Nissen, Alex; and Charles, Distel, 4,186,619, Cl. 74-414.000.
Vieau, William J., to FMC Corporation. Flexographic inking system including a reverse angle doctor blade. 4,186,661, Cl. 101-178.000.
Vigilante, Adele; and Vicesuinci, Louise V. Measuring, pressing and hemming device. 4,186,489, Cl. 33-2.00H.
Villa, Enrico; and Radice, Angelo, to Rockwell-Rimoldi, S.p.A. Apparatus for forming a chain of stitches on double needle sewing machines. 4,186,676, Cl. 112-165.000.
Vincent, David N.; and Chang, Cheng-Hsiung, to Champion International Corporation. Micro-capsules containing ureido fluoran chromogenic compounds. 4,187,193, Cl. 252-316.000.
Vinnitsky Politekhnichesky Institut, USSR, Vinnitsa: *See—*
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.
Virag, Sandor: *See—*
Takacs, Kalman; Literati, Peter N.; Kiss nee Ajzert, Ilona; Simay, Antal; Szentivanyi, Matyas; Virag, Sandor; and Farago, Katalin, 4,187,220, Cl. 260-239.00B.
Viscodynamics Corporation: *See—*
Braga, Luigi F., 4,186,852, Cl. 222-146.0HE.
Vishnyakov, Jury M.: *See—*
Stakhov, Alexei P.; Vishnyakov, Jury M.; Luzhetsky, Vladimir A.; Ovodenko, Alexandr V.; Solyanichenko, Nikolai A.; and Fomichev, Alexandr V., 4,187,500, Cl. 340-347.0DD.
Vitols, Visvaldis A.; and White, Stanley A., to Rockwell International Corporation. System for expanding the video contrast of an image. 4,187,519, Cl. 358-169.000.
Vockenhuber, Karl: *See—*
Keznickl, Eduard, 4,187,008, Cl. 352-108.000.
Vodrazka, Wolfgang: *See—*
Platz, Rolf; Fuchs, Werner; and Vodrazka, Wolfgang, 4,187,384, Cl. 568-618.000.
Voelkers, James D.: *See—*
Ball, Donald H.; and Voelkers, James D., 4,187,542, Cl. 364-502.000.
Vogel, Roger F.: *See—*
Madgavkar, Ajay M.; Vogel, Roger F.; and Swift, Harold E., 4,186,801, Cl. 166-256.000.
Vogel, Rolf: *See—*
Burghardt, Wilfried; Vogel, Rolf; and Zauser, Ludwig, 4,186,895, Cl. 242-107.40B.
Vogelsang, Charles J.: *See—*
Nielsen, Richard B.; and Vogelsang, Charles J., 4,187,174, Cl. 210-32.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Danckert, Hermann; Willmann, Michael; and Wundrak, Egon, 4,186,714, Cl. 123-195.00C.
Voltz, Sterling E.: *See—*
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., 4,187,548, Cl. 364-578.000.
von der Heide, Johann, to Papst-Motoren KG. Incremental positioning system. 4,187,456, Cl. 318-616.000.
von Kaenel, Walter: *See—*
Ficker, Walter W.; Lonser, David E.; Rance, William G.; Stricker, Alfred A.; and von Kaenel, Walter, 4,186,918, Cl. 271-232.000.
Voser, Othmar, to Kupferdraht-Isolierwerk Ag Wildegg. High frequency coaxial cable and method of producing same. 4,187,391, Cl. 174-106.00R.
Voss, Hans W.: *See—*
Reinmoller, Adolf; Voss, Hans W.; and Kluting, Bernd, 4,186,904, Cl. 248-395.000.
Vsesojuzny Nauchno-Issledovatelsky I Experimentalny Institut Po Pererabotke Khimicheskikh Volokon: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Zhmurov, Vyacheslav I.; Kozlov, Mikhail D.; Kuzmina, Vera I.; and Romanov, Nikolai T., deceased, 4,186,571, Cl. 68-5.00E.
Vsesojuzny Nauchno-Issledovatelsky, Proektno-Konstruktorsky i Tekhnologichesky Institut Elektrosvarochnogo Oborudova: *See—*
Eroshkin, Nikolai A.; Ivannikov, Alfred V.; Matveev, Vyacheslav N.; and Sergienko, Anatoly I., 4,187,410, Cl. 219-137.200.
Vuillemot, Daniel: *See—*
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Reijonen, Veli E., 4,187,148, Cl. 48-197.00R.
Vyzkumny ustav tvarecich stroju a technologie tvareni: *See—*
Kovar, Jan; Drkal, Jan; Zalesak, Jan; and Hladky, Vaclav, 4,186,583, Cl. 72-108.000.
Zalesak, Jan; and Kovar, Jan, 4,186,580, Cl. 72-14.000.
Vyzkumny ustav 070: *See—*
Dolezal, Ladislav; Weiss, Frantisek; Stanek, Petr; and Lorenc, Miroslav, 4,186,610, Cl. 73-805.000.
W. James Kemerer: *See—*
Vassar, Clyde W., 4,187,068, Cl. 425-381.000.
W. L. Gore & Associates, Inc.: *See—*
Gore, Robert W., 4,187,390, Cl. 174-102.00R.
Wachter, Erich: *See—*
Emhardt, Roland; and Wachter, Erich, 4,186,932, Cl. 277-207.00A.
Wada, Tomio: *See—*
Yano, Kohzo; Hishida, Tadanori; Inami, Yasuhiko; and Wada, Tomio, 4,187,004, Cl. 350-357.000.
Waddill, Harold G., to Texaco Development Corporation. Epoxy resins with improved adhesion and peel strength. 4,187,367, Cl. 528-94.000.
Wagenknecht, John H.: *See—*
Coleman, James P.; and Wagenknecht, John H., 4,187,156, Cl. 204-73.00R.
Wagner, Kuno, to Bayer Aktiengesellschaft. Process for lowering the viscosity of formose or mixtures of formose in mono- and/or di-saccharides, products produced thereby, and the use thereof in producing polyurethane resins. 4,187,354, Cl. 521-158.000.
Wagner, Kuno, to Bayer Aktiengesellschaft. Production of polyalkylene glycol ethers from formose and use thereof in the preparation of polyurethane resins. 4,187,355, Cl. 521-158.000.
Wagner, Kuno, to Bayer Aktiengesellschaft. Condensation of formaldehyde hydrate to form mixtures which, together with monomers capable of aminoplast formation are useful in the preparation of polyurethane foams. 4,187,356, Cl. 521-158.000.
Wagner, William T., to Dayco Corporation. Corrugated metal tube. 4,186,779, Cl. 138-121.000.
Waiamea Company, Inc.: *See—*
Donan, David C., Jr., 4,187,040, Cl. 405-259.000.
Wainer, Eugene; and Lewis, James M., to Horizons Research Incorporated. Photosensitive image forming composition containing at least one substituted bis-diaryl vinylidene compound and/or at least one substituted bis-diaryl imine compound. 4,187,105, Cl. 430-336.000.
Walden, Frank B. Mailbox attachment. 4,186,870, Cl. 232-35.000.
Walden, Jack M.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.
Wallace, John M.; and Pitner, Gerald A., to Frank Hamachek Machine Company. Article orientation determining apparatus. 4,187,545, Cl. 364-559.000.
Wallshein, Melvin. Orthodontic arch wire. 4,186,487, Cl. 433-20.000.
Wallshein, Melvin. Orthodontic bracket with multi-layer base. 4,186,488, Cl. 433-8.000.
Walmet, Gunnar E.; and Matson, Stephen L., to General Electric Company. Packaged membrane system and replenishment method. 4,187,086, Cl. 55-16.000.
Walter, John, to Continental Group, Inc., The. Base type dispenser for bottle-like container with collapsible dispensing and vent lines. 4,186,848, Cl. 222-23.000.
Walter, Karl, to Labortechnik M. R. Walter. Apparatus for transporting webs of photosensitive material. 4,187,022, Cl. 354-318.000.
Walton, Robert G. Sump alarm device. 4,187,503, Cl. 340-624.000.
Wang, Richard H. S.: *See—*
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,187,213, Cl. 252-402.000.
Wanlass, Cravens L. Polyphase electric motor having controlled magnetic flux density. 4,187,457, Cl. 318-729.000.
Ward, Donald H.: *See—*
Heffernan, James P.; Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,187,546, Cl. 364-565.000.
Ward, Gerald G., to International Harvester Company. Plow system. 4,186,806, Cl. 172-283.000.
Warkentin, James D.: *See—*
Rasheed, Khalid; and Warkentin, James D., 4,187,096, Cl. 71-90.000.
Warne, Michael A., to Marston Excelsior Limited. Anode. 4,187,164, Cl. 204-196.000.
Warner, John L.: *See—*
Bizzarro, Peter; and Warner, John L., 4,187,090, Cl. 55-269.000.
Warner-Lambert Company: *See—*
Butler, Donald E., 4,187,311, Cl. 424-263.000.
Butler, Donald E., 4,187,379, Cl. 546-288.000.
Koch, Edwin R.; Abbazia, Leonard P.; and Puglia, Wayne J., 4,187,320, Cl. 426-3.000.
Warner & Swasey Company, The: *See—*
Shawke, Jerome R., 4,186,491, Cl. 33-143.00L.
Warren, John, to Lucas Industries Limited. Electrical switch. 4,187,419, Cl. 200-308.000.
Wassmer, Norman B.; and Hodges, Joseph L., to Ore-Ida Foods, Inc. Differential reflectivity method and apparatus for sorting indiscriminately mixed items. 4,186,836, Cl. 209-565.000.
Waszak, Lawrence: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, 4,187,011, Cl. 353-122.000.
Watanabe, Junichi: *See—*
Koide, Hiroshi; Watanabe, Junichi; and Tenmyo, Shigemoto, 4,186,991, Cl. 350-6.910.
Watanabe, Sakuji, to Nippon Kogaku K.K. Motor drive device in a camera. 4,187,017, Cl. 354-173.000.
Watanabe, Yoshiharu: *See—*
Nakagawa, Koji; and Watanabe, Yoshiharu, 4,187,118, Cl. 106-89.000.
Watanabe, Youichi, to Kabushiki Kaisha Meidensha. Drive simulator operating method. 4,186,593, Cl. 73-117.000.
Watson, Robert E.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.
Wausau Metals Corporation: *See—*
Weber, Ronald J., 4,186,656, Cl. 98-99.00R.
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; and Wollenhaupt, Karl-Heinz, to Carl Still, Firma. Method for producing form coke. 4,187,079, Cl. 44-10.00C.
Weber, Ida, to B.M.C.-Brevets-Marques-Chaussures S.A. Sole with high heel for woman footwear, consisting of a plastic material monoblock having a rigid and a flexible part. 4,186,498, Cl. 36-32.00R.
Weber, Roland: *See—*
Hafke, Carl; Weber, Roland; and Kohlen, Rudolf, 4,187,080, Cl. 48-202.000.
Weber, Ronald J., to Wausau Metals Corporation. Thermal break ventilator unit. 4,186,656, Cl. 98-99.00R.
Wedlake, Roger J.; and Penny, Anthony L. Hard materials of BCN in tetrahedral form and method of making it. 4,187,083, Cl. 51-307.000.
Wegmann, Jerome B., to McNeill Corporation. Lubricating apparatus. 4,186,821, Cl. 184-7.00D.
Wehrmann, Nicholas; and Williams, Charlie L., to Ithaca Textiles, Inc. Method of making hosiery. 4,186,471, Cl. 28-154.000.
Weidemann, Dieter: *See—*
Lutze, Hans; Weidemann, Dieter; and Weisshappel, Helmut, 4,186,957, Cl. 296-188.000.
Weil, Bradley S.; and Metz, Curtis F., III, to United States of America, Energy. Apparatus for shearing spent nuclear fuel assemblies. 4,186,657, Cl. 100-39.000.
Weiner, Arnold, to Knogo Corporation. Wafer and fastener for use in electronic theft detection system. 4,187,509, Cl. 343-873.000.
Weiss, Frantisek: *See—*
Dolezal, Ladislav; Weiss, Frantisek; Stanek, Petr; and Lorenc, Miroslav, 4,186,610, Cl. 73-805.000.
Weisshappel, Helmut: *See—*
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Welboren, Joseph A.: *See—*
de Jong, Hendrikus; and Welboren, Joseph A., 4,186,665, Cl. 105-456.000.
Welch, Charlie R. Dump-truck tail gate spread chain release device. 4,186,958, Cl. 296-50.000.
Welch, Robert F.; and Stamm, Russell D., to General Instrument Corporation. Tuner driving mechanism permitting play in location of input member. 4,186,612, Cl. 74-10.800.
Welge, Frederick T.: *See—*
Redmore, Derek; and Welge, Frederick T., 4,187,245, Cl. 260-502.500.
Wellman, Russel E.; and Brown, Robert W., to Xerox Corporation. Encapsulation process. 4,187,194, Cl. 252-316.000.
Wenninger, Fred, Jr.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.

Wessling, Ritchie A.: *See*—
Pickelman, Dale M.; Foster, William A.; and Wessling, Ritchie A., 4,187,142, Cl. 162-146.000.
Westcott, Vernon C.; and Bowen, John P., to Foxboro/Trans-Sonics, Inc. Magnetic techniques for separating non-magnetic materials. 4,187,170, Cl. 209-1.000.
Western Gear Corporation: *See*—
Fessett, Donald J., 4,186,624, Cl. 74-679.000.
Westinghouse Electric Corp.: *See*—
Braun, Howard E.; Dollard, Walter J.; and Tower, Stephen N., 4,187,147, Cl. 176-38.000.
Evans, Gary E., 4,187,508, Cl. 343-770.000.
Hine, Louis P., 4,186,474, Cl. 29-157.30A.
Lange, Frederick F., 4,187,116, Cl. 106-44.000.
Mueller, Norman P.; and Mutafelija, Boris A., 4,187,144, Cl. 176-24.000.
Peterson, Charles A., 4,187,524, Cl. 361-16.000.
Shen, Ti-Ke; and Coombe, John R., 4,187,146, Cl. 176-37.000.
Weyl, Helmut: *See*—
Steinke, Leo; and Weyl, Helmut, 4,187,163, Cl. 204-195.00S.
Wheeler, Colin. Rotary machine. 4,187,064, Cl. 418-187.000.
Whirlpool Corporation: *See*—
Brenner, Robert A.; and Cuthbert, Victor W., 4,186,573, Cl. 68-12.00R.
Thomson, Eugene F., 4,186,978, Cl. 312-138.00A.
White, Barry F., to Summit Packaging Systems, Inc. Continuous aerosol device. 4,186,853, Cl. 222-182.000.
White Consolidated Industries, Inc.: *See*—
Sundstrom, John A., 4,186,574, Cl. 68-17.00A.
White, Jack D., Jr., to Dayco Corporation. Wheel wedge. 4,186,823, Cl. 188-32.000.
White, Ronald P.: *See*—
Ballard, Samuel S.; and White, Ronald P., 4,187,490, Cl. 367-121.000.
White, Stanley A.: *See*—
Vitols, Visvaldis A.; and White, Stanley A., 4,187,519, Cl. 358-169.000.
Whitescarver, Olin D., to Union Oil Company of California. Handling fluid discharged from a conduit at a high velocity. 4,187,087, Cl. 55-43.000.
Whitman, William C. Solar energy heat collector. 4,186,721, Cl. 126-430.000.
Whitney, C. David. Multi-throw magnetic reed switch. 4,187,483, Cl. 335-206.000.
Widell, Marja: *See*—
Johannisson, Tom; Nilsson, Kai; Sjoblom, Rolf; and Widell, Marja, 4,186,582, Cl. 72-60.000.
Wieder, Irwin, to Analytical Radiation Corp. Continuously variable laser output coupler. 4,187,475, Cl. 331-94.50S.
Wiegand, Karl E.; Kao, James T. F.; and Dagani, Michael J., to Ethyl Corporation. Preparation of 5-aroyl-pyrrole compounds. 4,187,230, Cl. 260-326.470.
Wigley, Patrick A.; Dana, Edwin L.; and Pletz, Alfred, Jr., to CPS, Inc. Voltage power supply. 4,187,535, Cl. 363-16.000.
Wilcox, Richard L.; and Conrad, Sherman E., to Delavan Manufacturing Company. By-pass nozzles. 4,186,877, Cl. 239-124.000.
Wilder, Gene R.: *See*—
Maender, Otto W.; and Wilder, Gene R., 4,187,249, Cl. 260-576.000.
Merten, Helmut L.; and Wilder, Gene R., 4,187,248, Cl. 260-576.000.
William H. Byler and Thelma Byler, Trustees of William H. Byler Revocable Trust: *See*—
Byler, William H., 4,186,746, Cl. 128-403.000.
William H. Rorer, Inc.: *See*—
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Williams, Charlie L.: *See*—
Wehrmann, Nicholas; and Williams, Charlie L., 4,186,471, Cl. 28-154.000.
Willis, Roland G., to Eastman Kodak Company. Heat developable material and process. 4,187,108, Cl. 430-203.000.
Willmann, Michael: *See*—
Danckert, Hermann; Willmann, Michael; and Wundrak, Egon, 4,186,714, Cl. 123-195.00C.
Willy, John R.: *See*—
Lapp, John; and Willy, John R., 4,187,327, Cl. 427-8.000.
Wilson, Marlin V.; Nickell, Lawrence C.; and Nickell, Larry C., to Appalachian Electronic Instruments, Inc. Yarn tension control apparatus of the ball and funnel type. 4,186,898, Cl. 242-152.100.
Winnan, Hewart W., to Dow Corning Limited. Colored organosiloxane elastomers with improved flame retardancy. 4,187,208, Cl. 260-37.0SB.
Wirz, Walter, to Fahrni, Peter, Dr. Method and apparatus for deflecting a stream of spreadable particles. 4,186,847, Cl. 222-1.000.
Wishart, John D. Split cycle internal combustion engines. 4,186,561, Cl. 60-620.000.
Witmore, Ronald K.: *See*—
Maxfield, Thomas G.; and Witmore, Ronald K., 4,187,399, Cl. 179-15.0BY.
Witzeman, John S.: *See*—
Serafino, James M.; Yadlowsky, Slawko; and Witzeman, John S., 4,187,326, Cl. 426-590.000.
Wolfendale, Peter C. F., to Automatic Systems Laboratories Limited. Digital measurement of impedance ratios. 4,187,459, Cl. 324-60.00C.
Wollenhaupt, Karl-Heinz: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; and Wollenhaupt, Karl-Heinz, 4,187,079, Cl. 44-10.00C.
Wollnik, Hermann. Coil arrangement for electromagnetically influencing magnetic fields, in particular for homogenizing magnetic dipoles. 4,187,485, Cl. 335-299.000.
Wolski, Adolph, to Ni-Tec, Inc. Method and apparatus for constructing electronic devices. 4,186,980, Cl. 316-19.000.
Wood, Donald C.: *See*—
McLaughlin, Robert L.; and Wood, Donald C., 4,187,190, Cl. 252-99.000.
Wood, Prentice J., to Mead Corporation, The. Means for preventing the disfigurement of bottle labels. 4,186,867, Cl. 229-40.000.
Woods, Leslie A.; and Van Peski, Christopher. Electro-mechanical docking apparatus and method. 4,186,939, Cl. 280-477.000.
Woolley, Ronald L., to Billings Energy Corporation. Method and apparatus for providing increased thermal conductivity and heat capacity to a pressure vessel containing a hydride-forming metal material. 4,187,092, Cl. 62-48.000.
Work, John T., to BJ-Hughes Inc. Deck-mounted shaft bushing. 4,186,973, Cl. 308-3.900.
Woythal, Gerald C., to Borg-Textile Corporation. Non-seizing closed loop film transport system. 4,186,892, Cl. 242-55.19R.
Wright, Ansel J.: *See*—
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Wright, James J.: *See*—
Kuhn, James O.; Wright, James J.; and Bollinger, Howard N., 4,186,517, Cl. 46-119.000.
Wright, Larry G.: *See*—
Milberger, Walter E.; and Wright, Larry G., 4,187,458, Cl. 323-17.000.
Wright, William H.: *See*—
Rogers, Ronald A.; Wright, Ansel J.; and Wright, William H., 4,186,659, Cl. 101-47.000.
Wrightson, John M., to Aerojet-General Corporation. Polymeric isocyanate-hydroxy terminated polybutadiene compositions. 4,187,215, Cl. 528-51.000.
Wulff, Richard F. Carpet brush attachment for a floor treating machine. 4,186,459, Cl. 15-180.000.
Wundrak, Egon: *See*—
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WWG Industries, Inc.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,186,549, Cl. 57-293.000.
Xanthopoulos, Piritheous, to Stewart-Naumann Laboratories, Inc. Peristaltic infusion pump and disposable cassette for use therewith. 4,187,057, Cl. 417-63.000.
Xerox Corporation: *See*—
Hug, William F.; Hamerdinger, Randolph W.; Dunn, Phillip D.; and McQuillan, Robert C., 4,187,474, Cl. 331-94.50D.
Tutihasi, Simpei, 4,187,104, Cl. 430-57.000.
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Yadlowsky, Slawko: *See*—
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Yagihara, Morio; Tanaka, Mitsugu; Hirose, Takeshi; and Aono, Toshiaki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,187,110, Cl. 430-544.000.
Yamada, Takeo; Ando, Seigo; Miyashita, Yoshio; Murakami, Katsuhiko; Tate, Masahisa; and Mizui, Kiyoshi, to Nippon Kokan Kabushiki Kaisha. Apparatus for monitoring and controlling the level of the molten metal in the mold of a continuous casting machine. 4,186,792, Cl. 164-150.000.
Yamaga, Eiichi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Uchiyama, Yasuji; Yamaga, Eiichi; and Aoki, Eiichiro, 4,186,640, Cl. 84-1.030.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Takayama, Satoru, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,187,345, Cl. 428-337.000.
Yamaguchi, Takashi: *See*—
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Yamaha Hatsukoki Kabushiki Kaisha: *See*—
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Yamamoto, Toshiaki: *See*—
Harmon, William M.; Holtzmeier, Lindell R.; and Yamamoto, Toshiaki, 4,186,539, Cl. 52-580.000.
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; and Matsumoto, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Method for manufacturing a clutch facing. 4,187,133, Cl. 156-166.000.
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, to Brother Kogyo Kabushiki Kaisha. Device for driving information carrying members for use in a sewing machine. 4,186,675, Cl. 112-158.00D.
Yamashita, Keitarou: *See*—
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Yamazaki, Eiichi: *See*—
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,187,012, Cl. 354-1.000.
Yang, Charles C.: *See*—
Peltzman, Alan; and Yang, Charles C., 4,187,153, Cl. 203-81.000.
Yano, Kohzo; Hishida, Tadanori; Inami, Yasuhiko; and Wada, Tomio, to Sharp Kabushiki Kaisha. Negative type display in electrochromic display device. 4,187,004, Cl. 350-357.000.

Yarbrough, Jon A. Fiberboard chair construction. 4,186,965, Cl. 297-442.000.
Yarmilko, Vladimir G.: *See*—
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Yarovinsky, Grigory A.: *See*—
Teplinsky, Anatoly D.; Yarovinsky, Grigory A.; Snezhnoi, Rostislav L.; Burakov, Savely L.; Serebro, Vladimir S.; Ryvkis, Yakov M.; Kolienko, Lidia P.; Bolshakov, Anatoly I.; Antonov, Vladimir A.; Tsaizer, Gerbert G.; Shapiro, Moisei S.; and Pekarsky, Mark M., 4,186,793, Cl. 164-158.000.
Yascheritsyn, Petr I.; Sakulevich, Faddei J.; Olender, Leonty A.; and Kosobutsky, Alexandr A. Machine for treating spherical surfaces of parts with magneto-abrasive powder. 4,186,528, Cl. 51-161.000.
Yashiro, Kuniji; Ayano, Yukihiko; and Miyazaki, Yasushi, to Nihon Parkerizing Co., Ltd. Surface processing solution and surface treatment of aluminum or aluminum alloy substrate. 4,187,127, Cl. 148-6.15R.
Yasuda, Yushiro; and Bessho, Hironori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purification promoting device. 4,186,697, Cl. 123-117.00A.
Yates, Derek N.; and Presta, John C., to Celanese Corporation. Fiber reinforced composite shaft with metallic connector sleeves mounted by longitudinal groove interlock. 4,187,135, Cl. 156-187.000.
Yeh, Chan H. Korean (hangul) electronic typewriter and communication equipment system. 4,187,031, Cl. 400-83.000.
Yen, Shiao-Ping S.: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,187,333, Cl. 427-230.000.
Yim, Nelson C.: *See*—
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Yiu, Joseph T.; Lea, Jeffrey G.; and Holmes, Roy L., to Hy-Gain de Puerto Rico, Inc. Scanning receiver. 4,187,464, Cl. 325-470.000.
Yockey, Francis J.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,187,547, Cl. 364-710.000.
Yoshida, Dan; Onaka, Tatsumi; and Horiuchi, Yasuhiro, to Fuji Kuuki Kabushiki Kaisha; and Hitachi Zosen Kabushiki Kaisha. Air motor with discharge through gear chamber and silencer. 4,187,063, Cl. 418-90.000.
Yoshida Kogyo K.K.: *See*—
Yunoki, Akio, 4,186,863, Cl. 227-131.000.
Yoshida, Noriyuki: *See*—
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,186,675, Cl. 112-158.00D.
Yoshida, Shohei: *See*—
Narisawa, Shigeyuki; Yoshida, Shohei; and Kawahara, Hiroshi, 4,187,377, Cl. 544-219.000.
Youngblood, John W. Vehicle tow bar. 4,186,938, Cl. 280-402.000.
Yu, Arthur J.: *See*—
Goswami, Jagadish C.; and Yu, Arthur J., 4,187,159, Cl. 204-159.170.
Yum, Dooho, to Beltone Electronics Corporation. Amplifier employing matched transistors to provide linear current feedback. 4,187,472, Cl. 330-260.000.
Yunoki, Akio, to Yoshida Kogyo K.K. Staple fastener applying machine. 4,186,863, Cl. 227-131.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Jablonsky, Erich, 4,186,818, Cl. 180-133.000.
Zalesak, Jan; and Kovar, Jan, to Vyzkumny ustav tvarecich stroju a technologie tvareni. Apparatus for the discharge of waste ends of bars in the cross wedge rolling process. 4,186,580, Cl. 72-14.000.
Zalesak, Jan: *See*—
Kovar, Jan; Drkal, Jan; Zalesak, Jan; and Hladky, Vaclav, 4,186,583, Cl. 72-108.000.
Zaman, Shakir U.: *See*—
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Zaniewski, Michel H. Ring clamp and method of making same. 4,186,468, Cl. 24-243.00B.
Zauser, Ludwig: *See*—
Burghardt, Wilfried; Vogel, Rolf; and Zauser, Ludwig, 4,186,895, Cl. 242-107.40B.
Zaydel, Wieslaw S., to General Motors Corporation. Plastic plug, nut and stud fastener assembly. 4,186,645, Cl. 85-83.000.
Zeblisky, Rudolph J., to Kollmorgen Technologies Corp. Novel precious metal sensitizing solutions. 4,187,198, Cl. 252-434.000.
Zecher, Wilfried; Clarenz, Werner; Dunwald, Willi; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the production of polycondensate containing cyclic imide groups. 4,187,365, Cl. 528-45.000.
Zeeh, Bernd: *See*—
Goetz, Norbert; Mangold, Dietrich; and Zeeh, Bernd, 4,187,227, Cl. 548-226.000.
Zegeer, Jim: *See*—
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Zehel, Joseph J.; and Kreis, Joseph W., to Globe-Union Inc. Printed circuit contact. 4,187,417, Cl. 200-254.000.
Zeller, Gary P.; and Landwehr, DeWayne A., to General Motors Corporation. Energy absorbing cellular matrix for vehicles. 4,186,915, Cl. 267-140.000.
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Hromatka, Otto; Binder, Dieter; Zeller, Paul; and Pfister, Rudolf, 4,187,303, Cl. 424-246.000.
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Zezza, Louis J., to Automation Industries, Inc. High density fuel storage rack. 4,187,433, Cl. 250-507.000.
Zhitetsky, Leonid S.: *See*—
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,187,541, Cl. 364-497.000.
Zhmurov, Vyacheslav I.: *See*—
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Zicko, James A., to Container Corporation of America. Dispenser container with cover. 4,186,866, Cl. 229-17.00B.
Zijlstra, Jan G. H., to AHI Operations Limited. Wash-house fitting including a trough. 4,186,770, Cl. 137-572.000.
Zimmer, Erich: *See*—
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Zimmermann, Andreas, to BBC Brown, Boveri & Company, Ltd. Method and apparatus for operating an electrophoretic indicating element. 4,187,160, Cl. 204-180.00R.
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, to Ciba-Geigy Corporation. Stabilization systems from triarylphosphites and phenols. 4,187,212, Cl. 260-45.8NT.
Zitz, Alfred: *See*—
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Zoltan, Bart J., to Singer Company, The. Internal reference for stellar tracker. 4,187,422, Cl. 250-203.00R.
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Zudkevitch, David: *See*—
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Zukowski, Leonard J., to TRW Inc. Variably preloaded ball joint assembly. 4,187,033, Cl. 403-137.000.
Zydzik, George J.: *See*—
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,187,530, Cl. 361-433.000.
1st National Bank: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Carton, Michael L.; and Huetsch, Larry C., to Wagner Electric Corporation. Vehicle brake system. Re. 30,205, Cl. 303-7.000.

Caterpillar Tractor Co.: *See—*
Montgomery, Alvin W., Re. 30,203, Cl. 123-140.00R.

Eaton Corporation: *See—*
Kolze, Lawrence A.; and Jones, William H., Re. 30,207, Cl. 200-81.00R.

Ferguson, John G.; and Waters, Geoffrey D., to Rolls Royce (1971) Limited. Seals and method of manufacture thereof. Re. 30,206, Cl. 415-174.000.

Henke, Donald L., to Veda, Inc. Hay stacking machine. Re. 30,200, Cl. 56-346.000.

Huetsch, Larry C.: *See—*
Carton, Michael L.; and Huetsch, Larry C., Re. 30,205, Cl. 303-7.000.

International Shoe Machine Corporation: *See—*
Vornberger, Walter, Re. 30,202, Cl. 118-705.000.

Jones, William H.: *See—*
Kolze, Lawrence A.; and Jones, William H., Re. 30,207, Cl. 200-81.00R.

Kolze, Lawrence A.; and Jones, William H., to Eaton Corporation. Means for calibrating pressure switches at extra-low pressure settings. Re. 30,207, Cl. 200-81.00R.

Montgomery, Alvin W., to Caterpillar Tractor Co. Fuel control cross shaft. Re. 30,203, Cl. 123-140.00R.

Rolls Royce (1971) Limited: *See—*
Ferguson, John G.; and Waters, Geoffrey D., Re. 30,206, Cl. 415-174.000.

Root, James R., to Ruskin Manufacturing Company. Control damper. Re. 30,204, Cl. 137-77.000.

Ruskin Manufacturing Company: *See—*
Root, James R., Re. 30,204, Cl. 137-77.000.

Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for start-spinning a thread on an open-end spinning unit of an open-end spinning machine. Re. 30,201, Cl. 57-263.000.

Stahlecker, Hans: *See—*
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Veda, Inc.: *See—*
Henke, Donald L., Re. 30,200, Cl. 56-346.000.

Vornberger, Walter, to International Shoe Machine Corporation. Cement applying mechanism. Re. 30,202, Cl. 118-705.000.

Wagner Electric Corporation: *See—*
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Waters, Geoffrey D.: *See—*
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Emerson, Frank H.: *See—*
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Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See—*
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Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,500, 2-5-80, Cl. 69.000.

Hough, L. Fredric: *See—*
Williams, Edwin B.; Janick, Jules; Emerson, Frank H.; Dayton, Daniel F.; Hough, L. Fredric; and Bailey, Catherine H., 4,499, Cl. 34.000.

Janick, Jules: *See—*
Williams, Edwin B.; Janick, Jules; Emerson, Frank H.; Dayton, Daniel F.; Hough, L. Fredric; and Bailey, Catherine H., 4,499, Cl. 34.000.

Purdue Research Foundation: *See—*
Williams, Edwin B.; Janick, Jules; Emerson, Frank H.; Dayton, Daniel F.; Hough, L. Fredric; and Bailey, Catherine H., 4,499, Cl. 34.000.

Williams, Edwin B.; Janick, Jules; Emerson, Frank H.; Dayton, Daniel F.; Hough, L. Fredric; and Bailey, Catherine H., to Purdue Research Foundation. Distinct cultivar of apple tree: COOP 16. 4,499, 2-5-80, Cl. 34.000.

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Aladdin Manufacturing Company: *See—*
Wintz, Donald E., 254,122, Cl. D9-184.000.

Alexander, Fred C., to Universal-Rundle Corporation. Combined bathtub and shower stall. 254,148, 2-5-80, Cl. D23-49.000.

Allen, Wesley D. Electric lamp. 254,155, 2-5-80, Cl. D48-20.00R.

American Research and Knitting, Inc.: *See—*
Avins, William O., 254,153, Cl. D47-2.000.

Avins, William O., to American Research and Knitting, Inc. Double knit fabric. 254,153, 2-5-80, Cl. D47-2.000.

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Beniya, Masaaki, to TDK Electronics Co., Ltd. Magnetic necklace. 254,126, 2-5-80, Cl. D11-6.000.

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Breger, Carl-Arne, to Sandvik Aktiebolag. Protective helmet with ear muffs and face protection. 254,100, 2-5-80, Cl. D2-232.000.

Bussey, Harry, Jr. Loose fill packaging element. 254,123, 2-5-80, Cl. D9-294.000.

Carabetta, Vito J. Automobile body. 254,128, 2-5-80, Cl. D12-91.000.

Chandler, Marlene Y. Toilet tissue cover. 254,108, 2-5-80, Cl. D6-86.000.

Chromcraft Corporation: *See—*
Wilson, Robert L., 254,104, Cl. D6-31.000.

Colani, Luigi, to ITT Industries, Inc. Combined water control lever and cover plate. 254,147, 2-5-80, Cl. D23-29.000.

Criswell, John. Paint scraper holder. 254,103, 2-5-80, Cl. D2-400.000.

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Daenen, Robert H. C. M., to Dart Industries, Inc. Holder for a measuring spoon set or the like. 254,116, 2-5-80, Cl. D7-74.000.

Dart Industries, Inc.: *See—*
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Data Packaging Corporation: *See—*
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de Bock, Johannes M. M. H. Physical exerciser. 254,143, 2-5-80, Cl. D21-195.000.

De Masi, Robert J., to Utility Verification Corp. Telephone call cost determining device. 254,141, 2-5-80, Cl. D18-7.000.

Drevitch, Nolan A.: *See—*
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Engalitcheff, John, Jr., to Baltimore Aircoil Company, Inc. Water injected cooling tower. 254,149, 2-5-80, Cl. D23-139.000.

Felix, Cristian J.; and Genaro, Donald M., to Singer Company, The. Sewing machine. 254,135, 2-5-80, Cl. D15-69.000.

Garden Maid, Inc.: *See—*
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Genaro, Donald M.: *See—*
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Gerard, David L.: *See—*
Barton, Steven A.; and Gerard, David L., 254,150, Cl. D24-26.000.

Gilbert, John H. Athletic sock. 254,101, 2-5-80, Cl. D2-330.000.

Greenfield, Martin L. Moon clock. 254,124, 2-5-80, Cl. D10-6.000.

Handler, Milton E.; and Sylvan, Richard. Workbench. 254,112, 2-5-80, Cl. D6-179.000.

Helena Rubinstein, Inc.: *See—*
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Hock, Donal D., to Turco Manufacturing Company. Combined trapeze bar and hand rings. 254,144, 2-5-80, Cl. D21-235.000.

Hosoe, Isao, to Sacea S.a.s. di Tirinnanzi Giampietro & Co. Chair. 254,105, 2-5-80, Cl. D6-31.000.

Iijima, Takekazu, to Pioneer Kabushiki Kaisha. Loudspeaker with grille. 254,130, 2-5-80, Cl. D14-30.000.

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Johnson, Howard B. Combined camper support and jack. 254,129, 2-5-80, Cl. D12-55.000.

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Kimble, Thomas E., to D. H. Baldwin Company. Organ console. 254,137, 2-5-80, Cl. D17-6.000.

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Kuipers, Marvin V. Multiple drum bracket. 254,140, 2-5-80, Cl. D17-22.000.

Lang, James L. Safety rail for sliding panels. 254,120, 2-5-80, Cl. D8-331.000.

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Lyman, George; Mathus, Gregory; and Yonkers, Edward, to Data Packaging Corporation. Display for photographs or the like. 254,114, 2-5-80, Cl. D6-234.000.

Marden, Jay W. Combined tractor, trailer, helicopter and vehicle toy. 254,152, 2-5-80, Cl. D21-134.000.

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Rickard, James H., 254,139, Cl. D17-20.000.

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Pax Technology Ltd.: *See—*
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Price, Ronald L. Combined liquid dispenser and disposable cup holder. 254,109, 2-5-80, Cl. D6-91.000.

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Richards, Shirley T. Undergarment shield. 254,096, 2-5-80, Cl. D2-225.000.

Richards, Shirley T. Undergarment shield. 254,097, 2-5-80, Cl. D2-225.000.

Richards, Shirley T. Undergarment shield. 254,098, 2-5-80, Cl. D2-225.000.

Richards, Shirley T. Undergarment shield. 254,099, 2-5-80, Cl. D2-225.000.

Rickard, James H., to Ovation Instruments, Inc. Guitar body or the like. 254,138, 2-5-80, Cl. D17-20.000.

Rickard, James H., to Ovation Instruments, Inc. Combined tailpiece, bridge and mute unit for a guitar or the like. 254,139, 2-5-80, Cl. D17-20.000.

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Sgroi, Carlo M., to Pax Technology Ltd. Combined flowerpot tray, and watering reservoirs. 254,127, 2-5-80, Cl. D11-153.000.

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Sheldon, Gary L., to Garden Maid, Inc. Combined auger and tine unit for a garden tiller. 254,133, 2-5-80, Cl. D15-12.000.

Sheldon, Gary L., to Garden Maid, Inc. Combined auger and tine unit for a garden tiller. 254,134, 2-5-80, Cl. D15-12.000.

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Wilcock, Anthony C. Inline water filter. 254,145, 2-5-80, Cl. D23-4.000.

Wilson, Robert L., to Chromcraft Corporation. Chair. 254,104, 2-5-80, Cl. D6-31.000.

Wintz, Donald E., to Aladdin Manufacturing Company. Tackle box or the like. 254,122, 2-5-80, Cl. D9-184.000.

Wolff, Henry. Combined lipstick and cigarette lighter. 254,151, 2-5-80, Cl. D28-77.000.

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Lyman, George; Mathus, Gregory; and Yonkers, Edward, 254,114, Cl. D6-234.000.

Young, Warren H.; Drevitch, Nolan A.; and Rosati, Anthony G., to Polaroid Corporation. Movie lamp or similar article. 254,154, 2-5-80, Cl. D48-20.00K.

CLASSIFICATION OF PATENTS

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10.8 4,186,612
52 4,186,613
63 4,186,614
89.15 4,186,615
200 4,186,616
245 S 4,186,617
339 4,186,618
414 4,186,619
424.8 R 4,186,620
459 4,186,621
501 R 4,186,622
572 4,186,623
679 4,186,624
780 4,186,625
801 4,186,626
869 4,186,627

CLASS 75

60 4,187,102

CLASS 76

108 A 4,186,628

CLASS 81

53 R 4,186,629

CLASS 82

4 C 4,186,630
5 4,186,631

CLASS 83

13 4,186,632
155 4,186,633
478 4,186,634

CLASS 84

1.01 4,186,635
4,186,636
4,186,637
4,186,638
1.03 4,186,639
4,186,640
1.16 4,186,641
1.24 4,186,642
4,186,643
422 R 4,186,644

CLASS 85

83 4,186,645

CLASS 86

29 4,186,646

CLASS 89

1.8 4,186,647
36 A 4,186,648

CLASS 91

170 R 4,186,649
369 A 4,186,650
375 R 4,186,651
434 4,186,652

CLASS 92

34 4,186,653
78 4,186,654

CLASS 98

1 4,186,655
99 R 4,186,656

CLASS 100

39 4,186,657
148 4,186,658

CLASS 101

47 4,186,659
128.1 4,186,660
178 4,186,661
218 4,186,662

CLASS 102

18 MS 4,186,663
66 4,186,664

CLASS 105

456 4,186,665

CLASS 106

39.8 4,187,115
44 4,187,116
56 4,187,117
89 4,187,118
126 4,187,119

CLASS 108

29 4,186,666
53.5 4,186,667

CLASS 110

213 4,186,668
347 4,186,669

CLASS 111

1 4,186,670
2 4,186,671

CLASS 112

121.15 4,186,673
153 4,186,674
158 D 4,186,675
165 4,186,676
186 4,186,677
273 4,186,672

CLASS 113

121 C 4,186,678

CLASS 114

20 R 4,186,679
103 4,186,680
240 R 4,186,681

CLASS 116

171 4,186,682
235 4,186,683

CLASS 118

410 4,186,685
705 Re.30,202
725 4,186,684

CLASS 119

1 4,186,686
4 4,186,687
96 4,186,688
102 4,186,689
110 4,186,690

CLASS 123

32 EL 4,186,691
32 L 4,186,692
41.12 4,186,693
41.31 4,186,694
52 M 4,186,695
90.61 4,186,696
117 A 4,186,697
119 A 4,186,698
4,186,699
4,186,701
4,186,702
4,186,703
119 EE 4,186,700
122 AA 4,186,704
122 AC 4,186,705
127 4,186,706
139 AV 4,186,707
139 AW 4,186,708
140 R Re.30,203
146.5 A 4,186,709
146.5 B 4,186,710
148 CB 4,186,712
148 CC 4,186,711
148 E 4,186,713
195 C 4,186,714
198 F 4,186,715

CLASS 126

29 4,186,716
66 4,186,717
67 4,186,718
143 4,186,719
270 4,186,722
299 D 4,186,727
430 4,186,721
443 4,186,723
4,186,724
4,186,725
444 4,186,726
445 4,186,720

CLASS 127

46 A 4,187,120

CLASS 128

1 R 4,186,728
1.3 4,186,729
24 R 4,186,732
32 4,186,733
33 4,186,734
153 4,186,738
158 4,186,739
201.19 4,186,736
201.25 4,186,735
203.28 4,186,737
214 R 4,186,740
218 P 4,186,741
270 4,186,742
284 4,186,743
287 4,186,744
349 R 4,186,745
403 4,186,746
660 4,186,747
736 4,186,731
4,186,748
748 4,186,749
4,186,750
4,186,751
766 4,186,752
769 4,186,730

CLASS 130

27 T 4,186,753

CLASS 131

23 A 4,186,754
135 4,186,755
140 C 4,186,756
149 4,186,757

CLASS 134

26 4,187,121
95 4,187,122

CLASS 135

5 AT 4,186,758

CLASS 136

206 4,187,123

CLASS 137

77 Re.30,204
240 4,186,759
244 4,186,760
315 4,186,761
343 4,186,762
344 4,186,763
414 4,186,764
4,186,765
458 4,186,766
501 4,186,767
516.25 4,186,768
566 4,186,769
572 4,186,770
596.17 4,186,771
604 4,186,772
625.23 4,186,774
625.3 4,186,773

CLASS 138

30 4,186,775
4,186,776
31 4,186,777
97 4,186,475
103 4,186,778
121 4,186,779

CLASS 139

383 A 4,186,780
420 R 4,186,781

CLASS 141

7 4,186,782
18 4,186,783

CLASS 144

253 J 4,186,784

CLASS 145

32 R 4,186,785

CLASS 148

1.5 4,187,124
4,187,125
4,187,126
6.15 R 4,187,127
121 4,187,128

CLASS 149

21 4,187,129

CLASS 150
3 4,186,786

CLASS 151
41.73 4,186,787

CLASS 152
209 B 4,186,788
354 R 4,186,789

CLASS 156
42 4,187,130
79 4,187,131
88 4,187,132
166 4,187,133
170 4,187,134
187 4,187,135
192 4,187,136
195 4,187,137
512 4,187,138
600 4,187,139
662 4,187,140

CLASS 160
329 4,186,790

CLASS 162
23 4,187,141
146 4,187,142
157 R 4,187,143

CLASS 164
66 4,186,791
150 4,186,792
158 4,186,793

CLASS 165
2 4,186,794
53 4,186,795
105 4,186,796
120 4,186,797
147 4,186,798
176 4,186,799

CLASS 166
256 4,186,800
4,186,801
280 4,186,802
292 4,186,803

CLASS 171
16 4,186,804

CLASS 172
248 4,186,805
283 4,186,806

CLASS 174
15 CA 4,187,387
68.5 4,187,388
73 R 4,187,389
102 R 4,187,390
106 R 4,187,391

CLASS 175
96 4,186,810
302 4,186,807
334 4,186,808
4,186,809

CLASS 176
24 4,187,144
36 R 4,187,145
37 4,187,146
38 4,187,147

CLASS 178
22 4,187,392
4,187,393
58 R 4,187,394

CLASS 179
1 GA 4,187,395
1 SC 4,187,396
1 SG 4,187,397
2 EB 4,187,398
15 AA 4,187,400
15 BW 4,187,401
4,187,402
15 BY 4,187,399
84 VF 4,187,403
100 R 4,187,404
107 FD 4,187,413
175.3 F 4,187,415
175.3 S 4,187,414

CLASS 180
6.48 4,186,811
9.5 4,186,812
13 4,186,813
24 4,186,814
41 4,186,815
54 A 4,186,817
133 4,186,818
243 4,186,816

CLASS 181
265 4,186,819

CLASS 182
93 4,186,820

CLASS 184
7D 4,186,821

CLASS 188
1 A 4,186,822
32 4,186,823
73.5 4,186,824
196 R 4,186,825

CLASS 192
13 R 4,186,826
18 A 4,186,827
98 4,186,828
109 F 4,186,829

CLASS 193
35 R 4,186,830

CLASS 195
104 4,187,149

CLASS 198
501 4,186,831
861 4,186,832

CLASS 200
81 R Re.30,207
153 S 4,187,416
254 4,187,417
295 4,187,418
308 4,187,419
321 4,187,420

CLASS 202
182 4,187,150
185 R 4,187,151

CLASS 203
62 4,187,152
81 4,187,153

CLASS 204
5 4,187,154
43 S 4,187,166
67 4,187,155
73 R 4,187,156
157.1 R 4,187,157
159.17 4,187,159
159.2 4,187,158
180 R 4,187,160
195 P 4,187,162
195 S 4,187,161
4,187,163
196 4,187,164
254 4,187,165

CLASS 206
225 4,186,833
320 4,186,834
443 4,186,835

CLASS 208
8 R 4,187,167
139 4,187,168
157 4,187,169

CLASS 209
1 4,187,170
44.3 4,187,172
383 4,187,171
565 4,186,836
4,186,837
581 4,186,838

CLASS 210
23 H 4,187,173
32 4,187,174
80 4,187,175
151 4,187,176
198 C 4,187,177
232 4,187,178
238 4,187,179
321 R 4,187,180
332 4,187,181
445 4,187,182
501 4,187,183

CLASS 212
135 4,186,839

CLASS 215
247 4,186,840

CLASS 219
10.55 A 4,187,405
59.1 4,187,406
91.2 4,187,407
121 LM 4,187,408
121 P 4,187,409
137.2 4,187,410
4,187,411
441 4,187,412

CLASS 220
6 4,186,841
206 4,186,842
210 4,186,843
333 4,186,844
461 4,186,845
468 4,186,846

CLASS 222
1 4,186,847
23 4,186,848
25 4,186,849
28 4,186,850
113 4,186,851
146 HE 4,186,852
182 4,186,853
185 4,186,854
321 4,186,855
424.5 4,186,856

CLASS 223
72 4,186,444
94 4,186,857
4,186,858

CLASS 224
205 4,186,859

CLASS 226
91 4,186,860
118 4,186,861

CLASS 227
130 4,186,862
131 4,186,863

CLASS 228
226 4,186,864

CLASS 229
5.7 4,186,865
17 B 4,186,866
40 4,186,867
92.1 4,186,868

CLASS 232
17 4,186,869
35 4,186,870

CLASS 235
380 4,186,871

CLASS 236
34.5 4,186,872
44 A 4,186,873
46 R 4,186,874
47 4,186,875
49 4,186,876

CLASS 239
124 4,186,877
160 4,186,878
172 4,186,879
177 4,186,880
198 4,186,881
327 4,186,882
491 4,186,883
533.8 4,186,884
654 4,186,885
691 4,186,886

CLASS 241
20 4,186,887
46.06 4,186,888
89.2 4,186,889

CLASS 242
18 A 4,186,890
55.19 R 4,186,891
4,186,892
56.9 4,186,893
86.6 4,186,894
107.4 B 4,186,895
131 4,186,896
147 R 4,186,897
152.1 4,186,898

CLASS 244
3.13 4,186,899
113 4,186,900
137 R 4,186,901

CLASS 248
73 4,186,902
210 4,186,903
395 4,186,904
478 4,186,905

CLASS 249
41 4,186,906
94 4,186,907
197 4,186,908

CLASS 250
199 4,187,421
203 R 4,187,422
312 4,187,423
315.1 4,187,424
358 P 4,187,425
364 4,187,426
366 4,187,427
4,187,428
445 T 4,187,429
4,187,430
492 A 4,187,431
493 4,187,432
507 4,187,433
515 4,187,434
559 4,187,435

CLASS 251
31 4,186,909
149.6 4,186,910

CLASS 252
8.55 D 4,187,073
4,187,185
8.8 4,187,184
51.5 R 4,187,186
62.54 4,187,187
65 4,187,188
70 4,187,189
99 4,187,190
143 4,187,191
313 R 4,187,192
316 4,187,193
4,187,194
402 4,187,213
412 4,187,195
429 B 4,187,196
431 P 4,187,197
434 4,187,198
455 Z 4,187,199
472 4,187,200
512 4,187,201

CLASS 254
93 R 4,186,911

CLASS 256
1 4,186,912
13.1 4,186,913

CLASS 260
4 R 4,187,202
17.4 ST 4,187,219
18 N 4,187,203
22 CB 4,187,204
23.5 A 4,187,206
30.4 A 4,187,205
37 N 4,187,207
37 SB 4,187,208
38 4,187,209
42.14 4,187,210
42.44 4,187,211
45.8 NT 4,187,212
45.9 KA 4,187,214
112.5 R 4,187,216
4,187,217
158 4,187,218
239 A 4,187,221
239 B 4,187,220
239.8 4,187,226
239.9 4,187,225
245.3 4,187,228
326.47 4,187,230
332.1 4,187,231
343 4,187,222
343.3 R 4,187,223
345.2 4,187,233
346.22 4,187,224
4,187,234
4,187,236
346.75 4,187,235
347.3 4,187,237
376 4,187,238
410.6 4,187,239
429 R 4,187,240
438.1 4,187,241
463 4,187,242
464 4,187,243
465 E 4,187,244
502.5 4,187,245
559 R 4,187,246
574 4,187,247
576 4,187,248
4,187,249
578 4,187,250
586 R 4,187,251
653 4,187,252
662 R 4,187,253
665 G 4,187,254

CLASS 261
50 B 4,187,262
77 4,187,263
84 4,187,264

CLASS 264
22 4,187,265
40.1 4,187,267
43 4,187,266
151 4,187,268
171 4,187,269
4,187,270
258 4,187,271
318 4,187,272
322 4,187,273
325 4,187,274
511 4,187,275
515 4,187,276

CLASS 267
4 4,186,914
140 4,186,915

CLASS 269
303 4,186,916
325 4,186,917

CLASS 271
232 4,186,918
267 4,186,919

CLASS 272
96 4,186,920

CLASS 273
26 E 4,186,921
55 R 4,186,922
67 D 4,186,923
81.4 4,186,924
244 4,186,928
340 4,186,926
357 4,186,927
389 4,186,925

CLASS 277
27 4,186,929
166 4,186,930
207 A 4,186,931
4,186,932

CLASS 279
1 K 4,186,933

CLASS 280
221 4,186,934
269 4,186,935
277 4,186,936
289 E 4,186,937
402 4,186,938
477 4,186,939
507 4,186,940
743 4,186,941
804 4,186,942

CLASS 283
7 4,186,943
8 R 4,186,944

CLASS 285
19 4,186,945
94 4,186,946
112 4,186,947
177 4,186,948
226 4,186,949
270 4,186,950

CLASS 289
16.5 4,186,951

CLASS 290
27 4,187,436

CLASS 292
202 4,186,952
210 4,186,953
340 4,186,954

CLASS 294
1 R 4,186,955
16 4,186,956

CLASS 296
50 4,186,958
188 4,186,957

CLASS 297
16 4,186,959
63 4,186,960
216 4,186,961
250 4,186,962
308 4,186,963
422 4,186,964
442 4,186,965
452 4,186,966

CLASS 299
25 4,186,967
39 4,186,968
43 4,186,969
4,186,970
64 4,186,971

CLASS 303
7 Re.30,205

CLASS 307
147 4,187,437
268 4,187,438
271 4,187,439

CLASS 308
3.8 4,186,972
3.9 4,186,973
15 4,186,974
187 4,186,975

CLASS 310
24 4,187,440
112 4,187,441

CLASS 312
138 A 4,186,978
194 4,186,976
215 4,186,977
333 4,186,979

CLASS 313
60 4,187,442
402 4,187,443

CLASS 315
39.71 4,187,444
54 4,187,445
58 4,187,446
85 4,187,447
176 4,187,448
205 4,187,449
278 4,187,450
381 4,187,451

CLASS 316
19 4,186,980

CLASS 318
128 4,187,452
135 4,187,453
568 4,187,454
594 4,187,455
616 4,187,456
729 4,187,457

CLASS 323
17 4,187,458

CLASS 324
60 C 4,187,459
60 CD 4,187,460
102 4,187,461
204 4,187,462
228 4,187,463

CLASS 325
31 4,187,465
42 4,187,466
133 4,187,467
396 4,187,468
464 4,187,469
470 4,187,464

CLASS 330
4 4,187,470
260 4,187,472
277 4,187,471

CLASS 331
8 4,187,473
94.5 D 4,187,474
94.5 S 4,187,475
117 D 4,187,476

CLASS 333
14 4,187,477
4,187,478
28 R 4,187,479
161 4,187,480
182 4,187,481

CLASS 335
12 4,187,482
75 4,187,484
206 4,187,483
299 4,187,485

CLASS 338
34 4,187,486

CLASS 339
14 R 4,186,981
17 C 4,186,982
91 R 4,186,983
103 R 4,186,984
111 4,186,985
114 4,186,986
116 C 4,186,987
176 MP 4,186,988
258 R 4,186,989
4,186,990

CLASS 340
52 R 4,187,494
58 4,187,495
63 4,187,496
65 4,187,497
149 A 4,187,498
309.1 4,187,499
347 DD 4,187,500
554 4,187,501
566 4,187,502
624 4,187,503
652 4,187,504
753 4,187,505
852 4,187,489

CLASS 343
100 R 4,187,506
754 4,187,507
770 4,187,508
873 4,187,509

CLASS 346
21 4,187,510
75 4,187,511
140 R 4,187,512

CLASS 350
6.91 4,186,991
36 4,186,992
91 4,186,993
96.17 4,186,994
96.20 4,186,995
4,186,996
96.21 4,186,997
4,186,998
4,186,999
162 SF 4,187,000
202 4,187,001
314 4,187,002
357 4,187,003
4,187,004

CLASS 351
38 4,187,005
44 4,187,006
108 4,187,007
4,187,008
130 4,187,009
162 4,187,010

CLASS 353
122 4,187,011

CLASS 354
1 4,187,012
4,187,013
33 4,187,019
62 4,187,014
109 4,187,015
152 4,187,016
173 4,187,017
195 4,187,020
266 4,187,018
293 4,187,021
318 4,187,022
321 4,187,023

CLASS 355
14 R 4,187,024

CLASS 356
133 4,187,025
326 4,187,026
400 4,187,027

CLASS 357
1 4,187,513
22 4,187,514
39 4,187,515
60 4,187,516
64 4,187,517

CLASS 358
93 4,187,518
169 4,187,519
257 4,187,520

CLASS 360
118 4,187,521
137 4,187,522

CLASS 361
16 4,187,524
30 4,187,523
42 4,187,525
120 4,187,526
235 4,187,527
399 4,187,528
404 4,187,529
433 4,187,530

CLASS 362
17 4,187,531
186 4,187,532
257 4,187,533
268 4,187,534

CLASS 363
16 4,187,535
21 4,187,536
127 4,187,537

CLASS 364
200 4,187,538
4,187,539
4,187,540
497 4,187,541
502 4,187,542
505 4,187,543
514 4,187,544
559 4,187,545
565 4,187,546
578 4,187,548
710 4,187,547
746 4,187,549
900 4,187,550
4,187,551
4,187,552

CLASS 365
8 4,187,553
15 4,187,554
19 4,187,555

CLASS 366
44 4,187,028
153 4,187,029
319 4,187,030

CLASS 367
13 4,187,488
93 4,187,487
121 4,187,490
125 4,187,491
127 4,187,492
135 4,187,493
155 4,187,556

CLASS 400
83 4,187,031

CLASS 403
15 4,187,032
137 4,187,033
217 4,187,034
318 4,187,035

CLASS 404
117 4,187,036

CLASS 405
150 4,187,037
204 4,187,038
217 4,187,039
259 4,187,040
263 4,187,041
291 4,187,042

CLASS 406
105 4,187,043
197 4,187,044

CLASS 408
240 4,187,045

CLASS 409
180 4,187,046

CLASS 414
332 4,187,047
542 4,187,048
704 4,187,049
723 4,187,050
744 4,187,051
786 4,187,052

CLASS 415
111 4,187,053
115 4,187,054
174 Re.30,206

CLASS 416
132 A 4,187,055
207 4,187,056

CLASS 417
63 4,187,057
234 4,187,058
454 4,187,059
490 4,187,060

CLASS 418
48 4,187,061
61 B 4,187,062
90 4,187,063
187 4,187,064

CLASS 422
16 4,187,277
63 4,187,077
132 4,187,278
185 4,187,279

CLASS 423
15 4,187,280
150 4,187,281
244 4,187,282
328 4,187,283

CLASS 424
1 4,187,284
4,187,285
44 4,187,286
49 4,187,287
4,187,288
70 4,187,289
93 4,187,290
94 4,187,291
122 4,187,292
149 4,187,293
150 4,187,294
177 4,187,295
180 4,187,296
4,187,297
4,187,298
181 4,187,299
198 4,187,300
241 4,187,301
245 4,187,302
246 4,187,303
249 4,187,304
4,187,305
251 4,187,306
4,187,307
253 4,187,308
258 4,187,309
4,187,310
263 4,187,311
274 4,187,312
278 4,187,313
282 4,187,314
305 4,187,315
4,187,316
309 4,187,317
330 4,187,318
333 4,187,319

CLASS 425
136 4,187,065
313 4,187,067
327 4,187,066
381 4,187,068
470 4,187,069
525 4,187,070

CLASS 426
3 4,187,320
43 4,187,321
72 4,187,322
250 4,187,323
460 4,187,324
510 4,187,325
590 4,187,326

CLASS 427
8 4,187,327
4,187,328
47 4,187,332
230 4,187,333
236 4,187,334
318 4,187,335

CLASS 428
34 4,187,336
95 4,187,337
159 4,187,338
208 4,187,339
210 4,187,340
213 4,187,341
283 4,187,342
288 4,187,343
304 4,187,344
337 4,187,345
342 4,187,346
375 4,187,347
395 4,187,349
418 4,187,348

CLASS 429
45 4,187,350

CLASS 430
1 4,187,106
2 4,187,109
4,187,111
40 4,187,103
57 4,187,104
103 4,187,330
110 4,187,329
203 4,187,108
252 4,187,107
285 4,187,112
328 4,187,331
336 4,187,105
510 4,187,114
533 4,187,113
544 4,187,110

CLASS 432
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PATENT AND TRADEMARK OFFICE NOTICES

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,440, Re. S.N. 093,686, Filed Nov. 13, 1979, Cl. 200/5 A, CALCULATOR KEYBOARD SWITCH WITH DISC SPRING CONTACT AND PRINTED CIRCUIT BOARD, Gilbert H. Durkee, et al., Owner of Record: *Bowmar Instrument Corporation, Ft. Wayne, Ind.,* Attorney or Agent: George A Gust, et al., Ex. Gp.: 217

3,346,272, Re. S.N. 944,544, Filed Sep. 21, 1978, Cl. 280/668, VEHICLE SUSPENSION DEVICE, Charles J. Smith, Owner of Record: *Monroe Auto Equipment Company, wholly-owned subsidiary of Tenneco Inc., Houston, Tex.,* Attorney or Agent: H. Keith Miller, Ex. Gp.: 316

3,526,220, Re. S.N. 099,107, Filed Nov. 30, 1979, Cl. 128/25 B, FOOT EXERCISER, Samuel N. Small, et al., Owner of Record: *World Medical Marketing Co., Central Islip, N.Y.,* Attorney or Agent: Sidney G. Faber, et al., Ex. Gp.: 335

3,608,911, Re. S.N. 098,928, Filed Nov. 30, 1979, Cl. 277/058, RESILIENT PLASTIC PISTON RING, Herbert F. Prasse, et al., Owner of Record: *Ramsey Corporation, St. Louis, Mo.,* Attorney or Agent: Thomas L. Tarolli, et al., Ex. Gp.: 241

3,706,515, Re. S.N. 096,549, Filed Nov. 21, 1979, Cl. 425/4, DEVICE FOR FEEDING FLOWABLE MATERIAL TO A MOLD CAVITY, Rudi Keuerleber, et al., Owner of Record: *Krauss-Maffei Aktiengesellschaft, Munich, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 147

3,796,330, Re. S.N. 098,478, Filed Nov. 29, 1979, Cl. 414/525, VAN FOR TRANSPORTING COMPRESSIBLE MATERIAL, Charles V. Dehner, Owner of Record: *Inventor,* Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 314

3,974,894, Re. S.N. 099,209, Filed Nov. 30, 1979, Cl. 182/113, PORTABLE RISER, Jerry A. Wenger, et al., Owner of Record: *Wenger Corporation, Owatonna, Minn.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 354

4,016,403, Re. S.N. 095,803, Filed Nov. 19, 1979, Cl. 219/550, ELECTRICAL HEATING ELEMENT, Lorne A. Best, Owner of Record: *National Element, Inc., Troy, Mich.,* Attorney or Agent: Charles R. Rutherford, et al., Ex. Gp.: 213

4,033,112, Re. S.N. 097,574, Filed Nov. 26, 1979, Cl. 60/39.28 R, FUEL CONTROL FOR GAS TURBINE ENGINE, Robert W. Schuster, Owner of Record: *The Bendix Corporation, South Bend, Ind.,* Attorney or Agent: Leo H. McCormick, Jr., et al., Ex. Gp.: 343

4,062,737, Re. S.N. 097,572, Filed Nov. 26, 1979, Cl. 204/43 R, ELECTRODEPOSITION OF CHROMIUM, Donald J. Barclay, et al., Owner of Record: *International Business Machines Corporation, Armonk, N.Y.,* Attorney or Agent: Gunter A. Hauptman, Ex. Gp.: 114

4,130,944, Re. S.N. 092,659, Filed Nov. 9, 1979, Cl. 34/8, CENTRIFUGAL FLUIDIZED-BED DRYING METHOD AND APPARATUS, Gunther Hultsch, et al., Owner of Record: *Krauss-Maffei Aktiengesellschaft, Munchen, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 344

Update of Information Concerning the Patent Cooperation Treaty (PCT)

The following topics of interest to applicants and prospective applicants under the Patent Cooperation Treaty appear in this Notice:

Topic 1: Ratification of the Patent Cooperation Treaty (PCT) by Norway, Liechtenstein and Australia.
Topic 2: List of PCT contracting States as of January 1, 1980.
Topic 3: Table of Fees for the processing of PCT International Applications.
Topic 4: Patent Cooperation Treaty documents available.
Topic 5: PCT Information contained in the Consolidated Listing of Official Gazette Notices of January 1, 1980.

TOPIC 1—RATIFICATION OF THE PATENT COOPERATION TREATY BY NORWAY

Norway deposited its instrument of ratification with the International Bureau on October 1, 1979. Liechtenstein deposited its instrument of accession on December 19, 1979 and Australia deposited on December 31, 1979. According to the provisions of PCT Article 63, the Patent Cooperation Treaty came into effect for Norway on January 1, 1980 and will come into effect for Liechtenstein on March 19, 1980 and for Australia on March 31, 1980. The dates from which these States may be designated are listed under Topic 2.

TOPIC 2—LIST OF PCT CONTRACTING STATES AS OF JANUARY 1, 1980.

State	Ratification or Accession	Date of Ratification or Accession	Date From Which State May Be Designated
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 Oct. 1978
(20) Denmark	Ratification	01 September 1978	01 Dec. 1978
(21) Austria**	Ratification	23 January 1979	23 Apr. 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	24 April 1979	24 July 1979
(25) Norway	Ratification	01 October 1979	01 Jan. 1980
(26) Liechtenstein	Accession	19 December 1979	19 Mar. 1980
(27) Australia	Accession	31 December 1979	31 Mar. 1980

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI members states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

**Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional parent" must follow the designation of the States or States. Note: only one designation fee is due regardless of the number of EPC member states designated.

TOPIC 3—TABLE OF FEES FOR THE PROCESSING OF PCT INTERNATIONAL APPLICATIONS

Fee	*Amount*	*Time Due*
Transmittal Fee	$35.00	Upon filing.
Search Fee	300.00	Upon filing.
Supplemental Search Fee	200.00 per invention.	Within time limit set in notice to applicant.
International Fee:		
(1) Basic Fee:		
First 30 sheets of application	190.00	Upon filing.
Each Sheet over 30	3.50	Upon filing.
(2) Designation Fee:		
For each national patent desired	45.00	12 Months from the priority date, or, if no priority has been claimed, 12 months from the international filing date.
For each regional patent desired	45.00	

NOTE: Fee amounts are subject to change. Changes in the amounts of the fees, and the effective dates of the changed amounts will be published in the OFFICIAL GAZETTE.

TOPIC 4—PATENT COOPERATION TREATY (PCT) DOCUMENTS AVAILABLE

PCT documents are available from two sources: The U.S. Patent and Trademark Office and the World Intellectual Property Organization. As not all documents are available from both sources, please check the listing below for the correct source before submitting an order.

1. Documents Concerning the PCT Available From the United States Patent and Trademark Office:

PCT Document	*Price*
Patent Cooperation Treaty including Regulations (48 pages)	Free
Request forms, including fee calculation sheet (form PCT/ RO/101 and annex, 6 pages). *Note:* the Request form is a necessary part of the international application.	Free
PCT International Application transmittal letter (form PTO–1382).	Free
Declaration form under 37 CFR 1.70 for entering the national stage in the United States of America as a designated office (form PTO–1391).	Free
Transmittal form for use when filing in the United States of America as a designated office (form PTO–1390).	Free

Orders for PCT Documents available from the U.S. Patent and Trademark Office may be placed by mail or by telephone.

Mail Order Address for documents available from the United States Patent and Trademark Office:

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Telephone Order for documents available from the United States Patents and Trademark Office:

PCT Operations Area
(703) 557–2003

2. Documents Concerning the PCT Available From the World Intellectual Property Organization (WIPO)

PRICES IN U.S. DOLLARS PER COPY, INCLUDING MAILING CHARGES

Note: Prices are subject to change. Changes in prices will be published in the OFFICIAL GAZETTE.

Mode of ordering and paying for documents available from the World Intellectual Property Organization:

Orders should be addressed to:
WIPO—World Intellectual Property Organization,
PCT Division—Fees, Sales and Statistics Section

If by mail:
34, chemin des Colombettes
1211 Geneva 20
Switzerland
If by telex:
22376 WIPO CH
If by telephone:
(41) (22) 99 91 11
(ask for the PCT Division—Fees, Sales & Statistics Section).

	By surface mail	*By airmail*
PCT Published International Application (pamphlet) and Search report	3.50	4.50
PCT Applicant's Guide:		
English edition	37.00	47.00
(Revisions for 1980)	12.50	15.50
PCT (Treaty and Regulations)	4.50	5.50
PCT Gazette:		
Subscription for 1978	50.00	60.00
Subscription for 1979	145.00	155.00
Subscription for 1980	194.00	360.00
Single issues (1978 and/or 1979)	7.00	8.00
Single issues (1980)	8.50	10.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	7.00	8.00
As a separate A4 brochure	4.00	5.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	25.00	30.00
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for the Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/9)	First copy free of charge. For each additional copy: 0.50	1.00
Records of the Washington Diplomatic Conference (1970)	63.00	76.00

Payments may be effected by check or by transfer to the account of WIPO at the Swiss Credit Bank, 1211 GENEVA 11 (Switzerland). On request, an invoice will be sent.

TOPIC 5—PCT INFORMATION CONTAINED IN THE CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES OF JANUARY 1, 1980.

The following PCT information from past issues of the Official Gazette is contained in the Consolidated Listing of the Official Gazette Notice of January 1, 1980:

Subject matter/topic	*Original Official Gazette Citation*
PCT Implementing Legislation, Public Law 94-131	942 O.G. 177
Rule Promulgation Relating to Implementation of the Patent Cooperation Treaty	970 O.G. 100
Information for Prospective Applicants	970 O.G. 18
Changes to PCT Regulations of April 1978; Administrative Instructions, including Annexes.	
Update of Information concerning the Patent Cooperation Treaty	984 O.G. 2
Increase in International fees; PCT Member States; Changes in PCT Regulations of May 1979; Changes in Administrative Instructions.	
Filing of PCT or EPC Format Applications in Canada	973 O.G. 28
Answers to Questions Frequently Asked About the Patent Cooperation Treaty	976 O.G. 118

Jan. 8, 1980

SIDNEY A. DIAMOND
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 12, 1980

3,935,959	4,116,295	4,159,573	4,171,438
3,947,810	4,117,144	4,160,718	4,171,824
3,977,485	4,119,792	4,160,777	4,172,043
3,996,355	4,128,966	4,162,915	4,172,419
3,996,454	4,129,936	4,164,578	4,172,427
4,006,943	4,131,737	4,164,793	4,172,737
4,008,691	4,132,551	4,165,293	4,172,901
4,010,026	4,133,685	4,165,432	4,172,945
4,028,675	4,137,897	4,165,661	4,173,042
4,037,745	4,140,072	4,165,851	4,173,053
4,040,095	4,140,959	4,166,016	4,173,110
4,041,768	4,147,049	4,166,539	4,173,693
4,046,900	4,147,835	4,166,684	4,173,835
4,063,265	4,151,104	4,167,437	4,173,977
4,077,481	4,151,663	4,168,580	4,174,096
4,078,825	4,152,443	4,168,918	4,174,179
4,081,831	4,152,659	4,169,708	4,174,277
4,082,172	4,153,726	4,169,800	4,174,363
4,090,055	4,153,916	4,169,802	4,174,414
4,093,597	4,154,963	4,169,947	4,174,424
4,098,670	4,155,715	4,170,092	4,174,906
4,099,899	4,155,855	4,170,251	4,175,064
4,105,845	4,156,957	4,170,419	4,175,124
4,107,006	4,158,019	4,170,782	4,175,694
4,109,772	4,158,058	4,170,956	4,177,057
4,116,173	4,159,200	4,171,343	

Disclaimers

3,956,174.—*Joseph John Palcher,* Santa Ana, Calif. RUBBER AND POLYMER PRESERVATIVE. Patent dated May 11, 1976. Disclaimer filed Dec. 3, 1979, by the assignee, *Foremost-McKesson, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4 and 5 of said patent.

4,056,475.—*Hanslothar Sander, Siegfried Matusch* and *Uwe Hemminghaus,* Braunschweig, Germany. PULP CATCHER. Patent dated Nov. 1, 1977. Disclaimer filed Nov. 28, 1979, by the assignee, *AM International.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedications

3,164,982.—*Raphael A. Pasternak,* San Mateo, *Leonard A. Cavanagh,* San Jose, *Harry C. Ehrmantraut,* Los Altos, and *Bruce D. Marshall,* Palo Alto, Calif. THERMOELECTRIC OSMOMETER. Patent dated Jan. 12, 1965. Dedication filed Oct. 29, 1979, by the assignee, *Hewlett-Packard Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,195,346.—*Harry C. Ehrmantraut,* Los Altos, *Roderic E. Steele,* Portola Valley and *Wilmer E. Walker,* Sunnyvale, Calif. AUTOMATIC OSMOMETER. Patent dated July 20, 1965. Dedication filed Oct. 29, 1979, by the assignee, *Hewlett-Packard Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

4,135,240.—*Dennis M. Ritchie,* Summit, N.J. PROTECTION OF DATA FILE CONTENTS. Patent dated Jan. 16, 1979. Dedication filed Nov. 28, 1979, by the assignee. *Bell Telephone Laboratories.*

Hereby dedicates to the Public the entire remaining term of said patent.

October–December 1979 Classification Orders

The reclassifications covered by the following classification changes became effective between October and December 1979.

Classification Order 704, effective October 3, 1979:			
Abolished		324	Subclasses 0.5; 1–29; 29.5; 30–33.
Established		324	300–470.
			Cross-Reference Art Collections.
			800.
Classification Order 705, effective October 9, 1979:			
Abolished		271	63; 64; 172; 173; 174; 80.
Established		271	278–315.
Classification Order 706, effective October 19, 1979:			
Abolished		29	401–403.
Established		29	401.1; 402.01–402.09; 402.11–402.19; 402.21; 403.1–403.4.
Classification Order 707, effective October 29, 1979:			
Abolished		105	241.
Established		105	241.1; 241.2.
Classification Order 708, effective October 30, 1979:			
Abolished		414	142; 524.
		224	924.
Established		414	24.5; 24.6; 695.5–695.8.
Classification Order 709, effective November 5, 1979:			
Abolished		32	All.
Established	(New)	433	1–229.
Classification Order 710, effective November 6, 1979.			
Abolished		96	ALL.
		101	128.2; 128.3; 450; 463.
		156	659; 661.
		204	18.
		250	315–317; 327; 475.
		252	62.1; 501.
		346	1; 135.
		427	14–24; 43; 45; 53; 54; 56.
Established		101	128.21; 450.1; 463.1.
		156	659.1; 661.1.
		204	18.1.
		250	315.1; 315.2; 316.1; 317.1; 327.1; 475.1.
		252	501.1; 600.
		346	1.1; 135.1.
		350	322.
		427	41.1; 43.1; 45.1; 53.1; 54.1; 56.1.
	(New)	430	1–644;
			Cross-Reference Art Collections.
			900–967.
Classification Order 711, effective December 11, 1979:			
Abolished		128	140–147; 172–212; 351; Digest 2.
Established		128	200.11–200.19; 200.21–200.29; 201.11–201.19; 200.21–201.29; 202.11–202.19; 202.21–202.29; 203.11–203.19; 203.21–203.29; 204.11–204.19; 204.21–204.29; 205.11–205.19; 205.21–205.29; 206.11–206.19; 206.21–206.29; 207.11–207.19; 207.21–207.28;
			Cross-Reference Art Collection.
			909.
Title Change(s)		128	665; 738.
Classification Order 712, effective December 18, 1979:			
Abolished		105	366–368; 463–504; 376.
		244	118.
		248	119.
		280	179.
		296	35.
Classification Order 712, effective December 18, 1979:			
Established		244	118.1–118.6.
		296	35.1–35.4.
	(New)	410	1–156.

ALFRED C. MARMOR,
Administrator for Documentation,
January 15, 1980.

Set XIII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between July and September 30, 1979. All of these addenda have been consolidated into Set XIII of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class	Class
5	92	175	241	328	427
8	99	180	244	330	428
23	104	181	246	331	432
26	105	182	248	332	435
28	106	188	250	333	520
29	114	192	252	335	Classes:
33	115	193	254	336	(521)
34	116	195	260	340	(525)
35	122	196	261	343	(526)
47	123	201	264	346	(528)
53	126	202	267	350	530-570
56	127	203	280	356	Classes:
57	128	204	289	361	(531)
59	131	206	293	364	(536)
60	134	208	296	366	(544)
62	136	210	303	367	(548)
64	137	217	305	404	(549)
69	156	219	310	415	585
70	162	220	315	422	
71	165	224	318	423	
73	166	237	324	424	
74	172	239	325	426	

The following newly established classes issued between July and October 1979: Classes 367, 435, 525, and 549.

ALFRED C. MARMOR
Administrator for Documentation,
January 15, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Ac id Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-15-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	7-24-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

REISSUES

FEBRUARY 12, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,208

DISC BRAKE FOR RAILWAY VEHICLES

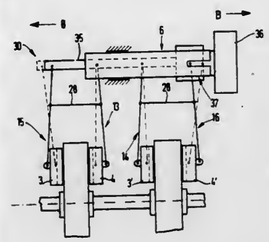
Hans Pollinger; Franz Prahl, and Mathias Schorwerth, all of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Original No. 4,015,691, dated Apr. 5, 1977, Ser. No. 622,958, Oct. 16, 1975. Application for reissue Apr. 17, 1978, Ser. No. 897,300

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1974, 2449853

Int. Cl.[2] **F16D** *55/228*

U.S. Cl. 188—59 **11 Claims**



1. A disc brake for a railway vehicle having two brake discs on the axle of a wheel and axle assembly, comprising a pair of brake shoes on opposite faces of each brake disc, means suspending said brake shoes from the frame of the wheel and axle assembly, a pair of brake levers for each brake disc, said brake levers each having one end thereof connected to a said brake shoe and the other ends of said brake levers being remote from said brake shoes, pull-rod means for pivotally connecting each pair of brake levers between the ends thereof, said brake levers defining two outer levers and two inner levers disposed between said outer levers, a displaceably supported brake cylinder having a reciprocable piston rod extending therefrom and said cylinder pivotally connected to the remote end of one of said outer brake levers, the remote end of the other of the outer brake levers being pivotally connected to said piston rod, [and] means for defining a pair of fixed points, said fixed points means comprising a carrier and the remote ends of said two inner brake levers being pivotally connected to said fixed points on said carrier, *and means on said carrier for guiding said piston rod and brake cylinder parallel to the axis of the wheel and axle assembly.*

Re. 30,209

SKID CONTROL SYSTEM

Joseph H. McNinch, Jr.; John A. Urban, both of Livonia, and Gary L. Hopkins, Farmington, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 3,966,267, dated Jun. 29, 1976, Ser. No. 528,218, Nov. 29, 1974. Continuation of Ser. No. 326,676, Jan. 26, 1973, abandoned. Application for reissue Jun. 23, 1978, Ser. No. 918,670

Int. Cl.[2] **B60T** *8/02*

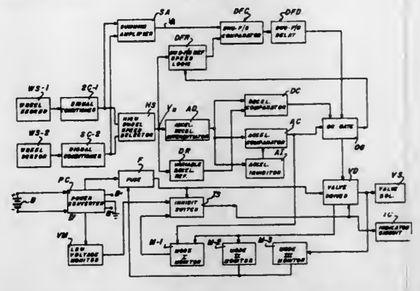
U.S. Cl. 303—106 **9 Claims**

1. A skid control system for use with a vehicle having at least first and second spaced apart independently rotatable wheels and having a braking system for applying braking forces to said wheels and comprising:

brake control means responsive to a skid signal for controlling said braking system to release the braking forces on said wheels;

means for providing first and second wheel speed signals of magnitudes respectively representative of the wheel speeds of said first and second wheels;

logic circuit means for providing a skid signal when the acceleration rate of the faster of said wheels exceeds a predetermined positive acceleration; and



means for inhibiting said logic circuit means from providing said skid signal when the positive acceleration rate of the faster wheel [attains] *exceeds* a level representative of a second predetermined acceleration greater and more positive than that of said first predetermined acceleration.

Re. 30,210

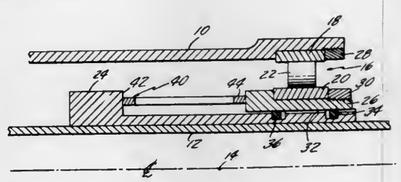
DAMPED INTERSHAFT BEARING AND STABILIZER

Dennis F. Buono, East Hartford; Nils G. Carlson, Glastonbury; David H. Hibner, Colchester, and Donald C. Moringiello, Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 4,046,430, dated Sep. 6, 1977, Ser. No. 666,530, Mar. 12, 1976. Application for reissue Nov. 22, 1978, Ser. No. 963,072

Int. Cl.[2] **F16C** *35/08*

U.S. Cl. 308—26 **11 Claims**



1. Damping means for an inner shaft and outer shaft mounted in coaxial relation, bearing means mounted between said inner shaft and said outer shaft, a fluid damper mounted under the bearing and includes an annular groove surrounding at least one of said shafts which is filled with a viscous fluid, radial restraint means mounted on said one of said shafts in parallel with the viscous damper means to impart a load to the other of said shafts to change its critical speed to a value above the maximum rotational speed of said one of said shafts and stabilize the viscous damper.

Re. 30,211

PHOTOGRAPHIC ELEMENTS CONTAINING COLOR-FORMING COUPLERS HAVING AN INHIBITING EFFECT UPON THE REACTIVITY OF COMPETING COUPLERS

Robert G. Cameron, Spencerport, and Dan Neuberger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

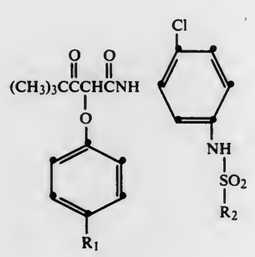
Original No. 3,933,501, dated Jan. 20, 1976, Ser. No. 478,123, Jun. 10, 1974. Continuation-in-part of Ser. No. 419,573, Nov. 28, 1973, abandoned. Application for reissue Jun. 16, 1978, Ser. No. 916,172

Int. Cl.[2] **G03C** *1/76, 1/40*

U.S. Cl. 430—503 **25 Claims**

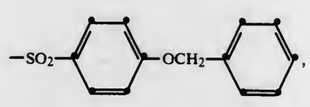
1. In a photographic element comprising a support coated with at least two silver halide emulsion layers; each of said emulsion layers being preferentially sensitive to different regions of the visible spectrum and each of said emulsion layers being associated with at least one coupler compound which, upon reaction with oxidized primary aromatic amine color developing agent, forms an image dye; a first emulsion layer sensitive to the relatively shorter wavelength region of the visible spectrum overlying the second emulsion layer in said element, said second emulsion containing a cyan dye-forming coupler compound or a magenta dye-forming coupler compound;

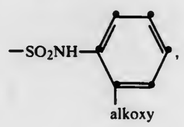
the improvement which comprises, in said element, the presence in said first emulsion layer of a yellow dye-forming coupler compound having a Competitive Reaction Ratio of at most about 1.20; said yellow dye-forming coupler compound being selected from those having [one of] the structure[s]:



wherein R_1, *and* R_2 [and R_3] can differ and are non-interfering coupler substituent groups; at least one of R_1 and R_2 [in structure A and at least one of R_1 and R_3 in structure B] being a ballasting group; said R_1 being

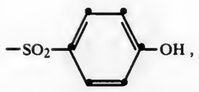
-nitro,

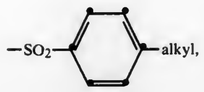


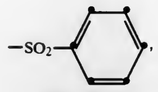


-continued

—$NHSO_2$-alkyl,







—SO_2-alkyl, or
—CN, and

said R_2 being

—C_nH_{2n+1}, where n is 1 to 30;
-alkaryl;
-aralkyl;
-phenyl; or
alkoxyphenyl,

wherein the groups designated as alkyl and alkoxy contain 1–30 carbon atoms and the alkaryl, aralkyl and alkoxyphenyl groups contain 7–35 carbon atoms.

Re. 30,212

COATING AND INK COMPOSITIONS

Charles H. Carder, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

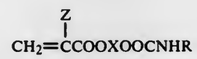
Original No. 4,003,751, dated Jan. 18, 1977, Ser. No. 503,476, Sep. 5, 1974. Application for reissue May 6, 1977, Ser. No. 794,420

Int. Cl.[2] **C09D** *11/00*

U.S. Cl. 106—20 **11 Claims**

1. A coating or ink composition comprising:

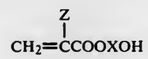
a. from 1 to 80 weight percent of at least one monofunctional acrylate-urethane of the formula:



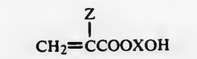
wherein Z is hydrogen or methyl; X is divalent alkylene of 1 to 10 carbon atoms, cycloalkylene of 5 to 12 carbon atoms; and R is alkyl of 1 to 10 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, or aryl of 6 to 12 carbon atoms;

b. from 20 to 99 weight percent of at least one polyfunctional acrylate-urethane of the group:

i. polycaprolactone-polyurethane-polyacrylate oligomers, said oligomers being the reaction product of polycaprolactone polyol having a molecular weight of from 130 to 20,000, organic polyisocyanate and hydroxyl substituted ester of the formula:

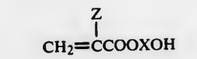


ii. diurethane-diacrylate, said compound being the reaction product of two moles of a hydroxyl substituted ester of the formula:



and one mole of an organic diisocyanate, or,

iii. urea-urethane-polyacrylate oligomer said oligomer being the reaction product of a hydroxyl substituted ester of the formula:



an organic diisocyante and a hydroxylamine of the formula:

HOR'NHR

wherein R' is a linear or branched divalent alkylene of 1 to 12 carbon atoms, cycloalkylene of 5 to 12 carbon atoms, or arylene of 6 to 12 carbon atoms and Z and X are as hereinabove defined;

c. from 0 to 50 weight percent of at least one polyfunctional acrylate crosslinker; and

d. from 0 to 30 weight percent of at least one monofunctional acrylate.

Re. 30,213

METHOD OF MAKING FOAMED COPOLYIMIDES AND PRODUCT OBTAINED THEREFROM

John Gagliani, San Diego, and John V. Long, El Cajon, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Original No. 3,966,652, dated Jun. 29, 1976, Ser. No. 522,765, Nov. 11, 1974. Application for reissue Mar. 29, 1979, Ser. No. 25,004

Int. Cl.[2] **C08J** *9/02*

U.S. Cl. 521—185 **7 Claims**

1. A process of making a copolyimide foam which comprises the steps of: dissolving two or more diamines in a mixture of an esterifying agent and one or more esters of a tetracarboxylic acid in an amount such that the imide forming functionalities are substantially equimolar, one of said diamines being heterocyclic and having nitrogen in the ring, another of said diamines being a para- or meta-substituted aromatic diamine which is free of aliphatic moieties, and any additional diamine being either a heterocyclic or an aromatic diamine as aforesaid; adding from 0.1 to 10 parts by weight of a surfactant based on the weight of the ester and diamine constituents; heating the resulting material at a temperature in the range of 150°–250° F. until the volatiles content of the material is from one to five percent lower than the theoretical volatiles content of the ester and diamine constituents; and thereafter heating the unfoamed precursor material existing at the end of said step of reducing the volatiles content to a temperature in the range of 220°–325° F. to develop a polymeric foam and then to a temperature of 550°–600° F. to cure the foam.

PLANT PATENTS

GRANTED FEBRUARY 12, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,501

PLUM TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Jan. 11, 1979, Ser. No. 2,784

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized, in comparison to the Cassellman, by late ripening freestone fruit having less red exterior color at harvest but which red color intensifies during shipment and storage.

4,502

CARNATION NAMED DOOKA PINK

Akira Dooka, and Michiko Dooka, both of 1621 Old San Jose Rd., Soquel, Calif. 95073

Filed Aug. 28, 1978, Ser. No. 937,088

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar substantially as herein shown and described, characterized by its profuse and continuous production of relatively small variegated pink and white flowers on strong, rigid stems.

PATENTS

GRANTED FEB. 12, 1980

ERRATA

For CLASS	See PATENT NO.
227–066	4,187,589
101–379	4,187,772
101–001	4,187,774
414–421	4,187,950
416–226	4,188,171
430–022	4,188,216
430–495	4,188,218
430–208	4,188,219
430–536	4,188,220
430–284	4,188,222
430–270	4,188,223
204–159.15	4,188,224
430–007	4,188,225
430–620	4,188,226
435–179	4,188,263
023–230 B	4,188,264
435–313	4,188,265
548–229	4,188,323
548–240	4,188,324
549–087	4,188,327
585–274	4,188,348
525–366	4,188,349
525–187	4,188,352
426–276	4,188,399
028–167	4,188,422
427–040	4,188,426
364–200	4,188,662

PATENTS

GRANTED FEBRUARY 12, 1980

GENERAL AND MECHANICAL

4,187,557
ATHLETIC GLOVE
Aldo L. Tombari, 2872 Valleyview Dr., Huntington, Ind. 46750
Filed Apr. 10, 1978, Ser. No. 895,269
Int. Cl.[2] A41D *19/00*; A63B *71/14*
U.S. Cl. 2—19 **10 Claims**



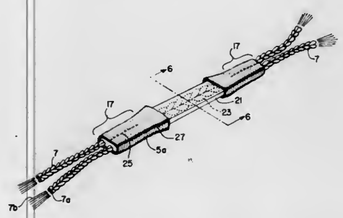
1. An athletic glove adapted to be used by baseball batters or the like, and characterized by the ability to improve the leverage imparted to the bat by the hands, to thereby improve directional control and obtain greater swing velocity, and comprising

a body portion adapted to overlie at least a portion of the palm of a wearer's hand,

at least two tubular finger portions attached to said body portion and adapted to respectively receive the third and fourth fingers of the wearer's hand, and having a length sufficient to overlie the second phalange of each such finger, and

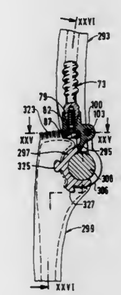
a single pad mounted to the inside of each of said two finger portions, with each of said pads positioned to overlie only the second phalange of the respective fingers and with the remainder of said finger portions being free of any pad, said pads each having a thickness sufficient to enable the third and fourth fingers to significantly increase the force which they are able to apply to a bat.

4,187,558
PROSTHETIC LIGAMENT
Burton L. Dahlen, Cardiff-by-the-Sea, and James A. Stubstad, Lafayette, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Filed Oct. 25, 1977, Ser. No. 844,678
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1 **9 Claims**



1. A surgically implantable skeletal ligament comprising an elongated flexible body having two end portions and having secured thereto between the end portions at least one collar member, the collar member being a deformable material having two major surfaces, an inner surface in intimate contact with the ligament body and an opposite outer velour-like surface adapted to invite tissue ingrowth when the collar of the ligament is implanted within a living bore, the collar member including a deformable flared mouth portion continuous with and extending from the collar member and adapted to loosely receive a portion of the ligament body prior to its intimate contact with and attachment to the collar member.

4,187,559
BODY JOINT ENDOPROSTHESIS
Helmut Grell, Aalen, and Achim Engelhardt, Frankfurt, both of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.
Continuation of Ser. No. 672,963, Apr. 2, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,738
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514793
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **32 Claims**



1. A body joint endoprosthesis comprising:

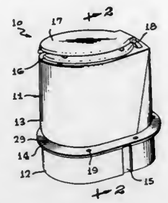
an anchoring part comprising a shaft adapted to be anchored in a first bone;

a pivot member comprising a first joint member and a support element adapted to bear against a seating surface of the first bone, said pivot member being connected to said anchoring part by a joint that permits said support element to pivot in a direction substantially normal to said seating surface; and

a second joint member adapted to be connected to a second bone, with said first joint member and said second joint member forming a body implant joint.

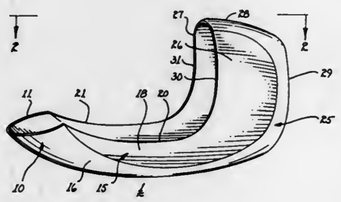
4,187,560
Patent Not Issued For This Number

4,187,561
TOILET RISER
David B. Bogan, 7303 Paso Robles Ave., Van Nuys, Calif. 91406
Filed Aug. 4, 1978, Ser. No. 931,184
Int. Cl.[2] A47K *11/02*
U.S. Cl. 4—116 **2 Claims**



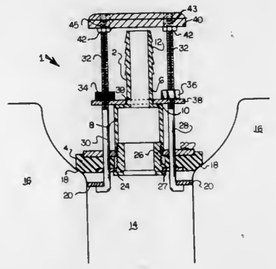
1. A toilet riser comprising:
an open-ended, hollow body of integral, unitary construction;
said body having a straight walled base or lower portion and a tapered walled upper portion;
an outwardly projecting flange integrally provided at the juncture of said lower and said upper portion;
an inwardly extending lip integrally formed at the termination end of said upper portion defining a central opening leading into the hollow interior of said body;
side wall reinforcement means vertically provided on opposite sides of said lower portion;
a splash panel integrally formed beneath said lip at the rear of said upper portion;
said body is characterized as being fabricated by seamless molded techniques and the composition of said body is cross-linked polyethylene; and
said body includes a hinge support portion integrally formed with and adjacent to said lip at the rear of said body.

4,187,562
PERSONAL URINAL DEVICE FOR FEMALES
Victoria F. Mioduski, 1226 N. Torino Ave., Tucson, Ariz. 85712
Filed May 4, 1978, Ser. No. 902,888
Int. Cl.[2] A61G *9/00*; A47K *11/12*
U.S. Cl. 4—144.3 **8 Claims**



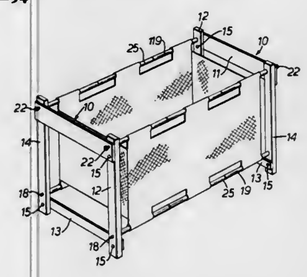
1. A semi-rigid personal urinal for collecting urine from women, said urinal being useable by a woman while she is in a sitting or supine position by placing said urinal upon the same surface supporting the user, said urinal comprising in combination:
(a) a receiving end for receiving urine discharged from the orifice of the urethra, said receiving end including a lip for sealingly engaging a part of the labium;
(b) a central section continuous with said receiving end and having a longitudinal axis and extending longitudinally from said receiving end for channeling the urine away from said lip, said central section being of sufficient capacity to receive and retain a substantial part of the discharged urine, said central section including opposed walls having concave wall sections for contactingly engaging at least the lower part of the adjacent portions of the user's thighs and through such engagement constraining movement of said urinal relative to the user's thighs and urethra;
(c) a container disposed downstream of and continuous with said central section, said container being configured to store the collected urine upon rotation of said urinal from a horizontal position to a vertical position, said container including an upright portion extending vertically from the longitudinal axis of said central section for a distance sufficient to place the upper end of said upright section above the mid point of the user's thighs when said urinal is in use, said upright portion including further wall sections extending from said wall sections of said central section for engaging the adjacent surfaces of the user's thighs, said further wall sections including concave sections for contactingly receiving at least the mid points of the user's thighs and constraining vertical and horizontal movement of said urinal with respect to the user's thighs;
whereby, said urinal is maintained in place by contact with the user's thighs and is accessible by the upper end of said upright portion before, during and after use.

4,187,563
FLUSHING DEVICE
Victor Semke, 10617 Chamonieux Dr., Palos Hills, Ill. 60465
Filed Jul. 24, 1978, Ser. No. 927,009
Int. Cl.[2] E03C *1/306*; F16L *5/02*
U.S. Cl. 4—256 **12 Claims**



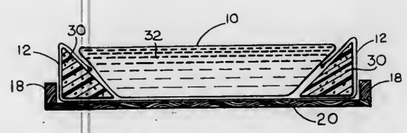
1. A device for flushing a drain pipe having an anchor point by applying fluid under pressure to the interior of the pipe, said device comprising:
(a) conduit means for passing fluid therethrough under pressure;
(b) resilient sealing means connected to said conduit means for providing a fluid tight seal between said sealing means and said pipe during passage of fluid through said conduit means;
(c) securing means operatively connected to said sealing means for detachably securing said sealing means over the mouth of said pipe, said securing means including
(i) restraining means including at least two restraining members each slidably engaged with said sealing means and having an anchoring portion engageable with said anchor point; and
(ii) urging means operatively connected to said restraining member and said sealing means for urging said anchoring portions of said restraining member against said anchor point simultaneously with urging said sealing means into sealing engagement with said pipe to create said seal; and
(d) disengagement prevention means including an apertured transverse locking member engageable with and interconnecting said restraining members at a point between said urging means and the end of said restraining members opposite from said anchoring portions for preventing rotation and disengagement of said restraining means from said anchor point when said sealing means is brought into sealing engagement with said pipe.

4,187,564
INFANTS COT
Antonio D. Alomar, Paseo Maritimo 12, Edificio Bellver, Palma de Mallorca, Balearic Islands, Spain
Filed Mar. 28, 1978, Ser. No. 890,870
Claims priority, application Spain, Apr. 4, 1977, 227.650[U]
Int. Cl.[2] A47D *7/04*
U.S. Cl. 5—94 **7 Claims**



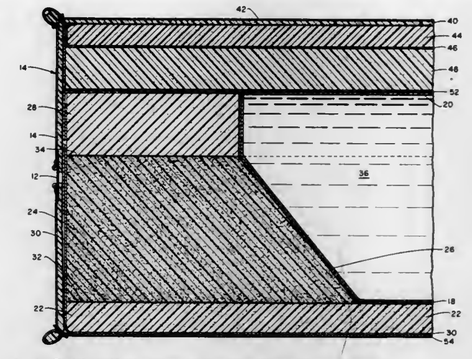
1. A frame assembly for an infant's cot, including a pair of end frames, each having four members pivotally interconnected by three joints and being foldable from a first substantially rectangular configuration to a second configuration in which the members are in substantially superimposed alignment, and bracing members for interconnection said pair of end frames, said pair of end frame members being secured in said first configuration by engagement with two of said bracing members.

4,187,565
WATERBED CONSTRUCTION
Lee B. Zeltzer, 3145 Camino Juan Paisano, Tucson, Ariz. 85718
Filed Dec. 5, 1977, Ser. No. 857,470
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **10 Claims**



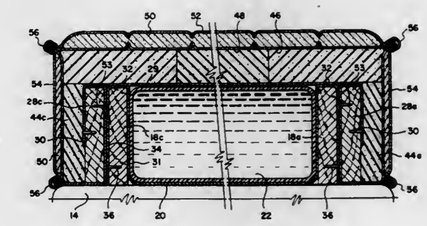
1. Improvements in waterbed construction having lower platform support and water filled mattress thereupon, said improvements comprising side means juxtaposed in touching relationship the outside perimeter of the sides of the water mattress, and waterproof liner means interposed the water mattress and lower platform support, said liner means additionally partially enclosing said side means.

4,187,566
WATER MATTRESS CONSTRUCTION
Warren E. Peterson, Santa Ana, Calif., assignor to Wilshire Bedding Co., Inc., Los Angeles, Calif.
Filed Feb. 8, 1978, Ser. No. 876,073
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **26 Claims**



1. A fluid cell mattress construction comprising:
a rectangular layer of low-density elastomeric foam;
an intermediate rectangular layer of medium-density elastomeric foam on top of said low-density foam forming a cavity;
a rectangular layer of low-density elastomeric foam around the perimeter of said cavity on top of said medium-density foam;
a rectangular cover of substantially non-stretchable fabric covering the bottom and sides formed by the three layers of foam, thereby forming the foam layers into a self-supporting frame;
a fluid bladder formed to fit into said cavity;
a second layer of low-density foam covering the top of said layers of foam and said bladder; and
a cover of ticking enclosing the assembly of layers of foam and said bladder.

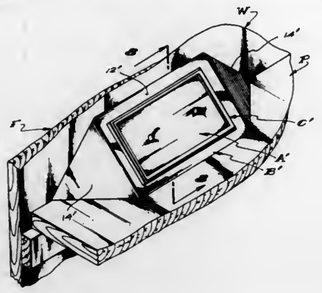
4,187,567
WATERBED
Curt P. Crowther, 663 S. 13th East, Salt Lake City, Utah 84112
Filed Aug. 4, 1978, Ser. No. 930,921
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **6 Claims**



1. A waterbed comprising an inner rigid frame member having a rigidity and flexibility equivalent to wood for circumscribing and laterally supporting a liquid containing bladder and removable cushioned cover unit having outer rigid side walls having a rigidity and flexibility equivalent to wood and flexible top member for covering said bladder a flexible bottom wall member which follows the contours of the inner surface of the inner rigid frame member and is fastened to the outer surface of said rigid frame member, wherein the rigidity and

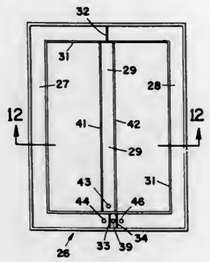
flexibility of said inner and outer rigid side walls are such that the outer surface of said inner side walls will exert a slight force against the inner surface of said outer side walls and flexible member to provide an interlocking and sealing effect when in use.

4,187,568
WATER BED TRANSDUCER
James P. McMullan, and Albert Stevens, both of 2630 Seaman Ave., El Monte, Calif. 91733
Filed May 15, 1978, Ser. No. 906,240
Int. Cl.[2] A47C *27/08;* A61G *7/04;* A61H *1/00;* A47D *9/02*
U.S. Cl. 5—451 **6 Claims**



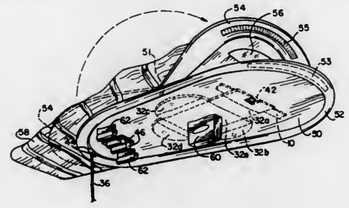
1. In combination, a water bed structure including a frame with at least one vertical side wall, a horizontal platform within the frame and a water filled bladder mattress contained within the frame adjacent said side wall and supported on the platform, a transducer unit including an elongate body arranged in a portion of the corner defined by the platform and said wall and having an outer side engaged with said wall, a bottom side engaged with said platform and an upwardly and inwardly disposed inner side opposing the mattress, a plate positioned between the mattress and the inner side of the body and supporting the portion of the mattress adjacent the unit, resilient coupling means coupling the plate with the body for limited relative movement therebetween and an electro-magnetic vibrator fixed to said plate and projecting freely into the body.

4,187,569
WATER MATTRESS CONSTRUCTION
Dave Calleance, 1945 23rd Ave., San Francisco, Calif. 94116
Continuation-in-part of Ser. No. 761,499, Jan. 21, 1977, Pat. No. 4,080,676. This application Mar. 6, 1978, Ser. No. 883,523
Int. Cl.[2] A47C *27/08, 17/14*
U.S. Cl. 5—451 **4 Claims**



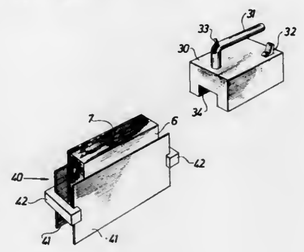
1. A unitary water mattress construction, comprising three web portions in vertically stacked relationship, said web portions being parallel and substantially similar in size and shape; a continuous edge weld joining the outer edges of said web portions in sealing fashion; a second, continuous weld spaced inwardly from said edge weld, joining the upper and medial ones of said web portions in sealing fashion; third and fourth welds extending between said edge weld and said second weld joining said upper and medial ones of said web portions in sealing fashion; said mattress including a water chamber defined by said medial and the lower web portions and said edge weld; and a pair of peripheral upper air chambers defined by said upper and medial web portions, said edge weld, said second weld, and said third and fourth welds and sealed from each other by said third and fourth welds; a water valve extending through said upper and medial web portions to said water chamber; and a pair of air valves extending through said upper web portion to said pair of peripheral upper air chambers.

4,187,570
SHIP ESCAPE AND SURVIVAL SYSTEM
David N. De Simone, Cornwells Heights, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 17, 1978, Ser. No. 878,556
Int. Cl.[2] B63C *9/00*
U.S. Cl. 9—14 **17 Claims**



1. A personnel survival system for deployment of an individual from a platform above water, comprising:
a harness formed to fit about the torso of the individual;
descent means connected to said harness for lowering the individual from the platform to the water; and
flotation means connected to said harness and including a raft having two inflatable cells angularly connected so that said cells urge against each other when inflated for sealingly encapsulating the individual during the lowering.

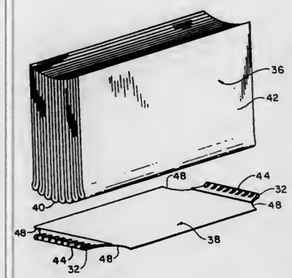
4,187,571
MANUALLY MOVABLE BINDING APPARATUS
Ulf J. E. Asterö, Tumba, Sweden, assignor to Asthausbolagen HB Asterö & Stockhaus, Tumba, Sweden
Filed Jun. 23, 1978, Ser. No. 918,511
Claims priority, application Sweden, Jun. 27, 1977, 7707406
Int. Cl.[2] B42C *9/02*
U.S. Cl. 11—1 AD **8 Claims**



1. In an apparatus for binding bundles of paper, comprising means for holding a bundle of paper as a unit, and a binding means comprising a band folding means for attaching a band

provided with a binder to an edge of the bundle, the band folding means being divided into a press means acting on the bundle edge and, in series therewith, a pair of band folders facing each other and acting on the bundle rims adjacent the bundle edge; the improvement wherein: the bundle holding means is a stationary apparatus and the binding means is mounted in a housing adapted to be manually moved along the upper edge of the bundle; further wherein the press means is a press plate which is spring urged toward the upper edge of the bundle and both of the band folders acting on the upper rims of the bundle are spring urged toward each other so as to accommodate for varying bundle thicknesses.

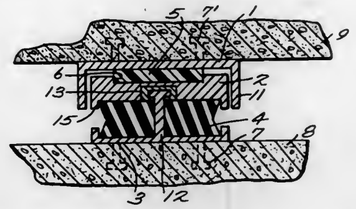
4,187,572
METHOD FOR MAKING INTEGRATED BOOK LINING
Peter P. Savich, Longmeadow, Mass., assignor to The Smyth Manufacturing Company, Bloomfield, Conn.
Continuation-in-part of Ser. No. 785,964, Apr. 8, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,728
Int. Cl.[2] B42C *15/00*
U.S. Cl. 11—2 **32 Claims**



1. A method of making integrated book spine linings to be applied to spines of a succession of books and comprising the steps of providing a supply of strip lining material having a crosswise dimension between opposite longitudinal side edges generally corresponding to the book spine length, feeding a strip from the supply of lining material, printing simulated headbands on an outer surface of the strip adjacent its longitudinal side edges, folding the longitudinal side edges of the strip toward one another to expose the outer surface of the strip with the folded crosswise strip dimension between its opposite longitudinal side edges being substantially equal to the book spine length, and cutting the strip transversely to its longitudinal axis to form a succession of individual linings to be applied in registered relation respectively to spines of a corresponding succession of books.

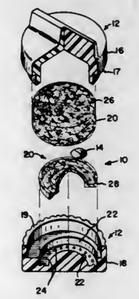
4,187,573
HIGH LOAD BEARING FOR BRIDGES AND SIMILAR STRUCTURES
Edward R. Fyfe, Burlington, Canada, and Stewart C. Watson, Williamsville, N.Y., assignors to Watson Bowman Associates, Inc., Buffalo, N.Y.
Continuation of Ser. No. 812,477, Jul. 5, 1977. This application Jun. 26, 1978, Ser. No. 919,390
Int. Cl.[2] E01D *19/06*
U.S. Cl. 14—16.1 **5 Claims**

1. In a high load bearing comprising upper and lower plates which do not substantially increase their lateral dimensions under load, a load bearing elastomer pad
on the upper surface of said lower plate and the lower surface of said upper plate being on the upper surface of said bearing pad, said elastomer pad having a groove extending around its periphery and a cooperating bearing member constructed and arranged to substantially prevent shearing movement between said plates and thereby substantially prevent shearing of said elastomer pad but permitting rotational movement between said plates,
the improvement comprising means mechanically abutting said load bearing elastomer pad to at least limit lateral expansion of the upper and lower surfaces of said elastomer pad under load without preventing bulging of said periphery,



said mechanically abutting means comprising means projecting from said plates adjacent the periphery of said load bearing elastomer pad, and in which a lateral clearance is provided between said surface of said load bearing elastomer pad and said projecting means when said bearing is not under load, whereby said load bearing elastomer pad is permitted limited lateral expansion before abutting said projecting means.

4,187,574
CONTACT LENS CLEANSING APPARATUS
Richard J. Wrue, Greece, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Jul. 27, 1978, Ser. No. 928,751
Int. Cl.[2] B08B *11/02*
U.S. Cl. 15—104.92 **11 Claims**



1. An apparatus for the cleansing of contact lens, comprising:
housing means for containing a contact lens;
said housing means including a top portion and a bottom portion;
said top portion being both movable and removable in relation to said bottom portion;
scrubbing pad means within said top and bottom portions comprising a top pad member in said top portion and a bottom pad member in said bottom portion for the scrubbing of said contact lens when said top portion of said housing is joined to and rotated in relation to said bottom portion of said housing means;
said housing means further including a circular shoulder member within said top portion and a circular rim member within said bottom portion, said rim member supporting said shoulder member when said top and bottom portions are joined so as to precisely position said top pad means in relation to said bottom pad means and to facilitate back and forth rotation of said top pad means in relation to said

bottom pad means whereby a consistent force between said top and bottom pad means and scrubbing action on a contact lens contained therebetween may be effected without damage to said contact lens;

said scrubbing pad means further comprising a cellular non-shredding plastic foam material of such a consistency as to safely scrub a contact lens without damaging said lens while at the same time being of sufficient stiffness to effectively scrub said lens.

4,187,575

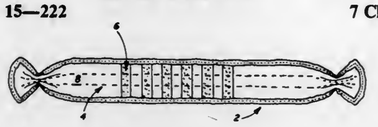
BACK WASH-MASSAGE-SCRUBBER

Robert Collins, 144 Shaw St., Garfield, N.J. 07026

Continuation-in-part of Ser. No. 866,250, Jan. 3, 1976, abandoned. This application Oct. 4, 1978, Ser. No. 948,467

Int. Cl.[2] A47K *7/02*

U.S. Cl. 15—222 **7 Claims**



1. A combination hand washer and back scrubber, comprising:

an elongated strip of fabric, having two lateral edges;

transverse, expansible scrubber strips comprising transverse, expansible soap-and-water retaining strips and transverse abrasive strips, attached to a first side of said fabric strip, each of said transverse strips extending substantially the entire width of said fabric strip;

a water absorbent strip attached to an opposite second side of said fabric strip, said water absorbent strip being non-abrasive to skin; and

a transverse elastic hand strap of an elongated dimension attached at its opposite ends to said respective lateral edges on said fabric strip at approximately the midpoints thereof to form a loop for retaining said fabric strip in a folded position and for allowing the hand of a person to fit within said loop to use said combination hand washer and back scrubber as a wash cloth.

4,187,576

WIPER BLADE

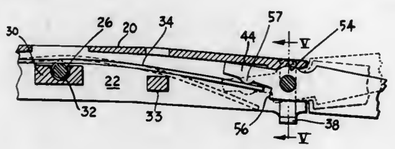
Raymond A. Deibel, West Falls; Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, all of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Continuation of Ser. No. 860,669, Dec. 15, 1977, Pat. No. 4,127,912. This application Dec. 1, 1978, Ser. No. 965,496

The portion of the term of this patent subsequent to Aug. 8, 1992, has been disclaimed.

Int. Cl.[2] B60S *1/04, 1/38*

U.S. Cl. 15—250.42 **3 Claims**



1. In a windshield wiper blade assembly including a pressure distributing superstructure having a transverse receptor for pivotally receiving a wiper arm connecting pin, the pin having a circumferential recess forming a pair of opposed radially extending shoulders, said superstructure includes a spring positioned to span and chordally intersect said transverse receptor, means to bias said spring to a position wherein an intermediate portion is positioned to lie in said recess between said opposed shoulders for retaining said pin in said receptor; characterized in that a fulcrum means is disposed intermediate said receptor and one end portion of said spring, said fulcrum having its axis lying parallel to the axis of said transverse receptor and externally accessible means for applying a force at said one end portion of said spring in a direction against said fulcrum whereby application of such force effects movement of said intermediate portion of said spring to a position out of engagement with the circumferential recess and opposed shoulders to permit removal of said pin from said receptor.

4,187,577

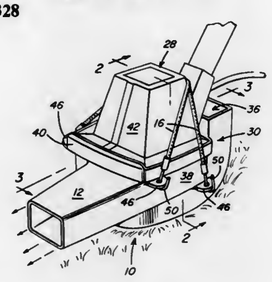
BLOWER ATTACHMENT FOR LINE TRIMMER

Lee A. Hansen, and William A. Conrad, both of 712 N. Piedra, Sanger, Calif. 93657

Filed Aug. 23, 1978, Ser. No. 936,182

Int. Cl.[2] A47L *9/00*

U.S. Cl. 15—328 **4 Claims**



1. An attachment apparatus for converting a portable hand held power apparatus having a head and drive shaft into a blower, comprising: an impeller; a housing for enclosing said impeller and a portion of the head, said housing comprising an impeller chamber surrounding said impeller, an intake port having a first vertically disposed portion opening to the surrounding atmosphere at its uppermost end and leading to a second intake portion at its lower end, said second portion having a covered bottom and covered sides and including a top having an aperture leading to said impeller chamber; and an outlet port connected to said impeller chamber and extending laterally from said impeller chamber in a substantially coplanar relation thereto and an attachment means for maintaining the housing in position upon the head.

4,187,578

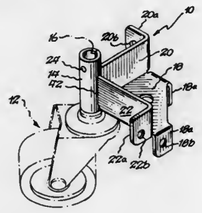
CASTER BRACKET AND METHOD OF FORMING SAME

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,132

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—29 **3 Claims**



1. In a caster bracket of the type having a tubular means sized to receive a mounting stud of a caster assembly and plate means for attaching said tubular means to a piece of furniture, the improvement permitting the forming of said tubular means and said plate means from a single metal plate, said improvement comprising:

said plate means includes a pair of side plates formed integrally with and arranged to upstand from one surface of a connecting plate along adjacent side edges thereof, said side plates having end edges disposed relatively adjacent one another, said tubular means is a curl formed integrally with and as an extension of one of said side plates along its one of said end edges, said curl having a free marginal edge disposed parallel to and immediately adjacent said one of said end edges of said one of said side plates, said free marginal edge is bonded to said one of said side plates, said curl is lengthwise bisected by each of said side plates, and said curl is bonded to the other of said side plates along its one of said end edges.

4,187,579

ADJUSTABLE HINGE FOR MOTOR-VEHICLE SEAT

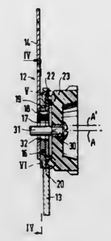
Walter Gensicke, Rockenhausen, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,821

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 7640079

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—139 **10 Claims**



1. An adjustable hinge for interconnecting the back part and the seat part of a motor-vehicle seat, said hinge comprising:

a first hinge element connected to one of said parts;

an array of outwardly directed outer teeth centered on a first axis and fixed on said first element;

a disk fixed to said first element adjacent said array of outer teeth and having a circular outer edge surface centered on said first axis;

a second hinge element connected to the other of said parts and having a recess with a circular inner edge surface aligned radially with said edge surface of said disk and centered on a second axis spaced from and substantially parallel to said first axis, said second hinge element having in radial alignment with said array of outer teeth an array of inwardly directed inner teeth centered on said second axis, said outer and inner teeth having tooth depths equal at least to the spacing between said axes;

an eccentric ring having a circular outer periphery juxtaposed with said inner edge surface and centered on said second axis and an inner periphery juxtaposed with said outer edge surface and centered on said first axis; and

means including a handle connected to said ring for rotating same about said second axis and thereby orbiting said first axis about said second axis while simultaneously rolling said array of outer teeth in said array of inner teeth and thereby changing the inclination between said parts.

4,187,580

OVER-CENTER HINGE

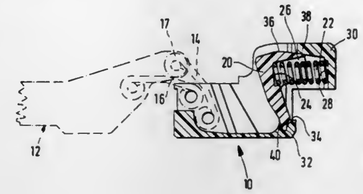
Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,155

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812459

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—145 **3 Claims**



1. A hinge for a furniture door, having a door-related hinge part in the form of a cup-like element for mounting in a recess in a door, said element having a bottom portion with a pocket, and a wall portion spaced from said bottom portion, a knuckle mounted in said element for pivoting by a given angular amount, a compression spring acting on said knuckle, a bearing surface provided on said element, said knuckle being movable through a dead-center position on one side of which it urges the door to a closed position and on the other side of which it exerts a pressure in the direction of opening said door, said knuckle having one end in the form of a relatively narrow edge, said edge being inserted in said pocket so as to form a fulcrum, the other end of said knuckle being remote from said one end and defining approximately an arc of a circle whose center coincides approximately with the fulcrum of the knuckle, said knuckle being secured against escape from the fulcrum pocket by said wall portion of said cup-like element, said wall portion closely overarching said other end in every position of movement of said knuckle.

4,187,581

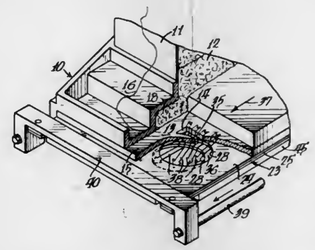
MOLDING DEVICE

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Apr. 17, 1978, Ser. No. 897,292

Int. Cl.[2] A22C *7/00*

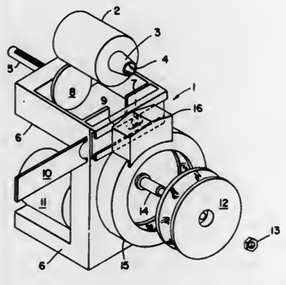
U.S. Cl. 17—32 **12 Claims**



1. A device for molding food articles of raw finely divided beef and similar tissue containing food material that is normally subject to uneven shrinkage during cooking, comprising: supply means for said material; a mold comprising superimposed mold plates each having an opening each with a peripheral edge with the edges of said plate openings being adapted to be aligned to define a mold opening comprising a said article forming cavity said plate openings being of the same shape and

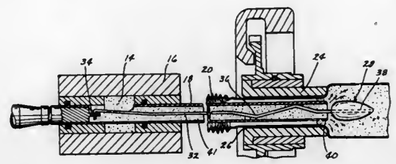
size; a supply passage means for supplying pressurized said material to said plate openings when said mold is in a mold filling position with said plate opening edges out of alignment thereby providing a flow passage means comprising the edge portion of one plate opening and the adjacent surface of the other plate for projecting said food material into the non-aligned openings to fill substantially completely said plate openings with said pressurized material; means for moving said plate openings into edge alignment to comprise said mold opening; and means for moving said aligned plates to an exterior position preparatory to removing the resulting molded food article from said mold opening.

4,187,582
MEATBALL MACHINE
Lohret J. DiLoreto, 268 Parkview Ter., Oakland, Calif. 94610
Filed Jan. 10, 1978, Ser. No. 868,454
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **7 Claims**



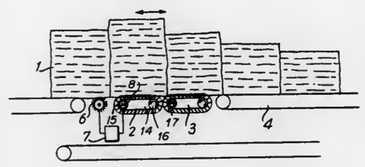
1. An apparatus for making meatballs which comprises:
(a) a meat compaction means for compressing ground meat used in making meatballs under a pressure of 0.5 to 6 psi and forcing the compressed meat through an orifice positioned at one end of said compaction means, said orifice having a diameter from about 0.4 to 1 times the diameter of the meatball,
(b) a meat rolling means connected to said meat compaction means for receiving the compressed meat from said orifice and rolling the compressed meat into a spherical meatball; said meat rolling means having (1) a stationary housing member (2) an internally mounted center member having a circular cross-section, said center member being rotatable about its axis, (3) semi-circular first groove around the internal perimeter of said housing member adjacent said member, (4) a semi-circular second groove around the external perimeter of said center member adjacent said housing member and positioned immediately opposite said first groove to form an elongated circular chamber between said housing member and said center member, (5) an entrance channel through said housing member communicating with said elongated circular chamber, and (6) an exit channel through said housing member communicating with said elongated circular chamber;
whereby the ground meat is compressed in said meat compaction means, extruded through said orifice, falls through said entrance channel into said elongated circular chamber of the meat rolling means, rolled between the stationary housing member and the rotating center member into a spherical meatball and recovered through said exit channel.

4,187,583
METHOD AND MEANS FOR ENCASING SAUSAGE OR THE LIKE
Ray T. Townsend, and David W. Smith, both of Des Moines, Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa
Continuation of Ser. No. 730,669, Oct. 7, 1976, abandoned. This application Sep. 5, 1978, Ser. No. 939,786
Int. Cl.[2] A22C *11/10, 11/02*
U.S. Cl. 17—49 **7 Claims**



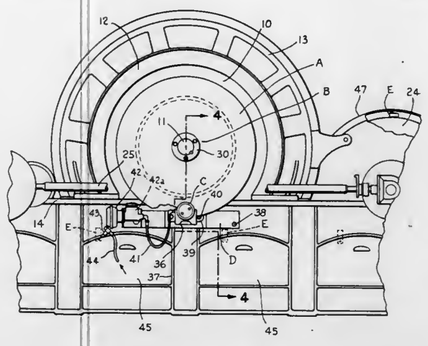
1. The method of creating a link in a meat product being extruded from the discharge end of a stuffing tube into a casing comprising the steps of:
extruding a quantity of meat product from the discharge end of a stuffing tube into an elongated casing,
applying at least some rotational torque to the meat product from within the extruded meat product at an exterior location beyond the discharge end of said stuffing tube whereby the meat product and casing will have rotational torque applied thereto to form a link.
3. In combination,
an emulsion encasing apparatus including a stuffing tube having a discharge end, said stuffing tube adapted to have a folded casing positioned thereon,
a restrictor means mounted on said apparatus and having a restrictor element comprising an elongated wire coil extending outwardly from the discharge end of said stuffing tube, said elongated wire coil being adapted to deform a column of emulsion extruded from the discharge end of said stuffing tube at an exterior location beyond said discharge end, and to impart rotational torque to such extruded emulsion and to the casing engaged by such extruded emulsion.

4,187,584
METHOD AND APPARATUS FOR OPENING TEXTILE FIBER BALES
Hermann Trützschler, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany
Filed Aug. 10, 1978, Ser. No. 932,502
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737434; Sep. 17, 1977, 2742016
Int. Cl.[2] D01G *7/06*
U.S. Cl. 19—81 **7 Claims**



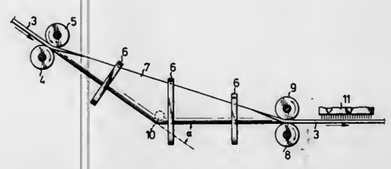
1. A process for opening of textile fiber bales, by which a row of bales are loosened on their undersides and separated, said process employing rotary pairs of needle tables having needles, whereby the rotational speed of said needle tables is varied, said process comprising the steps of: altering the rotary speed of at least one pair of needle tables temporarily in response to textile fiber bale hardness characteristics, and varying said speed from a relative zero speed between the needles and bales.

4,187,585
CARDING MACHINE DRIVING APPARATUS
Jerry B. Lowe, Simpsonville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.
Filed Mar. 27, 1978, Ser. No. 890,253
Int. Cl.[2] D01G *15/36*
U.S. Cl. 19—98 **5 Claims**



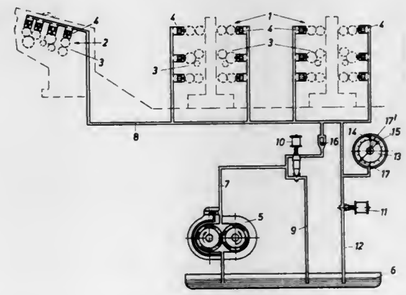
1. A drive for a carding machine having a frame carrying a driven main cylinder and other carding components including a doffer comprising:
opposed braking surfaces carried by disk means;
mounting means fixing said disk means to said main cylinder in transverse aligment therewith;
said opposed braking surfaces extending radially outwardly, concentrically of said main cylinder;
caliper means having spaced opposed brake pads clampingly engaging said opposed braking surfaces;
means fixing said caliper means in respect of said frame;
means driving said other carding components from said main cylinder; and
switch means on said carding machine actuating said caliper means for effecting clamping engagement between said pads and respective opposed braking surfaces instantaneously stopping said main cylinder and other carding components;
whereby the coming down of the web produced by the carding machine is avoided.

4,187,586
PROCESS FOR THE MANUFACTURE OF NON-WOVEN STRUCTURES
Valentin Semjonow, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Feb. 16, 1978, Ser. No. 878,436
Claims priority, application Germany, Feb. 18, 1977, 2706976
Int. Cl.[2] D04H *1/44, 1/46*
U.S. Cl. 19—161.1 **1 Claim**



1. In a process for avoiding waste material in the manufacture of non-woven fabric, in which, prior to the main consolidation of a web, a part of each of the border zones for a web is folded towards the center, the improvement comprising directing the non-woven fabric in the folding zone about a bending zone, at an angle which is inclined towards that level towards which the border zone is folded, said angle being taken between an imaginary projection of an inclined plane of the web and the plane forward of the bending zone about which said web is guided, said angle being defined as $\alpha \geqq 2\text{arc Sin } B_R/L$ wherein B_R is the width of individual border zones of said web, L is the length of the within said folding zone, said angle not to exceed about 90°, said width of both folded border zones being less than the ultimate entire width of said web, and said individual border zones being folded onto the same web surface.

4,187,587
TEXTILE MACHINE HAVING HYDRAULICALLY CONTROLLED DRAFTING ROLLERS
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneve, Switzerland
Filed Mar. 16, 1978, Ser. No. 887,299
Claims priority, application Switzerland, Mar. 22, 1977, 3554/77
Int. Cl.[2] D01H *5/52;* **B30B** *15/16*
U.S. Cl. 19—272 **4 Claims**



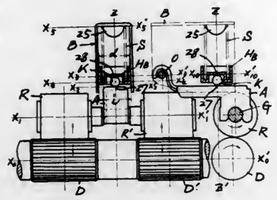
1. A textile machine comprising a plurality of sets of drafting rollers, hydraulic piston and cylinder assemblies respectively allocated to said sets of drafting rollers for maintaining pressure between the rollers in each set thereof by introduction of hydraulic pressure into the cylinders of said piston and cylinder assemblies, a main pipe circuit interconnecting all said cylinders, a tank for containing oil, a motor-operated pump connected to withdraw oil from said tank, a pipe system comprising both a feed pipe, interconnecting said pump and said main pipe circuit, and a first return-flow pipe branched from said feed pipe and leading to said tank for the return of oil thereinto, a first solenoid-controlled valve having alternative open and closed conditions and mounted in said pipe system for directing oil into said pipe circuit when in one of said open and closed conditions and through said first return-flow pipe when in the other of said open and closed conditions, a second return-flow pipe leading from said main pipe circuit to said tank, a second solenoid-controlled valve in said second return-flow pipe for controlling the flow of oil through said second return-flow pipe, and a pressure gauge connected to said main pipe circuit and operatively connected to control said first solenoid-controlled valve in response to hydraulic pressure in said main pipe circuit.

4,187,588

CONSTRUCTION OF PENDULUM ARM TYPE HIGH SENSITIVITY SELF-ALIGNING WEIGHTING ARM

Zenzaburo Tsukumo, 7of11, Masumi-cho, Ikeda, Japan, assignor to NTN Toyo Bearing Co. Ltd. and Zenzaburo Tsukumo, both of Osaka, Japan

Continuation of Ser. No. 754,890, Dec. 27, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,221
Claims priority, application Japan, Dec. 26, 1975, 50-157034
Int. Cl.² D01H *5/50*
U.S. Cl. 19—281 **7 Claims**



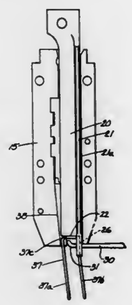
1. In a pendulum arm type, self-aligning weighting arm assembly for use with textile machinery and having casing means, said casing means including a pivot member, weighting arm means pivotally mounted at one end to the said pivot means of said casing means for movement in a plurality of directions, rotatably driven roller means rotatably mounted on the opposite end of said weighting arm means, driving body means operatively positioned with said driven roller means for rotating same and pressing means operatively engaged with said weighting arm means intermediate the ends thereof urging said driven roller means into engagement with said driving means, the improvement of the pressing means which comprises cap means U-shaped in cross-section positioned in the lower end of said casing means for vertical movement therein, a rolling contact bearing element positioned within said casing means and between the bottom of said cap means and the top surface of the weighting arm means intermediate its ends thereof and in bearing engagement therewith, said rolling contact element being smaller than the width of the open end of the inverted U-shaped cap means for free rolling movement therein, and spring means positioned in said casing means and above said cap means positively urging said cap means vertically downwardly against said rolling contact bearing element.

4,187,589

SLOTTING FASTENER DRIVING DEVICE

William T. Jobe, II, 2263 Swings Corner Rd., Bethel, Ohio 45106

Filed Feb. 27, 1978, Ser. No. 881,413
Int. Cl.² B25C *1/04*
U.S. Cl. 227—66 **12 Claims**



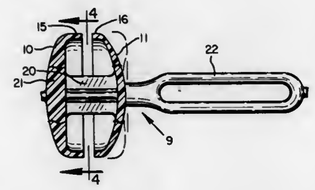
1. In a tool for securing a rigid sheet of material to a base so as to be slidable thereon, by means of fasteners, said tool having a guide body, a fastener driver reciprocal in said guide body, a fastener magazine, and means for feeding fasteners from said magazine to said guide body in a position to be driven by said driver, means for forming a slot in the sheet of material around the fastener shank contemporaneous with driving of the fastener.

4,187,590

ELASTIC FASTENER

Richard D. Harris, Albany; Franklin G. Smith, and Jerome F. Moshofsky, both of Portland, all of Oreg., assignors to R. D. Bussard & Son, Inc., Albany, Oreg.

Continuation-in-part of Ser. No. 789,024, Apr. 20, 1977, Pat. No. 4,118,835. This application Aug. 24, 1978, Ser. No. 936,322
Int. Cl.² A44B *21/00, 1/26*
U.S. Cl. 24—73 P **4 Claims**



1. An elastic fastener for fastening together layers of material, comprising:

a pair of spaced elastic, generally dish-shaped head members adapted to fit on opposite sides of layers of material to be joined, said head members each each having a rim, said head members being disposed concavely inwardly with their rims facing each other;

an elastic shank member joining said head members and adapted to pass through an opening in said layers or material,

one of said dish-shaped head members having a thicker bottom and thus less flexibility than the other of said dish-shaped head members so as to resist passage through said opening;

a boss positioned on the exterior of said other of said dish-shaped head members; and

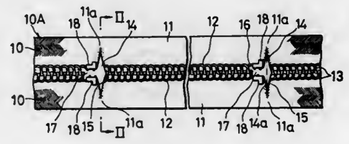
means disposed in said boss for releasably attaching a pulling means to said other of said dish-shaped head members for deformably pulling the same through said opening in said layers of material, thereby to position said head members on opposite sides of said layers of material and establish said fastener in place.

4,187,591

CONTINUOUS SLIDE FASTENER STRINGERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Continuation of Ser. No. 814,218, Jul. 11, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,290
Claims priority, application Japan, Jul. 12, 1976, 51-92624[U]
Int. Cl.² A44B *19/00*
U.S. Cl. 24—205 R **2 Claims**



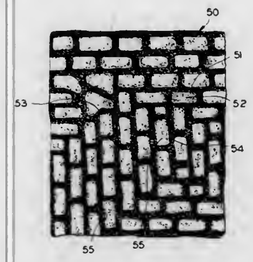
1. A pair of slide fastener stringers of continuous length comprising: a pair of opposed stringer tapes of continuous length and containing thermoplastic fibers; a pair of rows of fastener elements having interengageable coupling heads and carried on and along the respective confronting inner longitudinal edges of said stringer tapes, thread means securing said rows of fastener elements to the respective stringer tapes; and a plurality of top end stops attached to said rows of fastener elements, said stringer tapes having a plurality of openings each disposed at substantially equal intervals and extending transversely across the rows of fastener elements when coupled and beyond the width of a slider and defining a substantially diamond-like configuration with the longer diagonal of the diamond oriented generally normal to said rows of fastener elements and being of a length such that the opening terminates short of the outer longitudinal edges of the respective stringer tapes and forms a substantially V-shaped cut portion at one direction of the rows of fastener elements when coupled said rows of fastener elements including a plurality of coupling head-free sections each arranged immediately adjacent to said opening and opposite to said V-shaped cut portion, said top end stop being disposed at their portions where said coupling head-free sections are located, and the fibers of said stringer tapes being fused together at and along marginal edges defining said openings by thermoplastic material derived solely from the thermoplastic fibers of said stringer tapes.

4,187,592

METHOD FOR PRODUCING DECORATIVE FABRIC

Rebecca A. Bissi, 820 Forest Ave., Apt. E-2, Evanston, Ill. 60202

Filed Aug. 25, 1978, Ser. No. 936,733
Int. Cl.² D06C *23/00*
U.S. Cl. 28—163 **21 Claims**



1. An improved method for producing decorative fabric of the type wherein a desired geometrical design is imparted onto a fabric through dyeing, wherein said method comprises:

A. smocking said fabric by gathering portions of said fabric into juxtaposition so as to form a plurality of ridges on a top side of said fabric;

B. generally applying a plurality of color dye means to the exposed portions of said smocked fabric;

C. hardening said smocked fabric through stiffening means so as to stiffen said ridges on said top side of said fabric so as to make said ridges capable of maintaining said smocked position even when touched and manipulated;

D. applying a substantially concentrated color dye agent to the upper portions of said ridges;

E. outlining the uppermost peaks of said ridges with an outlining medium;

F. releasing said portions of said gathered fabric from said justaposition;

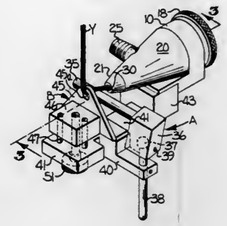
G. finishing said colored fabric having said desired design into decorative fabric material for use in such articles of apparel, wall decorations and upholstery material.

4,187,593

YARN TEXTURING AIR JET WITH CYLINDRICAL AND PLANAR BAFFLES

Samuel T. Price, Kennett Square, Pa., assignor to Enterprise Machine and Development Corporation, New Castle, Del.

Filed Apr. 9, 1979, Ser. No. 28,340
Int. Cl.² D02G *1/16*
U.S. Cl. 28—254 **7 Claims**



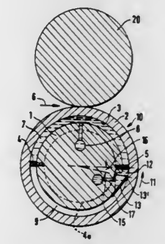
1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, an entrance end for passage of multifilament yarn into said air jet, an exit orifice for passage of yarn from said air jet, and means for directing pressurized air into the central bore of said housing to contact the yarn and pass outwardly through the exit end of said air jet to impart crimps, curls and loops to the filaments as the yarn passes through said air jet; the combination therewith of first and second baffles for enhancing the texturing of the yarn by said air jet, said first and second baffles being supported adjacent said exit orifice for successive engagement by the yarn and air leaving said air jet, said first baffle comprising an elongate element with a longitudinal axis extending across the path of travel of and being engaged by the yarn downstream of said exit orifice of said air jet, said second baffle comprising a relatively thin flat baffle plate positioned downstream of said first baffle and substantially perpendicular to the path of travel of the yarn, and said baffle plate including an opening through which the yarn passes after leaving said first baffle.

4,187,594

ROLL FOR PRESSURE TREATING WEBS OF MATERIAL

Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,431
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744524; Dec. 7, 1977, 2754380
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 AD **12 Claims**



1. In a roll for pressure treating webs of material comprising a stationary core which is surrounded by a rotatable hollow cylinder radially spaced from the core, said roll having between the core and the hollow cylinder, longitudinal seals and end seals which seal off a longitudinal chamber which extends between the core and the hollow cylinder on one side of the roll and is adapted to be filled with a pressure liquid, and

discharge means provided in the core for discharging leakage liquid from the remaining space between the core and the hollow cylinder, which space remains between the core and the hollow cylinder on the other side of the roll, the improvement comprising:

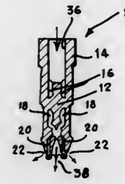
a strip, which extends longitudinally along the hollow cylinder for the length of said longitudinal chamber and is secured to the core, said strip having a free long edge cooperating with the inner circumferential surface of the hollow cylinder to collect therefrom said leakage liquid in said remaining space and carried by said surface during rotation of said hollow cylinder, said strip extending from the core toward the inner circumference of the hollow cylinder and being arranged in the vicinity of that one of said longitudinal seals toward which when rotating the hollow cylinder runs, said discharge means being positioned to discharge leakage liquid collected by said strip.

4,187,595

METHOD OF FABRICATING NOZZLE BLADES FOR LASERS

Ralph F. Kuhn, Jr., Calabasas, Calif., assignor to The United States of Amrica as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 12, 1978, Ser. No. 941,718
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—157 C **1 Claim**



1. A method of fabricating nozzle blades for lasers comprising the following steps:

(a) forming an annular-shaped blade core of a rigid, chemically resistant material,

(b) forming a pair of opposed circumferentially located grooves in said annular-shaped core,

(c) machining an open-ended exit nozzle on the outside diameter of said core intermediate said grooves,

(d) pressing said exit nozzle into its final configuration;

(e) placing a chemically resistant, nonconductive, low melting point material within said exit nozzle,

(f) machining a plurality of pairs of cutout portions within said core,

(g) electric discharge machining a first set of passageways within said core adjacent said cutout portions in order to interconnect said cutout portions,

(h) placing a chemically resistant, nonconductive, low melting point material within said cutout portions and said first set of passageways,

(i) electrodepositing said core with a closure of chemically resistant material,

(j) removing said chemically resistant, nonconductive, low melting point material from said cutout portions, said first set of passageways and said exit nozzle, thereby forming the coolant channels, injection manifolds and trip manifolds of said nozzle,

(k) electric discharge machining a centrally located feed hole within said core opposite said exit nozzle, said feed hole being operably connected to said coolant channels, injection manifolds and trip manifolds, and

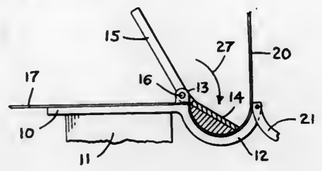
(l) electric discharge machining a second set of passageways in said closure adjacent said exit nozzle, thereby forming additional trip manifolds.

4,187,596

METHOD AND APPARATUS FOR MANUFACTURING A SOLAR ENERGY COLLECTOR

Robert L. Nevins, 12 Franklin Rd., Great Neck, N.Y. 11024

Filed Oct. 20, 1978, Ser. No. 953,197
Int. Cl.[2] B23P *15/26;* **B21D** *53/02*
U.S. Cl. 29—157.3 C **1 Claim**



1. A method for producing thermally efficient tubing with an attached solar heat collecting sheet; the method comprising steps of:

clamping a portion of the sheet above a half-cylindrical female mold,

pivoting a male die against the sheet to force the sheet to conform to the half-cylindrical shape of the female mold and to enable the bitter end of said sheet to stand generally perpendicular to the clamped portion of the sheet,

removing the male die from the female mold and sheet combination,

placing a tube in the female mold on top of the conforming shape of the sheet portion,

drawing another female mold over the exposed surface of the tube to press the balance of the sheet portion against the tube and to cause this sheet portion to conform to the shape of the tube,

drawing the female molds together to stretch and to press the sheet portion into close contact with the tube,

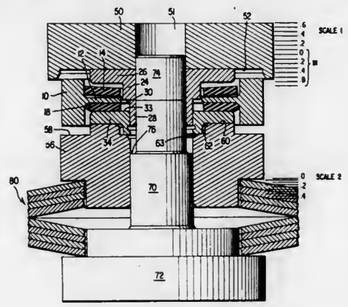
and joining the bitter end of the sheet portion to the body of the sheet.

4,187,597

TORSIONAL VIBRATION DAMPER HAVING TWO PART HUB

Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Division of Ser. No. 724,058, Sep. 16, 1976, Pat. No. 4,150,587.
This application Aug. 18, 1978, Ser. No. 935,012
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.3 **1 Claim**



1. An apparatus for assembling a torsional vibration damper, the damper being of the type having an outer inertia member carrying a radially extending web, the web sandwiched by a pair of elastomer elements, the elastomer elements being sandwiched by two pieces of a two-piece hub which are held together by deformation, the assembly apparatus including,

(a) a base from which an integral stud projects, the stud having at least two portions of different diameters, the said two stud portions joined by an annular shoulder, the shoulder forming a swaging deformation zone,

(b) an annular ram having a through aperture, the aperture receiving at least a portion of the stud,

(c) an annular anvil having a through aperture, the aperture receiving at least a portion of the stud, the anvil positioned between the ram and the base,

(d) Belleville springs abutting said base and said anvil and urging the anvil away from the base,

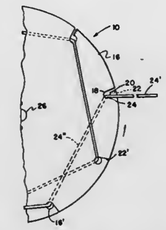
(e) whereby, with an unassembled damper of the type recited placed between the ram and the anvil, movement of the ram towards the anvil will be resisted by the Belleville springs, thereby compressing and distorting the elastomer members until a flat part of the Belleville spring load-deflection characteristic is reached, at which time the desired maximum compression and distortion of the elastomer elements is reached and further ram movement, to effect deformation of at least one of the hub members, does not result in further distortion of the elastomer members.

4,187,598

FILAMENT WOUND PERFORATE PLATE SYSTEM

Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Division of Ser. No. 587,648, Jun. 17, 1975, Pat. No. 4,035,915.
This application Jul. 6, 1977, Ser. No. 813,351
Int. Cl.[2] B23P *11/00;* **B26B** *27/00;* **A01D** *55/18*
U.S. Cl. 29—513 **13 Claims**



3. The method of manufacturing a vegetation filament-trimmer plate, comprising the steps:

(i) winding successive intermediate portions of a filament over and around the periphery of a plate through a plurality of temporary openings in the periphery of the plate;

(ii) closing the plurality of temporary openings to outward passage of the windings therefrom by surrounding the plurality of temporary openings with a member; while

(iii) leaving a free end of the filament extending from the plate; thereby manufacturing a vegetation filament-trimmer plate.

4,187,599

SEMICONDUCTOR DEVICE HAVING A TIN METALLIZATION SYSTEM AND PACKAGE CONTAINING SAME

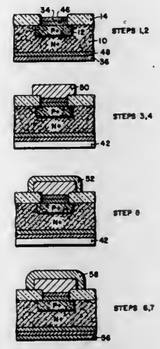
Dervin L. Flowers; Richard L. Greeson, both of Scottsdale, and V. Louise Rice, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 734,794, Oct. 22, 1976, abandoned, which is a continuation of Ser. No. 567,960, Apr. 14, 1975, abandoned. This application May 22, 1978, Ser. No. 908,037
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—588 **3 Claims**

1. A method of encapsulating a semiconductor device comprising:

providing a semiconductor device comprising a body of a first conductivity type, having first and second major surfaces, a region of second conductivity type in said body at a first major surface and forming a PN junction at said first surface, and an insulating layer covering said body and said PN junction at said first surface, a barrier metal on said second region at said first surface, and a barrier metal on said second major surface;

selectively electroplating a layer of silver on said barrier metal using said insulator as a mask, said silver forming a bump extending above said insulator;



selectively electroplating a layer of tin on said silver bump using said insulating layer as a mask;

providing a glass housing and conductor means for making electrical contacts external to said housing; and

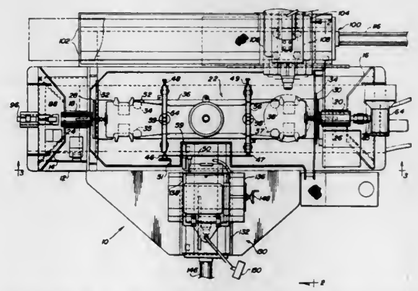
heating said assembly to metallurgically bond said conductor means to said tin layer and simultaneously said semiconductor device in said glass housing.

4,187,600

APPARATUS FOR MACHINING RAILROAD TRUCK BOLSTERS

Richard P. Yeates, Downers Grove; Boris S. Terlecky, Fox Lake, and Jagdish K. Shah, Chicago, all of Ill., assignors to Trailer Train Company, Chicago, Ill.

Filed Sep. 26, 1978, Ser. No. 945,837
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—564 **11 Claims**



1. An apparatus for machining railroad wheel truck bolsters comprising:

a base;

a fixture mounted for rotation about an axis on said base, said fixture including clamp means to clamp the truck bolster on said fixture in a predetermined position;

rotating means for rotating said fixture about said axis to different predetermined positions so that the truck bolster may be oriented in proper position for machining various critical surfaces of the bolster;

lock means for locking said fixture in a selected one of said predetermined positions;

a first machining head mounted on one side of said fixture for sliding movement in a first direction horizontally and parallel to the axis of rotation of said fixture, in a second direction horizontally and perpendicularly to the axis of rotation of said fixture, and in a third direction vertically and perpendicularly to the axis of rotation of said fixture so that certain of said various critical surfaces of the bolster can be machined by said first machining head when said fixture is in certain ones of said predetermined position;

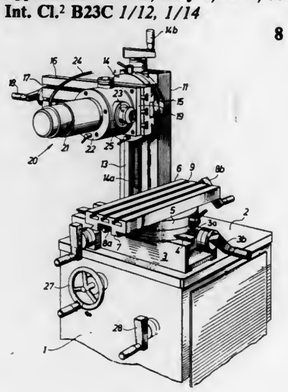
a second machining head mounted on the other side of said fixture for movement in a direction horizontally and perpendicularly to the axis of rotation of said fixture, said machining head having a combined boring and facing tool mounted for rotation on said machining head said boring and facing tool adapted to machine the bolster bowl surface of the bolster when said fixture is in one of said predetermined positions.

4,187,601

UNIVERSAL TYPE MACHINE TOOL

Per O. Aldrin, Strandpromenaden 25, 130 11 Saltsjö-Duvnäs, Sweden

Filed Apr. 26, 1978, Ser. No. 900,326
Claims priority, application Sweden, May 4, 1977, 7705179
Int. Cl.[2] B23C *1/12, 1/14*
U.S. Cl. 29—560 **8 Claims**



1. A universal type machine tool, comprising:

a frame (1, 2);

a horizontal bed (3) on said frame and having an elongated guide (4);

a first rotatable intermediate slide means (5) displaceably and feedably mounted on said guide (4) of said bed (3), said first intermediate slide means (5) being rotatable around a vertical axis;

an elongated rectangular table (6) supported on said first intermediate slide means (5) and being rotatable about said vertical axis, said rectangular table (6) being displaceable and feedable in the direction of its longest side relative to said first intermediate slide means (5);

an elongated vertical column (11) mounted to said frame, said column (11) having a vertically directed longitudinal axis;

a second rotatable intermediate slide means (14) mounted to said vertical column (11) and being displaceable and feedable along said longitudinal axis of said vertical column (11), said second intermediate slide means (14) being rotatable around a horizontal axis;

an elongated rectangular plate (16) mounted to said second intermediate slide means (14) and being displaceable and feedable in the direction of its longest side relative to said second intermediate slide means (14), said rectangular plate (16) also being rotatable about said horizontal axis;

feed means (18) coupled to said rectangular plate (16) for feeding said rectangular plate (16) relative to said second intermediate slide means (14) in the direction of the longest side of said rectangular plate (16); and

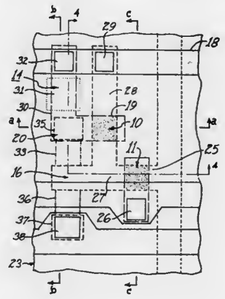
a drive unit (20) selectably mountable to said displaceably feedable rectangular plate (16) and, when mounted to said rectangular plate (16), being displaceable relative to said rectangular plate in the direction of the longest side of said rectangular plate (16) for fixation of said drive unit (20) in different positions, said drive unit (20) being turnable relative to said rectangular plate (16) around a horizontal axis.

4,187,602

STATIC MEMORY CELL USING FIELD IMPLANTED RESISTANCE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 754,208, Dec. 27, 1976, Pat. No. 4,092,735.
This application May 30, 1978, Ser. No. 910,246
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **8 Claims**



1. A method of making an integrated circuit having first and second resistors and an active circuit element comprising the steps of: forming a first resistor in the face of a silicon body by ion implanting; growing thermal oxide over said first resistor; applying a layer of polysilicon on said face at least partially overlying the thermal oxide to define a second resistor and to define an electrode of said active circuit element; implanting the polysilicon with impurity to a low level of concentration to define the resistivity of the second resistor; and introducing impurity into the polysilicon layer in all areas except that of the second resistor to form low resistance connections and said electrode; the first and second resistors and the active circuit element being interconnected in a circuit.

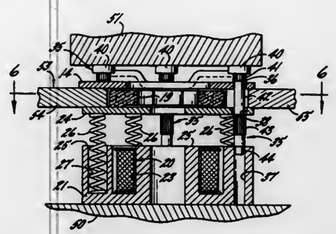
5. A method of making electrical connection simultaneously to a region of a face of a semiconductor body and to a strip of polycrystalline silicon on said face, comprising the steps of: exposing a contact area on said face of the body over said region, with the surrounding area on said face being covered with an insulating coating; depositing a strip of polycrystalline silicon over the insulating coating and extending into the contact area but not covering said contact area; applying another insulating coating on said face over the polycrystalline silicon and opening an aperture over the contact area to expose a portion of the region and to expose a portion of the polycrystalline silicon over the region; and applying a strip of metal to said face extending along the insulating coating and into the aperature at the contact area to engage said portion of the region and said portion of the polycrystalline silicon to provide said electrical connection.

4,187,603

METHOD OF MAKING AN ELECTRICALLY RELEASED ELECTROMAGNETIC FRICTION BRAKE

Edward R. Kroeger, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Wis.

Division of Ser. No. 828,525, Aug. 29, 1977, Pat. No. 4,156,478.
This application Oct. 16, 1978, Ser. No. 951,770
Int. Cl.[2] H01F *41/00*
U.S. Cl. 29—602 R **2 Claims**



1. A method of assembling a brake having a subassembly comprising (a) a shell, (b) an annular electromagnetic coil disposed within said shell and (c) spring means disposed within said shell, said brake further having an armature, having friction material adapted to rotate relative to said subassembly and said armature, and having a plate adapted to be fixed against rotation relative to said subassembly and said armature, said armature being drawn away from said friction material and toward one face of said shell when said coil is energized and being resiliently biased into engagement with said friction material and pressing the latter against said plate when said coil is de-energized, said shell, said armature and said plate all being formed with angularly spaced holes adapted to be alined with one another, said method comprising the steps of, placing one face of said armature next to said one face of said shell with the holes in said armature alined with the holes in said shell, placing said friction material next to the other face of said armature with the friction material located radially inwardly of said holes, placing one face of a gage of predetermined axial thickness next to said other face of said armature, the axial thickness of said gage being greater than the axial thickness of said friction material, placing said plate next to the other face of said gage with the holes in said plate alined with the holes in said armature and said shell, inserting pins into the holes in said plate, said armature and said shell, said pins being sized to be received with a press fit in the holes in said plate and said shell and with a loose fit in the holes in said armature, pressing said pins into said plate and said shell until said armature abuts said shell, said gage abuts said armature and said plate abuts said gage, and removing said gage from between said armature and said plate to enable said spring means to press said armature into engagement with said friction material and to shift said armature away from said one face of said shell by a distance equal to the difference between the axial thickness of said gage and the axial thickness of said friction material.

4,187,604

TOOL AND METHOD FOR INSTALLING FLEXIBLE TUBING IN A MULTI-CAPSULE REED RELAY SWITCHING ASSEMBLY

James V. Koppensteiner, Chicago; Khaja M. Jameel, Glen Ellyn; Charles K. Kubik, Brookfield, and George Len, Arlington Heights, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

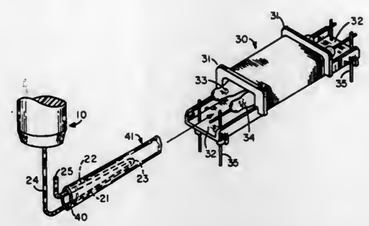
Filed Oct. 2, 1978, Ser. No. 947,977
Int. Cl.[2] H01H *11/00*
U.S. Cl. 29—622 **7 Claims**

1. A tool for inserting a flexible tube between two or more parallel and spaced apart glass encapsulated reed switches of a reed relay switching assembly, said tool comprising;

a rigid horizontal bottom leg including first and second ends;

a deflectable and angularly positioned top leg including first and second ends; and,

a rounded insertion knee joining said top leg first end and said bottom leg first end;



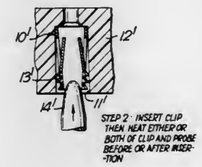
said tool slidably inserted into said tubing, deflecting said top leg toward said bottom leg and causing said top leg to apply pressure to an inside wall of said tubing, vertically elongating said tubing and allowing for insertion of said tubing between said reed switches.

4,187,605

METHOD OF MAKING ELECTRICAL CONNECTOR ASSEMBLY

Gerald J. Selvin, Birmingham, Mich.; Leland W. Oliver, Santa Ana, Calif.; Stephen K. Yamamoto, Los Angeles, Calif., and Clarence V. Hogan, Sun Valley, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 788,315, Apr. 18, 1977, Pat. No. 4,114,976, which is a continuation-in-part of Ser. No. 679,342, Apr. 22, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,913
Int. Cl.[2] H02G *15/00*
U.S. Cl. 29—629 **13 Claims**



1. The method of making an electrical connector assembly, said method comprising the steps of:

providing a thermally deformable insulator body having a bore therein;

providing a contact retention clip comprising a longitudinally slit, hollow resilient body, said clip body embodying a forwardly and inwardly extending spring tine struck from the wall thereof providing an aperture in said wall and said clip body having a plurality of discontinuities therearound spaced from said aperture;

inserting said clip into said bore;

heating the portion of said insulator body surrounding said clip body in the vicinity of said discontinuities to cause said insulator body portion to soften; and

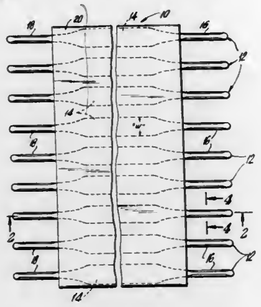
while said insulator body portion is softened, causing said clip body to expand in said bore to cause said insulator body portion to seize upon said discontinuities and to prevent axial movement of said clip in said bore.

4,187,606

FLEXIBLE ELECTRICAL JUMPER AND METHOD OF MAKING SAME

William Y. Sinclair, Stockton, N.J., assignor to Aries Electronics, Inc., Frenchtown, N.J.

Filed May 8, 1978, Ser. No. 903,898
Int. Cl.[2] H01R *13/04, 31/08*
U.S. Cl. 29—629 **5 Claims**



1. A method of making a flexible electrical jumper comprising the steps of:

providing an elongated flat strip of electrically conductive material;

milling out of the central portion of the strip along the longitudinal axis thereof;

forming said strip into a plurality of elongated, generally parallel leads extending transverse to the longitudinal axis of the strip and being interconnected by a carrier which extends along the longitudinal axis of the strip of conductive material, each lead including a central flat portion formed in the milled out portion of the strip, and opposed ends disposed in the portion of the strip which is not milled, at least one of said ends being releasably connected to said carrier strip;

embedding the central portions of the array of leads within a strip of flat flexible electrically insulating material; and

removing said carrier strip from the ends of the leads.

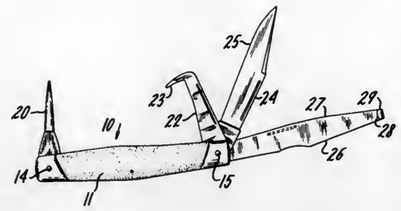
4,187,607

HORSEMAN'S POCKET KNIFE

Ernest G. Simuro, 624 Fenimore Rd., Mamaroneck, N.Y. 10543; Abraham A. Turk, and Nathan M. Turk, both of Rocking Horse Ranch, Highland, N.Y. 12528

Filed Apr. 24, 1978, Ser. No. 899,336
Int. Cl.[2] F41B *63/06;* B26B *3/04*
U.S. Cl. 30—152 **6 Claims**

1. A horseman's pocket knife of a size that will conveniently fit in a pants pocket, said knife having a handle with a recess of a predetermined depth and a plurality of blades pivoted about pivot pins located toward each end of the handle between closed positions in which the blades are positioned in the recess in the handle for storage and operative positions in which they are pivoted out from the handle recess for use, wherein the improvement comprises: one of said blades being a hoof-cutting blade for planing the bottom of a horse's hoof and shaping the hoof, said hoof-cutting blade having a lateral cutting edge along one lateral edge of the blade, said hoof-cutting blade being pivotally connected to the handle at one of said pivot pins so that it can be folded into the handle in such a way that the lateral cutting edge is concealed in the handle, said hoof-cutting blade additionally having its free end being of a hook shape in a plane perpendicular to the plane of the lateral width of the blade, said hook-shaped end having a transverse cutting edge transverse to the longitudinal dimension of the blade, the lateral width of the cutting blade decreasing toward said hook-



shaped free end so its width at the transverse cutting edge is at least substantially as small as the depth of the recess in the handle so that the transverse cutting edge is substantially concealed in the recess when in the closed position and the hook shape having an arc such that the hoof-cutting blade fits within the handle without interfering with any other blade by extending about such a blade.

4,187,608

IMPLANTABLE TEETH AND METHOD OF MAKING

Andrew C. Nyce, 1157 Shore Rd., Cape Elizabeth, Me. 04107

Continuation-in-part of Ser. No. 407,085, Oct. 17, 1973, abandoned. This application Jan. 12, 1976, Ser. No. 648,307
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—201 **12 Claims**



1. A method of producing an artificial tooth for implantation in a natural tooth socket in the human body comprising the steps of mixing substantially spherical power metallurgical particles compatible with human body tissue of different size diameters such that the smaller particles fill the interstices of the next larger particles, molding an exact replica of an extracted tooth from said particles thereby creating a molded replica of the natural tooth having a porosity which allows the periodontal membrane to enter and grow into the pores of the implant and coating exterior portions of said molded replica with a finish having approximately the coloring of a natural tooth.

4,187,609

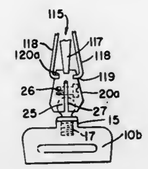
SUBMERGED FUNCTIONAL IMPLANT AND METHOD

Alfred E. Edelman, 2723 Federal St., Camden, N.J. 08105

Continuation of Ser. No. 819,119, Jul. 26, 1977, abandoned, which is a continuation of Ser. No. 559,226, Mar. 17, 1975, abandoned. This application Jul. 18, 1978, Ser. No. 925,764
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—176 **1 Claim**

1. A submerged dental implant comprising a non-rotatable insert portion including an enlarged permanent body portion and a short hollow internally threaded neck portion of relatively small cross-section adapted to receive the threaded stem

of a thin removable temporary cap member or a similarly threaded stem of an artificial tooth receiving head, said insert portion including an applied cap being adapted to be wholly submerged in a recess of the patient's jaw and thereafter covered by surface skin of the jaw and after a considerable period of time the surface skin of the gum and the temporary cap of the said submerged implant may be removed, said submerged implant neck portion being then adapted to receive an artificial



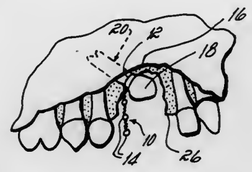
tooth receiving head member which projects above the surface of the gum to receive an artificial tooth, said tooth receiving head member having a stem fitting the neck of the insert and a universal joint including a ball member, and a socket portion fitting over the ball member, said socket portion being externally shaped to receive an artificial tooth, said socket portion comprising a pair of flexible side portions, partially separated by a split and adjustable means for holding said flexible portions in engagement with the ball member of the joint.

4,187,610

IMPACTED TOOTH LIGATION CHAIN

Thomas F. Ziegler, 6924 Old Chapel Dr., Cincinnati, Ohio 45244

Continuation-in-part of Ser. No. 675,547, Apr. 9, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,305
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—24 **3 Claims**



1. A method of applying an eruptive force to a patient's impacted tooth comprising:

surgically exposing the anatomic crown of the impacted tooth,

encircling the anatomic crown with a tooth encircling loop of a ligation chain, said ligation chain comprising a wire having two ends, said wire twisted so as to provide at a position intermediate the ends thereof a tooth encircling loop, the other end of said tooth ligation chain comprising the ends of said wire, said tooth encircling loop being generally circular in shape and having a diameter greater than the anatomic crown of the impacted tooth to be erupted so that after the anatomic crown of the impacted tooth has been surgically exposed said tooth encircling loop can be placed over said crown and said chain can be secured to said tooth by twisting said wire, a plurality of eyelets formed by twisting said wire, said eyelets lying between the ends of said wire and said tooth encircling loop, said eyelets being separated from each other by twists in the wire, said eyelets providing a position for attaching a ligature thread to the ligation chain,

twisting the chain adjacent to the anatomic crown so that the tooth encircling loop cannot slip over the tooth,

surgically closing the wound,

attaching a ligature thread to an eyelet of the ligation chain, and

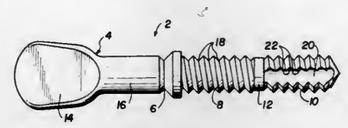
tensioning the ligature thread so as to apply an eruptive force on the impacted tooth.

4,187,611

DENTAL RETENTION PIN AND METHOD

Kai C. Chan, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Oct. 7, 1977, Ser. No. 840,280
Int. Cl.[2] A61C *5/00*
U.S. Cl. 433—225 **5 Claims**



1. A dental retention pin threadedly engageable in a pinhole drilled in the dentin at the base of a restoration cavity of a tooth for projecting into said cavity to assist in retaining in said cavity a subsequently inserted body of restorative material such as a dental amalgam, said pin comprising,

a lower shaft portion having external threads of a given root diameter for engaging the dentin and a vent passage means for releasing fluid from the pinhole as the lower shaft portion is inserted therein,

a pinhole-sealing portion at the upper end of the lower shaft portion, said pinhole-sealing portion being insertable into the pinhole and having a peripheral sealing surface for engaging the pinhole surface to prevent fluid from entering the pinhole when the lower shaft portion is fully inserted in said pinhole, and

an upper shaft portion extending upwardly from the pinhole-sealing portion for embedment in restorative material in a restoration cavity;

wherein the crest diameter of said threads is greater than the diameter of said pinhole sealing portion;

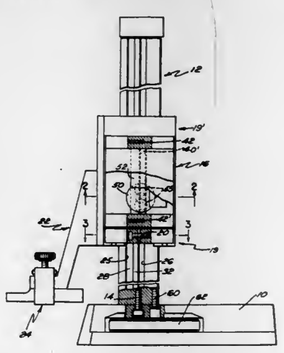
wherein the diameter of the pinhole sealing portion is greater than the root diameter of said threads.

4,187,612

HEIGHT GAGE

Ian M. Scott, East Greenwich, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Sep. 12, 1978, Ser. No. 941,568
Int. Cl.[2] G01B *7/02*
U.S. Cl. 33—172 E **7 Claims**



1. A height gage comprising a base, a vertical circular column mounted on said base, a carriage movable on said column, said column having a longitudinal groove therein with at least

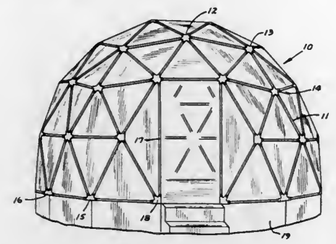
one surface extending on a chord of said column, a second surface on a radius of said column in said groove, shoe means on said carriage engaging the second surface, resilient means on said shoe engaging said one surface of said groove, means coupled between said column and said carriage for generating an electrical signal as a function of distance and displaying the information.

4,187,613

JIG FOR PRECISE MEASUREMENT OF PANELS FOR GEODESIC

Robert P. Ivers, and Mark J. Thimsen, both of Minnetonka, Minn., assignors to Geodesic Shelters, Inc., Minnetonka, Minn.

Filed Aug. 24, 1978, Ser. No. 936,633
Int. Cl.² G01B 3/14, 3/38
U.S. Cl. 33—174 G **8 Claims**



1. A jig of accurately measuring triangular panels for a geodesic dome of the type having a plurality of generally flat polygonal hub plates and interconnecting struts, each hub having a recessed panel-receiving rabbet in at least some of its edges and each strut having a recessed panel-receiving rabbet in its outer edges, said jig comprising:
   (A) three shoes adapted to engage the recessed rabbets of adjacent hubs of an assembled dome, each shoe having:
      (1) a straight edge engageable with the longitudinal side wall of one of said hub rabbets, the length of said straight edge being the same as the length of said rabbet side wall,
      (2) a flat surface engageable with the face of said rabbet,
      (3) a thickness at least equal to the depth of said rabbet, and
      (4) a fastener-receiving aperture adjacent each end,
   (B) three elongated bars each extending between two of said shoes, each bar having:
      (1) a length at least equal to the distance between adjacent dome hubs, and
      (2) a fastener-receiving aperture adjacent each end, and
   (C) six adjustable fastening members, each extending through the aperture adjacent the end of a shoe and through the aperture at one end of a bar, and adapted to rigidly secure said shoes and bars together.

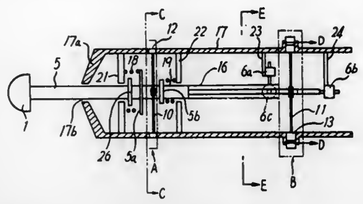
4,187,614

TRACER HEAD

Hisanori Abiru; Yoshiaki Nakao; Yoshiaki Imamura, and Hidetaka Sada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 931,280
Int. Cl.² G01B 7/02, 7/28
U.S. Cl. 33—174 L **7 Claims**

1. A tracer head for effecting three dimensional tracing of the surface of a model, comprising a base frame, a tracer shaft means extending through said base frame and having a tracer shaft on one end thereof, a stylus mounted at the free end of said tracer shaft for tracing the surface of the model, a plurality of at least two supports for said tracer shaft means in said base frame spaced along the length of said tracer shaft means, the support closer to the end of said tracer shaft means supporting said tracer shaft adjacent the other end of said tracer shaft, said tracer shaft means further having a rod spring extending from the other end of said tracer shaft and being supported by the second support and having a moderate resiliency in the radial direction of said tracer shaft means, each support including a member which has a moderate resiliency in the thrust direction and at the least substantially no resiliency and at the most rigidity in the radial direction of the tracer shaft means, a thrust displacement detector adjacent said rod spring for having movement of the stylus in the thrust direction transmitted



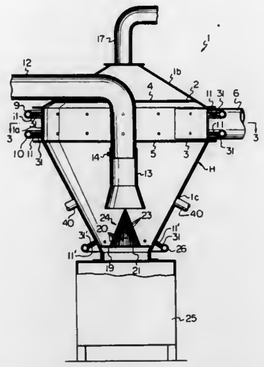
thereto by the rod spring, a pair of lateral movement detectors positioned adjacent said tracer shaft means between said supports for detecting components of lateral movement of said tracer shaft means imparted thereto by lateral movement of said stylus, and a cylindrical transmission member around said rod spring and mounted on said tracer shaft means between said supports and movable upon lateral movement of said tracer shaft and bending of said rod spring as a result of such movement and contacting said lateral movement detectors for transmitting the lateral movement thereto.

4,187,615

PROCESS FOR TREATING FEATHERS AND CYCLONE USED FOR CARRYING OUT THE PROCESS

Takuzo Iwata, Osaka, Japan, assignor to Iwata Co., Ltd., Kyoto, Japan

Filed May 5, 1978, Ser. No. 903,780
Claims priority, application Japan, May 9, 1977, 52-53521
Int. Cl.² F26B 3/34
U.S. Cl. 34—1 **15 Claims**



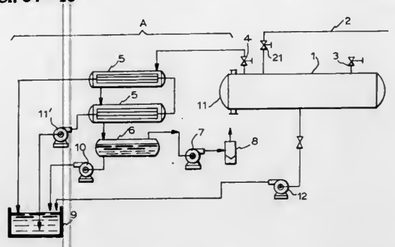
1. A process for treating feathers, adapted for separating impurities attached thereto, comprising the steps of;
   (a) introducing feathers into a treatment zone;
   (b) generating, in the treatment zone, by horizontal swirl motion of introduced feathers together with downward movement of said feathers toward the bottom of said zone;
   (c) ejecting a flow of ionized air transversely and inwardly directed to said swirl motion of said feathers from substantially the entire outer periphery of the swirl motions in order to cause said impurities to be separated from said feathers while said separated impurities are exhausted to the outside of said cyclone at the center of the swirl motion; and
   (d) removing purified feathers from said treating zone.

4,187,616

METHOD FOR COOLING AGED BOARD MATERIAL

Hirofumi Yamada; Noboru Takaki, and Michio Masuda, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 10, 1978, Ser. No. 904,519
Claims priority, application Japan, May 13, 1977, 52/055764
Int. Cl.² F26B 7/00, 5/04
U.S. Cl. 34—13 **7 Claims**



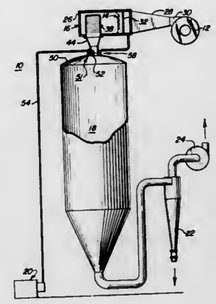
1. Method for cooling aged board material comprising the steps of
   (A) aging board material of inorganic substance using saturated steam of high temperature and high pressure for a predetermined period of time in an autoclave;
   (B) reducing the pressure in the autoclave to less than one atmosphere;
   (C) maintaining said reduced pressure at about the same value until the temperature of the board material becomes about the temperature at which water does not boil at the said reduced pressure; and
   (D) removing the board material from said autoclave; wherein said reduced pressure is 110 Torr.

4,187,617

SPRAY DRYER

James J. Becker, Jr., 1205 S. 1st St., Stillwater, Minn. 55082, and Henry T. Beresford, 2243 E. Larpenteur Ave., Apt. 115, Maplewood, Minn. 55109

Filed Dec. 18, 1978, Ser. No. 970,654
Int. Cl.² F26B 17/10
U.S. Cl. 34—57 R **12 Claims**



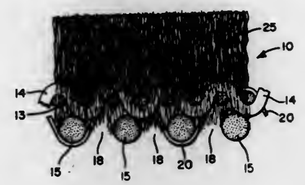
1. An improved spray dryer for transforming a liquid feed solution into a dry powder comprising:
   means for supplying a continuous flow of the air required for drying;
   means for heating the flow of drying air to a desired, relatively high temperature;
   a drying chamber for receiving dispersed, small droplets of the feed solution and wherein the droplets are transformed into dry particles;
   an air distribution system which is connected with the air supply means and which directs the flow of drying air into the drying chamber so that the air flowing into the drying chamber has substantially uniform temperature and velocity profiles;
   an atomizing system which forms and introduces the dispersed droplets of feed solution into the flow of drying air as the drying air is introduced into the drying chamber;
   a powder recovery system which collects the particles dried in the drying chamber and which removes the air from the spray dryer after it has passed through the drying chamber;
   the air distribution system including a first distribution chamber having a first air flow path defined therein between a first point and a second point; means for connecting the air supply means with the first chamber adjacent to the first point so that air may flow in the first chamber along the first defined air flow path from the first point to the second point; the air heating means being disposed in the first chamber in the first defined air flow path and between the first and second points; a diffuser member having a first and second end portions, with at least the first end portion being disposed in the first chamber adjacent to the second point of the first defined air flow path, the first end portion of the diffuser including a wall having a plurality of relatively small holes therein which permit heated air flowing along the first defined air path to flow through the small holes and into the interior of the diffuser member, with the plane of the wall being disposed at an angle with respect to the first defined air flow path; and means defining a second air flow path and extending between the interior of the diffuser member and the interior of the drying chamber, with the second defined air flow path being substantially perpendicular to the first defined air flow path.

4,187,618

PAPERMAKERS' FELT

Pieter S. Diehl, Pleasant Hill, Ohio, assignor to The Orr Felt Company, Piqua, Ohio

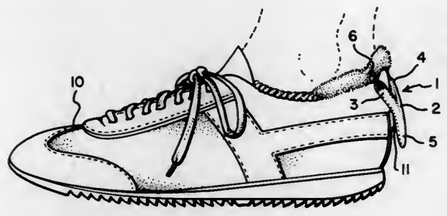
Filed Apr. 21, 1978, Ser. No. 898,819
Int. Cl.² B31B 5/06
U.S. Cl. 34—243 F **2 Claims**



1. A needled papermakers' felt for use in the press or dewatering sections of a papermaking machine or the like having improved drainage characteristics, comprising:
   a woven inner fabric having warp and filling yarns,
   a plurality of longitudinally extending, transversely spaced relatively heavy strands positioned on the bottom surface of said fabric, the transverse spacing of said strands being related geometrically to the warp yarns with said spacing being substantially in excess of that of said warp yarns,
   relatively light cross machine yarns interconnected with said strands, and
   a batting of non-woven material needled into the upper surface of said fabric with a portion of said batting carried

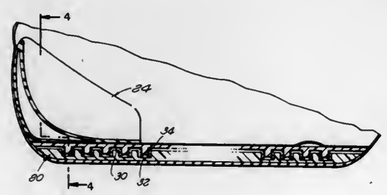
into and interlocking said strands to said fabric to provide additional stability of said strands while leaving relatively open longitudinal spaces between said strands.

4,187,619
STRAP FASTENING MEANS FOR A SOCK AND SHOE COMBINATION
Don W. Gibbs, 3452 Monte Verde Dr., Holladay, Utah 84109
Filed Mar. 6, 1978, Ser. No. 883,677
Int. Cl.[2] A43B *3/10*; A41B *11/00*
U.S. Cl. 36—10 **8 Claims**



7. A sock and shoe combination in which the sock and shoe are detachably fastened together by a connector having opposite ends and a sock fastening means on one end and a shoe fastening means on the other end, the connector being detachably fastened by a grasping element to the sock at or above its heel region and by an adhesive to the outside of the rear heel region of a shoe, such connector preventing the sock from sliding or riding into the shoe during activity by the wearer.

4,187,620
BIOMECHANICAL SHOE
Allen J. Selner, 13320 Riverside Dr. #216, Sherman Oaks, Calif. 91423
Filed Jun. 15, 1978, Ser. No. 915,642
Int. Cl.[2] A43B *13/18, 7/16*
U.S. Cl. 36—28 **9 Claims**



1. An athletic shoe comprising:
an upper covering;
a shoe bottom including a platform including a pair of platform members, one of said platform members defining a plurality of substantially vertical cylinder spaces disposed about said platform member, and said other platform member defining a plurality of plugs matingly aligned with said cylinder spaces, and said platform further including a plurality of coil springs disposed about said plugs to hold said platform members spaced apart in the absence of load; and
means for affixing said shoe bottom to said upper covering with said platform members aligned.

4,187,621
SHOE INNERSOLE
Leon H. Cohen, c/o Way Distributors 150 Gould St., Needham Heights, Mass. 02194
Filed Apr. 24, 1978, Ser. No. 898,935
Int. Cl.[2] A43B *13/40*
U.S. Cl. 36—44 **4 Claims**



1. Innersole for athletic shoes and the like comprising, a molded laminate of two layers completely bonded at their interface and cut and conformed in contour and varying thickness thereof to the last shape of the shoe with which the innersole is associated, the laminate having,
a relatively soft upper (towards the foot of the wearer) layer of 30–100 kilograms per cubic meter density and a compression set of 20–40% cellular plastic material and,
a lower layer of relatively hard cellular plastic material of 100–200 kilogram per cubic meter density and 1–6% compression set.

4,187,622
INNER SOLE FOR A SHOE
Fong G. Sung, No. 116, Tam Kung Rd., 1st Floor, Kowloon, Hong Kong
Filed May 8, 1978, Ser. No. 903,570
Claims priority, application United Kingdom, Jan. 12, 1978, 1274/78
Int. Cl.[2] A43B *13/38, 7/06*
U.S. Cl. 36—44 **1 Claim**

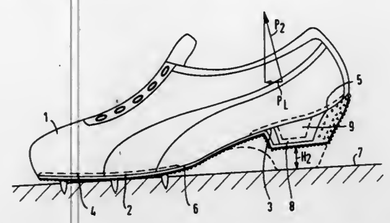


1. An inner sole for a shoe comprising:
a first layer fabricated from a nylon fabric mesh material;
a second layer fabricated from an identical nylon fabric mesh material, said first layer being identical in size, shape and contour to said second layer, said first and second layers being disposed in opposing relationship such that their contours mate and edges abut, said first and second layers being sealed together at their abutting edges such that the opposing surfaces of said first and second layers define a cavity thereinbetween;
a medicinal powder disposed in said cavity, said inner sole being reversible and thus positionable in either a left or right foot shoe, said nylon fabric mesh being sized that said powder will seep through said mesh into the interior of said shoe when pressure of a foot is exerted on said inner sole.

4,187,623
ATHLETIC SHOE
Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany
Filed May 8, 1978, Ser. No. 903,567
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720849
Int. Cl.[2] A43B *5/00, 13/04*
U.S. Cl. 36—129 **13 Claims**

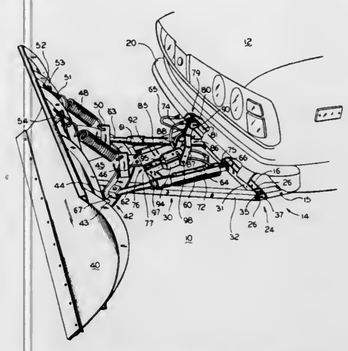
1. A lightweight athletic racing shoe, which comprises in combination:

a very flexible outer sole, of wear-resistant material, having a forward sole region with gripping elements as well as a heel section with a clearly elevated position occupied with respect to the forward sole region; and



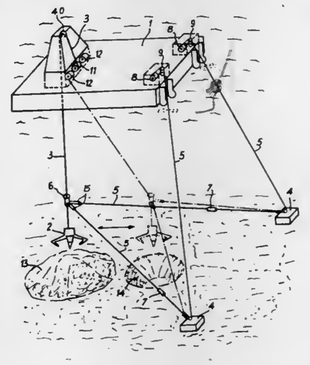
a heel associated with said heel section of said outer sole, the height of said heel being sufficient to impart to the wearer of said athletic racing shoe, when the wearer during forward movement places said heel on the ground, an acceleration component directed in the direction of said movement.

4,187,624
SNOW PLOW
James R. Blau, 13220 W. Burlawn Ct., Brookfield, Wis. 53003
Filed Mar. 8, 1978, Ser. No. 884,690
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—42 R **9 Claims**



1. A snow plow assembly suitable for use with a vehicle comprising:
bracket means on said vehicle for receivably accepting a plow support frame;
a plow support frame adapted for being coupled to said vehicle bracket means and including means for adjusting the angular orientation of a snow plow blade;
a plow blade coupled to the front of said frame and to said adjustment means;
bell crank means coupled between the front of said vehicle and a forward portion of said frame to permit vertical adjustment of said blade;
cylinder means including a first cylinder mounted to said frame and having a piston rod means coupled to said bell crank means for moving same to cause said vertical adjustment, and fluid means for extending and retracting said piston rod means;
first bell crank coupling bracket means mounted to said vehicle above said snow plow accepting bracket means and second bell crank coupling bracket means on said frame generally adjacent said plow blade;
said bell crank means including a first generally Y-shaped link member the base of which is coupled to said first bell crank coupling bracket means and a second generally L-shaped link member having first and second sides, the end of said first side being coupled between the free ends of said first link member and the free end of said second side being pivotally coupled to said piston rod of said first cylinder, the angular corner of said second link member being pivotally coupled to said second bell crank coupling bracket means.

4,187,625
SYSTEM FOR EXCAVATION AT SEA THROUGH HORIZONTAL GUIDING BY MEANS OF CABLES
Jean J. Duval, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France
Filed Mar. 20, 1978, Ser. No. 888,448
Claims priority, application France, Mar. 21, 1977, 77 08421; Mar. 1, 1978, 78 05832
Int. Cl.[2] E02F *3/44*
U.S. Cl. 37—71 **21 Claims**

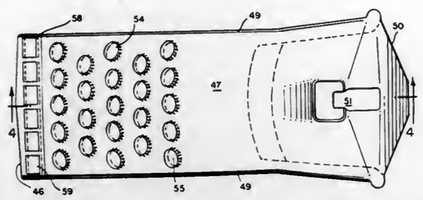


1. An underwater excavation system comprising:
(a) an excavation means;
(b) a carrying line therefor;
(c) means connecting said excavation means to said carrying line;
(d) a support station on the surface fixed in a position generally above a dumping site on the seabed;
(e) lifting means mounted on the support station for controlling the length of the carrying line;
(f) at least one guide line;
(g) connecting means fixedly connecting the guide line to said carrying line,
(h) fixed position means located on the seabed near the site to be excavated,
(i) a winch for the guide line mounted on the support station, and
(j) sheave means mounted on the fixed position means through which the guide line passes to run from the connecting means to the guide line winch,
(k) whereby the guide line is winched in to position the excavation means above the excavation site, and slackened to allow the excavation means to gravationally swing over to the dumping site.

4,187,626
EXCAVATING TOOL HAVING HARD-FACING ELEMENTS
Donald J. Greer, Danville, Ill., and John D. MacEwan, Jr., Portland, Oreg., assignors to ESCO Corporation, Portland, Oreg.
Filed Feb. 27, 1978, Ser. No. 881,724
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 R **4 Claims**

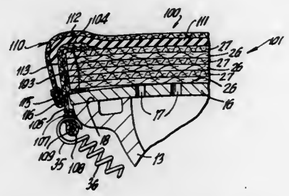
1. In a tool for excavating, a unitary metal member having a material engaging edge at one end and a mounting means

spaced from said one end, said member having a generally planar material engaging surface extending generally from said one end, and a plurality of wear resistant elements mounted in said surface, the improvement characterized by the fact that each element has a generally planar outer face disposed at an angle to said surface, the outer face of each wear element being



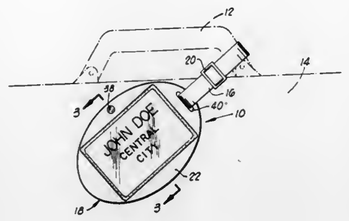
intersected by the plane of said surface, each element being of a uniform thickness in the direction measured perpendicular to said face, said face being generally perpendicular to the average line of force of material being engaged by said tool, said tool being equipped with an integral shoulder upstanding from said surface for each element.

4,187,627
PADS FOR BUCKS OF GARMENT PRESSING MACHINES
Jerome H. Cohen, Bayside, N.Y., assignor to Burtest Products Corp., New York, N.Y.
Filed Jul. 13, 1978, Ser. No. 924,191
Int. Cl.[2] D06F *81/14, 83/00*
U.S. Cl. 38—66 **6 Claims**



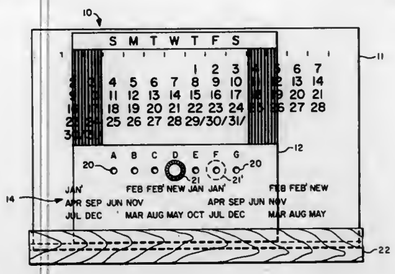
1. A buck pad to be placed on a perforated plate of a buck of a garment pressing machine, said pad comprising a sub-pad, said sub-pad comprising one or more pairs of layers, each pair comprising upper and lower superposed layers of textile material, said lower layers having relatively loosely integrated threads and said upper layers having relatively closely integrated threads, all said layers comprising high temperature resisting material, a binding stitched to the edges of said layers and a skirt stitched to said binding and extending down therefrom, said binding and skirt being made of high temperature resisting material, a cover pad on the sub-pad, said cover pad comprising a layer of soft resilient material, thicker than each layer of said pair or pairs of layers, placed over the top most layer of said sub-pad, and a top cover of relatively closely integrated threads, over said soft resilient layer and having a skirt extending downwardly and provided with means to attach said cover pad to said sub-pad, said top cover being made of high heat resisting material.

4,187,628
IDENTIFICATION DEVICE
Howard J. Thompson, 4300 N. Barnes, Apt. 108, Oklahoma City, Okla. 73112
Filed Jun. 23, 1977, Ser. No. 809,084
Int. Cl.[2] G09F *3/20, 3/14;* **B32B** *3/06;* **A47G** *1/12*
U.S. Cl. 40—10 D **1 Claim**



1. An identification device comprising:
a pair of synthetic resin outer plate elements of complementary elliptical configuration each including a transparent portion, each of said outer plate elements further characterized in having a rectangular opening positioned centrally therein and extending therethrough and constituted by a first recess projecting from one side thereof toward the other side of the respective plate element, and a second recess in each of said outer plate elements registering and communicating with the first recess therein and projecting into the respective outer plate element opposite said first side, said second recess being larger in area than said first recess and defining therewith a peripheral shoulder bordering said opening;
a transparent window disposed in each of said second recesses;
a flat central synthetic resin element of elliptical configuration which is complementary to the outer elements and is disposed therebetween, said central element including opposed surfaces textured for retention of indicia marked thereon in alignment with said transparent portion of said outer plate elements, and in a position for viewing through said transparent windows;
fastening means extending through said outer plate elements and said flat central element at a location on one of the major or minor axes of the outer plate elements and central element, and interconnecting said outer and central elements in overlapped, superimposed abutting contact for pivotation about a common axis located adjacent a peripheral edge of each of the elements and on said axes to facilitate movement of said plate elements and central element between registering, superimposed positions, and positions in which said elements are out of alignment with each other, said outer plate elements and central element each further including a slot formed therethrough and located on the other major or minor axis of the respective elliptical element from that upon which said fastening means is located, said slots being dimensioned and positioned for alignment with each other when said outer elements and central elements are in registering, superimposed positions, said fastening means comprising frictionally engaged, quick releasable cooperating male and female fastener elements; and
a flexible securing element detachably connected to said outer and central elements by extension through said aligned slots therein.

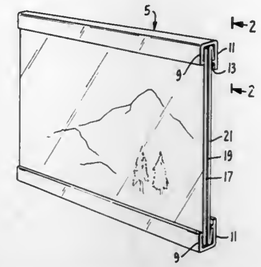
4,187,629
PERPETUAL AND MULTI-YEAR CALENDARS
Yoshikazu Yamada, Irvine, Calif., assignor to Yamada-Graphics Corp., Costa Mesa, Calif.
Filed Sep. 15, 1977, Ser. No. 833,522
Int. Cl.[2] G09D *3/10*
U.S. Cl. 40—109 **31 Claims**



1. A perpetual calendar comprising in combination:
first means bearing first calendar data;
second means movable relative to said first means and bearing second calendar data;
one of said first and second calendar data comprising indications of the days of the week by name, and the other of said first and second calendar data comprising indications of the days of the month by number;
one of said first and second calendar data being multiply listed, and the other of first and second calendar data being singly listed;
means for controlling adjustments of said second means relative to said first means in accordance with different occurring calendar interrelationships of said first and second calendar data each month, comprising third calendar data including indications of the months of the year associated with one of said first and second means and corresponding indexing means associated with the other of said first and second means; and
means for extending the usability of the calendar to an indefinitely long time, comprising means for making an adjustment each year of said indexing means relative to said third calendar data and to said other of said first and second means with which said indexing means are associated, including in said indexing means an index element movable relative to said other of said first and second means, said indexing means and said indexing element comprising a removable marker which further aids in said relative moving of said first and second means, including in said third calendar data an indication representing January of any year located in terms of an indexing position associated with the year preceding the particular year, and being separate and distinct from an indication of January of said preceding year.

4,187,630
PICTURE FRAME
Joe D. Giulie, and James E. Guilie, both of 1015 Corporation Way, Suite D, Palo Alto, Calif. 94300
Filed Jan. 6, 1978, Ser. No. 867,224
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **3 Claims**

1. A picture having a frame wherein a "U" shaped frame member forms the edge on a sheet of bendable, stiff material, said picture comprising in combination:
a. a "U" shaped edge member,
b. said "U" having a pair of arms extending upwardly from a bight,
c. an inwardly extending member on one of said arms spaced from said bight and extending toward, but terminating short of, the opposite arm,
d. a sheet of bendable, stiff material,
e. said sheet of material being folded parallel to a terminal edge to provide a fold line,
f. said fold line resting against said bight,



g. said terminal edge springing out from the main body of the sheet and resting against the corner formed between the inner side of said inwardly extending member and the arm of the "U" from which said member extends,
h. whereby said sheet is locked in said "U" shaped edge member.

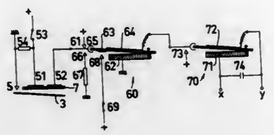
4,187,631
CARD INDEX
Ernst E. Zandelin, Sollentuna, Sweden, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 1, 1978, Ser. No. 882,460
Claims priority, application Sweden, Mar. 2, 1977, 7702299
Int. Cl.[2] B42F *17/34*
U.S. Cl. 40—381 **10 Claims**

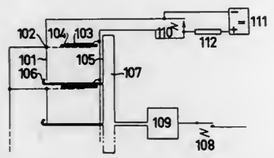


1. In a card index, a flat casing having a top, side walls and a front opening, a tray mounted to be pushed into and pulled out of the casing through said opening, said tray having a step between a rear part and a front part thereof, a pile of index cards supported on said tray and intended to have information written thereon, the front margins of said cards extending beyond said step, manually operable means for determining, before pulling out said tray, which index card is to be presented to an operator, said means comprising manually depressible keys in a number corresponding to the number of index cards in said pile and dog means on said keys adapted at the depression of said keys to pass down through corresponding cutouts in the front margin of the casing top and at some distance in front of said step to bend down towards the front portion of the tray, the front portion of a number of said index cards corresponding to optionnally selected keys, thereby causing the remaining index cards lying thereabove to be pressed upwards into engagement with the inside of said casing top, and catch means at the underside of said casing top between said cutouts

therein to stop said remaining index cards when pulling out said tray together with the bent-down index cards.

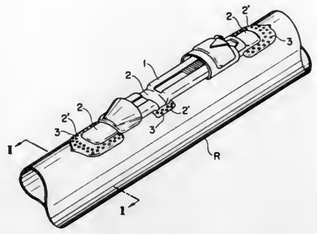
4,187,632
REMOTE CONTROLLED IMAGE DISPLAY DEVICE
Hans F. Rydström, 17, Dannemansvägen, Lidingö, Sweden
Continuation of Ser. No. 418,221, Nov. 23, 1973, abandoned.
This application Sep. 4, 1975, Ser. No. 610,409
Claims priority, application Sweden, Nov. 24, 1972, 15309/72; Oct. 29, 1973, 7314656
Int. Cl.² G09F *11/30*
U.S. Cl. 40—446 **2 Claims**





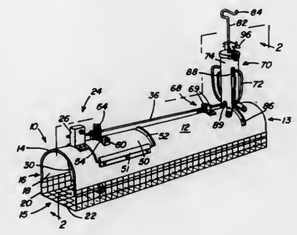
1. An electrostatically controlled visual display device comprising, in combination:
a contrast body having an electrically conductive portion and mounted for movement between a rest position and an optionally arrestable position, said contrast body comprising a planar member mounted for movement about a pivotal axis and exhibiting to a viewer a contrast which depends upon which of the said positions it occupies;
impelling means optionally operable for bringing said contrast body from its rest position to its optionally arrestable position, said impelling means comprising a compressed air source, an on-off control for said compressed air source and a nozzle positioned adjacent a surface of said contrast body for directing a jet of the compressed air against said surface for a short period of time;
electrostatic arresting means sufficient to retain said contrast body in said optionally arrestable position after being brought to said optionally arrestable position by said impelling means, said electrostatic arresting means comprising a fixed electrode and a movable electrode constituted by said electrically conductive portion of said contrast body which is brought into a position adjacent to but spaced from said fixed electrode to establish an electrostatic attractive force therebetween; and
means optionally operable for energizing and de-energizing said electrostatic arresting means comprising a voltage source to which said fixed and movable electrodes are connected through a charging resistor and relay controlled switch means for closing a discharge path directly between said electrodes and which serves to eliminate the electrostatic attractive force therebetween, said contrast body being self-restorable to its rest position when said electrostatic arresting means is in its de-energized state.

4,187,633
REEL SEAT FOR FISHING RODS
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan
Filed Feb. 7, 1978, Ser. No. 875,923
Int. Cl.² A01K *87/06*
U.S. Cl. 43—22 **1 Claim**



1. A reel seat for fishing rods having a foot protruding from each end thereof, wherein each foot has multiple holes perforated therein, is made thinner than the reel seat, and is formed of a separate piece of metal.

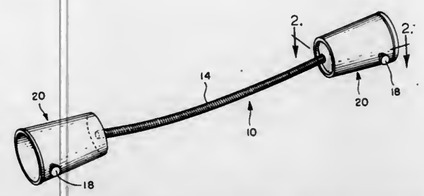
4,187,634
ANIMAL TRAP FOR CAPTURING BURROWING ANIMALS
Glenn W. Kintz, 3306 Ammon Way, Forest Grove, Oreg. 97116
Filed May 18, 1978, Ser. No. 907,288
Int. Cl.² A01M *23/20*
U.S. Cl. 43—61 **9 Claims**



1. A trap for capturing burrowing animals which is disposable within a tunnel formed by said animals, the trap comprising:
a body member having an open entry end and an end opposite said entry end, and including upper and lower roof and floor portions, respectively;
a trigger mechanism disposed near the opposite end of the body member, the trigger mechanism including a transverse trigger plate disposed within the interior of the body member in the path an animal would follow through the trap, the trigger mechanism further including means for mounting the trigger plate for pivotal movement and a trigger rod carried by the mounting means at one end of said trigger rod;
gate means carried by the body member for closing the entry end of the body member, the trigger rod extending longitudinally of the body member to engage the gate means when the trap is in a set conformation; and,
spring means carried by the body member for holding the gate mean under tension in the set conformation, displacement of the trigger rod on pivotal movement of the trigger releasing the gate means to allow the spring means to force said gate means into a position blocking the entry end of the body member, said trigger plate having a pad of

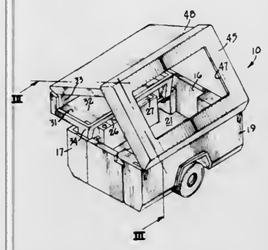
soft material disposed on the side thereof opposing said open entry end.

4,187,635
METHOD AND APPARATUS FOR SOUND PRODUCTION
Robert J. Deissler, 4540 W. 213 St., Fairview Park, Ohio 44126
Filed Apr. 3, 1978, Ser. No. 892,822
Int. Cl.² A63H *5/00*; G10D *13/08*; G08B *1/00*
U.S. Cl. 46—174 **16 Claims**



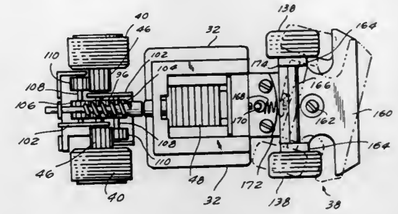
1. An apparatus for producing sound effects comprising:
two diaphragms;
a resonator affixed to each diaphragm;
a helically-coiled spring positioned between and attached to the diaphragms whereby said diaphragms can be moved with respect to each other to induce spring, diaphragm, and resonator vibrations, said spring having a lowest resonance frequency less than 18 hertz; and
at least one support member affixed to each resonator whereby each resonator can be supported vibrations without substantially muffling the vibrations of each resonator.

4,187,636
CAMPING TRAILER
Ronald R. Pauly, Mound, Minn., assignor to Tonka Corporation, Spring Park, Minn.
Filed Sep. 9, 1977, Ser. No. 831,861
Int. Cl.² A63H *11/10*
U.S. Cl. 46—201 **4 Claims**



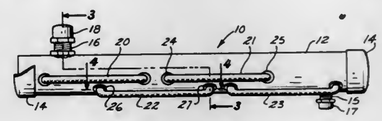
1. A toy camping trailer including a pair of wheels rotatably mounted on an axle, a box supported on said axle, a top means associated with said box, said top means including a first member and a second member, said first member being pivotably mounted along one edge to said box, and including a play access opening through which a child may insert and remove toy figures, said second member being pivotably mounted to the opposite side edge of said first member, said second member being pivotable from a first position aligned with said first member to a second position supported adjacent the opposite edge of said box, said second member serving to close said play access opening when in said aligned position.

4,187,637
TOY VEHICLE
Edwin A. Nielsen, Oceanside, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.
Division of Ser. No. 783,849, Apr. 1, 1977, Pat. No. 4,109,913, which is a division of Ser. No. 747,441, Dec. 6, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 841,226
Int. Cl.² A63H *17/36*
U.S. Cl. 46—262 **13 Claims**



1. A toy vehicle adapted for use on a track having side walls and including a frame, a pair of drive wheels, a drive motor in said frame, transmission means for selectively driving one or the other of said drive wheels to steer said vehicle to the right or left, and a shock absorbing wheel mount on said frame including a one piece wheel support element pivotally mounted on said frame, a pair of wheels both of which are rotatably mounted on said wheel support element; and spring means engaged between said support element and said frame for biasing said wheel support element into a normal, central position on said frame; said wheel support element including integral bumper surfaces extending beyond opposite sides of said frame; whereby when said bumper surfaces engage the side walls of the track said wheels move with said wheel support element pivoting therewith on the frame in the same direction as said wheel support element.

4,187,638
METHOD AND APPARATUS FOR APPLYING CHEMICALS TO WEEDS AND PLANTS
James H. Hardy, P.O. Box 259, Tr. 2, and James E. Roberson, 220 Bates St., both of Batesville, Miss. 38606
Filed Sep. 26, 1978, Ser. No. 945,875
Int. Cl.² A01N *5/00*
U.S. Cl. 47—1.5 **25 Claims**





1. Apparatus for applying a chemical to plants comprising
an elongate hollow body having an inside for containing a plant treating liquid, and an outside;
means for introducing a plant treating liquid into said body;
wick means on said body for applying the plant treating

liquid to plants to be treated by contact of the wick means with the plants, said wick means comprising:

a plurality of wicks supported by the body and having exposed lengths extending along the outside of said body, each such wick having an unexposed length extending from each end of the exposed length and forming a continuation of the exposed length, said unexposed lengths communicating with the interior of said body,

peripheral seal means between said exposed and unexposed lengths of each of said wicks, and

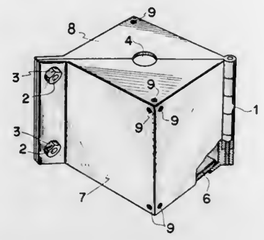
seal compressing means mounted on said body for compressing said seal means to peripherally seal each of said wicks with respect to said body.

4,187,639

MOLDING PROCESS FOR A NATURAL FRUIT OF A FRUIT-TREE OR VEGETABLE, A MOLDING FRAME THEREFOR AND MOLDED ABOVE FRUIT

Tomoyuki Ono, No. 31, Tsukasa Mansion, 1-chome, Minato-ku, Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 878,909
Claims priority, application Japan, Mar. 3, 1977, 52-022193
Int. Cl.² A01G *1/00*
U.S. Cl. 47—58 **3 Claims**



1. A molding process comprising the step of mounting a transparent molding frame about an immature natural net melon whose compressed surface would be injured after removing the molding frame from the net melon after it is molded, said frame being mounted about the net melon before growth of the met melon is completed and having a molding inner shape of an inner size sufficiently large to permit further growth of the net melon therewithin and small enough to shape the resultant fruit, and said method further comprising growing said net melon without said molding frame for a sufficient period to form a net on said compressed surface, and thereafter mounting said molding frame about said net melon for a predetermined period of time, whereby said net melon grows in conformity with the inner shape of said molding frame and results in a completely ripe molded fruit for use as a food.

4,187,640

COMPLETE DOOR SET

Erik Freilev, Blaakildevej 12, DK-5634Sandager, Denmark

Filed Feb. 9, 1978, Ser. No. 876,516
Claims priority, application Denmark, Feb. 18, 1977, 693/77
Int. Cl.² E06B *1/00;* **E05D** *7/02*
U.S. Cl. 49—380 **1 Claim**

1. A reversible door set assembly, comprising:

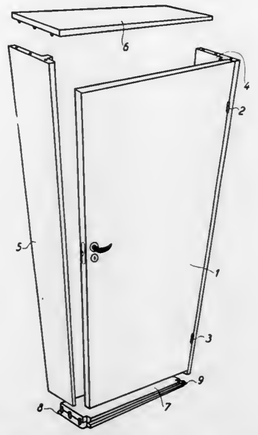
a door having upper and lower hinge mounting portions on one vertical edge thereof, with a distance d between the center of said upper portion and the top of the door and a distance e between the center of said lower portion and the bottom of the door;

first and second vertical side jamb members, said first member having two spaced hinge mounting areas on one vertical surface thereof, with a distance a_1 between the center of one of said areas and the adjacent first end of the jamb and a distance a_2 between the center of the other of said areas and the adjacent second end of the jamb opposite said first end thereof;

a horizontal sill member comprising a sill plate extending between said jamb members and having a height g and a bottom recess of height p for receiving a horizontal supporting plate, with a desired clearance f between the bottom of said door and the top of said sill;

a horizontal head member extending between said jamb members with a desired clearance c between the top of said door and the bottom of said head member;

wherein a_1 is approximately equal to a_2, d and e are both less



than the smaller dimension of a_1 and a_2, and $c+d=e+f+g-p$;

dowel joint means for connecting said sill and head members to said side jamb members, said means comprising dowels extending from said sill and head members and corresponding dowel holes in said side jamb members; and

insertion hinge means connecting said door member and said side jamb members, and reversible lock means mounted on said door member, to permit said door set to be changed from a left-hinged door to a right-hinged door without remounting said hinge means, by inverting said first jamb member and rotating said door through a 180° angle about a vertical axis. /

4,187,641

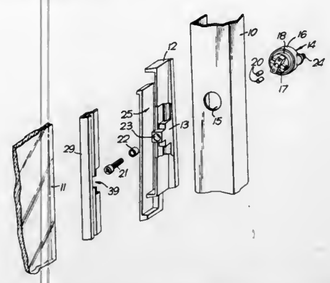
LOUVRE WINDOWS

Norman Thompson, Bridgnorth, England, assignor to Beta Aluminium Products Limited, Bridgnorth, United Kingdom

Filed Sep. 12, 1978, Ser. No. 941,808
Claims priority, application United Kingdom, Sep. 15, 1977, 38487/77
Int. Cl.² E06B *7/08*
U.S. Cl. 49—403 **8 Claims**

1. A blade holder for a louvre window comprising an elongated member, means on the elongated member for retaining an end edge of a louvre blade, a rebate of non-circular cross-section formed in that surface of the elongated member which, in use, is disposed adjacent the surface of a window frame on which the blade holder is pivotally mounted, a drive plate for pivotally mounting the elongated member on the window frame, said drive plate comprising a main body and a boss separated by a bearing portion, the bearing portion being adapted for rotational engagement within an aperture in the

window frame, and the boss having a configuration such that it has a driving engagement with said rebate, and at least one



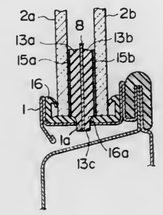
hardened pin mounted on the driving plate to extend axially thereof, said pin extending at least through said boss.

4,187,642

WEATHER-TIGHT SEAL STRUCTURES FOR AUTOMOBILE WINDOWS

Teruhiko Morinaga, and Ikuo Nishikawa, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed May 31, 1978, Ser. No. 911,150
Claims priority, application Japan, May 31, 1977, 52-70859[U]
Int. Cl.² E05D *15/16*
U.S. Cl. 49—406 **6 Claims**



1. In a double sliding window structure for a motor vehicle which comprises window frame means having upper and lower run channel means, two window glass panels substantially parallel to each other throughout areas thereof and mounted on said frame means for sliding movement between open and closed positions along the run channel means, said glass panels having marginal portions which are coextensive with remaining portions of the panels and overlapped each other in the closed position, the improvement comprising a weather-tight seal structure including elongated seal means extending between and attached to the upper and lower run channel means, said seal means having resilient sealing lip means which extends substantially throughout the length of the seal means and is always in slidable and sealing engagement with the window glass panels, said sealing lip means having upper and lower ends which are in close contact with the upper and lower run channel means respectively.

4,187,643

WINDOW AND DOOR FRAME ASSEMBLY ADAPTED TO FACILITATE INSTALLATION AND REMOVAL OF WINDOW PANES

Thomas Sconzo, 141 Macon St., Sayville, N.Y. 11782

Filed Nov. 17, 1978, Ser. No. 961,677
Int. Cl.² E05D *15/06*
U.S. Cl. 49—455 **10 Claims**

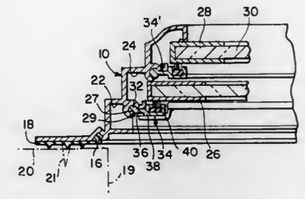
1. A window frame assembly, comprising:

a pair of side frame members;

a pair of end frame members joined to ends of said side frame members to define a rectangular frame for supporting at least one sash;

a tubular channel integrally formed with one frame member of one of said pairs of frame members, and extending for substantially the length of said frame member, said channel having a lateral slot therein;

a spline member having a cylindrical bead rotatably and slidably engaged in said channel, and having a blade portion extending through said slot and for the length of said channel for retaining said sash in said window frame;



spring means in said channel bearing against one end of said spline member urging the same lengthwise along said channel; and

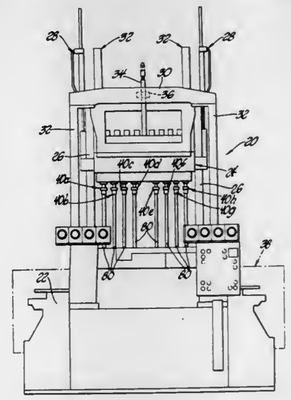
a pocket formed in a member of the other pair of frame members adjacent said one frame member and having a configuration which prevents rotation of said spline member when the other end of said spline member is seated in said pocket and for releasing said other end of said spline member, whereby said spline member can be moved longitudinally against the bias of said spring means to release said spline member, so that said sash can be readily installed and removed.

4,187,644

DUAL FEED APPARATUS FOR MULTIPLE SPINDLE HONING MACHINE

Paul Fitzpatrick, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

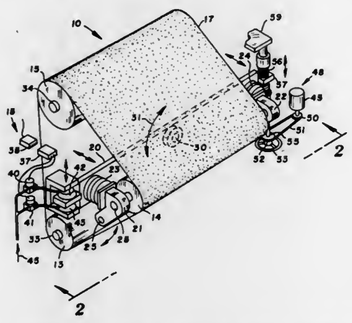
Filed Jun. 26, 1978, Ser. No. 919,198
Int. Cl.² B24B *5/08*
U.S. Cl. 51—34 D **32 Claims**



1. In a multiple spindle honing machine including a base, a spindle head mounted on the base for reciprocally driven movement with respect thereto, a plurality of rotatable spindles mounted on the head for reciprocation therewith, each spindle including an expandable and contractable honing tool for simultaneously machining a plurality of bores, and a drive train for rotating the spindles, improved feed apparatus com-

prising: feed cylinders mounted on the head in respective association with the honing tools; each spindle including a connector that connects one of the feed cylinders and the associated honing tool such that operation of the feed cylinders provides an initial expansion of the tools after insertion thereof into the bores; mechanical locks for respectively locking the feed cylinders after the initial tool expansion; a constant rate feed mechanism for continuing to expand all of the tools after the feed cylinders are locked; and control means for individually sensing the size of each bore being machined and for operating the associated mechanical lock to unlock the feed cylinder controlled thereby to allow the feed cylinder to contract the tool independently of each other tool when the bore has been machined to a predetermined size.

4,187,645
REACTIVE SYSTEM FOR ACCOMMODATING BELT STRETCH AND TRACKING
Fred W. Lind, Osseo, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.
Filed Jul. 26, 1978, Ser. No. 928,173
Int. Cl.[2] B24B *21/18*
U.S. Cl. 51—135 BT **1 Claim**



1. In combination with a belt-type abrading machine comprising a frame, a drive roll and a belt tensioning and tracking roll, wherein said drive roll and belt tensioning and tracking roll drive an endless abrasive belt orbitally along a defined path; belt positioning means mounting said belt tensioning and tracking roll for pivotal motion about an axis arranged generally normal to the longitudinal axis of said tensioning and tracking roll to control the axial disposition of an orbitally moving endless belt mounted on said roll; said belt positioning means including a rocker support arm for journalably supporting said belt tensioning and tracking roll, with said belt tensioning and tracking roll being mounted upon said support arm; means mounting said support arm upon said frame for pivotal movement about an axis generally normal to the longitudinal axis of said belt tensioning and tracking roll, with said rocker support arm having segments extending laterally outwardly of the pivotal support axis therefor:

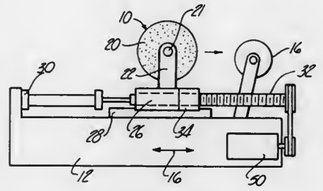
(a) first sensing means for determining the axial tracking disposition of said endless belt upon said rolls, and second sensing means responsive to the extent and direction of pivotal motion imparted to said support arm by said first sensing means;

(b) primary belt tracking drive means for reflecting the pivotal motion of said rocker support arm and responsive to signals from said first sensing means;

(c) secondary belt tracking drive means for effecting pivotal motion of said rocker support arm upon the continuous actuation of said primary belt tracking driver means for a certain predetermined time period, with said secondary belt tracking drive means being disposed in opposed relationship to said primary belt tracking drive means with respect to the rocker support arm pivot mount;

(d) said primary belt tracking drive means being operative to pivot said rocker support arm in either of two opposed arcuate directions for imparting lateral motion to an endless belt trained about said belt tensioning and tracking roll in response to a drive signal from said first sensing means, and with said secondary belt tracking drive means being operative to pivot said rocker support arm in the same arcuate direction as said primary belt tracking drive means whenever the duration of the drive signal of said first sensing means exceeds a predetermined magnitude.

4,187,646
APPARATUS FOR GRINDING
David L. Smith, Brighton, and Norman J. Scherr, Jr., Warren, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.
Division of Ser. No. 714,405, Aug. 16, 1976, Pat. No. 4,150,513.
This application Oct. 4, 1977, Ser. No. 839,196
Int. Cl.[2] B24B *49/16*
U.S. Cl. 51—165.77 **8 Claims**



1. For use in combination with a grinder of the type having a wheel and a workpiece spindle movable relative to one another and operable in a substantially repetitive fashion to grind a production run of workpieces from varying starting diameters to substantially the same finish diameter;

a controller apparatus comprising:

electronic gauge means for contacting the workpiece to provide signals representing the diameter of the workpiece;

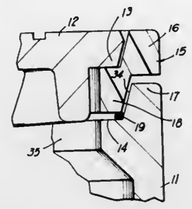
controllable motor means operatively connected to produce relative feed motion between the wheel and spindle at speeds and in directions determined by the character of signals input thereto; and

a programmable computer means operatively electrically connected in signal transfer relationship between the gauge means and the motor means, said computer means having storage means containing a plurality of control signals representing feed rate profiles for a given time period and being responsive to a starting diameter signal to retrieve the control signal of such character which, when applied to the motor means, automatically effects a grind cycle to achieve said finish diameter in said given time period irrespective of variations in the starting diameter.

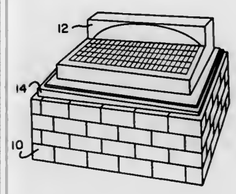
4,187,647
MANHOLE EXTENDER ELEMENTS
John R. Hall, Atlanta, Ga., assignor to Margaret T. Hall, Atlanta, Ga. and James B. Turner, Jr., Raleigh, N.C.
Filed Oct. 25, 1977, Ser. No. 844,649
Int. Cl.[2] E02D *29/14*
U.S. Cl. 52—20 **16 Claims**

1. A manhole extender ring adapted for seating on a manhole structure below pavement level for the purpose of elevating a manhole cover substantially to a newly laid pavement level, said extender ring being unitary and having an inwardly recessed seating surface for receiving a manhole cover such that

when said manhole cover is placed upon said seat, a portion of said ring surrounds said manhole cover and an upper surface of said ring will be at about the level of the upper surface of said manhole cover, said extender ring having a height about the upper level of said manhole structure for retaining the newly laid paving material above the level of the manhole structure, said ring having a lower portion for projecting into the upper opening of said manhole structure, said lower portion having spaced flat annular radial upper and lower surfaces and a frusto conical downwardly tapered outer wall joining the inner periphery of the upper surface of said lower portion and the outer periphery of the lower surface of said lower portion, said upper and lower surfaces of said lower portion and said outer wall of said lower portion conforming generally to the shape and dimensions of said manhole structure for seating on the upper and inner edge portions thereof, and said extender ring being composed essentially of plastics material which has a melting point well above the application temperature of asphalt paving material but will soften somewhat at such application temperature.



4,187,648
FORM FOR A MORTAR CAP
Raymond F. Hahn, 11 First St., Mine Hill, N.J. 07801
Filed Apr. 6, 1978, Ser. No. 893,943
Int. Cl.[2] E02D *29/14*; E04G *15/06*
U.S. Cl. 52—21 **10 Claims**



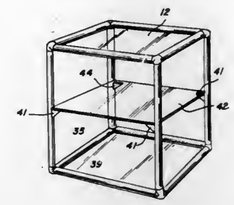
1. A form for a mortar cap, for receiving cementitious materials therewithin, such as cement, mortar, and the like, to define a footing for a catch basin grating, comprising:

at least first means defining multilateral, walled channels for receiving cementitious materials therewithin; and

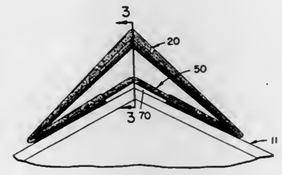
means fixed adjacent to said channels and projecting from said first means for pilotingly aligning said channels with a top course of a catch basin.

4,187,649
FRAME CONSTRUCTION
William H. Chaffee, Chicago, Ill., assignor to Technical Exhibits Corporation, Chicago, Ill.
Filed Jul. 26, 1978, Ser. No. 928,085
Int. Cl.[2] A47B *5/00*
U.S. Cl. 52—36 **8 Claims**

6. The frame construction of claim 1 wherein said frame construction further includes a shelf support having an insert portion received between the inturned ends of an upright edging element free of a panel edge therein at a position spaced above the corner element, and a shelf support portion extending from the insert portion, said insert portion having a thickness preselected to provide an effective frictional retention of the insert portion between said inturned ends of the edging element.



4,187,650
CONSTRUCTION UNIT
James E. Poplin, 3466 W. Magill, Fresno, Calif. 93705
Filed Mar. 13, 1978, Ser. No. 885,615
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—57 **7 Claims**



1. A construction unit comprising an envelope having a forward portion, bottom panels folded toward each other to define an interior for the envelope and an upper panel folded rearwardly at said forward portion into said interior to impart increased rigidity to the upper panel at said forward portion and wherein said upper panel is folded along a longitudinal axis extending at approximately right angles to the forward portion of the envelope; and an insert disposed within the interior of the envelope adjacent to said forward portion and captured by the bottom panels, wherein said bottom panels at the forward portion of the envelope are folded rearwardly toward the interior of the envelope and about the insert to capture the insert within the interior at the forward portion of the envelope and wherein said bottom panels of the envelope are slidable to and from each other along the insert whereby the distance between said longitudinal axis of the upper panel and the insert can be increased and alternatively decreased by sliding the bottom panels toward and alternatively from each other.

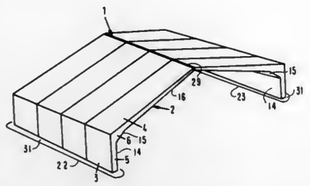
4,187,651
METHOD FOR MANUFACTURING THERMALLY INSULATED BUILDINGS, CONSTRUCTION ELEMENTS SUITABLE FOR APPLICATION IN THIS METHOD AND A METHOD OF MANUFACTURING THE BUILDING CONSTRUCTION ELEMENTS
Auke Tolsma, Polarisstraat 48, Emmeloord, Netherlands
Filed Jul. 12, 1977, Ser. No. 814,925
Claims priority, application Netherlands, Jul. 15, 1976, 7607840
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—79.1 **7 Claims**

1. A thermally insulated building construction element in the form of a half truss of plate truss shape comprising:

a polyurethane hard foam core having an outer arch side, an inner arch side, two lateral sides, and a weight per unit volume of at least about 30 kg/m^3 wherein the density and

strength of the hard foam core in the angular region of the element are greater than the density and strength of the core adjacent to the ends of the element.

a bent plate outer lining bonded to the outer arch side of the hard foam core; and



a bent plate inner lining bonded to the inner arch side of the hard foam core, the lateral sides of the building construction element being unlined.

4,187,652

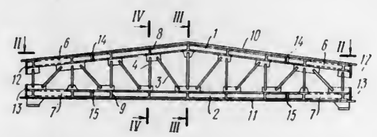
SPACE STRUCTURE OF A ROOF COVERING FOR A BUILDING

Anatoly P. Bobrovnikov, ulitsa Usacheva, 25, kv. 91; Alexandr V. Zakharov, ulitsa Kooperativnaya, 10, kv. 8; Gennady I. Soloviev, ulitsa Davydkovskaya, 6, kv. 102; Gennady G. Mikhailov, Mozhaiskoe shosse, 24, kv. 298; Tamara N. Golubeva, Gvardeiskaya ulitsa, 13, kv. 19, and Nina N. Glushkova, Malaya Filevskaya ulitsa, 48, kv. 58, all of Moscow, U.S.S.R.

Filed Sep. 14, 1978, Ser. No. 942,148

Int. Cl.[2] E04C *3/02*

U.S. Cl. 52—90 **7 Claims**



1. A space structure of a roof covering for a building, incorporating: at leat two roof trusses, each comprising a top longitudinal chord and a bottom longitudinal chord, diagonal rods and vertical posts, by means of which said top chord is connected with said bottom chord; cross braces located in the vertical planes of cross-section of said space structure, said cross braces serving to interconnect said roof trusses and being mounted at the ends of said structure and in the intermediate planes of cross-section between the structure ends at distances sufficient to ensure lateral rigidity of said structure; top and bottom abutment girder members provided at the ends of said top and bottom chords, respectively, and top and bottom purlins arranged between said top and bottom abutment girder members, respectively, at the same levels therewith in panel points of said trusses, said top and bottom abutment girder members and top and bottom purlin being connected to the top and bottom chords, respectively; a top prestressed sheet covering and a bottom prestressed sheet covering, supported by the top and bottom abutment girder members and purlins, respectively, and attached to said members and purlins and to said top and bottom chords, respectively, said top and bottom abutment girder members keeping said respective top and bottom sheet coverings tensioned and said respective top and bottom chords compressed; top and bottom flanges for securing said space structure to external means by which said top and bottom sheet coverings are tensioned, said flanges attached to the end faces of said top and bottom chords, respectively; said space structure wherein said top and bottom chords are made sectional lengthwise, with the connection between the sections of the top chords as well as the sections of the bottom chords made rigid.

4,187,653

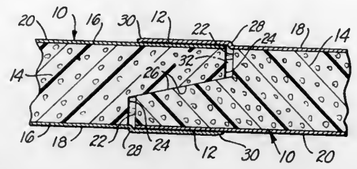
STRUCTURAL MEMBERS AND JOINTS BETWEEN SUCH MEMBERS

Aron Kliewer, Jr., Blue Jay, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed May 5, 1978, Ser. No. 903,078

Int. Cl.[2] E04C *2/20*; E04B *2/08*

U.S. Cl. 52—98 **13 Claims**



1. A structural member constructed so as to include a flat core having sides, a first side member and a second side member, said side members being located against and secured to said sides of said core, said structural member having an end in which the improvement comprises:

the end of said core adjacent to said end of said structural member including a first spacing wall located adjacent to said first side member, a second spacing wall located adjacent to said second side member, and a sloping wall located between and connecting said first and second spacing walls,

said spacing walls extending inwardly from said side members toward the center region of said structural member located between said side members,

said first spacing wall being located further from said end of said structural member than said second spacing wall,

said first side member extending a sufficient distance from said first spacing wall so as to be capable of overlying the second side member of the end of another corresponding structural member which has been fitted into said end of said structural member,

said sloping wall being located at an angle relative to said side members such that when the end of such another structural member is fitted into said end of said structural member the sloping walls of the structural members are held in engagement with one another by the first side member of each structural member engaging the second side member of the other structural member with the opposed spacing walls of the structural members being located separate and apart from one another,

said sloping wall being dimensioned relative to said spacing walls so as to provide a space between the first spacing wall of said structural member and a second spacing wall of the end of another corresponding structural member which has been fitted into said end of said structural member and so as to provide a space between the second spacing wall of said structural member and as first spacing wall of the end of another corresponding structural member which has been fitted into said end of said structural member.

4,187,654

VACUUM SYSTEM FOR SWIMMING POOLS

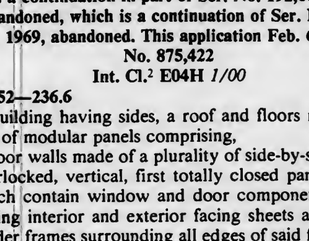
Spiridon Constantinescu, 161 Violet Dr., Stoney Creek, Ontario, Canada (L8E 3J2)

Filed Mar. 2, 1978, Ser. No. 882,943

Int. Cl.[2] E02D *27/00*; E04H *12/20*

U.S. Cl. 52—169.7 **2 Claims**

1. A vacuum system for swimming pools having a vinyl liner, comprising in combination: a vacuum network installed beneath the bottom and around a swimming pool connecting each plane of the pool bottom to an upper surrounding pipe which is further connected to a separator and a vacuum pump; said vacuum network having at least one pipe for each plane of the pool bottom and each said pipe being connected to said upper surrounding pipe by a gate valve; said gate valves being able to separate the different planes of the pool bottom from said upper surrounding pipe; the surface of the pool bottom comprising plastic or rubber tiles having their upper surface impressed with geometrical designs such as squares, hexagons, circles, or any other regular geometrical figure either polygonal or curvilinear spaced enough to allow the movement of vacuum air between them and yet protect the vinyl liner against puncture; said tiles having a central thickened part which has in the middle a hole big enough to accommodate a plastic nail for fixing said tile to the ground; said thickened part being impressed like the head of said plastic nail so that when the nail is driven, the upper face of said tile mates exactly with the head of said plastic nail; said plastic nail having a series of elastic blades which secure the nail into the ground and consequently fix said tile in place; at least one said tile of each said



plane of the pool bottom being connected to said pipe of said vacuum network by means of a first drain pipe and a second drain pipe; said first drain pipe having its top channeled and perforated to allow the air to flow from between the vinyl liner and tile surface into the vacuum network, its exterior being smooth on the upper part and provided with blades on the bottom part; said second drain pipe having inside, at its upper part two or more circular channels capable of receiving ring gaskets, at its lower part two or more circular rigid ribs, and at its bottom a flange for connecting to said pipe; said upper part of said first drain pipe mating with said hole of said tile and engaging said ring gaskets; said lower part of said first drain pipe fitting with said rigid ribs; said first drain pipe and said second drain pipe being able to provide a flexible and air-tight connection between said tile and said pipe; smooth strips of Styrofoam or Foaming-rubber being placed at each corner and edge of said pool bottom to separate said planes of the pool bottom; all seams between said tiles and said smooth strips being taped with wide masking tape; and all impressions in said tiles under said masking tape being filled with synthetic resin.

4,187,655

PANEL CONSTRUCTED BUILDING

Ernest L. Anderson, 4606 148th Ave. NE., Bellevue, Wash. 98007

Division of Ser. No. 657,473, Feb. 12, 1976, Pat. No. 4,090,339, which is a continuation-in-part of Ser. No. 192,601, Oct. 26, 1971, abandoned, which is a continuation of Ser. No. 823,590, May 12, 1969, abandoned. This application Feb. 6, 1978, Ser. No. 875,422

Int. Cl.[2] E04H *1/00*

U.S. Cl. 52—236.6 **6 Claims**

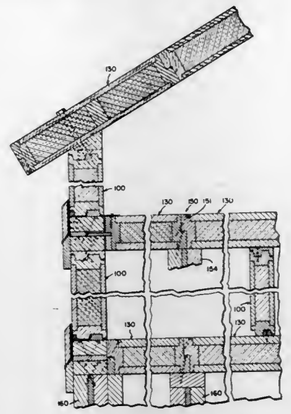
3. A building having sides, a roof and floors made from a plurality of modular panels comprising,

first floor walls made of a plurality of side-by-side abutting, interlocked, vertical, first totally closed panels, some of which contain window and door components and each having interior and exterior facing sheets and enclosing border frames surrounding all edges of said facing sheets,

second floor walls made of a plurality of side-by-side abutting said interlocked vertical first panels separate from said first floor panels,

said first panels being primary load-carrying members for carrying the load of the roof, sidewalls and floors, first and second floors made of side-by-side and end-to-end abutting interlocked separate horizontal second panels,

a roof made of said interlocked second panels,



a plurality of horizontal supports for supporting the floors and roof in spans not directly above an interior supporting wall, and

said floor panels lying completely interiorly of the interior facing sheet of said wall first panels and abutting a plane adjacent to and interiorly of the wall panels.

4,187,656

TACKING STRIP OR RAIL

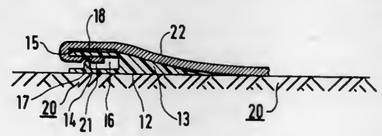
Hermann Lutz, Gartenstrasse 3, 7404 Ofterdingen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,498

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701128

Int. Cl.[2] A47G *27/04*

U.S. Cl. 52—273 **8 Claims**



1. The combination of a sheet materail having a border-edge zone and tacking rail adapted to retain the said border-edge zone of the sheet material under tension, the tacking rail comprising:

a longitudinal rail having a flat bearing surface, said longitudinal rail having a characteristic cross-sectional shape, which includes a wedge-shaped region defining one longitudinal edge of said longitudinal rail and of said flat bearing surface;

said characteristic cross-sectional shape also including two parallel wall members extending from said wedge-shaped region, said two wall members defining a tensioning groove therebetween which extends along substantially the entire length of said tacking rail;

a projection extending from at least one of said two parallel wall members into said tensioning groove;

said border-edge zone of said sheet material being positioned over the upper one of said two wall members and inserted

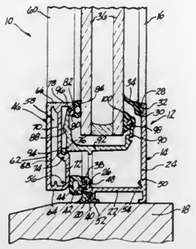
and wedged into said tensioning groove so as to completely cover the upper surface of said upper wall member.

4,187,657

THERMAL WINDOWS

Ronald D. Sukolics, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 3, 1978, Ser. No. 921,818
Int. Cl.[2] E06B *3/00*
U.S. Cl. 52—397 **45 Claims**



1. An improved thermally broken window construction wherein said window is thermally broken without the need of an insulating material comprising:

a stationary frame member defining a window opening;

at least one face member;

said face member being provided with means for securing a window pane within said frame member;

said frame member being provided with a substantially flat base portion, a first leg portion extending from said base portion toward said window pane and substantially perpendicular to said base portion and having a free end and a second leg portion extending from said base portion in the same direction as said first leg portion and having a free end;

said first leg portion and said second leg portion each being provided with nib means extending substantially parallel to said base portion which define with said base portion first and second opposing grooves; and

said stationary frame member is provided with sealing means in direct sealing engagement with one side of said window pane such that said stationary frame member is thermally broken from said securing means without the need of a thermal insulating material.

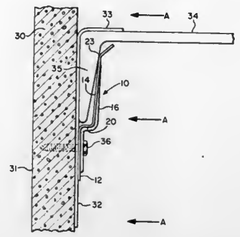
4,187,658

PANEL CLAMP

Ernest W. Reinwall, Jr., McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 688,199, May 20, 1976. This application Oct. 11, 1977, Ser. No. 841,251
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—489 **6 Claims**

1. In a building assembly system for resiliently securing erect facing panels to structural members, the combination of a facing panel member, a structural beam member with an L-shaped securing extremity and a clamp device designed for resilient securement of the inner surface of the panel member to the downwardly extending leg on the structural member, the downwardly extending leg being of a tapered cross-section with its cross-sectional width being greatest at the juncture of the L, the clamp device for resiliently securing a panel member to a structural member including a base portion integrally connected to a spring arm portion by a web extending generally upwardly from the base portion, the arm and base portions extending in opposing lateral directions from the web, the arm having a free extremity forming a force accepting point and extending downwardly from the web at an acute angle toward the plane of the base thereby creating a cantilever spring biased toward the plane of the base, the force accepting point at the free extremity of the cantilever spring permitting resilient point contact between the spring arm and the surface of the leg on the structural member in a region of thickness which is greater than the distance between the plane of the base and the contact point when the spring arm is in an unloaded condition, the resilience of the spring arm in conjunction with the downward extension thereof permitting the clamping device to engage the leg portions of structural members having a predetermined range of thicknesses, a flange extending outwardly



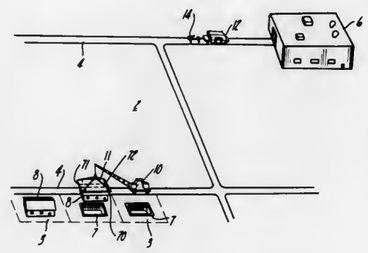
and upwardly from the force accepting point to facilitate association between the free extremity of the spring arm and the structural member, rib means formed on the arm extending lengthwise of the arm, the rib means being of decreasing height from a region adjacent the web to the region adjacent the free extremity, the base portion being clampingly secured to the panel member with a fastener having a shank and clamping head with the free extremity of the arm resiliently bearing on the structural member, wherein the arm creates a resilient clamping force on the structural member which force increases as the strain on the arm in the direction away from the plane of the base increases.

4,187,659

HOME BUILDING METHOD AND APPARATUS

Leon Blachura, Clarkston, Mich., assignor to North Oakland Development Corporation, Pontiac, Mich.

Division of Ser. No. 720,690, Sep. 7, 1976. This application Dec. 29, 1977, Ser. No. 865,469
Int. Cl.[2] E04G *21/00*
U.S. Cl. 52—745 **1 Claim**



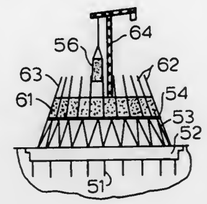
1. A method of constructing a residential development comprising, in combination, providing a suitable unitary tract of land; constructing on the tract a factory building suitable for the simultaneous, progressive fabrication of several dwelling houses, fabricating complete houses in the factory building; delivering the houses from the factory to locations on the tract and installing the houses on the foundations; and converting the factory building on its original site to use in providing services to the occupants of the residential development upon termination of fabrication of the houses and installation on the foundations.

4,187,660

METHOD OF CONSTRUCTING COOLING TOWER EMPLOYING PRECAST REINFORCED CONCRETE PANELS

Tung-Yen Lin, El Cerrito, and Yue-Chyou Yang, San Francisco, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Division of Ser. No. 768,175, Feb. 14, 1977, Pat. No. 4,092,811. This application Nov. 3, 1977, Ser. No. 848,294
Int. Cl.[2] E04C *3/20*
U.S. Cl. 52—747 **6 Claims**



1. A method for erecting a cooling tower or the like comprising the sequential steps of:

providing a foundation,

erecting on said foundation a closed-curve series of columns inclined inwardly and also along a generally conical surface,

providing a lower ring joining the upper ends of all said columns together,

erecting on said lower ring, without the use of removable temporary holding structure, a lowermost tier, comprising a series of precast reinforced concrete panels, each having a relatively thin reinforced skin and a plurality of reinforcing ribs,

providing post-tensioning tendon means for said lowermost tier and post-tensioning said tendon means,

similarly erecting on said lowermost tier, without the use of removable temporary holding structure, a second tier comprising said panels and post-tensioning that tier,

securing said second tier to said lowermost tier,

continuing to erect said wall, tier by tier, in the same manner, securing each upper tier to its adjacent lower tier, and post-tensioning each said tier,

providing upwardly-extending post-tensioning tendons and tensioning them, and

erecting an upper ring on the upper end of said tower.

4,187,661

BUILDING SIDING REMOVAL AND REINSTALLATION SYSTEM

William R. Poiry, 5306 N. State Rt. 590, Oak Harbor, Ohio 43449

Filed Nov. 28, 1977, Ser. No. 855,428
Int. Cl.[2] E04G *23/00*
U.S. Cl. 52—748 **1 Claim**

1. A method of removing and reinstalling building siding comprising the steps of:

uncoupling the lower overlapped edge of a first section of siding from the upper marginal edge of a second section of siding to be removed;

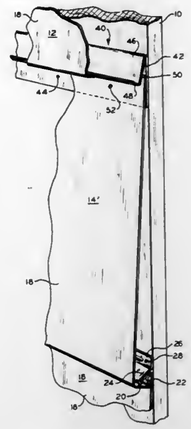
removing the upper marginal edge of said second section of siding from the associated building;

uncoupling the lower overlapped edge of said second section of siding from the upper portion of a third section of siding immediately below said second section;

securing a strip to the building to couple the lower marginal edge of said first section of siding;

severing the upper marginal edge of said second section from the main portion of said second section of siding;

reinstalling said second section of siding by placing the free severed upper edge portion thereof against at least a portion of the said strip adjacent the bottom edge of said first section of siding and coupling the bottom edge thereof with the upper edge of said third section of siding; and



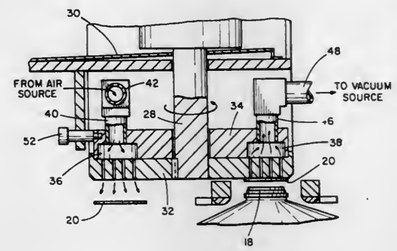
fastening the upper portion of said second section of siding to said strip.

4,187,662

APPARATUS FOR REMOVING PRESSURE SENSITIVE TAPE FROM CONTAINERS

Donald D. Cochran, Bartlett, Ill., assignor to Packaging Systems, Inc., Itasca, Ill.

Filed Oct. 2, 1978, Ser. No. 947,448
Int. Cl.[2] B65B *43/40*
U.S. Cl. 53—381 A **9 Claims**



1. A device for removing tape from the tops of containers moving along a conveyor comprising:

(a) a rotor positioned above the containers provided with a plurality of vertical air passages therethrough,

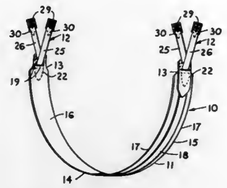
(b) a stator disposed above the rotor provided with first and second plenum chambers, said chambers being spaced one from the other, said first chamber being positioned directly over the containers on said conveyor,

(c) means for rotating said rotor relative to said stator to cause the air passages to alternately communicate with said first and second plenum chambers,

(d) means for maintaining said first chamber below atmospheric pressure and said second chamber above atmospheric pressure,

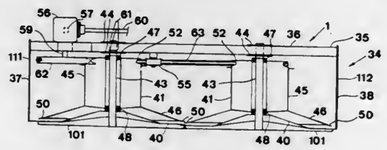
whereby the partial vacuum maintained in said first chamber draws air upwardly through the rotor air passages creating a force sufficient to remove said tape from said container, and temporarily position it on said rotor, the increased pressure maintained in said second chamber subsequently effecting removal of tape positioned on the rotor.

4,187,663
SADDLE GIRTH
Gene LaCroix, Jr., 17011 N. 54th St., Scottsdale, Ariz. 85255
Filed Sep. 12, 1977, Ser. No. 832,655
Int. Cl.[2] B68C *1/00*
U.S. Cl. 54—23 10 Claims



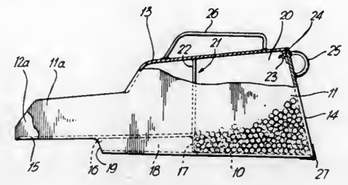
1. A saddle girth comprising:
an elongated belt portion formed of a fused solid elastomeric plastisol plastic material having a smooth inside non-moisture absorbent, abrasive resistent surface for engagement with the flesh of a horse about its rib cage and an outside surface, the plastic material being non-porous so as to not absorb moisture within the elongated belt portion during use;
wherein the belt portion is formed of a platisol plastic material comprising plasticized polyvinyl chloride having an ultimate elongation of between 300% and 450%; and
strap fastening elements at opposite ends of the belt portion adapted to be secured to a riding saddle.

4,187,664
AGRICULTURAL MACHINE STRUCTURE
Nigel W. Meek, and Jeffrey S. Ramsay, both of Aylesbury, England, assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Mar. 27, 1978, Ser. No. 890,357
Claims priority, application United Kingdom, Apr. 5, 1977, 14244/77
Int. Cl.[2] A01D *49/00*
U.S. Cl. 56—13.6 8 Claims



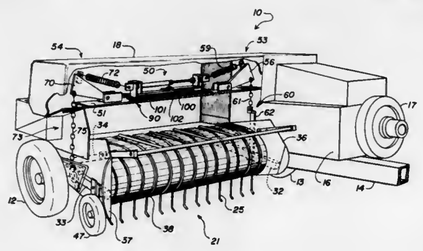
1. A harvesting machine comprising:
a rigid, generally rectangular frame having upper and lower transverse beams and substantially vertical legs interconnecting the respective ends of said upper and lower transverse beams;
a plurality of mounting shafts detachably rotatably journalled between said upper and lower transverse beams;
a cutter unit rotatably mounted on each said mounting shaft;
upper and lower bracket means detachably connected to said upper and lower transverse beams, respectively, for rotatably journalling each said mounting shaft;
a single belt power transfer means interconnecting each said cutter unit for transferring rotational power therebetween, said single belt power transfer means being entirely below said upper transverse beam;
power input means connected to said power transfer means for delivering rotational power thereto.

4,187,665
DEVICE FOR USE IN PICKING BERRIES
Walter Nedila, Box 63, MacDowall, Saskatchewan, Canada (SOK 2SO)
Filed Feb. 6, 1978, Ser. No. 875,162
Claims priority, application Canada, Jun. 10, 1977, 280252
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—330 1 Claim



1. A device for use in picking berries comprising a container defined by a planar flat bottom wall, a top wall, a pair of opposed side walls, a hingedly mounted rear wall and an open front wall, a handle rigidly secured to said top wall, a scoop-like portion projecting forwardly from said open front wall, said scoop-like portion having side walls provided by extensions of said opposed side walls of the container, a plurality of spaced apart parallel tines disposed in a plane above the bottom wall of the container and extending rearwardly into the container to overlap a portion of said bottom wall, said tines extending forwardly between the extensions of the side walls providing a bottom wall of said scoop-like portion, said latter mentioned bottom wall being in a plane spaced upwardly from the bottom wall of the container, a screen extending across the interior of the container at a position spaced forwardly of the rear wall providing therebetween a compartment for holding berries picked from a shrub by using said tines, said screen being connected to said tines adjacent ends of the latter located in the container and defining a foraminous wall intersecting said tines, said screen having openings of sufficient size to allow berries of a selected maximum size to pass therethrough into said compartment but prevent passage therethrough of at least a major portion of leaves, branches and the like debris picked with the berries and said tines having spacings therebetween less than said selected maximum size.

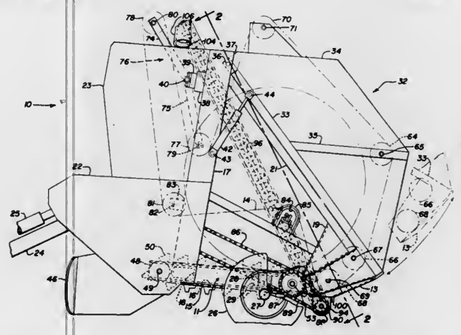
4,187,666
BALER PICKUP COUNTER BALANCING MEANS
Irwin D. McIlwain, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Jun. 24, 1977, Ser. No. 809,889
Int. Cl.[2] A10D *39/00*
U.S. Cl. 56—341 10 Claims



1. In a baler having a mobile frame adapted to move across a field, means on said frame operable to receive crop materials and form said materials into bales and a pickup assembly including pivot means on said frame and pickup means disposed

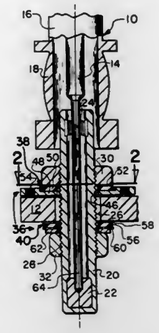
generally forwardly of said pivot means and operable to pick up crop materials from the field and feed said materials to said receiving and forming means, said pickup means being connected to said pivot means for vertical swinging movement about a generally horizontal axis defined by said pivot means, a counterbalance means for said pickup including a pair of aligned pivot cranks fixed to said frame generally above said pickup means, one of said pair of pivot cranks positioned above each lateral end of said pickup means and fixed thereto for swinging movement in a plane parallel to the longitudinal axis of the pickup means, each said pivot crank including a resilient biasing means having a first end connected to the pivot crank and a second end affixed to said frame such that said pivot cranks are urged in a direction to counterbalance said pickup means, an improved mechanism for adjusting the counterbalance forces comprising:
an elongate keeper means affixed to said frame with its longitudinal axis directed along a line between said pivot cranks;
a variable length coupling means fixed to each of said resilient biasing means at the second ends thereof whereby variation of the length of said coupling means correspondingly changes the distance between said second ends; and
said coupling means is slidingly engaged with said keeper means.

4,187,667
COLLECTION AND RECYCLING APPARATUS FOR CROP PARTICLES IN A ROLL FORMING MACHINE
Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Jan. 3, 1978, Ser. No. 866,330
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 7 Claims



1. A roll forming machine for crop material comprising:
(a) a mobile frame adapted to move across an open field, said frame having a front end, two opposing sides, and a rear end;
(b) conveying means fixed to said frame, said conveying means having a front end, two opposing sides and a rear end thereby defining a transport plane along which crop material is moved from said front end towards said rear end, said front end, opposing sides and rear end of said conveying means further being in substantially the same orientation as said front end, opposing sides and rear end of said frame;
(c) pickup means mounted to said frame adjacent said front end of said conveying means for engaging crop material and depositing it on said transport plane of said conveying means;
(d) bale forming means mounted to said frame substantially above said conveying means defining therebetween a bale forming region, said bale forming means including a movable motion-imparting curvilinear surface extending at least from a first location substantially in the same plane as said transport plane to a second location above said transport plane;
(e) drive means operably connected to said bale forming means to impart motion thereto such that crop material delivered to the bale forming region by said conveying means is rotated to form a substantially cylindrical bale;
(f) collection means supported on said frame adjacent said conveying means' rear end, said collection means positioned below said transport plane and at least partially below said first location of said bale forming means; and
(g) return means supported on said frame whereby crop material accumulated by said collection means is moved therefrom back to the bale forming region.

4,187,668
ADJUSTABLE SUPPORT SYSTEM
Edward J. Olowinski, Erie, Pa., and Leonard W. Foster, Richardson, Tex., assignors to Lord Corporation, Erie, Pa.
Filed Dec. 8, 1978, Ser. No. 967,746
Int. Cl.[2] D01H *7/12*
U.S. Cl. 57—130 20 Claims



1. An adjustable support system for mounting a first member on a second member and for reducing the transmission of vibrations between the first and second members, said support system comprising:
(a) means defining a substantially rigid flange member;
(b) means secured to the flange member for mounting the first member resiliently relative to the flange member, the resilient mounting means including at least one body of elastomer;
(c) means for spacing the flange member apart from the second member, the spacing means including a portion for at least contacting the flange member and a portion for at least contacting the second member;
(d) means for adjusting the spacing between at least a portion of the flange member and at least a portion of the second member so as to change the flange member's orientation relative to the second member, the adjusting means including a portion for at least contacting the flange member and a portion for at least contacting the second member, the adjusting means being disposed to contact the flange member in spaced relation relative to the resilient mounting means so as to avoid compressing the elastomer in the mounting means between the adjusting means and the flange member; and
(e) means for resiliently permitting and accommodating adjustments in the spacing between the flange member and the second member, the adjustment accommodating means including at least one body of elastomer and having a portion for at least contacting the second member and a portion for at least contacting a member that moves in response to adjustments of the adjusting means.

20. An adjustable, vibration isolating support system for mounting a textile spindle on a machine rail or the like, the

machine rail having formed in it an opening to receive the textile spindle, the spindle carrying two annular flanges that extend radially from the spindle and are spaced apart along the length of the spindle, at least one of said two spindle flanges being movable along the length of the spindle to clamp the spindle to a supporting structure disposed between the spindle flanges, the support system comprising:

(a) means defining a flange member fabricated of substantially inextensible material, the flange member having formed in it a central opening for receiving the textile spindle and at least two peripheral openings that are spaced from the central opening and from each other in a circumferential array about the central opening;

(b) means secured to the flange member about the central opening for mounting the textile spindle resiliently relative to the flange member, the resilient mounting means including at least one body of elastomer that has formed in it a central opening aligned with the central opening in the flange member;

(c) means for spacing the flange member apart from the machine rail, the spacing means including a portion for at least contacting the flange member and a portion for at least contacting the machine rail;

(d) means for adjusting the spacing between at least a portion of the flange member and at least a portion of the machine rail so as to change the flange member's orientation relative to the machine rail and thereby to change the vertical orientation of the textile spindle relative to the machine rail when said spindle is mounted on the machine rail by the support system, the adjusting means including at least two threaded members that are received in the peripheral openings of the flange member, each threaded member having a surface for at least contacting the flange member and a surface for at least contacting the machine rail, the threaded members also being spaced from said at least one body of elastomer of the resilient mounting means so as to avoid compressing said at least one body of elastomer between the threaded members and the flange member; and

(e) means for resiliently permitting and accommodating adjustments in the spacing between the flange member and the machine rail, the adjustment accommodating means including at least one body of elastomer that has formed in it a central opening, the adjustment accommodating means having one surface for contacting the machine rail and a second surface opposite the first surface for contacting a member that moves in response to adjustments of the adjusting means.

4,187,669

KNITTING MATERIAL

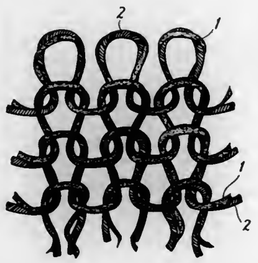
Rikio Hamanaka, Kyoto, Japan, assignor to Hamanaka Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 26, 1978, Ser. No. 872,660

Claims priority, application Japan, Feb. 1, 1977, 52-10439; Aug. 9, 1977, 52-106877[U]

Int. Cl.[2] D02G *3/06, 3/44*

U.S. Cl. 57—235 **8 Claims**



1. Knitting material which comprises a fine tape comprised of a non-woven fabric prepared by the spun-bond process, said tape having been prepared by slitting said non-woven fabric lengthwise, said tape having a weight per area of not more than 30 g/m^2 and having a width of 5 to 20 mm, said tape having been twisted so as to have, on the average, from 2 to 20 turns per one meter lengthwise.

4,187,670

TIME SIGNAL GENERATOR CIRCUIT FOR USE IN AN ELECTRONIC TIMEPIECE

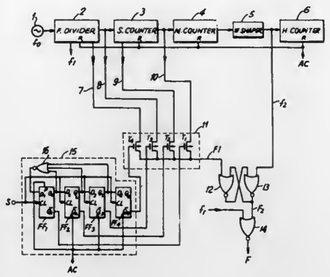
Yasunobu Okano, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,767

Claims priority, application Japan, Mar. 4, 1977, 52-23598

Int. Cl.[2] G04C *3/00, 21/12, 21/16;* **G08B** *3/00*

U.S. Cl. 58—23 R **8 Claims**



1. A time signal generator circuit comprising:

an oscillator for generating a reference frequency signal;

means connected to said oscillator for frequency-dividing said reference frequency signal to generate electric signals, respectively, every second, every minute and every hour;

means for deriving an audio frequency signal by frequency-dividing said reference frequency signal;

means for deriving a plurality of time duration decision signals respectively having different predetermined periods among the signals obtained upon processing said reference frequency signals;

means for detecting a preset time when a time signal is to be generated;

a time duration switching circuit having a plurality of input terminals, a corresponding number of control terminals and an output terminal, said time duration decision signals being applied to said plurality of input terminals, one of said control terminals receiving a control signal for delivering at said output terminal said time duration decision signal applied to said input terminal associated with said one control terminal;

a ring counter consisting of a plurality of flip-flops cascaded with each other, said control signal being derived from one of the output terminals of said flip-flops, the output terminals of said flip-flops in said ring counter being connected, respectively, to said control terminals of said time duration switching circuit to thereby apply said control signals to said control terminals; and

means for transmitting said audio frequency signal to an audible signal converter in response to the output of said means for detecting a preset time, during a time duration equal to the period of said time duration decision signal;

wherein said frequency-dividing means comprises a frequency-divider transforming said reference frequency signal into 1 H_z signal, a second counter counting said 1 H_z signal and deriving 1/60 H_z signal, a minute counter counting said 1/60 H_z signal and deriving 1/3600 H_z signal, and an hour counter counting said 1/3600 H_z signal; and

wherein said means for transmitting said audio frequency signal to an audible signal converter comprises an R-S flip-flop having a set terminal connected to the output of said preset time detecting means and a reset terminal to which is operatively applied the output obtained at said output terminal of said time duration switching circuit, and means for applying said audio frequency signal to the audible signal converter during the time when said R-S flip-flop produces an output.

4,187,671

ELECTRONIC WATCH WITH REACTION TIMER

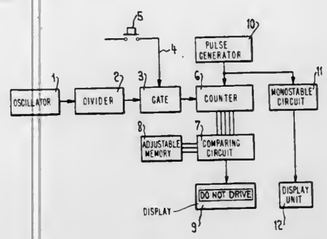
Jean-Claude Fatton, Le Landeron, Switzerland, assignor to Ebauches Electroniques S.A., Marin, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,176

Claims priority, application Switzerland, Nov. 22, 1976, 14639/76

Int. Cl.[2] G04B *47/06*

U.S. Cl. 58—152 B **6 Claims**



1. An electronic watch capable of measuring the time in which a user of the watch reacts to a stimulus the occurrence of which is unknown to and independent of control of the user, comprising:

oscillator means for generating clock signals;

first display means providing the stimulus to signal the start of a reaction time test sequence;

generator means coupled to said first display means for automatically activating said first display means independent of external control;

counter means for counting said clock signals, said counter means being reset by said generator means simultaneous to actuation of said first display means;

control means operatively coupled to said counter means for stopping the count thereof, said control means being manually operable by the user of the watch in response to the actuation of said first display means such that the count of said counter means is a measure of the reaction time of the user;

means for memorizing a time reference;

comparator means for comparing the reaction time represented by the count of said counter means with said memorized time of reference; and

second display means controlled by the output of said comparator for delivering a warning whenever the reaction time exceeds said time of reference.

4,187,672

APPARATUS FOR CONVERTING CARBONACEOUS MATERIAL INTO FUEL GASES AND THE RECOVERY OF ENERGY THEREFROM

Ned S. Rasor, Sunnyvale, Calif., assignor to Rasor Associates, Inc., Sunnyvale, Calif.

Filed Nov. 17, 1977, Ser. No. 852,525

Int. Cl.[2] F02B *43/08;* **C10J** *3/20*

U.S. Cl. 60—39.12 **29 Claims**

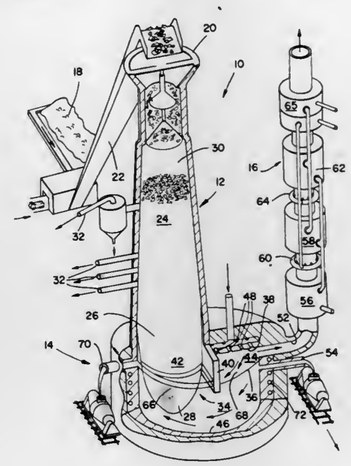
1. Apparatus for converting a feed which includes a sulfur component and which yields carbon on being heated above a carbonization temperature thereof and which is solid at ambient temperature into a hot gas, comprising:

a reactor;

a liquid solvent for carbon which fills said reactor up to a liquid level therein below a top thereof;

partition means, separating said reactor above said liquid level into a carbonization chamber and oxidation chamber means, said partition means terminating below said liquid level and above a bottom of said reactor to allow flow of liquid between said carbonization chamber and said oxidation chamber means, said partition means further defining a leaching chamber within said reactor separated above said liquid level from said carbonization chamber and said oxidation chamber means but allowing flow of liquid thereinto and thereoutof;

means for introducing a feed which yields carbon on being heated above a carbonization temperature thereof and which is solid at ambient temperature into said carbonization chamber;



means for introducing oxidizing means having an oxygen content into said oxidation chamber means to produce oxygen bound in said liquid solvent;

means for causing flow of said liquid between said carbonization chamber and said oxidation chamber means;

means for introducing a metal oxide, said metal forming a sulfide which is insoluble in said liquid and of a different density therefrom whereby said metal sulfide when formed separates into a sulfide layer, into said leaching chamber;

means for conducting off gas formed by reaction of said metal oxide with sulfur and carbon dissolved in said liquid in said leaching chamber away therefrom;

means for removing said sulfide layer from said leaching chamber; and

means for conducting away from said oxidation chamber means a first hot gas formed therein.

4,187,673

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 11, 1977, Ser. No. 840,569

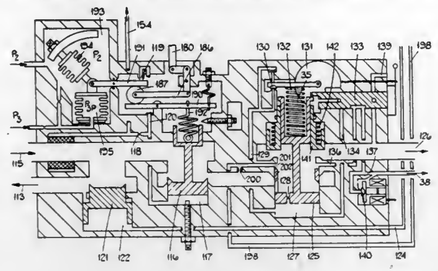
Claims priority, application United Kingdom, Oct. 13, 1976, 42485/76; Jan. 7, 1977, 655/77

Int. Cl.[2] F02C *9/04*

U.S. Cl. 60—39.28 R **18 Claims**

1. A fuel control system for a gas turbine engine, comprising a fuel metering valve which is responsive to a first servo pressure signal, a first pilot valve for regulating said first servo pressure signal, a control element which is movable in response

to a second servo pressure signal, a second pilot valve for controlling said second servo pressure signal, means responsive to engine speed, for positioning said second pilot valve, selector means movable in response to changes in a desired speed of the engine, a member slidable relative to said control



element and co-operating therewith to define a pressure-regulating valve, an actuator for controlling said first pilot valve, said actuator being responsive to the pressure controlled by said pressure regulating valve, and means for positioning said member relative to said control element in accordance with the position of said actuator.

4,187,674

COMBUSTION EQUIPMENT FOR GAS TURBINE ENGINES

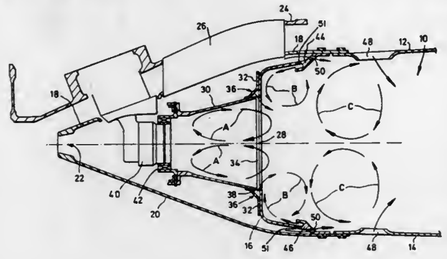
John P. Richardson, Yokohama, Japan, assignor to Rolls-Royce Limited, London, England

Filed Jan. 18, 1978, Ser. No. 870,593

Claims priority, application United Kingdom, Jan. 21, 1977, 2467/77

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.36 **4 Claims**



1. Combustion equipment for a gas turbine engine to be located in a stream of compressed air, comprising:

an annular flame tube having an upstream end wall provided with a circumferential array of equi-spaced generally circular apertures for the admission of liquid fuel and air into said tube, the diameter of each of said apertures being less than the radial dimension of said end wall;

a plurality of upstream-projecting vortex-generating pots, one for each of said apertures arranged adjacent the upstream side thereof and aligned therewith, each of said pots comprising a downstream-diverging generally conical duct;

liquid fuel injection means adjacent the upstream end of each of said pots which, in operation, tends to form a film of fuel on the inner surface of the corresponding one of said ducts; and

duct means adjacent the downstream end of each of said pots comprising a substantially circumferential gap between the downstream end of the corresponding one of said pots and said upstream side of the corresponding one of said apertures for directing a supply of the compressed air substantially radially inwardly across said downstream end of the corresponding one of said ducts for detaching therefrom the film of fuel on the inner surface thereof so that the film will be entrained in vortices formed within the upstream end of said flame tube and will not burn on the walls of said tube.

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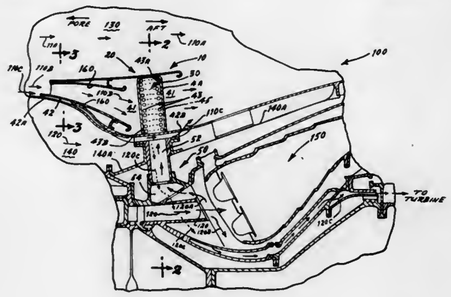
COMPACT AIR-TO-AIR HEAT EXCHANGER FOR JET ENGINE APPLICATION

Thomas G. Wakeman, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1977, Ser. No. 842,139

Int. Cl.² F02C *7/18*

U.S. Cl. 60—39.75 **5 Claims**



1. A compact air-to-air heat exchanger, adapted for use in a gas turbine engine of the fan bypass type having a hot flow of cooling air, a cool flow of fan air, and a primary fan air stream duct in which a first portion of said cool flow of fan air flows, comprising:

a. means for cooling said hot flow of cooling air;

b. and, means for heating a second portion of said cool flow of fan air, with this said means in association with said cooling air cooling means;

wherein said compact air-to-air heat exchanger is disposed internal of said bypass type gas turbine engine, whereby heat is transferred from said hot flow of cooling air to said second portion of said cool flow of fan air, thereby resulting in an exhaust flow of cooled cooling air; and

wherein said means for cooling and said means for heating include, in common, a secondary fan air stream duct, adjacent to said primary air stream duct, through which flows said second portion of said cool flow of fan air, and, a plurality of flow tubes through which flows said hot cooling air, with said flow tubes disposed within and in transverse relationship to said secondary fan air stream duct, and are also simultaneously disposed in cross flow relationship with and to said second portion of said cool flow of fan air, and with said flow tubes having a plurality of circumferentially spaced, radially extending headers which are supported from and are connected to a common cooling air inlet manifold disposed radially inward therefrom and a plurality of circumferentially spaced, radially extending headers which are supported from and are connected to a common cooling air outlet manifold disposed radially inward therefrom.

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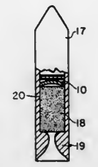
BI-METALLIC THERMAL COMPENSATOR FOR MOUNTING A SOLID PROPELLANT GRAIN

Scott M. O'Neil, Ridgecrest, Calif., and Howard H. Payne, Las Vegas, Nev., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 13, 1978, Ser. No. 885,706

Int. Cl.² F02K *9/04*

U.S. Cl. 60—255 **4 Claims**



1. A thermally responsive bi-metallic compensator for stabilizing the position of free-floating solid propellant grain in a rocket motor combustion chamber, comprising:

a first metallic layer having a first predetermined coefficient of thermal expansion; and

a second metallic layer having a second predetermined coefficient of thermal expansion, said second metallic layer joined to said first metallic layer to form a thermally responsive bi-metallic structure, said thermally responsive bi-metallic structure mounted in the front end of said rocket motor combustion chamber.

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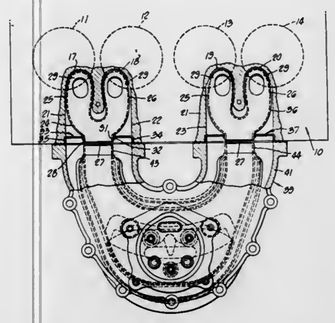
EXHAUST PORT LINER SUPPORT FOR INTERNAL COMBUSTION ENGINE

Yoshitoshi Sakurai, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 677,665, Apr. 16, 1976, abandoned. This application Apr. 7, 1978, Ser. No. 894,588

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **2 Claims**



1. In an internal combustion engine having an exhaust valve operatively interposed between walls forming a combustion chamber and wall forming an exhaust port passage, the improvement comprising, in combination: an exhaust port liner insertable into position within the exhaust port passage, in the absence of said valve, said liner being bifurcated to form two entrance portions, the major portion of the length of said liner being spaced with respect to the wall forming said exhaust port passage, said liner having a circular projection defining a discharge opening for said liner, and a support piece having a peripheral skirt tightly fitting into said wall of the exhaust port passage, said support piece being fixed on said liner projection, said support piece acting to prevent flow of exhaust gases between said liner and the wall of the exhaust port passage.

4,187,678

MARINE ENGINE MANIFOLD

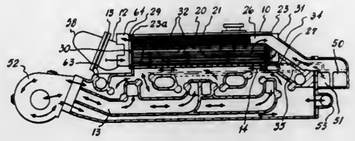
Frederik J. Herenius, Peterborough, England, assignor to Perkins Engines Limited, London, England

Filed Mar. 31, 1977, Ser. No. 783,353

Claims priority, application United Kingdom, Apr. 8, 1976, 14220/76

Int. Cl.² F01N *3/02*

U.S. Cl. 60—321 **4 Claims**



1. A manifold comprising a body formed from a single casting and connectible to exhaust and induction parts of an internal combustion engine, an induction manifold and an exhaust manifold respectively comprising an induction duct and an exhaust duct both with port matching branches all formed integrally with said body, means for connecting said branches respectively to said parts, walls integrally formed with said body enclosing said induction and exhaust ducts and defining a coolant jacket including a lower portion surrounding said ducts while forming coolant passages between the exhaust and induction ducts, means for connecting said coolant jacket to a source of liquid coolant including a coolant outlet of said engine, walls defining a header for said coolant jacket formed integrally with said body to create an upper portion of said coolant jacket above the lower portion, heat exchange means, support means in said header for said heat exchange means, said heat exchange means forming an inlet passage for coolant flowing from said source and said casting further including an integrally formed by-pass duct parallel to and adjacent said header and extending substantially the length of said heat exchanger means for connecting said coolant jacket directly to the said source of liquid coolant.

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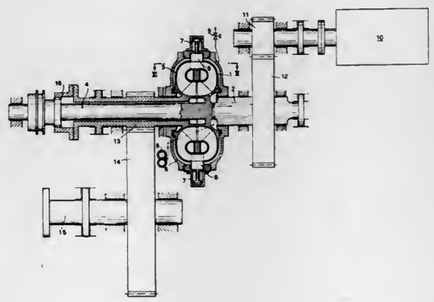
DEVICE FOR INVERTING THE DIRECTION OF ROTATION OF A DRIVEN SHAFT

Enrico Fortunato, Milan, Italy, assignor to Franco Tosi S.p.A., Milan, Italy

Filed Feb. 27, 1978, Ser. No. 881,715

Int. Cl.² F16D *33/04*

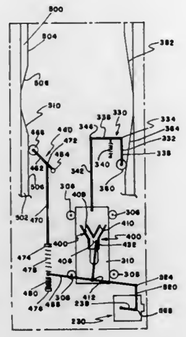
U.S. Cl. 60—331 **5 Claims**



1. A hydraulic coupling device for transferring rotational drive from a driving shaft to a driven shaft, the device compris-

ing a driving cup and a driven cup, vane means associated with the respective cups to establish fluid flow between the cups and rotation of the driven cup responsive to rotation of the driving cup, casing means defining an annular chamber between said cups in fluid flow communication with the vane means of the respective cups, a set of flow-diverting vanes associated with said casing means, said vanes having first positions relative to said channel establishing a first direction of rotation of the driven cup relative to the driving cup and second positions relative to said channel establishing a reverse direction of rotation of the driven cup relative to the driving cup and separate actuators for each of said vanes for moving the vanes between said first and second positions.

4,187,680
OIL WELL PUMP DRIVE
George A. Sanford, 300 E. Kansas, Arkansas City, Kans. 67005
Filed Jun. 12, 1978, Ser. No. 914,577
Int. Cl.[2] F16D *31/00;* **F15B** *15/22*
U.S. Cl. 60—369 **14 Claims**



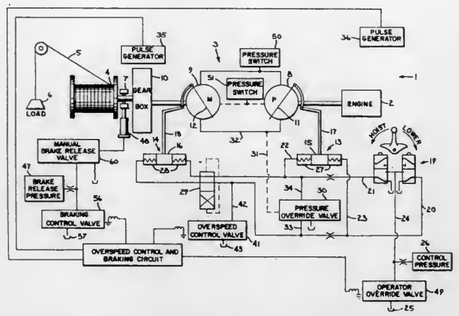
1. An oil well pumping system comprising a frame adapted to be fixedly mounted at a wellhead, a unit mounted on the frame for vertical reciprocation between upper and lower positions, said unit having vertically spaced upper and lower sprockets mounted thereon for rotation about parallel horizontal axes, an endless chain extending between and entrained over said sprockets to define front and rear chain flights, said chain being fixedly secured to the frame against vertical movement at a position along the rear flight of the chain in an arrangement such that the upper and lower sprockets are nearest the position of chain securance when the unit is in its lower and upper positions respectively, polish rod attachment means carried by the chain for enabling attachment of the latter to a well pump polish rod, said attachment means being carried by the chain at a location along the front flight thereof in an arrangement such that the lower and upper sprockets are nearest the location of the attachment means when the unit is in its lower and upper positions respectively, counterweight connection means carried by the chain at a position adjacent the location of the last recited means for enabling connection of the chain to a counterweight structure, and hydraulic means including a double-acting cylinder and piston rod combination for powering vertical reciprocation of the unit relative to the frame between its upper and lower positions.

4,187,681
HYDROSTATIC WINCH
Kenneth V. Johnson, Oconomowoc, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Aug. 28, 1978, Ser. No. 937,578
Int. Cl.[2] F15B *20/00, 15/22*
U.S. Cl. 60—395 **10 Claims**

1. A hydrostatic winch including a hydraulic control system with a dual valve for adjusting pressure in control lines to drive a winch to hoist or lower a load and a brake for stopping the movement of the winch and the load which is characterized by:

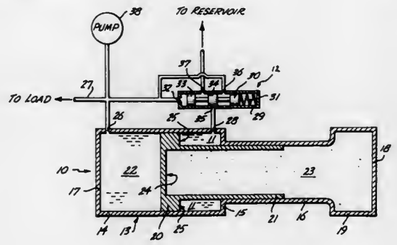
(A) an overspeed control system including:
  (1) a valve for bleeding pressure from a control line to slow the winch; and
  (2) valve control means which detects overspeed and activates the valve to slow the winch; and

(B) a fail safe system for smoothly stopping the winch and load, if necessary, including:
  (1) a normally "off" brake biased towards an "on" position and held in the "off" position by pressure in a hydraulic cylinder;



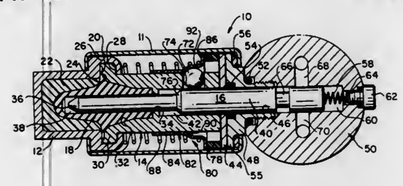
  (2) a valve for bleeding pressure from the hydraulic cylinder;
  (3) first means for detecting when the speed of the load or winch is exceeding a predetermined limit;
  (4) second means for detecting when an abnormal condition exists which could cause overspeed; and
  (5) control means for the valve for bleeding pressure from the hydraulic cylinder, which control means is activated by receipt of a signal from either first or second means to bleed pressure from said cylinder to apply the brake to smoothly stop the load.

4,187,682
CONSTANT PRESSURE HYDRAULIC ACCUMULATOR
Jan-son Shen, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Jan. 2, 1979, Ser. No. 66
Int. Cl.[2] F15B *1/02, 1/04*
U.S. Cl. 60—413 **7 Claims**



1. In a variable load demand hydraulic system having a pressure side and a return side and a pump operable to deliver only a portion of the intermittent peak load demanded of said system, a constant pressure hydraulic fluid accumulator assembly for augmenting the fluid flow output of said pump during intermittent periods of peak load demand comprising:
  a hydraulic fluid accumulator having an accumulator fluid reservoir and including elements relatively movable to vary the volume of said reservoir, means maintaining said fluid reservoir in fluid communication with the pressure side of said hydraulic system;
  gas compressor means having a gas reservoir containing a predetermined charge of gas, said gas compressor means including elements relatively movable to vary the volume of said gas reservoir, means operably connecting a movable element of said gas compressor means to a movable element of said fluid accumulator whereby the pressure of said gas in said gas reservoir causes pressure to be applied to fluid in said accumulator fluid reservoir;
  auxiliary fluid drive means having an auxiliary fluid drive reservoir and including elements relatively movable to vary the volume of said auxiliary fluid drive reservoir, means operably connecting a movable element of said auxiliary fluid drive means to a movable element of said hydraulic accumulator whereby pressure exerted by fluid in said auxiliary drive reservoir causes pressure to be applied to fluid in said accumulator fluid reservoir; and,
  pressure regulator valve means responsive to system pressure and operable to connect said auxiliary fluid drive reservoir in fluid communication with the pressure side of said hydraulic system in response to system pressure less than a predetermined system fluid pressure and to connect said auxiliary fluid drive reservoir in fluid communication with the return side of said hydraulic system in response to system pressure above said predetermined system fluid pressure.

4,187,683
THERMAL POWER ELEMENT WITH SAFETY LOCKUP
Richard A. Northrop, Jr., Cheshire, and David J. Wanat, Meriden, both of Conn., assignors to Century Brass Products, Inc., Waterbury, Conn.
Filed Jun. 12, 1978, Ser. No. 914,522
Int. Cl.[2] F03G *7/06;* **G05D** *23/12*
U.S. Cl. 60—527 **14 Claims**



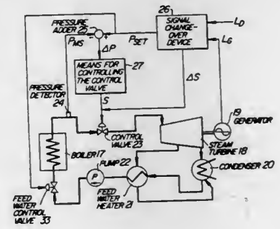
1. In a temperature responsive force transmitting device including a housing having a closed end containing a temperature sensitive expansible material and a piston guide having an interior guide chamber, a resilient boot within the housing adjacent the expansible material and having a neck extending within the piston guide, and a piston received within the boot and the guide chamber, the piston being axially movable between an inoperative position and an extended operating position respectively upon contraction and expansion of the temperature sensitive expansible material, a safety lockup comprising locking means within the housing movable into a locking position in cooperation with the piston in its operating position, and restraining means selectively operable for securing the locking means in locking position at a preselected temperature to lockup the piston in its operating position.

4,187,684
THERMALLY RESPONSIVE POWER ELEMENTS WITH MULTIPLE VAPOR/GAS FILLED CAPSULES AND HYDRAULIC FLUID TRANSMISSIONS
Charles R. Smith, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 17, 1976, Ser. No. 697,211
Int. Cl.[2] F03G *7/06*
U.S. Cl. 60—531 **3 Claims**



1. A thermally responsive unit for connection to a motion producing output unit in a closed system using fluid for power transmission in response to temperature changes, in combination, two housing members at least one of which is of shallow channel shape and has out-turned flanges which are sealed along its edges to the edges of the other member, a multiplicity of circular convoluted discs hermetically sealed to the inner surfaces of said housing members with air being evacuated from the spaces between each of said discs and the member to which they are sealed and individual partial fills of a thermally sensitive vapor/gas being provided in place thereof in said spaces.

4,187,685
METHOD AND SYSTEM FOR EFFECTING CONTROL GOVERNING OF A STEAM TURBINE
Kunio Tsuji; Katsukuni Hisano; Akira Sakai, all of Hitachi, and Shozo Nakamura, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Feb. 10, 1978, Ser. No. 876,944
Claims priority, application Japan, Feb. 18, 1977, 52-16897
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—660 **6 Claims**

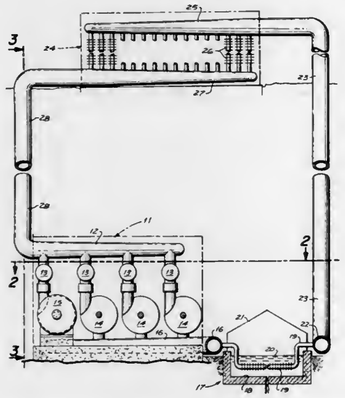


1. A method for effecting control governing of a steam turbine having a first stage nozzle including a steam chamber divided into a plurality of steam compartments, and a plurality of control valves each connected to one of said steam compartments and adapted to be individually operated to as to effect the governing of the nozzle by controlling the flow rate of steam introduced into the turbine, such method comprising the steps of:
  keeping constant the degree of opening of said control valves at low load operating the steam turbine by steam of a reduced pressure by reducing the pressure of steam at the inlet of the turbine so as to maintain, in a low load region, the volume flow rate of steam for a high load region;
  presetting the degree of opening of each of said control valves corresponding to a predetermined change in the value of a load so as to cope with a change in the value of the load;
  altering the degree of opening of the control valve involved

when the change in the value of the load is smaller than the predetermined change in the value of the load; and

controlling the pressure of steam at the inlet of the turbine when the change in the value of the load is greater than the predetermined change in the value of the load.

4,187,686
POWER GENERATOR UTILIZING ELEVATION-TEMPERATURE DIFFERENTIAL
Lorenzo A. Pommier, 3795 Roberta St., Los Angeles, Calif. 90031
Filed Jan. 16, 1978, Ser. No. 869,646
Int. Cl.[2] F03G *7/04*
U.S. Cl. 60—647 **11 Claims**



1. A power generator, utilizing a lower region maintained at an upper temperature, and an upper region maintained at a lower temperature, the power generator comprising:

a. a tubular closed loop system including an upper zone at said upper region, and a lower zone at said lower region, and a penstock column and a return column connecting the zones to complete the loop system;

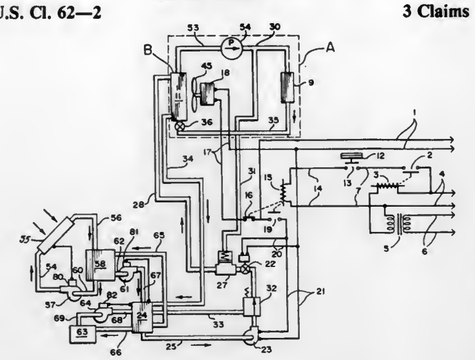
b. a fluid under pressure sealed in the loop system, the fluid being at a preselected upper pressure and temperature at the lower zone and at a preselected lower pressure and temperature at the upper zone, the fluid having a critical gas-liquid conversion pressure temperature between the pressure-temperature at the lower zone and the pressure-temperature at the upper zone;

c. a condensing heat exchanger at the upper zone for converting said fluid from a gaseous state to a liquid state for movement of the fluid in a liquid state into the penstock column to create a liquid head causing downward movement of the liquid therein;

d. an evaporating heat exchanger at the lower zone for converting said fluid from a liquid state to a gaseous state for movement of the fluid in a gaseous state up the return column, whereby continuous circulation of fluid is maintained in the loop system;

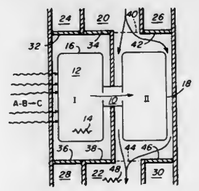
e. and at least one hydraulic motor is positioned for engagement by the liquid phase moving in the penstock column.

4,187,687
SYSTEM FOR UTILIZING SOLAR ENERGY AND AMBIENT AIR IN AIR CONDITIONERS DURING THE HEATING MODE
Harry A. Savage, Bellwood, Rt. #2, Box 41, Greenwood, Ark. 72936
Filed Jan. 16, 1978, Ser. No. 869,799
Int. Cl.[2] F25B *27/00*
U.S. Cl. 62—2 **3 Claims**



1. A system for utilizing solar energy and ambient air in air conditioners during the heating mode comprising the combination of an evaporator assembly for selective heat exchange with heated fluid and ambient air and a solar heat collector system, said evaporator assembly having a plurality of fluid pipes, header means connecting said fluid pipes, said header means having an inlet and an outlet, pump means connected to said inlet, a plurality of refrigerant pipes connected in series and telescopically mounted over said fluid pipes, said refrigerant pipes having an inlet and an outlet, a plurality of fins mounted on said refrigerant pipes, fans means mounted in proximity of said fins for directing ambient air in the direction of said fins, control means operatively connected to said pump means and said fan means for operating said pump means and rendering said fan means inoperative when the ambient air is less than a predetermined temperature and vice versa when the ambient air is above said temperature and said solar heat collector system having solar fluid heater means, a thermal storage tank and a tempering tank, first pump means connecting said solar fluid heater means, said thermal storage tank and said tempering tank and second pump means connecting said tempering tank and said header means inlet and outlet directing heater fluid to and from said heat exchanger.

4,187,688
SOLAR POWERED INTERMITTENT CYCLE HEAT PUMP
Charles A. Berg, Buckfield, Me., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 10, 1978, Ser. No. 950,069
Int. Cl.[2] F25B *27/00, 17/02*
U.S. Cl. 62—2 **42 Claims**



1. A process for heating a thermal sink using solar radiation as the primary energy source, said process comprising the steps of:

A. providing a solar collector,

B. providing a pressure tight enclosure defining first and second chambers separated by a valve, said enclosure containing a working refrigerant, said first chamber being in thermal communication with said collector and containing an adsorbent material capable of adsorbing said refrigerant exothermically;

C. raising the vapor pressure in said first chamber and desorbing the refrigerant from the adsorbent material using solar energy;

D. allowing the desorbed refrigerant vapor to migrate through the valve to said second chamber and condensing the vapor therein by transferring the refrigerant's heat of condensation into the thermal sink;

E. closing the valve to isolate the chambers;

F. transferring heat from the adsorbent material to the thermal sink to lower the vapor pressure in said first chamber;

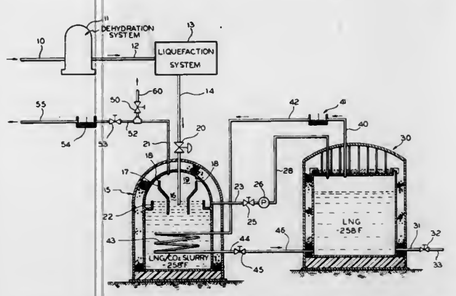
G. opening the valve for a sufficient amount of time to cool the condensed refrigerant in said second chamber by flash evaporation to a temperature below the temperature of the atmosphere;

H. readsorbing refrigerant vapor produced during flash evaporation in step G into said adsorbent material and transferring the resulting heat of adsorption from said first chamber to the thermal sink;

I. vaporizing the cooled refrigerant in said second chamber by extracting heat from the atmosphere to provide the refrigerant's heat of vaporization;

J. allowing the refrigerant vapor produced in step I to migrate through the valve to said first chamber to readsorb in said adsorbent material and transferring the resulting heat of adsorption from said first chamber to the thermal sink via a heat transporting fluid.

4,187,689
APPARATUS FOR RELIQUEFYING BOIL-OFF NATURAL GAS FROM A STORAGE TANK
Yuksel A. Selcukoglu, Naperville; Matloob Husain, Wheaton, and Carl C. Hanke, Jr., Oak Brook, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.
Filed Sep. 13, 1978, Ser. No. 941,785
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—54 **5 Claims**



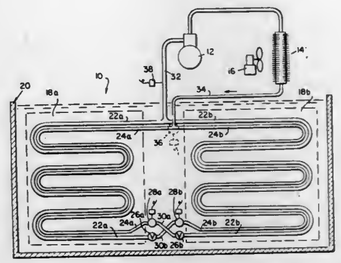
1. In a combination of apparatus for storing liquefied natural gas which includes an insulated separation tank in which solidified carbon dioxide is settled out of liquefied natural gas and a liquefied natural gas-solidified carbon dioxide slurry accumulates, an insulated liquefied natural gas storage tank, and a conduit for delivering liquefied natural gas from the separation tank to the storage tank, the improvement comprising:

means for withdrawing natural gas boil-off from the storage tank and compressing it,

conduit means for feeding the compressed natural gas boil-off into indirect heat exchange with a liquefied natural gas-solidified carbon dioxide slurry in the separation tank to cool the compressed natural gas to reliquefied natural gas, and

means to feed the reliquefied natural gas from the separation tank to the storage tank.

4,187,690
ICE-MAKER HEAT PUMP
Herbert S. Lindahl, Danville, Ill., assignor to Gulf & Western Manufacturing Company, New York, N.Y.
Filed Aug. 16, 1978, Ser. No. 934,079
Int. Cl.[2] F25C *1/08*
U.S. Cl. 62—138 **36 Claims**



1. An improved evaporator for an ice-making heat pump of the type which includes a compressor for circulating a supply of refrigerant, a condenser, and an evaporator, said evaporator adapted to be arranged in heat exchange relationship with water to be in contact therewith and comprising a plurality of freezing plates, each of said freezing plates having a first passageway therein arranged to conduct relatively cold evaporating refrigerant therethrough in heat exchange relationship with water to be in contact with the outer surfaces of said freezing plates to form ice on the outer surface of at least one of said freezing plates, and a second passageway therein arranged to conduct relatively warm refrigerant therethrough in heat exchange relationship with the ice to be formed on the outer surface of at least one of said freezing plates to release said ice, each of said passageways having inlet and outlet ends, respectively, and valve means coupled between said freezing plates arranged to selectively direct said refrigerant between said first and second passageways in each of said freezing plates to enable said ice to be selectively formed on and released from the outer surfaces of said freezing plates when said evaporator is operatively connected to said heat pump.

4,187,691
HEAT PUMP BYPASS VALVE ARRANGEMENT
John W. Irwin, Trenton, N.J., assignor to General Electric Company, Louisville, Ky.
Filed Aug. 14, 1978, Ser. No. 933,332
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—324 **3 Claims**

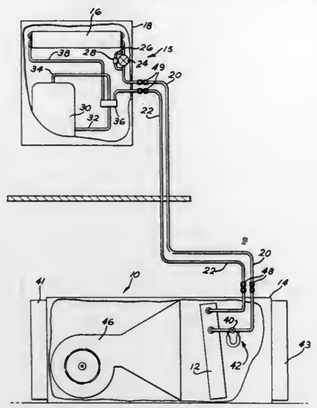
1. A split refrigeration system air conditioner of the heat pump type including an outdoor section having an outdoor heat exchanger and an indoor section having an indoor heat exchanger, said indoor and outdoor heat exchanger being connected in a closed refrigerant circuit;

means in said circuit including a compressor having a discharge line and a suction line and reversing valve means for reversibly connecting said discharge and suction line to said heat exchangers for effecting flow of refrigerant through said circuit in either direction whereby said heat pump may be operated on a cooling cycle with the outdoor coil functioning as a condenser and receiving high pressure refrigerant from said compressor or in a heating cycle with the indoor coil functioning as a condenser and receiving high pressure refrigerant from said compressor;

an outdoor refrigerant flow control means arranged in fixed

relationship relative to said outdoor heat exchanger, and outdoor conduit means arranged for bypassing refrigerant around said outdoor flow control means when said refrigerant flow is in a direction from said outdoor heat exchanger toward said outdoor flow control means;

an indoor refrigerant flow control means arranged in fixed relationship relating to said indoor heat exchanger, and indoor conduit means arranged by bypassing refrigerant



around said indoor flow control means when refrigerant flow is in a direction from said indoor heat exchanger toward said indoor flow control means;

said indoor conduit means having a first and second portion;

said portions having their axis arranged so that a horizontal plane passes through the intersecting point of the two respective axes;

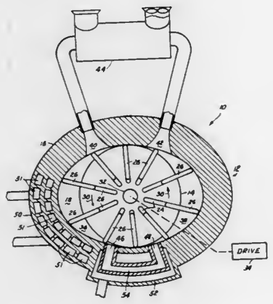
said axes extending from said intersecting point at a predetermined angle from said horizontal plane.

4,187,692

LIQUID COOLED ROTARY VANE AIR CYCLE MACHINE

Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

Filed May 3, 1978, Ser. No. 902,524
Int. Cl.[2] F25D *9/00*
U.S. Cl. 62—402 **1 Claim**



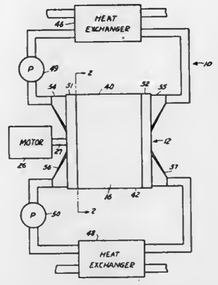
1. A rotary vane air cycle apparatus, comprising: a compressor and an expander driven by a common shaft; said compressor and expander including a rotor having vanes which form a plurality of cells which change in volume as the shaft rotates; said compressor having an inlet port and an outlet port; said expander having an inlet port and an outlet port; and means for supplying a gas to the compressor inlet port; a passage interconnecting the compressor outlet port and the expander inlet port; means, adjacent said compressor for cooling the gas in said compressor during compression of the gas; said means for cooling the gas in the compressor including a liquid cooled heat exchanger; means for supplying cooling liquid to said heat exchanger; a liquid cooled heat exchanger surrounding the passage between the compressor outlet port and the expander inlet port.

4,187,693

CLOSED CHAMBER ROTARY VANE GAS CYCLE COOLING SYSTEM

Ronald E. Smolinski, 4081 Forest Ridge, Dayton, Ohio 45424

Filed Jun. 15, 1978, Ser. No. 915,707
Int. Cl.[2] F25D *9/00*
U.S. Cl. 62—402 **5 Claims**



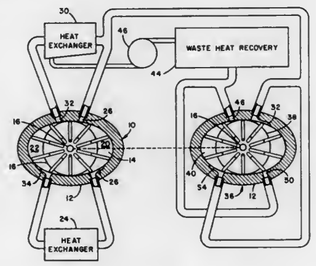
1. A rotary vane gas cycle cooling system, comprising: a compressor and an expander driven by a common shaft, said compressor and expander including a rotor, rotatably mounted on said shaft; said rotor having radially slidable vanes which form a plurality of cells which change in volume as the rotor rotates; said rotor being positioned within a closed chamber with said shaft being displaced from the center of said chamber; means for cooling the gas in said compressor and means for adding heat to the gas in said expander.

4,187,694

BINARY WORKING FLUID AIR CONDITIONING SYSTEM

Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

Filed Nov. 21, 1978, Ser. No. 962,742
Int. Cl.[2] F25D *9/00*
U.S. Cl. 62—402 **9 Claims**



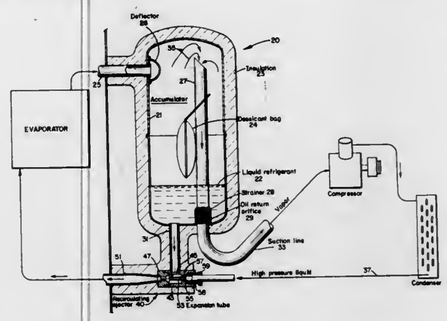
1. A compartment cooling system for vehicles driven by an internal combustion engine, comprising: a compressor and an expander driven by a common drive shaft; said compressor having an inlet port and an outlet port; said expander having an inlet port and an outlet port; a turbine connected to said common drive shaft; means for supplying a noncondensible gas to the inlet port of said compressor; a heat rejection heat exchanger connected between the outlet of said compressor and the inlet of said expander; means for supplying a super heated condensible fluid vapor to said turbine; said means for supplying a superheated condensible fluid vapor to said turbine including a vaporizable liquid and means for vaporizing and superheating the vaporizable liquid with waste heat from the internal combustion engine; said turbine having a fluid outlet connected to the outlet of said compressor, means for connecting said vaporizing and superheating means to said heat rejection heat exchanger adjacent the inlet port of said expander.

4,187,695

AIR-CONDITIONING SYSTEM HAVING RECIRCULATING AND FLOW-CONTROL MEANS

Ernest W. Schumacher, DeSoto, Tex., assignor to Virginia Chemicals Inc., Portsmouth, Me.

Filed Nov. 7, 1978, Ser. No. 958,368
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—503 **12 Claims**



1. In an air conditioning apparatus of the vapor compression type, comprising: an evaporator, an accumulator, a compressor, a condenser, and an expansion tube through which high-pressure liquid is expanded into said evaporator, the improvement comprising, in combination with said expansion tube and said accumulator:

A. an ejector block having a first side entrance, a longitudinal opening in which said expansion tube is coaxially disposed, and an inner cavity into which said expansion tube empties and with which said side entrance is connected;

B. a connection between said side entrance and an opening in the bottom of said accumulator; and

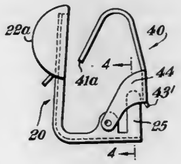
C. a diverging tube which is connected at its narrow end to said inner cavity and at its wide end to said evaporator, whereby said ejector block, said expansion tube, said side entrance, and said diverging tube form, in combination, an ejector means for ejecting liquid from said accumulator and for injecting said accumulated liquid, mixed with said expanded high-pressure liquid, into said evaporator.

4,187,696

EAR ORNAMENT CLIPS

Johannes A. W. P. van Bergen, Stollenbergweg 156, Berg en Dal, Netherlands

Continuation-in-part of Ser. No. 849,044, Nov. 7, 1977, which is a continuation of Ser. No. 724,970, Sep. 20, 1976, abandoned.
This application Nov. 25, 1977, Ser. No. 854,635
Claims priority, application United Kingdom, Oct. 1, 1975, 40113/75
Int. Cl.[2] A44B *21/00*
U.S. Cl. 63—14 C **5 Claims**



1. An ear ornament clip comprising:

a front part and back part, said front and back parts being so connected to one another as to permit angular movement of said parts relative to each other in order to grip or release a wearer's ear lobe;

said front part having a first portion of which a first face is adapted to carry the ornament and of which a second face is adapted to be placed in contact with that first surface of the wearer's ear lobe against which said ornament is to be displayed;

said front part having a second portion integral with said first portion and including elements which are so joined to one another at corresponding one ends thereof as to form resilient elements substantially in the form of a V, the corresponding other and free ends of said elements extending substantially parallel to said first portion of said front part;

said back part having a first portion which includes a third face of which at least a portion thereof is adapted to be placed in contact with that second surface of the wearer's ear lobe which is remote from said surface thereof against which said ornament is to be displayed;

said third face and said second face forming an acute angle with each other when placed in contact with said first and second surfaces;

said back part having a second portion which is integral with said first portion thereof and which comprises substantially parallel legs;

said front part having first means disposed near said resilient elements and said back part having second means disposed near the free ends of said legs, said first and second means cooperating to form a pivotal connection between said front and back parts;

relative angular movement of said front and back parts to a condition in which an ear lobe becomes gripped between said first portion of said front part and said first portion of said back part causing the lobe-gripping portions of said front and back parts of said clip to become disposed substantially directly opposite to each other, and also causing the inside surface of said legs to frictionally slide along the outside surfaces of said resilient elements towards said free ends of said resilient elements and to force said resilient elements together to establish and maintain the desired lobe-gripping condition of said front and back parts;

said first portion of said back part being substantially U-shaped with diverging legs;

said U-shaped first portion of said back part including a first diverging leg having a free end and a second diverging leg which is integral with said second portion of said back part; and

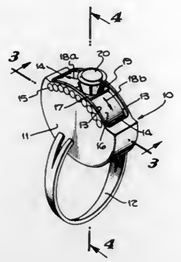
said free end of said first diverging leg comprising said lobe contacting portion of said first portion of said back part, the remainder of said first diverging leg being configured such that, when in place against the ear lobe, said third face will diverge sufficiently from the lobe to be accessible to the wearer for manual application of a pulling force thereagainst to remove the ear ornament clip.

4,187,697

JEWEL MOUNTING STRUCTURE

Angel Castelo, 9477 Brighton Way, Beverly Hills, Calif. 90210

Filed Oct. 16, 1978, Ser. No. 951,718
Int. Cl.[2] A44C *17/02, 9/02*
U.S. Cl. 63—31 10 Claims



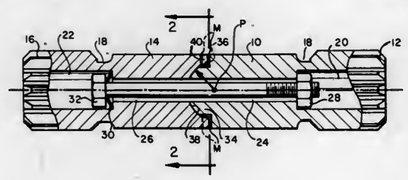
1. A jewel mounting structure comprising:
(a) a housing having an internal cavity and a substantially longitudinal opening at the top thereof;
(b) a shaft secured within the cavity of said housing and being disposed perpendicular to the longitudinal opening in said housing;
(c) a mounting guide including a guide portion having a uniform radius of curvature, said mounting guide being coupled to said housing within the opening therein, the interval between the guide portion and said shaft being equal to radius of curvature of said guide portion;
(d) a jewel mounting sleeve having a top and bottom surface and an opening therein, said opening being disposed about the guide portion, said sleeve being adapted to slideably move along the guide portion;
(e) pivot means for journeling said sleeve about said shaft, said means secured to the bottom surface of said sleeve; and
(f) weighted means for counterbalancing said jewel mounting sleeve, said weighted means being coupled to said pivot means on the diametrically opposed side of said shaft.

4,187,698

COUPLING FOR MISALIGNED SHAFTS

John F. Ohlson, 48 Judie La., Ambler, Pa. 19002

Filed Jun. 12, 1978, Ser. No. 914,311
Int. Cl.[2] F16D *3/18, 3/54*
U.S. Cl. 64—9 R 10 Claims



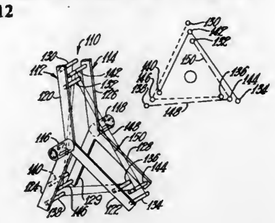
1. A coupling device for transmitting torque along the axes of rotation of a drive unit and a load respectively, comprising:
a pair of longitudinal members having mating proximal ends and formed to be connected respectively at the distal ends thereof to the drive unit and the load, and having mating spherical surfaces on the respective proximal ends thereof surrounded by a plurality of intermeshing axial teeth; and
urging means extending along the axes of said members and yieldingly connected therein for axially forcing said surfaces into sliding contact.

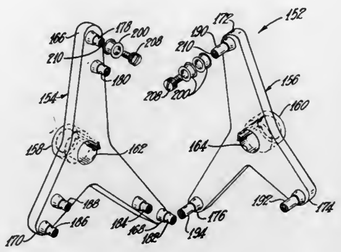
4,187,699

UNIVERSAL JOINT FOR CONNECTING SHAFTS

Warren W. Weible, Defiance, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Division of Ser. No. 736,863, Oct. 29, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,088
Int. Cl.[2] F16D *3/58, 3/62, 3/54*
U.S. Cl. 64—12 6 Claims





1. A universal joint for transmitting torque from one shaft to another shaft, said universal joint comprising a first member, means for attaching a central portion of said first member to an end of one of said shafts to be positioned transversely to the longitudinal extent of said shaft, a second member, means for attaching a central portion of said second member to an end of the other of said shafts to be positioned transversely to the longitudinal extent of said other shaft, said first member having at least three first extremities extending transversely outwardly beyond the shaft, said second member having at least three second extremities extending transversely outwardly beyond the other shaft, each of the first extremities of said first member having a first projection extending toward said second member, said first projections being at the same distance from the central portion of said first member, each of said second extremities having two second projections, including an outer second projection and an inner second projection, said outer second projections being at the same distance from the central portion of said second member, which distance is more than the distance of said first projections, said inner second projections being at the same distance from the central portion of said second member, which distance is less than the distance of said first projections, and flexible bridging means connecting rotationally-spaced first and second projections of said members, said bridging means connecting said first projections to rotationally displaced inner second projections in one direction and to outer rotationally spaced second projections in the other direction.

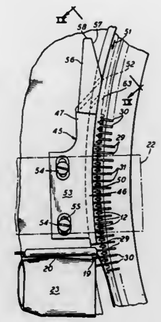
4,187,700

LATCH GUARD AND DEEP PILE FABRIC CIRCULAR KNITTING MACHINE FITTED THEREWITH

Ralph A. Koegel, Brookfield, Wis., assignor to Borg Textile Corporation, Oak Brook, Ill.

Filed Nov. 3, 1977, Ser. No. 848,100
Int. Cl.[2] D04B *9/14*
U.S. Cl. 66—111 7 Claims

1. A latch guard assembly for a circular knitting machine having a rotatable cylinder means with a fixed outside radius and with needles rotatable in a predetermined projected path with said cylinder means, said latch guard assembly being adapted to eliminate stray fiber build up on the front edge of prior art latch guards during operations of such knitting machine, said latch guard comprising
(A) an arcuate, elongated guard member having a longitudinal radius of curvature associated with an inside face thereof which is generally somewhat larger by a preselected amount than said outside radius of said predetermined projected circumferential path assumed by each of said needles that are functionally associated with outside upper rim portions of a said cylinder means, a longitudinally forward upper end portion of said guard member, relative to a predetermined direction of rotation of said cylinder means, terminating in a circumferentially more forwardly spatial position than a longitudinally forward circumferentially lower end portion thereof,



(B) flattened, substantially horizontally disposed deflector means integrally associated therewith and projecting forwardly from said longitudinally forward upper end portion thereof to a deflector means end, said deflector means being adapted to eliminate pointed regions associated with said latch guard whereon fiber members can accumulate and being further adapted to guide loosened fiber members into positions circumferentially adjacent said cylinder means, during operation of said circular knitting machine, said deflector means being so located relative to said guide member that said deflector means end is from about 0.5 to 2 centimeters radially from said projected path, and also is from about 1 to 4 centimeters longitudinally from said longitudinally forward upper end portion, and
(C) mounting means for mounting said latch guard to a predetermined machine support means in a predeterminable relationship to said cylinder means.

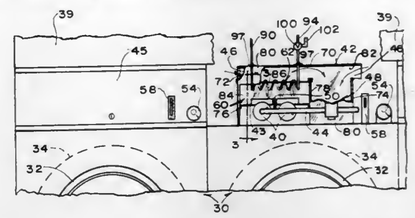
4,187,701

LAUNDRY HOT WATER SUPPLY SYSTEM AND APPARATUS

Ion L. Wendel, St. Petersburg, Fla., assignor to WenLo Corporation, St. Petersburg, Fla.

Filed Feb. 23, 1976, Ser. No. 660,323
Int. Cl.[2] D06F *31/00, 39/04, 58/00*
U.S. Cl. 68—20 12 Claims

1. In a laundry dryer for use in association with a clothes washer and wherein the dryer includes a laundry chamber for receiving laundry to be dried, a heating unit for heating gas to be delivered to said laundry chamber to dry laundry therein, said heating unit including a casing and heating means in said casing for heating gas to be delivered to said laundry chamber, said heating means including a gas burner having gas orifices; the improvement comprising water handling means including a water conduit positioned in said casing adjacent said gas orifices of the burner for heating water in the conduit for use in a clothes washing operation simultaneously with the heating of gas to be delivered to said laundry chamber, said water conduit including a coil having a plurality of upper runs and a plurality of lower runs lying in generally parallel planes with the upper runs being interconnected to the lower runs and all of the runs are located within the heating chamber to the associated heating unit.

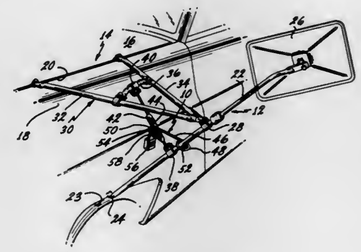


4,187,702

LOCKING ADAPTER FOR TRAILER TOWING MIRROR

Marvin E. Benton, 1252 E. Willow, Anaheim, Calif. 92806

Filed Sep. 25, 1978, Ser. No. 945,304
Int. Cl.[2] E05B *65/00*
U.S. Cl. 70—57 7 Claims



1. A locking device for locking a trailer towing mirror to a vehicle, the trailer towing mirror of the type having at least two supports, one support hinged upon the other support,
a turnbuckle attaching to and capable of maintaining said supports in a fixed relationship with respect to one another and to the vehicle to which the trailer towing mirror is attached,
said turnbuckle of the type having a right-hand threaded hole in one end and a left-hand threaded hole in the other end, and a central opening, the improvement which comprises:
an elongated member having a first end and a second end;
said elongated member being formed of a material substantially resistant to sundering;
said first end of said member including a first hole;
said first hole dimensioned such that one of said supports fits through said first hole retaining said elongated member on said support;
said second end of said elongated member including a second hole;
said second end of said member being dimensioned such that at least a portion of said second end of said member is capable of passing through said central opening in said turnbuckle;
said second hole positioned in said second end such that when said second end is passed through said central opening in said turnbuckle,
said hole in said second end lies on the opposite side of said turnbuckle from the majority portion of said elongated member;
a lock;
said lock including a shank;
said hole in said second end dimensioned to receive said

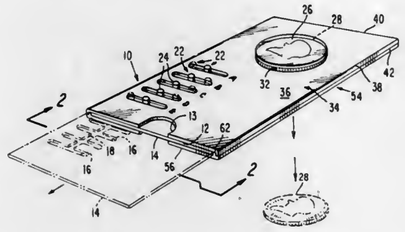
shank of said lock such that when said second end of said member is passed through said central opening in said turnbuckle and said shank of said lock is passed through said hole in said second end, said lock inhibits said second end of said member from passing back through said central hole in said turnbuckle, retaining said member in said central opening in said turnbuckle and inhibiting rotary movement of said turnbuckle.

4,187,703

CONTAINER OF THE COMBINATION-LOCKED ENVELOPE TYPE

Ralph J. Ippoliti, Cornwells Heights, and John J. Nelson, Bristol, both of Pa., assignors to Product Dynamics, Ltd., Levittown, Pa.

Filed Sep. 20, 1978, Ser. No. 944,234
Int. Cl.[2] E05B *37/16, 65/52*
U.S. Cl. 70—63 **17 Claims**



1. A packaging device of the combination-lock type for lockably confining at least one article and for freeing the same responsive to the finding of a pre-set unlocking combination, comprising:

(a) a housing for said article having an opening through which the article may be removed;

(b) means within the housing normally extending as a barrier across the opening; and

(c) a plurality of locking keys mounted in the housing in locking engagement with said means and operable through a pre-set combination to free said means for movement to a position in which the opening is uncovered and the article is freed for removal from the housing.

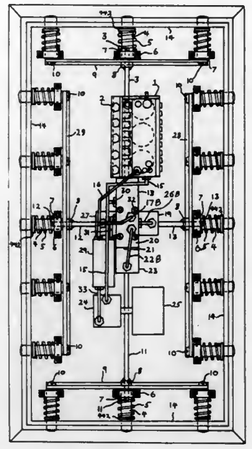
4,187,704

HYDRAULIC LOCKING SYSTEM

Spasoje Ristic-Petrovic, 860 Royal Oak Ave., Victoria, B.C., Canada (V8X 3T2)

Filed Apr. 11, 1977, Ser. No. 786,413
Claims priority, application Canada, Jun. 14, 1976, 254783
Int. Cl.[2] E05B *51/02*
U.S. Cl. 70—263 **12 Claims**

1. A hydraulically operated locking system comprising a pressurized fluid source, a master control valve and a slave valve each connected to said pressurized fluid source, a movable locking member, a piston cylinder assembly operatively associated with said slave valve and connected to the locking member for moving the same upon actuation of the slave valve and said slave valve being operatively associated with said master control valve for actuation thereby, said master control valve comprising a plurality of valves operatively interrelated and interconnected by passage means in series parallel relation such that, when selected ones thereof are operated in a predetermined sequence, they cause operation of the other ones of the interrelated valves so as to allow the pressurized fluid to flow through said passage means to the slave valve actuating the latter and means for actuating selected ones of said plurality of valves for operating the same in random sequence including said preselected sequence, said actuating means comprising a plurality of distributor valves arranged in at least one group and means for actuating the distributor valves individually and only one at a time in each group, said actuating means precluding operation of the other distributor valves when one of the valves in that group is being actuated.

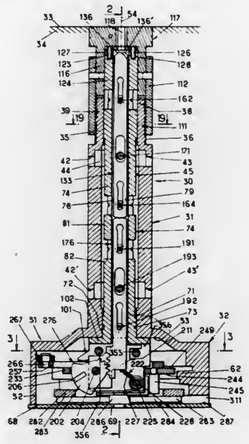


4,187,705

IMPROVEMENTS IN OR RELATING TO BRAMAH LOCKS

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche French Body Corporation, Velizy, France

Filed Mar. 20, 1978, Ser. No. 888,198
Claims priority, application France, Mar. 24, 1977, 77 08877
Int. Cl.[2] E05B *29/00*
U.S. Cl. 70—362 **21 Claims**



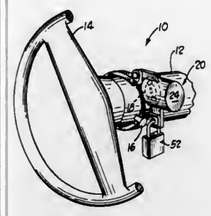
1. A Bramah lock for a door of a safe-deposit box or an armored door, comprising a locking and unlocking mechanism actuatable by motion transmitting members formed as bars disposed in at least two serially arranged sets extending through the door to a keyhole and co-operable by abutment from the keyhole to the locking and unlocking mechanism so that displacements towards the keyhole of motion transmitting members relatively adjacent to the keyhole are not transmitted to motion transmitting members relatively remote therefrom.

4,187,706

ANTITHEFT GUARD FOR IGNITION SWITCH

John C. Hill, 11604 Thornwood, Cleveland, Ohio 44108

Filed Dec. 22, 1977, Ser. No. 863,084
Int. Cl.[2] E05B *17/14*
U.S. Cl. 70—428 **1 Claim**



1. An antitheft device for an automobile comprising:

(a) a pair of arcuately contoured pipe sections each adapted partially to encircle and engage a steering column;

(b) a first hinge fixed to the pipe sections and having a pivot axis adapted to parallel the axis of such steering column such that the sections may be brought into a column engaging position in coaxial relationship with the column;

(c) an ignition switch covering cup connected to one of the sections by a second hinge and including an annular pipe section having an end opening defined by an end wall adapted to engage such steering column with the cup pipe section positioned in ignition lock surrounding relationship;

(d) the cup including structure closing its end remote from said end wall to prevent ignition lock tampering when the cup is positioned over such lock;

(e) the second hinge permitting pivoting of the cup about a fixed location second hinge axis to provide ignition lock access without removal of the antitheft device from a steering column when its automobile is in use but adapted to deny ignition lock access when the cup is secured in this theft inhibiting position; and,

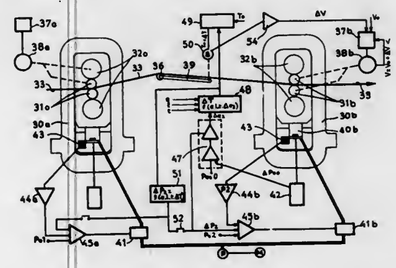
(f) a pair of apertured ears respectively fixed to the cup and the other of the pipe sections, the ears each including a lock receiving aperture with the apertures adapted to be aligned and receive a padlock or the like to fix the cup over an ignition lock when the antitheft device is in use.

4,187,707

THICKNESS CONTROL METHOD AND APPARATUS FOR A ROLLING MILL

André Quehen, Paris, France, assignor to SECIM, Courbevoie, France

Filed Sep. 25, 1978, Ser. No. 945,674
Claims priority, application France, Sep. 26, 1977, 77 28873
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 **10 Claims**



1. A process for controlling the thickness of a flat product being rolled by a continuous hot tandem rolling mill having a first reference stand, and a second reference stand upstream from said first reference stand in which the following steps are continuously performed:

with respect to at least said first stand, maintaining a constant rolling pressure on the product as it passes between the rolls thereof,

measuring the gap or a change in the gap between the work rolls of said first reference stand,

producing a signal representative of the difference between the measured roll gap value for said first reference stand and a selected gap value for said first reference stand, which signal corresponds to the amount the rolled thickness produced by said first reference stand differs from the desired thickness for the product issuing from said first reference stand,

employing said difference signal by itself or with other variables such as thickness, width or temperature of the product to produce a signal representing the corrective tensile force that must be exerted on the product as it passes between said first and second reference stands to cause the roll gap of said first reference stand to be adjusted until it produces a product of said desired thickness, and

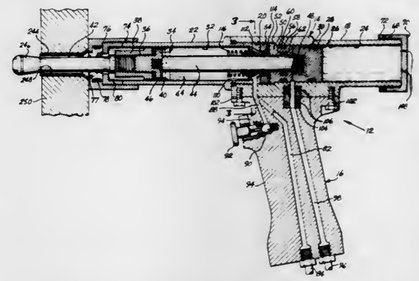
employing said tensile force signal to operate a means for exerting a tensile force on said product passing between said first and second reference stands for effecting said gap adjustment.

4,187,708

PULLING APPARATUS AND METHOD

Louis A. Champoux, Seattle, Wash., assignor to Industrial Wire & Metal Forming, Inc., Tukwila, Wash.

Filed Apr. 11, 1977, Ser. No. 786,096
Int. Cl.[2] B21D *39/08*
U.S. Cl. 72—30 **26 Claims**



1. A pulling apparatus comprising: a cylindrical housing, a pair of sealed pistons slideably mounted inside the housing and joined to a common shaft, a stationary member inside the housing having an opening through which the shaft sealingly extends and with the stationary member acting as a divider, a working unit to move as the shaft with pistons move, means for introducing compressed air into a space between a first one of the pair of pistons and the divider to move the working unit to starting position, and means for exhausting air out of the space between the first piston and the divider and for introducing a hydraulic fluid under pressure into a space between a second one of the pair of pistons and the divider to pull on the working unit and perform work on a work piece.

4,187,709

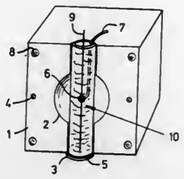
EXPLOSIVE FORMING

Roland A. Legate, Hitchin, England, and Kevin Strickland, 28 Hazel Grove, Stotfold, Hitchin, Hertfordshire, England, assignors to Kevin Strickland, Hitchin, England

Division of Ser. No. 716,564, Aug. 23, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,836

Int. Cl.[2] B21D *26/02*

U.S. Cl. 72—56 **4 Claims**



1. A method of forming a hollow spherical article having at least two substantially diametrically opposed apertures in the spherical surface, said article being of wrought metal said method comprising placing an open ended tube of wrought metal in a die with the interior of said tube communicating with the exterior of said die, positioning a plurality of explosive charges within the tube and sequentially detonating the explosive charges to act directly on and expand the tube into said hollow spherical article having two cylindrical portions extending generally radially from opposed sides of said article, said cylindrical portions defining said substantially diametrically opposed apertures in said surface.

4,187,710

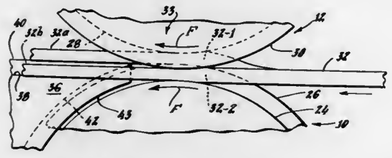
METHOD AND APPARATUS FOR SIMULTANEOUSLY ROLLING AND SLITTING METAL STRIP

Allan Stikeleather, Canton, Mass., assignor to Industrial Blast Coil Corporation, South Easton, Mass.

Filed Jun. 12, 1978, Ser. No. 914,447

Int. Cl.[2] B21B *1/00*

U.S. Cl. 72—204 **25 Claims**



1. The method of slitting one metal strip of predetermined thickness and a width at least several times its thickness into a plurality of substrips in a rolling zone which comprises:

compressively working said strip across its entire width in one rolling zone, thereby reducing its thickness; and

in the same rolling zone separating said strip along at least one plane perpendicular to its major surfaces and parallel to its longitudinal centerline by displacing the metal on opposite sides of each such plane in opposite directions perpendicular to said major surfaces for offsetting the portions of the metal on opposite sides of each such plane above and below each other for forming a plurality of substrips each of which is thinner than said strip.

4,187,711

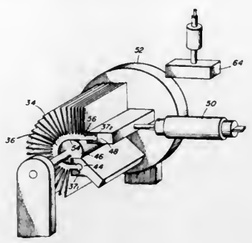
METHOD AND APPARATUS FOR PRODUCING A HIGH FIN DENSITY EXTRUDED HEAT DISSIPATOR

Ronald B. Lavochkin, Newton, and Thomas D. Coe, Boxford, both of Mass., assignors to Wakefield Engineering, Inc., Wakefield, Mass.

Continuation-in-part of Ser. No. 790,621, Apr. 25, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,206

Int. Cl.[2] B21C *23/14, 25/02;* **B21D** *3/00, 25/04*

U.S. Cl. 72—256 **6 Claims**



1. The method of manufacturing an integral heat dissipator having high density fins extending from a surface of a base comprising:

extruding the integral heat dissipator with a partial cylindrical base having the fins extending substantially radially from the outer cylindrical surface of the base;

placing the said extruded heat dissipator about a mandrel;

securing one end of the base to the mandrel;

securing the other end of the base to a means for applying a tensile stress to the base in a plane tangent to the mandrel at a line of tangency;

braking rotation of the mandrel while applying the tensile stress to rotate the mandrel thereby gradually straightening the dissipator;

after the base has been substantially straightened stopping further rotation of the mandrel; and

increasing said tensile stress to a value slightly above the yield point to further strain straighten the base of the heat dissipator.

4,187,712

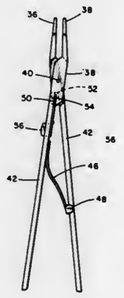
HEMOSTATIC CLIP APPLICATOR

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

Division of Ser. No. 786,021, Apr. 8, 1977, Pat. No. 4,146,130. This application Dec. 4, 1978, Ser. No. 966,321

Int. Cl.[2] B21D *7/06*

U.S. Cl. 72—410 **3 Claims**



1. In a clip applicator including a pair of opposed crimping jaws adapted to receive and crimp a hemostatic clip, said jaws

secured for relative movement of a boxed hinge, arms having finger holes at the end thereof attached to said jaws to permit manual relative movement of said jaws and a spring means for biasing the jaws to an open position in the absence of manual pressure, the improvement comprising:

means for preventing said jaws from opening more than a selected distance, said selected distance corresponding to the correct distance for receiving a clip in said jaws, said preventing means including:

(a) a locking bar secured to one of said arms,

(b) slots provided through the arm portions of said boxed hinge, said slots being dimensioned and positioned relative to each other and said locking bar that when said jaws are at said selected distance said slots are in alignment,

said locking bar being dimensioned to pass into the aligned slots to thereafter prevent opening of said jaws beyond said selected distance.

4,187,713

QUICK CHUCKING DIE HOLDER DEVICE FOR FORGING PRESSES

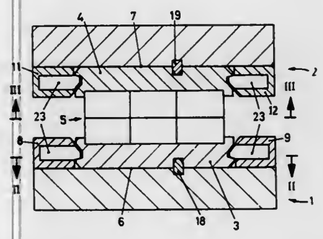
Georg Fellner, Am Tale 4, D-7203 Fridingen, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,680

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716023

Int. Cl.[2] B21J *13/02*

U.S. Cl. 72—446 **13 Claims**



1. In a quick chucking die holder device for forging presses having a lower die holder for fastening to the press bed and an upper die holder for fastening to the ram, said die holders containing lower and upper dies making at least two molds so as to form individual work pieces successively by one stroke of the ram each, the improvement comprising a lower and an upper adapter plate containing said dies in fast relation, centering gibs for transversely centering said adapter plates within said die holders in horizontal directions, said centering gibs fitting into centering grooves and being arranged between the ultimate and penultimate mold, borders being disposed on the die holders and embracing the adapter plates at least on two sides, the horizontal distance between said borders being great enough to provide an expansion joint between said borders and said adapter plates, bevelled inner edges provided on the borders and co-acting with similar bevelled edges of said adapter plates for centering same in a coarse manner during insertion, and spring-loaded horizontally movable chucking wedges in the borders, said wedges having each an inclined surface of greater angle of inclination co-acting with said bevelled edges of said adapter plates and an inclined surface of minor angle of inclination co-acting with chucking surfaces of said adapter plates to thereby clamp said adapter plates onto said die holders.

4,187,714

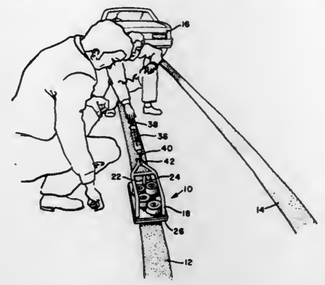
SURFACE FRICTION TESTER

Myron K. Cox, Fairborn; William J. McGrath, Dayton, and James E. Cantrill, Fairborn, all of Ohio, assignors to Wright State University, Dayton, Ohio

Continuation of Ser. No. 845,550, Oct. 26, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 949,611

Int. Cl.[2] G01N *19/02;* **G01P** *3/00*

U.S. Cl. 73—9 **9 Claims**



1. A portable surface friction tester in the form of a friction sled comprising:

(a) a frame having a relatively flat rectangular base plate with front and rear edges of a lesser dimension than the lateral edges thereof and having side bars elevated above said base plate, said side bars extending substantially the length of said base plate along each lateral edge and joined to said base plate at each corner of the rear edge and the lateral edge, said bars also converging beyond said front edge to form a tongue;

(b) a friction surface attached to the bottom of said base plate and characterizing a vehicle tire tread,

(c) weight means supported by said frame for loading said friction sled,

(d) pull means connected to said tongue by which said friction sled can be pulled over the surface to be tested, and

(e) a scale intermediate said pull means and said tongue to provide a measurement giving the coefficient of friction of the surface to be tested as said friction sled is pulled in a smooth, steady state over that surface.

4,187,715

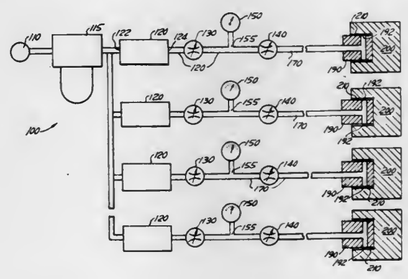
METHOD AND APPARATUS FOR DIMENSIONAL GAGING WITH FLUID PRESSURE

James S. Nevitt, Bellbrook, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 7, 1978, Ser. No. 922,705

Int. Cl.[2] G01B *13/10*

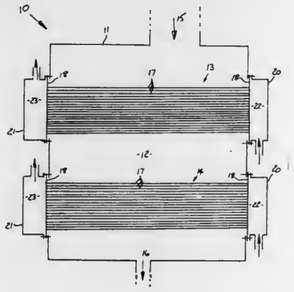
U.S. Cl. 73—37.9 **5 Claims**



1. A fluid pressure gaging apparatus for indicating a dimension of a workpiece surface, said apparatus comprising:

a fluid pressure regulator having an input and an output, said regulator adapted to receive a pressurized fluid at the input and to provide the fluid at a regulated pressure at the output;
gage tooling including at least one opening formed in said gage tooling and directed at the workpiece surface;
a fluid conduit connecting the output of the regulator with the gage tooling, said gaging tooling provides a fluid back pressure in the fluid conduit which varies with the distance between the opening and the workpiece surface;
means for indicating the fluid pressure in the conduit as an indication of the dimension of the workpiece surface, said indicating means located intermediate the regulator and the gage tooling and coupled to the conduit at a first location; and
means for adjusting the fluid pressure in the conduit, said means including a first variable passage restriction located in the conduit between the regulator and the first location and a second variable passage restriction disposed in the conduit between the first location and the tooling, said first and second variable passage restrictions each being in series connection with the conduit, whereby the first and second variable passage restrictions may be adjusted to adjust the indicated dimension on the indicating means.

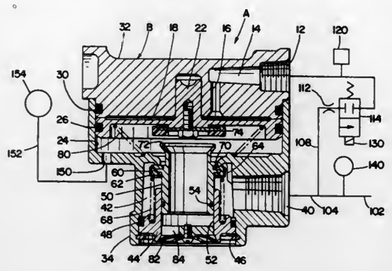
4,187,716
CONDENSER LEAK SEARCHING PLUGS
Robert Simpson, 84B Eglinton Rd., Ardrossan, Ayrshire, Scotland
Continuation of Ser. No. 733,854, Oct. 19, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,933
Claims priority, application United Kingdom, Oct. 22, 1975, 43244/75
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40 **3 Claims**



1. An appliance for detecting leakage from coolant tubes to a condensate space in a vapour condenser comprising a plug having a tapered body, a recess extending into the body from the larger end face thereof, a resiliently yieldable non protruding planar membrane covering and sealing the open side of said recess where said membrane forms the central part of a cap of elastic material which cap fits over the larger end of the body, and a through duct extending from said recess to the smaller end face of the body.

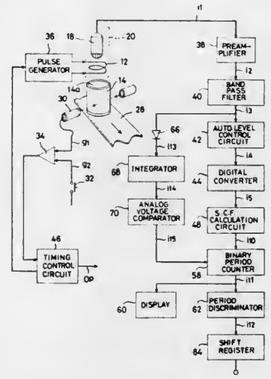
4,187,717
APPARATUS AND METHOD FOR TESTING PRODUCTS FOR LEAKS
Larry A. Wilhelm, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Jun. 19, 1978, Ser. No. 916,610
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—46 **11 Claims**

1. Testing apparatus for determining leakage in products to which primary and secondary air is supplied at substantially different pressures comprising: a supply air source having a supply pressure substantially greater than atmospheric, primary air supply means for supplying primary air from said supply air source to a test product at a primary air pressure substantially greater than atmospheric, secondary air supply means for supplying secondary air from said supply air source to a test product, said secondary air supply means including sensing means for sensing the secondary air pressure in a test



product, said secondary air supply means including valve means for opening and closing flow of secondary air to a test product, said valve means being responsive to said sensing means for supplying and maintaining in a test product a predetermined secondary air pressure above atmospheric and substantially less than said primary air pressure, and flow means for indicating flow from said supply air source to said primary and secondary air supply means.

4,187,718
METHOD AND APPARATUS FOR INSPECTING AN INTERNAL PRESSURE OF HERMETICALLY SEALED CONTAINER
Kyuichi Shibasaki, Yokosuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Mar. 13, 1978, Ser. No. 886,010
Claims priority, application Japan, Mar. 26, 1977, 52-32820; Dec. 5, 1977, 52-145169
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—52 **21 Claims**



1. A method of inspecting the internal pressure of a hermetically sealed container consisting of the following steps: a free vibration is compulsorily excited on the elastic wall of a hermetically sealed container, the excited vibration is converted and detected as an electrical signal, the intrinsic self-correlation function of the detected signal itself is calculated through analysis and arithmetic operation including a processing for compressing logarithmicly the amplitude of the relevant detected signal, and the adequacy of the internal pressure is

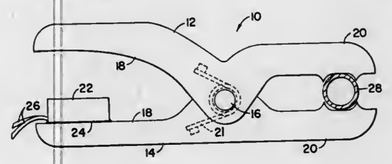
discriminated as an output in accordance with the measured period obtained from the relevant self-correlation function.

4,187,719
APPARATUS TO DETERMINE THE SEDIMENTATION RATE OF RED BLOOD CELLS
Ulrich Brethauer, Melsungen, Fed. Rep. of Germany, assignor to B. Braun Melsungen Aktiengesellschaft, Melsungen, Fed. Rep. of Germany
Filed Jul. 31, 1978, Ser. No. 929,287
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 7724900[U]
Int. Cl.[2] G01N *15/04, 33/16*
U.S. Cl. 73—61.4 **3 Claims**



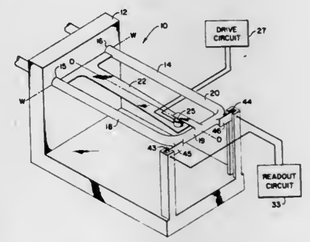
1. Apparatus for the determination of the sedimentation rate of red blood cells, comprising:
a sedimentation tube adapted to hold a blood column,
a closure valve of elastomeric material on one end of the sedimentation tube with said closure valve having a self-sealing perforation providing communication between the outside of the tube and the tube interior,
said closure valve having a hollow recess surrounded by a wall into which recess the tube end tightly fits, and
an extension plug, located in the other end of the tube, having a recess to receive the end of a syringe to inject liquid into the tube, and an orifice extending from the recess into the tube interior space.

4,187,720
FUEL LINE INJECTION SENSOR
Keith R. Baker, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Nov. 6, 1978, Ser. No. 957,901
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A **13 Claims**



1. A device for sensing pulsating fluid flow caused vibrations in a conduit and providing a signal indicative of one or more characteristics of the flow in the conduit, the device comprising:
self-closing and manually releasable clamp means adapted to be clamped to the conduit so that vibrations in the conduit are transmitted to the clamp;
pickup means mounted on the clamp means for providing a variable level signal indicative of the vibrations; and
signal processing means connected to the pickup means for receiving the variable level signal and providing an output indicative of a characteristic of the flow in the conduit, the signal processing means comprising first circuit means for amplifying the variable level signal, peak detector means for establishing a reference level indicative of but less than the peak level of the amplified signal, and comparator means for comparing the reference level and the amplified signal.

4,187,721
METHOD AND STRUCTURE FOR FLOW MEASUREMENT
James E. Smith, Boulder, Colo., assignor to S & F Associates, Boulder, Colo.
Continuation-in-part of Ser. No. 818,475, Jul. 25, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,468
Int. Cl.[2] G01F *1/86*
U.S. Cl. 73—194 B **55 Claims**

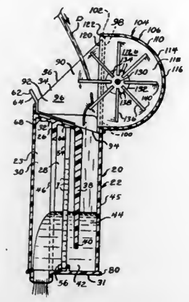


51. A method for measuring flow of a material comprising:
flowing the material through a "U" shaped conduit;
oscillating the conduit around an axis of oscillation passing through the legs of the conduit at substantially equal angles; and
measuring the forces tending to deflect the "U" shaped conduit around a deflection axis perpendicular to the oscillation axis and symmetrical to the conduit by determining the time lag between the passage of one side of the conduit through a plane substantially at the midpoint of oscillation and the passage of the other side of the conduit through such plane.

4,187,722
DEVICE FOR MEASURING THE VELOCITY OF A URINE DISCHARGE
Terry N. Layton, Wheeling, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Mar. 22, 1978, Ser. No. 889,153
Int. Cl.[2] A61B *5/00;* **G01F** *1/06*
U.S. Cl. 73—229 **13 Claims**

1. A device for measuring a urine discharge, comprising: a hollow receptacle having an inlet port adjacent an upper end of the receptacle and channel means below the inlet port to receive the liquid passing through the inlet port, a paddle assembly rotatably mounted on the receptacle and having rotatable blade means located in the path of said discharge, and means responsive to the rate of rotation of the paddle assembly

for measuring the velocity of said discharge passing from the port to the channel means, including means for measuring and



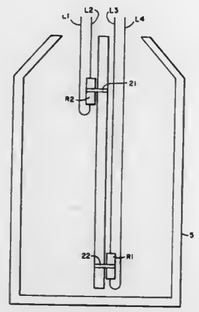
recording the maximum velocity of said discharge passing from the port to the channel means.

4,187,723

LIQUID NITROGEN LEVEL INDICATOR

Stephen P. Golden, Huntsville, and Charles T. Jennings, New Market, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 16, 1978, Ser. No. 951,925
Int. Cl.[2] G01F *23/22*
U.S. Cl. 73—295 **1 Claim**



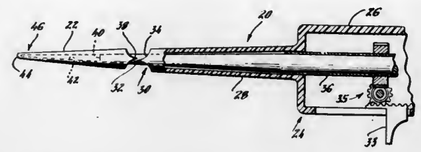
1. A system for indicating the presence or absence of a fluid in a given area comprising a first variable resistance means located at said area; said resistance means changing its resistance in accordance to the presence or absence of said fluid; first circuit means connected to said variable resistance means so as to determine its resistance, and therefore, whether the fluid is present or absent; said first circuit means comprising a first constant current generator connected to said first variable resistance means so as to cause a constant current to flow through said variable resistance means; a first comparator means connected to sense the voltage across said variable resistance means; first indicator means connected to the output of said comparator means so as to indicate the presence or absence of said fluid; a second variable resistance means located in a second area; a second circuit means identical to said first circuit means connected to said second variable resistance means so as to indicate the presence or absence of fluid at said second area; said first and second areas being located in a container that holds said fluid; said first area being located at an upper end of said container; said second area being located at a lower end of said container; a wood rod; two heat shrinkable tubings attaching said first and second variable resistance means to said wood rod; and said wood rod being located inside said container so as to position said resistance means in their respective areas in the container.

4,187,724

REPLACEABLE TIP FOR A PIPETTE

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Brookfield Center, Conn.

Continuation of Ser. No. 868,686, Jan. 11, 1978, abandoned. This application Oct. 4, 1978, Ser. No. 948,486
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.4 P **8 Claims**



1. A replaceable tip for use on the working end of a pipette used to take up and discharge liquid comprising

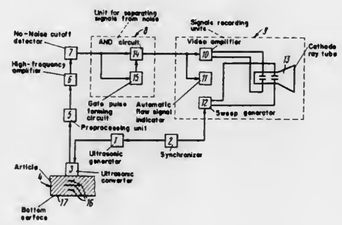
a longitudinal hollow tip body having a liquid flow port through which liquid is to be moved for intake and discharge, said hollow tip body having a pipette receiving end sized to fit over the working end of a pipette, said hollow tip body terminating at said pipette receiving end with a cam surface which is inclined relative to the longitudinal hollow tip body, said cam surface being further inclined to produce a rotational twist of the tip when the working end of a pipette is inserted into the pipette receiving end of the tip.

4,187,725

METHOD FOR ULTRASONIC INSPECTION OF MATERIALS AND DEVICE FOR EFFECTING SAME

Valery S. Gavrev; Jury M. Goncharuk; Sergei B. Birjukov; Alexandr V. Savitsky, and Ljudmila A. Popova, all of Kishinev, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov, Kishinev, U.S.S.R.

Filed Jul. 6, 1978, Ser. No. 922,585
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—613 **5 Claims**



1. A method for ultrasonic inspection of materials, comprising the steps of

transmitting ultrasonic vibrations into a material being tested;

receiving and processing reflected ultrasonic vibrations;

separating signals from noise at a preset level by means of time selection of these signals, performed within time intervals during which the amplitudes of said signals exceed said preset noise level;

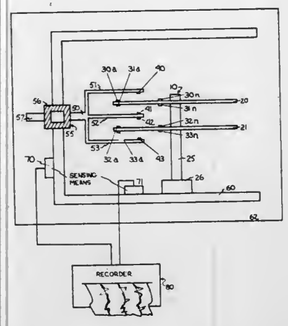
using said signals to evaluate the dimensions of flaws.

4,187,726

COMPUTER PERFORMANCE MEASUREMENT DEVICE AND PROCESS

Edward A. Olmstead, Federal Way, Wash., assignor to Black Bocs, Ltd., Federal Way, Wash.

Continuation-in-part of Ser. No. 662,013, Feb. 27, 1976, Pat. No. 4,068,302. This application Jan. 9, 1978, Ser. No. 868,036
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—660 **33 Claims**



27. A method of obtaining data about the performance of a disc information storage device of a computer, said storage device having discs accessed by read-write heads on moveable combs, comprising

detecting the vibrational reaction to the movement of said comb, and

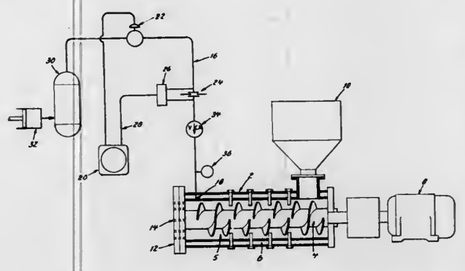
determining from the beginning of said vibrational reaction to comb acceleration the discrete moves of said comb.

4,187,727

FOOD EXTRUDER PRESSURE INDICATOR

Amir A. Bhimji, Park Forest South, Ill., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 19, 1978, Ser. No. 943,843
Int. Cl.[2] G01L *7/00*
U.S. Cl. 73—706 **1 Claim**



1. A pressure sensing device for continuously measuring the pressure within the barrel of a food extruder operating under pressure which comprises:

(a) a source of pressurized fluid;

(b) a conduit connecting said source of pressurized fluid with the interior of the extruder barrel;

(c) means operatively engaged with said conduit for measuring the flow of fluid therethrough;

(d) means responsive to the measured flow rate for controlling the flow of fluid through the conduit to maintain a positive flow within a predetermined fixed range;

(e) pressure sensing means operatively engaged with said conduit for sensing the pressure within the conduit at a location between the means for measuring flow of fluid and the food extruder, said pressure sensing means being calibrated to indicate the internal extruder pressure; and

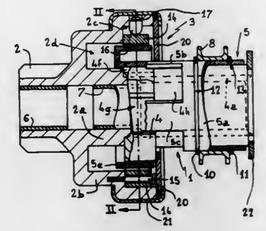
(f) a check valve in the conduit between the means operatively engaged with said conduit for measuring the flow and the extruder to prevent the possibility that a sudden surge in pressure in the extruder would cause a backflow of material into the pressure sensing means.

4,187,728

UNIDIRECTIONAL DRIVE SYSTEMS

Alfred Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyon, France

Filed Jan. 25, 1978, Ser. No. 872,207
Claims priority, application France, Jan. 31, 1977, 77 03091
Int. Cl.[2] F02N *15/06*; F16D *41/12, 43/20*
U.S. Cl. 74—6 **11 Claims**



1. A drive pinion assembly for a starter having an electric motor comprising a ratchet wheel adapted to be driven by the starter motor, a cage round the ratchet wheel, a drive pinion connected to the cage for rotation therewith, at least one pivotted pawl on the cage which can move into a first position in engagement with the ratchet wheel under the influence of biassing means, and into a second position out of engagement with the ratchet wheel under the influence of centrifugal force caused by rotation of the cage, and a movable stop device which, when the pawl is in its second position, can be so located as to prevent the pawl from engaging with the ratchet wheel.

4,187,729

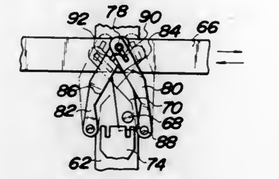
PUSHBUTTON TUNER

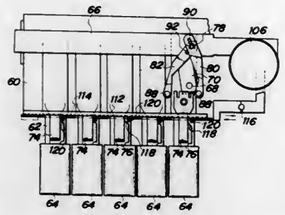
Takao Kanai, and Yashuhisa Nishikawa, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,668
Claims priority, application Japan, Dec. 16, 1976, 51/150293; Dec. 17, 1976, 51/168173; Dec. 28, 1976, 51/175143; Dec. 28, 1976, 51/175144
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.9 **12 Claims**

1. In a pushbutton tuner including support means, a plurality of operative means each having a pushbutton connected thereto and positioned on said support means with the associated operative means for similar movement from an inoperative position to an operative position upon depression of the pushbutton, and first tuning means positioned on said support means for movement in a direction transverse to the direction of movement of the operative means, the improvement comprising: linkage means responsive to the depression of any selected one of said pushbuttons for moving said tuning means in said transverse direction a distance which varies with the particular pushbutton which is depressed, said linkage means comprising a pair of somewhat L-shaped links associated with each operative means, each pair of links being supported for pivotal movement about parallel pivot axes spaced apart in a direction parallel to said transverse direction, the free end portions of each pair of links overlapping one another and each having elongated slots receiving a projection extending from said tuning means so that as each pair of links assumes different

relative angular positions with respect to the associated pivot points the tuning means has a different corresponding position, and there is associated with each of said operative means adjustable tuning control means for engaging at least one of the confronting edges of the associated pair of links when the associated pushbutton is fully depressed, each of said adjustable control means being lockably adjustable in position in a direction parallel to said transverse direction of movement of





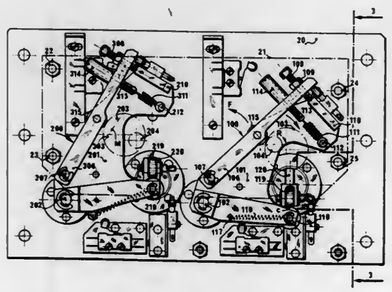
said tuning means and so that upon full depression of the associated pushbutton the tuning control means will first engage at least one confronting link edge to pivot the associated links when the pushbutton is partially depressed and upon further depression of the associated pushbutton will slide along the latter edge until it reaches the point of intersection between said confronting edges where further pivotal movement of the links is terminated.

4,187,730

LEVER CONTROL ARRANGEMENT FOR CONTROLLING THE MOVEMENT OF AN OSCILLATING LEVER

M. Raymond Delorme, Bagnolet, France, assignor to Compagnie Internationale pour l'Informatique, Paris, France

Filed Jun. 17, 1977, Ser. No. 807,742
Claims priority, application France, Jul. 7, 1976, 76 20785
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—54 **10 Claims**



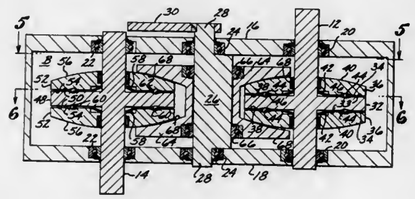
1. In a lever control arrangement for controlling the alternate reciprocating movement of a main lever pivotally mounted ona first shaft from a drive means including a motor having a rotatable shaft adapted to be rotatably driven upon energization of the motor, a cam attached to said rotatable shaft and a transmission mechanism disposed between said cam and said main lever and operably connecting said cam to the main lever for relaying the movement of the cam to the said main lever without any direct contact between the cam and the said main lever, comprising a first auxiliary lever, pivotally mounted to a second shaft arranged parallel to the first shaft of the main lever, said auxiliary lever being in contact with said cam, spring means connecting the two levers and urging the main lever in a first direction of said alternate movement, means limiting the displacement of said main lever to a defined value in the direction in which it is urged by the said spring means, and setting means associated with the said spring means for adjusting the interacting force exerted by the spring means on the two levers to a predetermined value, such that, if the main lever in the course of its movement in the first direction arising from the rotary movement of the cam, is arrested by an article arranged in its path, the force exerted by the main lever on the said article is at least equal to the said predetermined value multipled by the ratio between the distance which separates the first shaft of the main lever from the point where the said interacting force is exerted on said lever, and the distance which separates this same shaft from the point where the main lever is in contact with the said article.

4,187,731

VARIABLE SPEED TRACTION TRANSMISSION

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Aug. 15, 1977, Ser. No. 824,345
Int. Cl.[2] F16H *15/26, 15/08, 55/34, 15/00*
U.S. Cl. 74—198 **9 Claims**



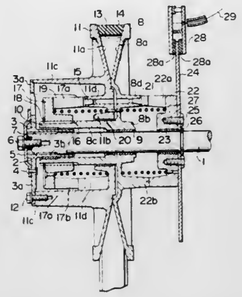
1. A variable speed traction transmission that includes:
a. a housing that includes a pair of side walls;
b. a driving shaft and a driven shaft journalled in said pair of side walls and extending therebetween in spaced parallel relationship;
c. first circular driving means and first circular driven means rigidly secured to said driving shaft and driven shaft and disposed in said housing;
d. second circular driving means and second circular driven means rotatably and slidably mounted on said driving and driven shaft within said housing and adjacently disposed to said first driving and driven means, said second driving and driven means on the portions thereof most remote from said first driving and driven means being convolved to form first elliptical surfaces of revolution;
e. first and second spring means for maintaining said second driving and driven means at a first distance relative to said first driving and driven means where said first driving and driven means may rotate without rotating said second driving and driven means;
f. first and second means operatively associated with said first and second driving means and said first and second driven means for concurrently rotating said first and second driving means and said first and second driven means when said first distance is lessened to a second distance and said driving shaft is rotated;
g. a third shaft journalled in said side walls and extending therebetween, said third shaft intermediately disposed between said first and second shafts, said third shaft laterally movable relative to said driving and driven shafts;
h. a circular power transmitting element rotatably supported on said third shaft, said element defining a ring-shape having a peripheral groove convolved on the inwardly opposing faces thereof to form second elliptical surfaces of revolution; and
i. third means for moving said third shaft and power transmitting element laterally relative to said driving and driven shafts, said third means when disposing said third shaft and power transmitting element in a first position allowing said driving shaft and first driving means to rotate without driving said second driving means, but said third means when disposing said third shaft and power transmitting element in any one of a plurality of second positions moving said second driving means towards said first driving means due to a first section of said ring-shaped surface forcibly and frictionally contacting said first elliptic surface of said second driving means to lessen said first distance to said second distance and said first and second driving means rotating said power transmitting element, and a second section of said ring-shaped surface forcefully and frictionally contacting said first elliptic surface of said second driven element to move said second driven element to said second distance relative to said first driven element, with said driven shaft rotating at a different rate than said driving shaft when said first and second sections are at different radial distances from said third shaft.

4,187,732

SHEAVE ASSEMBLY FOR V-BELT TYPE INFINITELY VARIABLE TRANSMISSIONS

Izumi Takagi, and Shigeo Adachi, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 7, 1977, Ser. No. 849,219
Claims priority, application Japan, Nov. 12, 1976, 51/152439[U]
Int. Cl.[2] F16H *55/52*
U.S. Cl. 74—230.17 M **3 Claims**



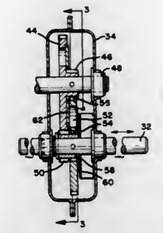
1. Sheave assembly for a V-belt type infinitely variable transmission comprising a shaft, a fixed sheave element secured to the shaft and having a frustoconical side surface, a movable sheave element mounted on said shaft for axial movement along the shaft, said movable sheave element having a frustoconical side surface located in opposed relationship with respect to the frustoconical side surface on the fixed sheave element to define a circumferential groove of substantially V-shaped cross-section between said side surfaces on the sheave elements for engagement with a V-belt of the transmission, means for resiliently biasing said movable sheave element toward said fixed sheave element, cam means provided between said movable sheave element and a member rotatably mounted on said shaft, means provided for applying retarding force to said rotatable member so as to produce a relative displacement between said movable sheave element and said member, said cam means being responsive to said relative displacement to produce a cam force which urges said movable sheave element toward said fixed sheave element.

4,187,733

SPEED REDUCTION MECHANISM FOR SEMI-TRAILER LANDING GEAR

William D. Walther, Kettering, and Charles E. Phillips, Bryan, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed May 30, 1978, Ser. No. 910,832
Int. Cl.[2] F16H *3/22;* B60S *9/04*
U.S. Cl. 74—342 **5 Claims**



1. In a geared speed reduction crank mechanism for a semi-trailer landing gear, the improvement comprising:
a support housing;
a pair of parallel vertically spaced horizontally disposed shafts mounted for rotation in said housing, one of said shafts having an end portion extending outwardly from said housing and the other of said shafts engaging means for raising and lowering said landing gear;
crank means secured to said end portion of said one shaft for causing rotation thereof;
first and second gears secured to said other of said shafts;
a third gear secured to said one of said shafts and engageable with said first gear;
a fourth gear having internal and external gear teeth and mounted for independent rotation on said one of said shafts, said external teeth being engageable with said second gear and said internal teeth being engageable with said third gear;
means maintaining said fourth gear in substantially laterally fixed position; and
said one shaft being axially movable between a position in which said third gear is in driving engagement with said first gear while said fourth gear is free to rotate and a position in which said third gear drivingly engages said fourth gear and said fourth gear drivingly engages said second gear.

4,187,734

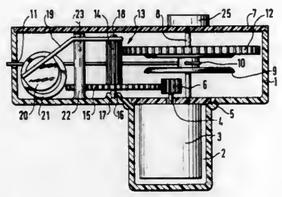
ELECTRIC REGULATING DEVICE

Arnold Mann, Bieber, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,678
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658093; Sep. 15, 1977, 2741475
Int. Cl.[2] F16H *57/00*
U.S. Cl. 74—405 **11 Claims**

1. An electrical regulating device, particularly for a speed control device for motor vehicles, comprising
a regulating member,
means for actuating said regulating member, said means constituting a rotatably mounted element, said element is formed as a cable pulley,
a servomotor,
a coupleable mechanical gearing means and a coupling means therefor including an electromagnet for operatively connecting said cable pulley with said servomotor,
an armature cooperating with said electromagnet, and

said gearing means includes a plurality of gears, at least one of said gears of said gearing means being substantially



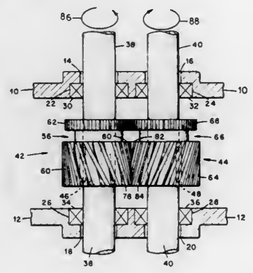
radially and/or axially moveably mounted and being operatively connected with said armature.

4,187,735

HELICAL DRIVE TRAINS WHICH ELIMINATE THE NEED FOR THRUST BEARINGS

Clegia L. Terry, 2116 Curving Rd., Knoxville, Tenn. 37912

Filed Aug. 7, 1978, Ser. No. 931,555
Int. Cl.[2] F16H *57/00*
U.S. Cl. 74—410 **8 Claims**



1. A helical gear, spur gear drive combination for controlling end thrust comprising;

a first support shaft;

a first combination including a first helical toothed gear securely attached to a first straight toothed gear, said first helical toothed gear and said first straight toothed gear having a common pitch diameter and a common axis of rotation, said first combination being mounted on said support shaft such that rotation of said shaft results in rotation of said first combination and such that rotation of said first combination results in rotation of said first shaft;

a second combination including a second helical toothed gear and a second straight toothed gear securely attached to each other, said second helical toothed gear and said second straight toothed gear having a common pitch diameter and a common axis of rotation, the teeth of said second helical gear having a pitch angle equal to and opposite that of the teeth of said first helical gear, and a tooth size and spacing such that teeth of said first and second helical gears may properly mesh, the teeth of said second straight toothed gear having a tooth size and spacing such that they may properly mesh with the teeth of said first straight toothed gear; and

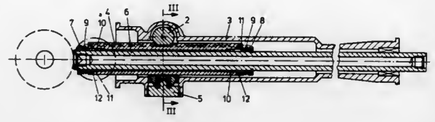
a second support shaft on which is mounted said second combination such that rotation of said second shaft results in rotation of said second combination and such that rotation of said second combination results in rotation of said second shaft, said second support shaft being located parallel and adjacent to said first support shaft such that the helical gear teeth and the straight toothed gear teeth of said first combination are in a meshing relationship with the helical gear teeth and the straight toothed gear teeth of said second combination, respectively.

4,187,736

RACK STEERING

Gerhard Haegele, Hohenstadt, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,640
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736631
Int. Cl.[2] B62D *1/20*
U.S. Cl. 74—422 **10 Claims**



1. In a gear rack steering device comprising a steering shaft having a pinion and a gear rack engaged thereby, the improvement which comprises a guide bar with said gear rack being slidably carried thereon;

shock cushioning means carried by said guide bar and secured thereto and engaging respective ends of said gear rack;

said guide bar being adapted for connection to a steering linkage mechanism and reciprocated through said cushioning means by said gear rack to effect steering by operation of said steering shaft;

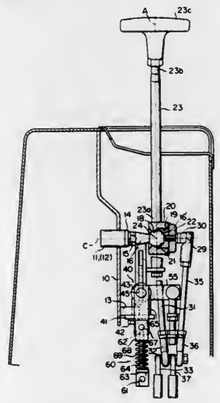
wherein road shock transmitted from a steering linkage mechanism to said guide bar is absorbed by said cushioning devices.

4,187,737

CONTROL MECHANISM FOR HYDRAULIC SYSTEM

Ikuo Mori, Komatsu, and Kenichi Yoshida, Kanazu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,676
Claims priority, application Japan, Apr. 19, 1977, 52-44151
Int. Cl.[2] G05G *9/04*
U.S. Cl. 74—471 XY **4 Claims**



1. A control mechanism for hydraulic system comprising a frame, a stud member fixedly secured to said frame, said stud member having a ball formed at one end thereof, a socket means mounted on the ball of said stud member encircling

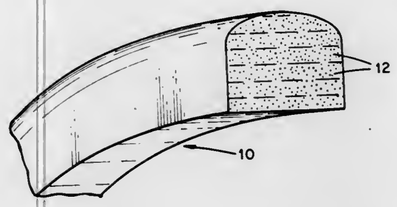
thereof, said socket means being adapted to pivot in every direction relative to the ball, a control lever fixedly secured to said socket means, said control lever having a straight portion and an extension reference line of the axis thereof passing through the center of the ball of said stud member, first and third ball coupling means fixedly secured to said socket means, said first and third ball coupling means being arranged in such a manner that the centers thereof are located on a first crossing reference line passing through the center of the ball of said stud member and at right angles to the extension reference line, second ball coupling means fixedly secured to said socket means, said second ball coupling means being arranged in such a manner that the center thereof is located on a second crossing reference line passing through the center of the ball of said stud member and at right angles to the extension reference line and also the first crossing reference line, first and second connecting rods, each being connected to said first and second ball coupling means, respectively, at upper ends thereof, the lower ends of which being connected to first and second control valves, respectively, a third connecting rod connected at its lower end to a third control valve, and motion translation connecting means interconnecting said third ball coupling means and said third connecting rod for translating a rotational motion of said third ball coupling means into a linear motion of said third connecting rod.

4,187,738

RIM FOR ROTARY INERTIAL ENERGY STORAGE DEVICE AND METHOD

Charles E. Knight, Jr., Knoxville, and Roy E. Pollard, Powell, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,676
Int. Cl.[2] F16F *15/30;* **F16C** *15/00*
U.S. Cl. 74—572 **5 Claims**



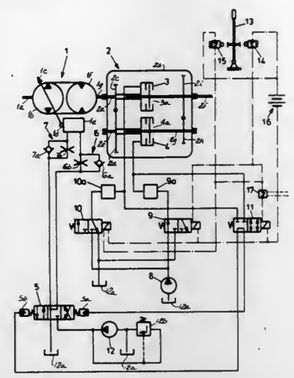
1. An improved rim for a rotary inertial energy storage device, said rim comprising a plurality of concentrically disposed and abutting layers of filamentary material in a resin matrix with said resin bonding together adjacent layers of filamentary material, said layers being characterized by being discretely and sequentially formed by winding a resin impregnated filamentary material in a circumferential side-by-side pattern with the resin impregnant being cured prior to the application of each succeeding layer and with the filamentary material in each layer extending from the radially innermost layer to the radially outermost layer being applied with a greater and sufficient winding tension to provide a different residual stress within each of the wound layers adequate for counterbalancing the radial stresses generated during the rotation of the rim throughout the entire radial thickness of the multilayers and thereby providing sufficient stretching of the filamentary material in each of the layers to inhibit deleterious delamination during rotation.

4,187,739

HYDROSTATIC TORQUE CONVERTER HAVING A STEPPED TRANSMISSION

Karlmann Hamma; Anton Ott, both of Tettnang; Werner Vetter, and Arun Chatterjee, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,162
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—732 **7 Claims**



1. A hydrostatic torque converter comprising:

an input shaft and an output shaft;

a hydrostatic transmission including a variable displacement pump connected to and driven by said input shaft and a hydrostatic motor hydraulically connected to said pump, said pump having a control element for varying the displacement per revolution thereof;

a stepped gear transmission shiftable under load connected between said motor and said output shaft, said gear transmission having at least two selectively engageable and disengageable clutches establishing respective transmission ratios of the gear transmission;

selector means including control valves for selectively feeding fluid to said clutches and discharging fluid from said clutches for the engagement and disengagement thereof to select one of said transmission ratios;

a switch valve connected with said hydrostatic transmission for controlling the displacement of said element;

means for applying the fluid pressure at said clutches to said switch valve for controlling same in response to selection of a transmission ratio to adjust said hydrostatic transmission for speed compensation upon switchover between said transmission ratios; and

pressure modulation valves in fluid connection with said clutches for modifying the rate of engagement thereof such that the adjustment of the hydrostatic transmission for speed compensation is effected outside the period wherein the clutch to be disengaged is still in an engaged condition and the clutch to be engaged has been subjected to incipient loading.

4,187,740

EPICYCLIC GEAR TRAIN PLANET CARRIER SYSTEM

Giovanni J. Silvestri, 4 Meadowbrook Dr., Barrington, R.I. 02806

Filed May 18, 1977, Ser. No. 798,066
Int. Cl.[2] F16H *1/28, 3/44*
U.S. Cl. 74—750 R **5 Claims**

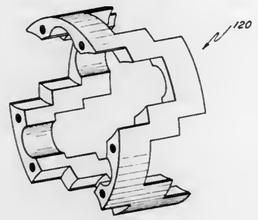
1. A planet carrier system in an epicyclic gear train assembly including two planet sets, each of the two planet sets having three planet clusters, which comprises:

an input planet carrier bearing plate for supporting one end of the first gear of each of said planet clusters, said input

planet carrier bearing plate having a first plurality of projections and slots and further having a first three pairs of threaded openings adjacent outer edge thereof, each pair of said first three pairs of threaded openings being 120 degrees apart from the remaining two pairs thereof;

an output planet carrier bearing plate for supporting the opposite end of the first gear of each of said planet clusters, said output planet carrier bearing plate having a second plurality of projections and slots and further having a second three pairs of threaded openings adjacent outer edge thereof, each pair of said second three pairs of threaded openings being 120 degrees apart from the remaining two pairs thereof and said second three pairs of threaded openings being adapted to be aligned with the corresponding members of said first three pairs of threaded openings; and

a generally cylindrical bridge member having a first end and a second end, said first end having a third plurality of projections and slots being adapted to be demountably engaged with the corresponding members of said first plurality of projections and slots on said input planet



carrier bearing plate and said second end having a fourth plurality of projections and slots being adapted to be demountably engaged with the corresponding members of said second plurality of projections and slots on said output planet carrier bearing plate, said bridge member further having a third three pairs of counterbored threaded openings on the first end thereof and a fourth three pairs of counterbored threaded openings at the second end thereof, each pair of said third plurality of counterbored threaded openings being 120 degrees apart from the remaining two pairs thereof and each pair of said fourth plurality of counterbored threaded openings being 120 degrees apart from the remaining two pairs thereof, and said first and second three pairs of threaded openings respectively on said input planet carrier bearing plate and on said output planet carrier bearing plate and said third and fourth three pairs of threaded openings respectively on the first end and second end of said bridge member being adapted to be aligned and mutually engaged for accurate positioning so as to form the planet carrier system.

4,187,741
POWER REGENERATIVE TRANSMISSION
Bengt E. Nyman, 5514 S. Crow's Nest Rd., Tempe, Ariz. 85283
Filed Jan. 3, 1977, Ser. No. 756,255
Int. Cl.[2] F16H *3/74;* B60K *9/00*
U.S. Cl. 74—751 **18 Claims**

1. A power regenerative transmission system for augmenting the power generated by the prime mover of a vehicle during acceleration of the vehicle drive shaft and recovering the kinetic energy of the vehicle during decelaration, said system comprising in combination:

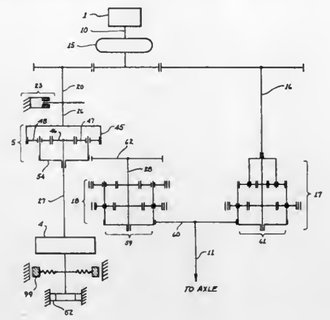
a. a transmission disposed intermediate the prime mover and the drive shaft for transmitting power therebetween;

b. flywheel means for receiving, storing and transmitting energy;

c. torque sensitive gearing means for preempting the power flow through said transmission during acceleration and deceleration of the drive shaft in response to the torque sensed, said torque sensitive gearing means including torque responsive means comprising:

i. a first leg in rotational communication with the prime mover for transmitting and sensing the torque present at the output shaft of the prime mover;

ii. a second leg in rotational communication with the drive shaft for transmitting and sensing torque to and from the drive shaft; and

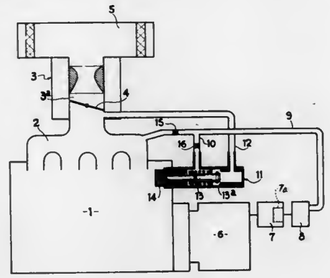


iii. a third leg in rotational communication with said flywheel means for transferring energy into and out of said flywheel means in response to power transfer between said first and second legs;

d. brake means disposed intermediate said first leg and the output shaft of the prime mover for braking said first leg;

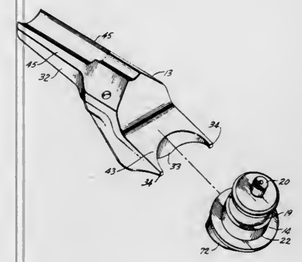
whereby, the energy stored within said flywheel means is transferred to the drive shaft during acceleration to augment the power generated by the prime mover and the kinetic energy of the vehicle is recovered by said flywheel means during deceleration of the vehicle.

4,187,742
CONTROL OF AN AUTOMATIC GEARBOX IN AN AUTOMOBILE
Michel Achard, La Garenne Colombes, France, assignor to Automobiles Peugeot, Paris, France
Filed Jun. 21, 1977, Ser. No. 808,518
Claims priority, application France, Jul. 2, 1976, 76 20275
Int. Cl.[2] B60K *23/00, 41/18*
U.S. Cl. 74—863 **4 Claims**



1. In a device combined with an automatic gearbox and an engine having an inlet pipe and a throttle valve in the inlet pipe for moving between an idling engine speed position and a full engine speed position, which device is for controlling the gearbox and comprises means defining a vacuum-responsive engine load correcting first valve which is adapted to vary engine loads at which speeds of the gearbox are automatically changed depending on the position of said valve, first passage means putting said valve in communication with the inlet pipe; the improvement comprising venting means for putting said first valve in communication with the atmosphere, the venting means comprising second passage means connected to the first passage means at a given connection and communicating with the atmosphere when the throttle valve is moved away from said idling engine speed position, a second valve inserted in the second passage means and responsive to the temperature of the engine for opening the second passage means when the engine is cold and closing the second passage means when the engine is warm, means for closing said second passage means off from the atmosphere when the throttle valve is in said idling engine speed position, calibrated restrictors respectively inserted in the first passage means between said given connection and the inlet pipe and in the second passage means between said given connection and the second valve, the first passage means being connected to the inlet pipe in a position to always communicate with the inlet pipe on the downstream side of the throttle valve relative to the fluid flow through the inlet pipe.

4,187,743
ROCK BIT AND METHOD OF MANUFACTURE
Robert D. Thomas, Tonkawa, Okla., assignor to Smith International, Inc., Newport Beach, Calif.
Filed Apr. 21, 1978, Ser. No. 898,913
Int. Cl.[2] E21B *9/08*
U.S. Cl. 76—108 A **10 Claims**



1. A method of making a rotary rock bit comprising the steps of:

forming a rock bit leg segment having an upper shank end and a lower end, the lower end including a socket having a semi-cylindrical faying surface transverse to the axis of the rock bit being formed;

forming a journal pin insert including a journal pin for mounting a rock bit cutter cone, a shirttail transverse to the journal pin, and a semi-cylindrical faying surface on the shirttail portion coaxial with the journal pin;

fitting the journal pin insert to the rock bit leg segment with the semi-cylindrical faying surface of the journal pin insert mated with the semi-cylindrical faying surface of the socket; and

electron beam welding the semi-cylindrical faying surfaces.

4,187,744
APPARATUS FOR ROTATING TRACK CHAIN BUSHING
Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jun. 19, 1978, Ser. No. 916,974
Int. Cl.[2] B25B *19/00*
U.S. Cl. 81—3 R **4 Claims**

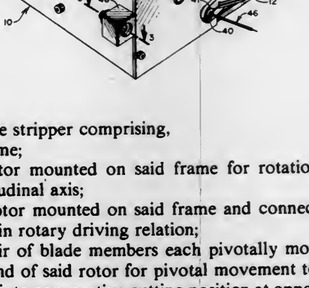
1. An apparatus for controllably rotating a track chain bushing **(14)** relative to a pair of track chain links **(12)** connected to opposed ends of the bushing **(14)**, comprising:

a clamp **(24)** having a construction sufficient for circumferentially engaging the bushing **(14)** with a force sufficient for preventing relative motion between the clamp **(24)** and bushing **(14)**;

a hydraulic cylinder **(30)** connected to the clamp **(24)** and movable between a retracted position and an extended position;

first means **(28)** for extending the cylinder **(30)** and applying a turning force to the clamp **(24)** and torquing the bushing **(14)** a preselected amount in a first direction;

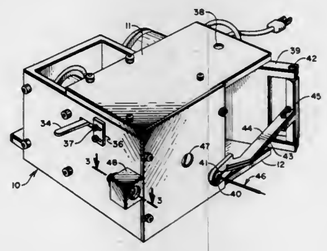
second means **(32)** for successively impacting a selected one of the pair of links **(12)** a number of times sufficient for rotating the bushing **(14)** a preselected amount relative to



the selected link **(12)** and alternatively, successively impacting the other one of the pair of links **(12)** a number of times sufficient for rotating the bushing **(14)** a preselected amount relative to said other link **(12)** said second means **(32)** including an eccentric crankshaft motor **(34)** having first and second impactors **(36,38)** of a size sufficient for impacting a selected area of an associated link **(12)**; and

a support chain **(42)** entrained about the bushing **(14)** and connected at its end points to the motor **(34)**, said chain **(42)** maintaining the impactors **(36,38)** at locations sufficient for impacting the links **(12)**.

4,187,745
WIRE STRIPPER
Roger T. Lambert, Fridley, Minn., assignor to Omnetics, Inc., Minneapolis, Minn.
Filed May 8, 1978, Ser. No. 903,858
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **29 Claims**



1. A wire stripper comprising,

(a) a frame;

(b) a rotor mounted on said frame for rotation about its longitudinal axis;

(c) a motor mounted on said frame and connected to said rotor in rotary driving relation;

(d) a pair of blade members each pivotally mounted upon one end of said rotor for pivotal movement toward each other into cooperative cutting position at opposite sides of the axis of rotation of said rotor and away from each other to retracted non-cutting position;

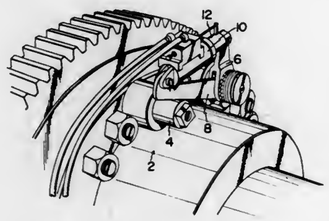
(e) the axis of pivot of each of said blade members extending parallel to the axis of rotation of said rotor and being located at opposite sides thereof;
(f) each of said blade members being flat and generally semi-circular in shape and having a generally diametrically extending edge and having its axis of pivot adjacent its periphery and its said diametrically extending edge;
(g) a cutting edge formed on each of said blade members along its said diametrically extending edge opposite the axis of rotation of said rotor;
(h) a sleeve telescopically carried by said rotor and rotating therewith and being controllably shiftable longitudinally thereof;
(i) camming means carried by said sleeve in camming engagement with said blade members for pivoting the same when desired into cooperative cutting positions with respect to the axis of rotation of said rotor, whereby the coating on a wire may be cut thereby when the wire is positioned along the axis of said rotor and between said blade members;
(j) an annular way carried by the outer circumferential surface of said sleeve and extending therearound;
(k) a lever pivotally mounted on said frame for pivotal movement thereof transversely of said annular way, and
(l) a way follower carried by said lever and extendinto said way in controlling relation therewith whereby said sleeve and said way and said camming means may be shifted longitudinally of said rotor by pivoting said lever to cam said blade members into said cutting position as and when desired.

4,187,746

POWER WRENCH HAVING RATCHET MEANS AT BOTH SURFACES OF SOCKET THEREOF

Tsugio Shibata, 7-2-1, Nagazumi, Minami-ku, Fukuoka-shi, Fukuoka, Japan

Filed Feb. 10, 1978, Ser. No. 876,603
Int. Cl.² B25B *13/26*
U.S. Cl. 81—57.39 **10 Claims**



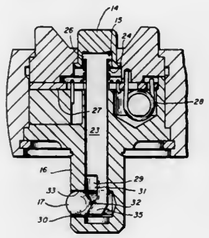
1. A wrench for fastening and unfastening a bolt or the like comprising:
a socket comprising a bolt receiving portion and an engaging portion, said engaging portion having a first part and a second part, said second part having a circular cross-section;
a drive lever having an annular portion at a torquing end thereof, said annular portion being rotatably mounted on said circular cross-section of said second part and having right-hand radial teeth and left-hand radial teeth formed on opposed and axially spaced faces of said annular portion;
a ratchet cap nonrotatably received on said first part of said engaging portion of said socket, said ratchet cap having ratchet teeth formed on a face thereof;
a biasing means detachably mounted on said socket for biasingly meshing said ratchet teeth of said ratchet cap with said right-hand radial teeth;
said drive lever being oscillateable to thereby intermittently rotate said socket in a right-hand direction through said right-hand radial teeth on said drive lever and said ratchet teeth on said ratchet cap to thereby tighten said bolt;
said ratchet cap being removable from said socket to thereby allow said drive lever to be removed from the socket and turned 180 degrees to be replaced on the socket such that said left-hand radial teeth on said drive lever are engageable with ratchet teeth on another ratchet cap placed on said second part of said engaging portion of said socket, whereby oscillation of said drive lever intermittently rotates said socket in a left-hand direction through said left-hand radial teeth on said drive lever and said ratchet teeth on said other ratchet cap to thereby loosen said bolt.

4,187,747

QUICK RELEASE MECHANISM FOR SOCKET WRENCH

Roy E. Pawlow, Middletown, Conn., assignor to Litton Industrial Products, Inc., New Britian, Conn.

Filed Feb. 21, 1978, Ser. No. 879,798
Int. Cl.² B25B *13/00*
U.S. Cl. 81—177 G **3 Claims**



1. In a socket wrench having an elongated handle, a head on one end of the handle, a driving stud protruding from the head for driving by engaging a socket thereon, and an axial passage in the driving stud, a mechanism comprising:
an aperture in a side wall of said driving stud communicating with the axial passage,
a spherical detent positioned within the aperture,
an elongated flat push bar means in the axial passage for urging the detent to protrude from the side wall through the aperture, the flat push bar means having a thickness which is substantially less than the diameter of the spherical detent,
a notch in one end of the flat push bar means, the notch comprising a constant depth portion and a sloped portion wherein the sloped portion is effective at one end thereof to urge the detent to protrude from the aperture and at the other end to allow the detent to retract into the aperture,
resilient means for biasing said push bar means, and
two surface means in the sloped portion of the notch, the two surface means contacting the spherical detent at spaced points to provide a positive seating surface for the detent, to urge the detent to protrude from the aperture, and to prevent the push bar means from rotating within the driving stud.

4,187,748

AUTOMATIC MACHINE TOOL

Richard F. Evans, 36 School La., Solihull, West Midlands, England

Filed Aug. 8, 1977, Ser. No. 822,655
Claims priority, application United Kingdom, Aug. 6, 1976, 32780/76
Int. Cl.² B23B *3/04, 13/12*
U.S. Cl. 82—2.5 **26 Claims**

1. An automatic machine tool of the kind comprising at least one rotatable main collet adapted to hold non-round bar stock during turning or other machining operations, and a respective feed tube axially aligned with each main collet and through

which non-round bar stock is arranged to be fed automatically to the main collet by a respective feed collet associated with each feed tube, each feed collet being carried adjacent to the end of the respective feed tube remote from the respective main collet, each feed collet is provided with at least one wedging element associated with a respective wedge surface of the feed collet, the arrangement being such that each feed collet is movable under non-round bar stock in the direction away from the respective main collet but on movement of the feed collet in the opposite direction each wedging element is wedged between the bar and the respective wedge surface to grip the bar, and means permanently keying each feed tube against angular movement relative to the respective main collet.



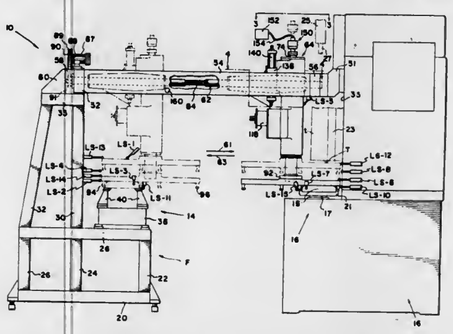
17. An automatic machine tool of the kind comprising at least one rotatable main collet for holding bar stock during a machining operation, and a respective feed tube axially aligned with each main collet, a respective feed collet associated with each feed tube, a stop, a feed station, means for moving said stop axially towards a main collet located at said feed station, said feed collet having first and second parts which are axially movable relative to each other, the second part of each feed collet being spaced further from the respective main collet than is the respective first part, resilient means acting between said first and second parts to urge said parts towards each other, and means securing said first part to a respective feed tube, said second part comprising a one way gripping device for gripping bar stock when said second part is moved towards said main collet.

4,187,749

METHOD AND APPARATUS FOR LOADING AND UNLOADING WORKPIECES

Robert Webber, Saginaw, Mich., assignor to Bay City Boring, Bay City, Mich.

Filed Mar. 13, 1978, Ser. No. 885,497
Int. Cl.² B23B *13/00;* **B25J** *3/00*
U.S. Cl. 82—2.7 **15 Claims**



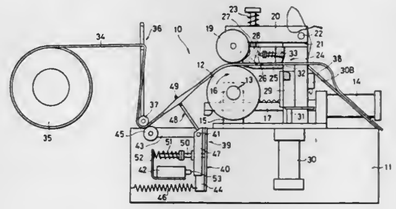
1. Loading and unloading apparatus for loading and unloading a machine tool comprising:
a frame;
a supply-discharge conveyor for supplying unmachined workpieces to a load-unload station and for receiving machined workpieces from said load-unload station; and
transfer means on said frame for transferring unmachined workpieces from said conveyor to said machine tool and for transferring machined workpieces from said machine tool to said conveyor at said load-unload station;
said transfer means including:
unmachined workpiece chuck means for gripping and holding unmachined workpieces on said conveyor, and removing an unmachined workpieces from said conveyor at said load-unload station to a first retracted position;
means for bodily forwardly transferring said unmachined workpiece chuck means and the unmachined workpiece held thereby from said first retract position to a first advanced position forwardly of said retracted position which is remote from said conveyor and adjacent such a machine tool;
machined workpiece chuck means for gripping and holding machined workpieces on a portion of such a machine tool and removing a machined workpiece from said portion of such a machine tool and transferring it to a second advanced position forward of said first advanced position;
means for interchanging the first and second advanced positions of said machined and unmachined workpiece chuck means adjacent said machine tool so that said unmachined workpiece chuck means and said unmachined workpiece held thereby is in said second advance position and said machined workpiece chuck means and said machined workpiece held thereby is moved to said first advance position;
means for operating said unmachined workpiece chuck means to deposit said unmachined workpiece on said portion of sad machine tool;
means for bodily rearwardly transferring said machined workpiece chuck means to said retracted position; and
means for operating said machined workpiece chuck means to release said machined workpiece for deposit on said conveyor.

4,187,750

MACHINE FOR AUTOMATICALLY CUTTING AN ELONGATE MATERIAL INTO LENGTHS

Kenichiro Ito, Monchen-Gladbach, and Kurt Schischkoff, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Yoshida Kogyo K K, Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,374
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714169
Int. Cl.² A44B *19/42*
U.S. Cl. 83—67 **7 Claims**



1. A machine for automatically cutting an elongate material into lengths, comprising:
(a) a base;
(b) roller means rotatably mounted on said base for feeding the elongate material a predetermined interval at a time;
(c) means on said base having a cycle of operation for rotating said roller means an angular amount corresponding to said predetermined interval;
(d) means on said base for cutting off the elongate material fed by said roller means; and
(e) means for alternately driving said rotating means and said cutting means and for automatically repeating the operation of said rotating means for a preselected number of cycles before actuation of said cutting means;
(f) said roller means including a conveyor roller rotatably

mounted on said base and an idler roller urged against said conveyor roller, the elongate material being transportable by and between said conveyor and idler rollers:

(g) said rotating means comprising a first fluid-pressure actuator having on its piston rod a toothed rack, there being a freewheeling pinion on the shaft of said conveyor roller, and said toothed rack being in mesh with said freewheeling pinion;

(h) said cutting means comprising a second fluid-pressure actuator having on its piston rod a cutter blade which on energization of said second actuator is movable across a passageway through which can pass the elongate material fed by said conveyor and idler rollers; and

(i) said driving and repeating means comprising a first fluid circuit including a first four-way valve for selecting the direction of movement of the piston rod of said first actuator, and a second fluid circuit including a second four-way valve for selecting the direction of movement of the piston rod of said second actuator, there being a pair of first and second limit switches for sensing the forward and rearward stroke ends, respectively, of the piston rod of said first actuator, and a pair of third and fourth limit switches for sensing the forward and rearward stroke ends, respectively, of the piston rod of said second actuator, said first four-way valve being switchable by said first and fourth limit switches, and said second four-way valve being switchable by said second and third limit switches.

4,187,751

LEAD CROPPING APPARATUS

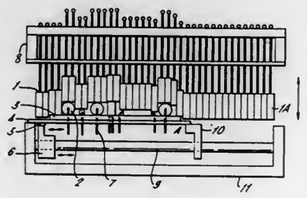
Leslie J. H. Barnacle, Coventry, England, assignor to Cosarnia Limited, St. Peter Port, Channel Islands

Filed Jun. 6, 1978, Ser. No. 913,579

Claims priority, application United Kingdom, Jun. 14, 1977, 24667/77; Mar. 11, 1978, 9723/78

Int. Cl.² B23C *1/08;* **B26D** *7/06*

U.S. Cl. 83—458 **28 Claims**



1. Apparatus for cropping the connecting leads of electrical components assembled on a circuit board having locating holes therein through which the leads have been inserted, said apparatus comprising a plate provided with holes at spacings corresponding to the holes in the circuit board which are to be used to locate the components, said plate having a first surface against which, in use, is placed the circuit board on which electrical components have been arranged by passing the leads thereof through appropriate holes in the circuit board, the leads extending through the holes in the circuit board and also through corresponding holes in the plate; a first structure adapted to support the plate and on which is mounted a cutter means movable in proximity to a second surface of the plate substantially parallel with said first surface to crop the portions of the leads of the components extending through the holes in the plate beyond said second surface by a shearing or cutting action; and a second structure carrying a multiplicity of substantially parallel rods which are movable into engagement with components on a circuit board placed on said plate which is supported on the first structure, the ends of the rods engaging said components to hold the components in position on the circuit board and said rods being individually axially displaceable whereby the rods are displaced relatively to one another according to the size or shape of the different components, said first and second structures being movable relative to one another whereby movement of one of said structures toward or away from the other is effective to move the rods into engagement with the components on the circuit board or to release the rods from the components.

4,187,752

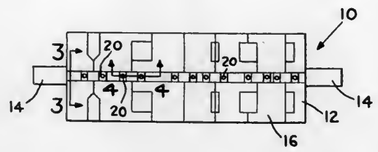
ROTARY DIE LOCK STRUCTURE

W. Richard Chesnut, West Caldwell, N.J., assignor to W. R. Chesnut Engineering, Inc., Fairfield, N.J.

Filed Dec. 15, 1977, Ser. No. 860,691

Int. Cl.² B23D *25/12*

U.S. Cl. 83—663 **3 Claims**



1. Die sheet locking structure for die roller assembly comprising:

a die roller having a circumferential surface;

a transverse channel formed in said die roller, said transverse channel having a base surface and a plurality of tapped bores formed in said base surface;

a die sheet disposed around said circumferential surface of said die roller, said die sheet having transversely extending terminal edges, said terminal edges having shoulder means formed thereon, and said die sheet further being provided with at least one land disposed around the circumferential surface thereof;

locking means disposed in said transverse channel, said locking means including at least one locking plate having a shoulder thereon, said shoulder on said locking plate for engaging at least one of said shoulders on said terminal edges of said die sheet;

means for drawing said locking plate toward said base surface of said transverse channel with said at least one shoulder of said locking plate in engagement with said at least one of said shoulders of said die sheet, said drawing of said locking plate for causing stretching of said die sheet into surface-to-surface engagement with said circumferential surface of said die roller;

a bridge element for causing a continuation of said land across said transverse channel, said bridge element including a die member and a land means; and

means for securing said bridge element to said locking plate of said locking means.

4,187,753

KNIFE DRUM FOR CROSS CUTTING MACHINES

Peter Walde, Diesseldorf, Fed. Rep. of Germany, assignor to Jagenberg Werke Aktiengesellschaft, Diesseldorf, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,181

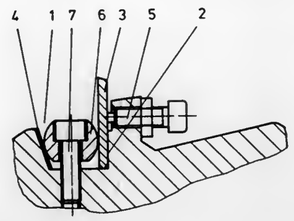
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741560

Int. Cl.² B26D *1/36*

U.S. Cl. 83—674 **4 Claims**

1. A knife drum for a cross cutting machine and the like comprising: a drum having an axial groove; a knife inserted in the groove with one side abutting one side of the groove, wherein the space formed between the other side of the knife and the other side of the groove defines a downwardly tapering groove; and means for releasably clamping the knife in place comprising a plurality of round chocks mounted for selected positioning in the radial direction with respect to the drum and having an arcuate cross section with the largest

diameter greater than the smallest width of the tapered groove, whereby in response to the radial positioning thereof, the knife



is alternatively clamped between the chocks and the one side of the groove or released.

4,187,754

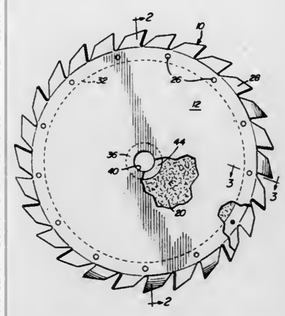
NOISE DAMPENED ROTARY SAW BLADE

Loma B. Beaty, 113 NW. First St., Fort Payne, Ala. 35967

Filed Sep. 21, 1978, Ser. No. 944,310

Int. Cl.² B27B *33/08*

U.S. Cl. 83—847 **12 Claims**



1. A vibration damped rotary disk, said rotary disk including a pair of circular disk panels disposed in side-by-side superposed relation, said disk panels including shallow concentric and opposing annular recesses therein of a radial extent greater than one-half the radial extent of said panels and spaced inwardly of the outer marginal portions of said panels, a filler of mechanical vibration absorbing material disposed in and filling said recesses, and means securing the outer marginal portions of said disk panels together.

4,187,755

APPARATUS FOR CUTTING SHEET GLASS

Kazuya Shirai, No. 5-21, 3-chome, Kashitanishi, Higashiosakashi, Osaka, Japan

Filed Apr. 10, 1978, Ser. No. 894,851

Claims priority, application Japan, Apr. 15, 1977, 52-49497[U]

Int. Cl.² B26D *3/08;* **C03B** *33/02*

U.S. Cl. 83—882 **7 Claims**

1. An apparatus for cutting sheet glass comprising in combination:

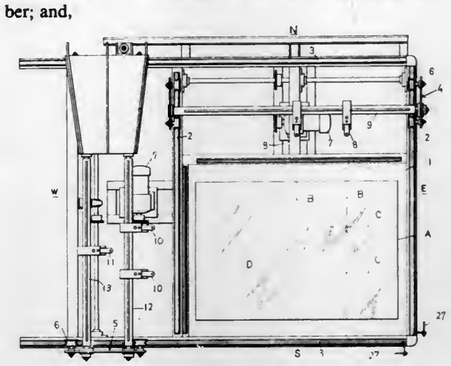
(a) a table **(1)** for placing a glass sheet thereon;

(b) a first and a second carriage **(4, 5)** adapted to travel along rails **(2, 3)** normal to each other, provided on longitudinally opposite sides and transversely opposite sides of the table;

(c) a rotatable horizontal shaft member **(9, 12, 13)** connected to each of said carriages, said shaft member being capable of turning at least from a first to a second position and return;

(d) cutters **(8, 10, 11)** secured to said shaft members **(9, 12, 13)** so as to be slidable therealong, said cutters being so disposed as to engage a glass sheet for cutting when said shaft is in said first position and removed from said glass sheet when said shaft is in said second position;

(e) a lever **(14, 15, 16)** coupled at one end to said shaft member; and,



(f) engaging means **(19, 21, 25)** for engaging and securing said lever and changing the angle thereof so as to turn said shaft between said first and second positions.

4,187,756

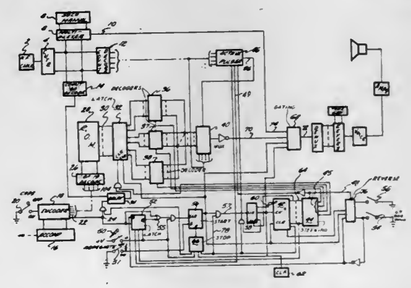
AUTOMATIC ARPEGGIATOR

John W. Robinson, and Stephen L. Howell, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 11, 1977, Ser. No. 850,591

Int. Cl.² G10H *1/00, 5/00*

U.S. Cl. 84—1.24 **19 Claims**



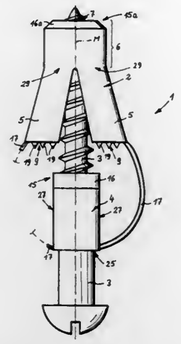
1. In an electronic organ having playing keys forming a keyboard and being grouped in a plurality of successively adjacent octaves, a multipitch tone generator, a transducer, a keyer connecting each pitch to the transducer, main multiplexer means for scanning the keys and developing a main data stream on each scan containing key-down signals in respective time slots corresponding to depressed keys, and demultiplexer means receiving said main data stream from the multiplexer means and actuating said keyers in conformity with said key-down signals, an arpeggiator comprising: second multiplexer means synchronized with said main data stream for developing an octave length second data stream containing key-down signals in time slots corresponding to notes of a selected chord played consecutively, arpeggio means for sequentially selecting successive octaves at a rate which is substantially lower than the rate at which said main multiplexer means scans said keys and for repetitively supplying said second data stream to said demultiplexer means only during the scanning of the selected octave by said main multiplexer means, said arpeggio means including variable frequency and variable duty cycle clock means for selectively controlling the rate at which said octaves are successively selected and for selectively control-

ling the duration and spacing of successive notes of the selected chord.

4,187,757
ARRANGEMENT FOR MOUNTING AN OBJECT TO A SUPPORT STRUCTURE

Albert Frischmann, Emmendingen; Kurt Mermi, Teningen, and Rudolf Königer, Buchholz-Batzenhäusle, all of Fed. Rep. of Germany, assignors to Upat GmbH & Co, Emmendingen, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 922,738
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—80 **54 Claims**

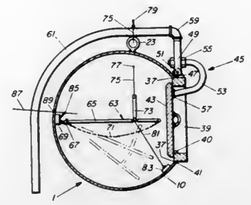


1. An arrangement for mounting an object to a support structure having a rear side which is difficult of access, the arrangement comprising an anchoring element having a base portion provided with an inner passage, and a plurality of leg portions extending from said base portion in a first direction which substantially corresponds to a loading direction of the arrangement, said leg portions being substantially rigid in said first direction and resiliently yieldable in a second direction which is substantially transverse to said first direction so that when said anchoring element moves to a first position in which it is inserted into a mounting hole of the support structure said leg portions are urged toward one another in said second direction, and when said anchoring element passes rearwardly beyond the rear side said leg portions spread apart from one another in said second direction; a centering bush arranged to be inserted into the mounting hole of the support structure after said anchoring element passes through the mounting hole, and having a further passage, said centering bush being connected with said anchoring element; connecting means including at least one flexible connecting member which extends between said anchoring element and said centering bush and connects them with one another; and a mounting element arranged for mounting the object to the support structure, said mounting element extending through said further passage of said centering bush and said inner passage of said base portion of said anchoring element and being operative for urging the latter in said first direction so that said leg portions of said anchoring element abut against the support structure at the rear side thereof, said anchoring member, said centering bush, and said connecting member being constituted by a synthetic plastic material and being of one piece with each other so as to form a one-piece unit whose anchoring element, including its base portion and leg portions, and centering bush all extend in said first direction when said anchoring element passes rearwardly beyond the rear side of the support structure, said centering bush is inserted in the mounting hole of the support structure, and said mounting element extends through said centering bush and said anchoring element.

4,187,758
BOMB CONTAINER WITH GRAVITY-CLOSED INTERNAL DOOR

Jon Petty, Newton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,667
Int. Cl.[2] F42B *33/00*
U.S. Cl. 86—1 B **3 Claims**



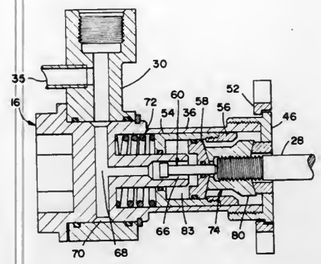
1. A bomb container comprising
a housing strong enough to contain the explosion products of an accidental explosion of an explosive device placed therein, said housing being closed except for a single access port therein;
a massive loop of strong material attached to the wall of said housing around the periphery of said port;
a massive door of strong material disposed within said housing with the outer face of its periphery normally fitting the inner face of said loop, to close said port;
means, external to said housing, for hingeing said door on said housing to swing inwardly and open said port, comprising a first hinge lug attached to the outside of said loop, a second hinge lug hinged to said first hinge lug, a hinge extension arm of U-shape having one end attached to said second hinge lug and the other end attached to the outer face of said door;
a safety operating arm attached to said second hinge lug at one end and extending over the top and down the back side of said housing, and said housing is spherical and is normally supported with said door disposed in a substantially vertical plane and with said hinge lugs located at the top thereof; whereby the weight of said door and of said operating arm keep said door normally closed.

4,187,759
SEPARATION NUT SYSTEM

Henry Toy, Los Altos; Phillip Bernstein, Sunnyvale, and Johan C. Van der Zwaan, Los Altos, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 833,834
Int. Cl.[2] F42B *15/10*
U.S. Cl. 89—1 B **6 Claims**

1. A separation nut system comprising:
(a) a plurality of separation nut assemblies, each having an initiator;
(b) a plurality of bolt catcher assemblies, one connected to each of said separation nut assemblies by a bolt;
(c) a manifold tube connecting each of said separation nut assemblies to the others such that the actuating gas generated by the initiator of one of said separation nut assemblies is distributed to actuate all of said separation nut assemblies; and

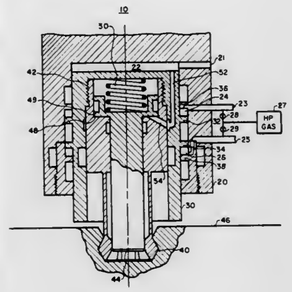


(d) means for automatically restoring each of said separation nut assemblies to its initial condition after each actuation.

4,187,760
INFLIGHT, STORES, FORCES AND MOMENTS MEASURING DEVICE

Lloyd J. Holt, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,885
Int. Cl.[2] B64D *1/04;* **F41F** *5/02*
U.S. Cl. 89—1.5 E **10 Claims**



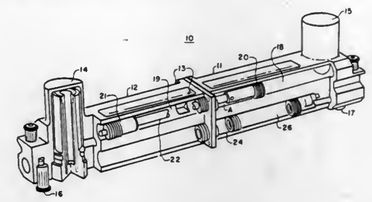
1. A measuring device for measuring the inflight forces and moments on a store carried by an aircraft comprising:
a mounting member
latch means for engagement with said store and configured to restrain the store against relative movement therebetween and for transmissions of loading stress therealong, said latch means being effectively connected to, and carried by said mounting member;
and pressure sensing means positioned between said mounting member and said latch means for sensing inflight forces on said store.

4,187,761
VARIABLE FORCE CONTROL SYSTEM FOR WEAPON EJECTION MECHANISMS

Lloyd J. Holt, China Lake, and Clayton E. Panlaqui, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,886
Int. Cl.[2] B64D *1/04;* **F41F** *5/02*
U.S. Cl. 89—1.5 R **11 Claims**

1. A variable-power, dual ejector for an aircraft weapon stores structure in a system having sensors for measuring inflight aerodynamic induced forces on the stores comprising:
a stores structure carried by the aircraft for carrying stores thereon;
fluid actuated ejector means on said stores structure for ejecting stores from said structure;
a source of working fluid in effective fluid communication with said ejector means;

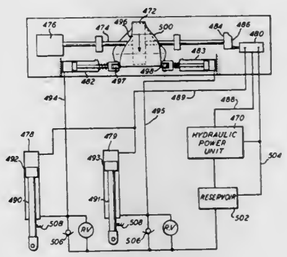


said source including a plurality of fluid chambers, each chamber having predetermined volume and pressure;
and valve means between said fluid actuated ejector means and said source of working fluid selectively controlling the release of said working fluid in said source.

4,187,762
DRIVE AND MOTION SYNCHRONIZING APPARATUS FOR A HYDRAULIC SYSTEM

Nicholas L. Buzby, 923 Williams Dr., Palatine, Ill. 60067

Continuation-in-part of Ser. No. 768,550, Feb. 14, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,761
Int. Cl.[2] F15B *21/02, 7/02*
U.S. Cl. 91—37 **8 Claims**



1. A cam-operated pressure transmitting and control apparatus for the operation of cyclic machine functions comprising:
a base frame;
a cam drive means supported on said base frame and having a pair of cam faces thereon;
means to rotatably drive said cam drive means;
a first and second fluid pressure generating means each being arranged to coact with a different one of said pair of cam faces;
a work cylinder means associated with machine functions;
a hydraulic fluid pressure system interconnecting said work cylinder means and said first and second fluid pressure generating means, whereby said first fluid pressure generating means is responsive to rotation of a first cam face of said pair of cam faces to deliver pressurized fluid to said machine work cylinder means to provide a predetermined pressure stroke therein in a first direction during a first predetermined period of rotation of the cam drive means; and
cam follower means to accurately control the movement of said work cylinder means in said first direction, being associated with said second fluid pressure generating means and operably engaging a second cam face of said pair of cam faces, and being responsive thereto to regulate a flow of pressurized fluid directed to said work cylinder

means by said first fluid pressure generating means by controlling an outflow of fluid from said work cylinder means and

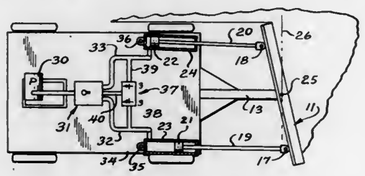
into said second fluid pressure generating means, wherein said second fluid pressure generating means is responsive to rotation of the cam drive means to regulate a predetermined volume and rate of flow of pressurized fluid delivered to said machine work cylinder means by said first fluid pressure generating means, said second fluid pressure generating means being further responsive to the rotation of said cam drive means to deliver a predetermined volume of pressurized fluid to the machine work cylinder means to provide a pressure stroke in a second direction during another predetermined period of rotation of the cam drive means, said first fluid pressure generating means including a hydraulic power unit having a control valve therefor operably engaged with the first cam face of said pair of cam faces, said control valve being responsive to the rotation of said first cam face to direct pressurized fluid to said work cylinder means to provide said pressure stroke in said first direction and wherein said second fluid pressure generating means includes a power/control cylinder having the cam follower means carried thereon for operable engagement with the second cam face of said pair of cam faces, being responsive to the rotation of said second cam face to control the predetermined volume and rate of flow of pressurized fluid delivered to said machine work cylinder by said hydraulic power unit to provide the pressure stroke in said first direction during said first predetermined period of rotation of the cam drive means by controlling the fluid expelled from said work cylinder means and directed to said power control cylinder and further being responsive to the rotation of said second cam face to deliver said predetermined volume of pressurized fluid to said machine work cylinder means to provide said pressure stroke in said second direction during said another predetermined period of rotation of the cam drive means.

4,187,763

OVERLOAD RELIEF VALVE

Vinod K. Nanda, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1978, Ser. No. 892,088
Int. Cl.² F01B *1/00, 15/00;* F15B *11/16*
U.S. Cl. 91—176 **6 Claims**



1. In an apparatus having a working element defining first and second spaced support portions, a first cylinder having a piston provided with a rod connected to said first support portion, a second cylinder having a piston provided with a rod connected to said second support portion, and adjustably controlled hydraulic supply means connected to said cylinders and including a return tank for providing hydraulic fluid to said cylinders for adjustably positioning said piston rods to position and retain said working element as desired, improved pressure relief means comprising:

a body defining a piston chamber, a first port opening to said chamber and connected to said first cylinder, a second port opening to said piston chamber and connected to said second cylinder, and a third port opening to said piston chamber and connected to said return tank;

a piston in said chamber having a valve portion removably seating on said body at said first port for selectively closing said first port and defining in said chamber an annular space communicating with said second port at all times, said piston defining at an inner end of said space a pressure surface; and

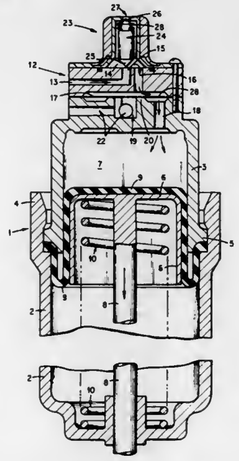
spring means biasing said piston to cause said valve portion to close said first port, said spring means piston and ports being arranged in a closed condition of the pressure relief means to have fluid pressure from either of said first cylinder acting on said valve portion closing said first port or fluid pressure from said second cylinder acting on said pressure surface to cause said piston to move against the action of the biasing means sufficiently to provide communication between said first and second ports through said annular space thereby as an incident of a first preselected high fluid pressure being delivered to either of said first and second ports, and to cause said piston to move further against the action of the biasing means and provide communication between said first, second and third ports through said piston chamber to dump fluid therethrough to said return tank as an incident of a second preselected, cumulative fluid pressure higher than said first preselected pressure resulting from high fluid pressure being delivered to said first and second ports concurrently, said piston having a piston rod movably engaging said body for guiding said piston in the movement thereof by said fluid pressures, said spring means comprising a coil spring concentric about said piston rod between said piston and said body.

4,187,764

FAST-ACTING VALVE ACTUATOR

Nakwon Cho, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 12, 1972, Ser. No. 270,796
Int. Cl.² F01B *3/00*
U.S. Cl. 91—442 **5 Claims**



1. A fast-acting valve actuator comprising:

(a) a piston housing;

(b) a piston reciprocably mounted within said housing having a spring driven side and a pneumatically loaded side;

(c) a connecting rod fixed to the spring driven side of said piston and extending out of said housing;

(d) a spring disposed within said piston housing acting on the spring driven side of said piston;

(e) an air inlet and exhaust assembly defining:

(i) a disk-shaped control cavity having opposed air supply and exhaust sides;

(ii) an air supply passageway in communication with the air supply side of said control cavity;

(iii) an exhaust port in communication with the central portion of the exhaust side of said control cavity and atmosphere; and

(iv) a connecting passageway extending between the exhaust side of said control cavity and the interior of said piston housing at a point on the pneumatically loaded side of said piston;

(f) a flexible diaphragm disposed intermediate the air supply and exhaust sides of said control cavity, said diaphragm being slit at an intermediate radial position to provide fluid communication between said air supply passageway and said connecting passageway; and

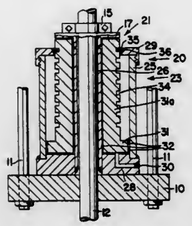
(g) means for selectively admitting pressurized air to said air supply passageway and venting said air supply passageway to the atmosphere.

4,187,765

APPARATUS FOR PUMPING FLUID FROM A WELL

Roland W. Mattoon, P.O. Box 1302, Drayton Valley, Alberta, Canada

Filed Dec. 29, 1977, Ser. No. 865,466
Claims priority, application Canada, Feb. 21, 1977, 272181
Int. Cl.² F04B *1/06*
U.S. Cl. 92—13.1 **5 Claims**



1. A device for varying the downstroke of the operating rod of a bottom hole pump, comprising:

a normally vertical hydraulic cylinder of annular form having outer and inner cylindrical walls and annular top and bottom plates, said inner wall being adapted to surround the said pump operating rod, said cylinder having an inlet for hydraulic fluid at its lower end, and being suitable for being carried by the operating mechanism of said pump,

an annular piston movable in said cylinder in sealing engagement with the outer and inner walls, said piston including an extension of such length as to be adjacent or above the top of said cylinder when the lower end of the piston is at the bottom of the cylinder, said extension having a series of detents in the outer surface thereof selectively engageable by holding means, which holding means are also engageable with the top plate of the cylinder to hold the piston in a selected raised position, said piston carrying means engageable with said operating rod to vary the downstroke thereof.

4,187,766

FLUID DEVICE AND METHOD FOR MAKING

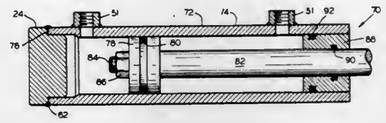
Richard P. Gaylord, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 16, 1978, Ser. No. 916,376
Int. Cl.² F16J *11/02, 15/18*
U.S. Cl. 92—169 **15 Claims**

1. A tube and end element assembly for a reciprocating fluid device, which tube and element assembly comprises an end element having an inner end and an outer end;

a cylindrical tube having first and second ends, having a first inside diameter portion that is proximal to said first end, and being joined to said end element by a bonded joint with said first end disposed proximal to said inner end; and

means, comprising a stressing member having a substantially circular outside diameter that is larger than said first inside diameter portion, and being inserted into said first inside diameter portion proximal to said first end, for mechani-



cally inducing an elastic diametral tensile strain in said tube proximal to said bonded joint and intermediate of said bonded joint and said second end; whereby

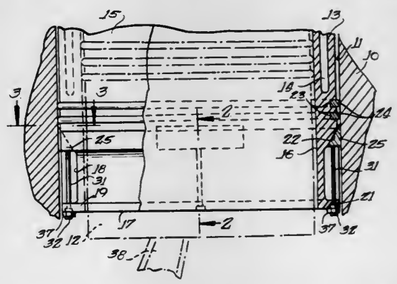
said mechanically-induced elastic diametral tensile strain reduces a cyclic diametral straining of said tube proximal to said bonded joint when cyclic fluid pressures are applied inside said tube.

4,187,767

DIESEL CYLINDER HEAD AND LINER

Robert H. Jones, Jr., and Richard B. Jones, both of 1321 E. 39th St., Hibbing, Minn. 55746

Filed Sep. 15, 1977, Ser. No. 833,497
Int. Cl.² F16J *11/04*
U.S. Cl. 92—171 **10 Claims**



1. In a diesel cylinder engine, in combination with a diesel engine block having a generally cylindrical bore therein, a diesel cylinder head adapted to be secured to the block, a cylinder liner adapted to be secured to the cylinder head and received in the bore, said liner having a generally cylindrical exterior surface and an interior cylindrical surface to receive a reciprocating piston therein, a plurality of clamping wedges circumferentially equally spaced about said liner and adapted to be positioned between the exterior surface of the cylinder liner and the surface of the bore adjacent the lower end of the liner to retain the liner in its operative position in the bore, said clamping wedges each having a surface generally paralleling the surface of said bore and an oppositely disposed inclined surface engaging the exterior surface of said liner, and a clamping bolt having a threaded end engaging a threaded opening in and actuating each wedge.

4,187,768

METHOD FOR THE MANUFACTURE OF A PAPER CONTAINER

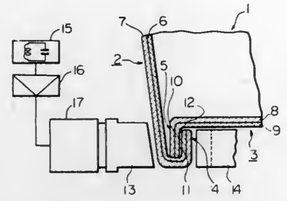
Shoichi Suzuki, Tokyo, Japan, assignor to Nihon Dixie Company, Limited, Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,259

Claims priority, application Japan, Nov. 15, 1977, 52-137184; Nov. 28, 1977, 52-142370

Int. Cl.[2] B31B *1/66, 17/02*

U.S. Cl. 93—39.1 R **14 Claims**



1. A method for the manufacture of a paper container having a substantially non-deformable upper mouth edge comprising the steps of:

blanking out a bottom panel component and a body component from a sheet of paper material having a coating of thermoplastic film applied to at least one side of said paper material, said body component having opposite side ends, an upper edge, a lower end and a lower edge;

downwardly bending the peripheral edge of said bottom panel at right angles to the plane of the bottom panel to form a peripheral flange;

positioning said peripheral flange of the bottom panel slightly above the lower edge of said container body component;

rolling said body component so as to bring the opposite side ends of the container body component into slightly overlapping relationship so as to form a container body wall having a side seam extending in a longitudinal direction along the body wall;

inwardly and upwardly bending the lower end of the container body wall along the peripheral flange of the bottom panel so as to encompass the peripheral flange of the bottom panel to thereby form a bottom seam having said plastic film layer on at least one inner side of said bottom seam;

ultrasonically welding said bottom seam and said side seam by ultrasonic welding means;

outwardly curling the upper circumferential edge of said container body portion to form a container mouth edge, said upper circumferential edge being outwardly curled to fold inwardly back on itself with said plastic film layer of said folded back edge being in face-to-face relationship with a surface portion of said upper circumferential edge to form an upper seam; and

ultrasonically welding said upper seam by using ultrasonic welding means, thereby forming a substantially non-deformable ultrasonically welded upper mouth edge.

4,187,769

APPARATUS FOR FOLDING BOX BLANKS

Allen R. Bullock, Stockport, England, assignor to Simon Container Machinery Limited, Stockport, England

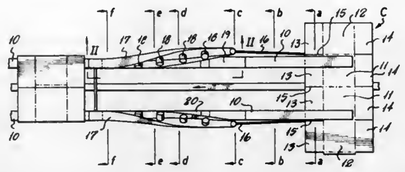
Filed Apr. 10, 1978, Ser. No. 895,063

Claims priority, application United Kingdom, Apr. 19, 1977, 16117/77

Int. Cl.[2] B31B *1/36*

U.S. Cl. 93—52 **5 Claims**

1. Apparatus for folding box blanks wherein each blank comprises a first portion and at least one further portion to be folded inwardly to lie over the first portion in superimposed relationship therewith, the apparatus including means for conveying the blanks successively through the apparatus during folding, means for progressively manoeuvering said further portion of each blank into the said folded position as the blank is conveyed, stationary means disposed to lie, in use, above the blank adjacent a line along which the further portion is to be folded so as to hold the blank against the conveying means, and a pair of elongate flat tongues, one above the other, extending



along the conveyor and spaced apart in their upstream end regions with respect to the direction of travel of the conveyor, by a member disposed between the opposed faces of the tongues, the tongues tending towards a face-to-face abutting relationship in their downstream end regions.

4,187,770

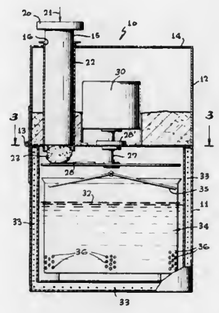
POTATO CHIP COOKING APPARATUS

Harold M. Coffield, 41120 N. 15th St. West, Palmdale, Calif. 93550

Filed May 30, 1978, Ser. No. 910,458

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—353 **1 Claim**



1. A potato chip cooking apparatus comprising

the combination of;

a cylindrical vat for holding a quantity of cooking oil;

a basket having perforated sidewall disposed in said vat partially submerged in said cooking oil;

a lid hingably carried on said vat and coaxially disposed with respect to said vat so that said lid pivots away from said vat to expose said basket;

a feeder means carried on said lid for introducing a raw potato to said vat;

cutting means operably carried on said lid and downwardly depending therefrom for engaging said raw potato and slicing a portion thereof so as to drop into said basket and cooking oil therebeneath;

electrical means for operating said cutting means and for heating said cooking oil;

said cutting means includes a circular platform having an arcuate opening therein and a cutting blade carried on said platform adjacent said opening;

said platform coupled to said electrical means in driving relationship so as to foricbly urge said potato portion;

said feeder means includes a sleeve mounted on said lid;

a plunger slidably carried in said sleeve and adapted to rest on top of said raw potato urging said raw potato into contact with said platform;

a plurality of prongs downwardly depending from one end of said plunger releasably engagable with said raw potato;

bracket means securing said electrical means for driving said platform to said lid;

handle means attached to said vat exteriorly for grasping by the user for moving said apparatus from place to place; and

said rotating platform resides within the confines of said vat when said lid is closed on top of said vat.

4,187,771

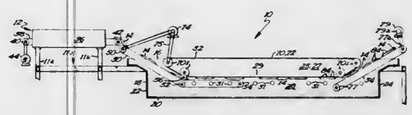
FRYING APPARATUS

Jack D. Westover, Burnsville, and Richard L. Keller, Minneapolis, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 31, 1977, Ser. No. 846,963

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—404 **6 Claims**



1. A food fryer for cooking a flat farinaceous dough food product comprising a frying vessel having an inlet end and an outlet end and being adapted for holding fat, a heater for the fat in the vessel, an inlet conveyor having an upper run portion inclined downwardly into the vessel from the inlet end, a hold-down conveyor having a feed end adjacent the inlet end with the hold-down conveyor extending generally horizontally from one end of the vessel to the other, drive means connected to the hold-down conveyor for advancing the conveyor, said hold-down conveyor having an endless conveyor element including upper and lower runs, the lower run being located in close enough proximity with the frying fat to engage the product to be fried, said hold-down conveyor further including a generally planar intermediate run between a pair of conveyor supports, at the feed end and extending between the upper run and lower run at an incline and spaced from and generally parallel to the inlet conveyor upper run portion, an upper end portion of the intermediate run being positioned above the surface of the fat, said product being bouyed by said fat into contact with said lower run, said hold-down conveyor comprising an open wire mesh defining a plurality of openings therein, said mesh being disposed in a generally flat horizontal plane along said lower run and said openings being operable to allow portions of the top surface of food product bouyed by said fat into contact with said wire mesh expand upwardly into said openings during frying to form on said surface a corresponding plurality of upwardly projecting blisters having side walls which engage the wires of the mesh and prevent slippage between the food product and the conveyor.

4,187,772

HAND OPERATED FLEXIBLE STAMP CARRIER

Paul R. Hollenbeck, Star Rte. Box 98, Eastsound, Wash. 98245

Filed Mar. 28, 1978, Ser. No. 890,959

Int. Cl.[2] B41K *1/04, 1/28*

U.S. Cl. 101—379 **1 Claim**

1. A hand operated stamp carrier on which a plurality of flexible stamps are resiliently supported, said stamp carrier comprising,

a handle,

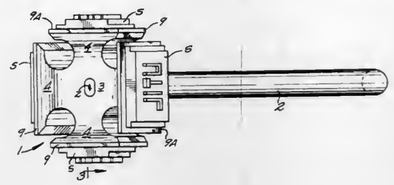
a central body portion affixed to one end of said handle,

yieldable appendages molded integral with and projecting outwardly from said central body portion,

yieldable stamp support members molded integral with the distal ends of said appendages but having a greater hardness rating than that rating of said appendages,

said central body portion, appendages and stamp support member being of unitary molded construction,

said appendages each having front, rear and sidewalls all converging in an inward direction to provide appendages



of substantially reduced section at mergence with the central body portion to render the appendages highly yieldable in the presence of asymetrical forces acting on said stamp support members to prevent distortion of a flexible stamp therein.

4,187,773

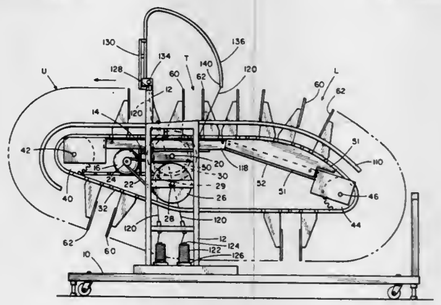
BUNDLE TYING MACHINE

Jacob Sampson, 6138 N. Clark St., Chicago, Ill. 60660

Filed Aug. 17, 1978, Ser. No. 934,632

Int. Cl.[2] B65B *13/22*

U.S. Cl. 100—4 **30 Claims**



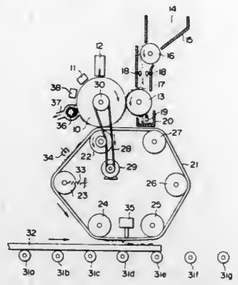
1. In a bundle tying machine having in sequence a loading zone and a bundle tying zone, and an endless conveyor which travels through said loading zone and bundle tying zone, a plurality of longitudinally spaced apart pairs of longitudinally spaced plates carried by the conveyor in outwardly spaced apart relation from the conveyor, means for guiding the conveyor for travel along a concave curvilinear path during passage through the loading zone and along a straight horizontal path during travel through the bundle tying zone whereby the plates in the pair extend angularly in the direction away from each other to provide increased spaced relation therebetween while travelling with the conveyor through the loading zone and a minimum spaced relation therebetween during travel with the conveyor through the bundle tying zone, stationary support means in substantially parallel relation with the conveyor spaced outwardly of the conveyor but inwardly of the plates for support of the material inserted between the plates whereby the material is easily inserted between the plates during travel through the loading zone and compressed between the plates during subsequent travel through the bundle tying zone.

4,187,774

ELECTROSTATIC PRINT MARKING APPARATUS

Masakazu Iwasa; Hisashi Kato, and Yoshio Kudo, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 14, 1978, Ser. No. 886,447
Claims priority, application Japan, Mar. 15, 1977, 52-28364
Int. Cl.[2] G03G *15/00*
U.S. Cl. 101—1 **2 Claims**



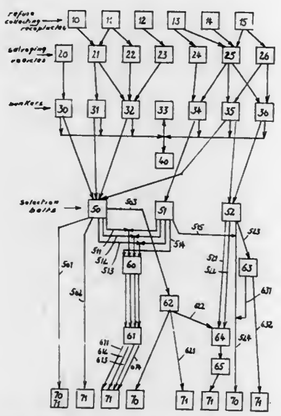
1. An electrostatic print marking apparatus for printing markings on steel plates wherein an electrostatic latent image is developed into a toner image and the toner image is transferred to an intermediate image carrying medium, and the toner image transferred to the intermediate image carrying medium is transferred to a steel plate, wherein the improvement comprises a DC charger provided in the vicinity of said intermediate image carrying medium for re-charging the toner image carried on the intermediate image carrying medium before the toner is transferred to the steel plate in the same polarity as the polarity in which the toner image is charged before the toner image is transferred to the intermediate image carrying medium.

4,187,775

METHOD OF AND DEVICE FOR TREATING HETEROGENEOUS WASTE

Hans F. Flender, Neuss, Fed. Rep. of Germany, assignor to Matthias Trienekens, Viersen, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,540
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730671
Int. Cl.[2] B30B *13/00*
U.S. Cl. 100—39 **19 Claims**



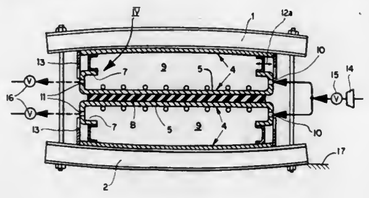
1. A method of treating at a treatment site heterogeneous waste from household garbage and industrial refuse, which includes the steps of: at said treatment site providing a plurality of discrete reception areas for respectively receiving waste according to the different general compositions of said waste and according to the respective collecting techniques employed; subsequently carrying out a selection and distribution of the waste at said reception areas; distributing the selected waste into streams of specific waste types; and subjecting said streams of specific waste types to individual treatments comprising at least one of the treatment types of breaking, separating, and sorting to thereby respectively obtain the selected products, while combining streams of like waste types from different selection areas for common treatment.

4,187,776

BELT PRESS

Rolf Schroder, Wuppertal, Fed. Rep. of Germany, assignor to Wagener & Co., Schwelm, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 927,974
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734025
Int. Cl.[2] B30B *5/02, 15/34*
U.S. Cl. 100—93 P **7 Claims**



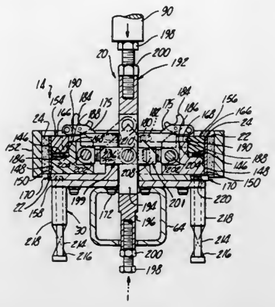
1. A belt press comprising:
vertically spaced upper and lower traverses;
upright links extending between said traverses and immovably positioning same relative to each other;
respective upper and lower traverse plates on said traverses having respective lower and upper imperforate surfaces having outer peripheries;
respective upper and lower press plates adjacent and generally parallel to said traverse plates and having respective lower and upper imperforate surfaces having outer peripheries;
respective upper and lower guide skirts on said traverse plates and surrounding the respective press plates, each of said press plates being vertically guided in the respective skirt;
respective rigid upper and lower reinforcing rims on said upper and lower press plates at the respective outer peripheries thereof, each of said rims extending from the respective press plate toward the respective traverse plate;
respective upper and lower annular membranes each having one end secured to the respective rim and another end secured to the periphery of the respective traverse plate, each membrane forming with the respective upper and lower surfaces a pressurizable chamber;
means including respective upper and lower heaters in said chambers for heating the respective press plates; and
means including ports in said press plates for pressurizing said chambers to compress a belt between said press plates with concomitant deformation of said traverses and of said traverse plates.

4,187,777

APPARATUS FOR BONDING BRAKE LININGS

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Filed Nov. 13, 1978, Ser. No. 960,456
Int. Cl.[2] B30B *15/04, 13/34*
U.S. Cl. 100—93 PB **23 Claims**



1. An apparatus for bonding brake linings to tables of brake shoes with an application of heat and pressure which comprises: a load ring constructed and arranged to encircle a pair of generally opposed brake shoes and brake linings received between the ring and the shoes and aligned to be bonded to the tables of the shoes, a pair of pressure blocks received within said ring in spaced apart generally opposed relation to each other and each constructed and arranged to bear on at least a substantial portion of the surface of the inner face of the table of one of the brake shoes received within the pressure ring, at least a portion of each pressure block bearing on the rear face of the table of a brake shoe being of a material having good thermal conductivity, actuator means operably associated with said blocks and constructed and arranged to force said blocks generally radially outwardly to apply sufficient force to the brake shoes to urge the tables of the brake shoes and the linings firmly together, said blocks and said ring being constructed and arranged to permit rotation of one relative to the other when said blocks are retracted with respect to said ring, and heating means operably associated with each of said pressure blocks and constructed and arranged to transfer heat by conduction through the tables of said brake shoes to heat a bonding material received between the brake linings and the tables of the shoes to an elevated curing temperature.

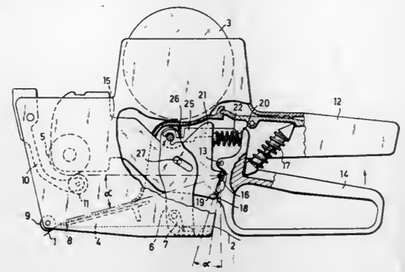
4,187,778

APPARATUS FOR PRINTING AND DISPENSING LABELS

Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Dymo Industries, Inc., San Francisco, Calif.

Filed Feb. 28, 1978, Ser. No. 882,627
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708728
Int. Cl.[2] B41F *1/08*
U.S. Cl. 101—291 **7 Claims**

1. Apparatus for printing and dispensing labels of a label strip, having (a) a transport device for the stepwise advancement of the label strip in the course of each operating cycle, (b) a printing table over which the label strip is conducted, (c) a printer which is arranged for movement with respect to the printing table and having associated therewith an inking device, (d) a hand lever pivotable about a pivot axis held in a braced position by a return spring, (e) a printer lever, which pivots through a predetermined angle in response to pivotal movement of the hand lever against said return spring, (f) the printer rigidly secured to the said printer lever, the inking device and the transport device being operationally connected to said printer lever, and (g) said printer lever having an abutment face which is maintained contiguous to an abutment face of the hand lever by a second spring arranged between the hand lever and the printer lever, whereby motion of said hand lever against said return spring is transmitted to said printer lever via said second spring to thereby move the printer towards the printing table as said printing lever is pivoted through said predetermined angle, wherein the improvement



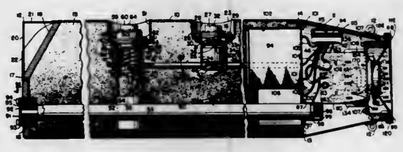
comprises the pivot axis of the printer lever being disposed between the pivot axis and the abutment of the hand lever when it is in its braced position, said printer lever pivot axis being in the closer to of the pivot axis of the hand lever than to the abutment whereby the angle through which the printer rotates is greater than the angle through which the hand lever rotates for a given angle of hand lever rotation.

4,187,779

MARINE MINE

Harry S. Jones, East Orange, N.J.; David B. Kirkpatrick, Oreland, Pa., and Robert G. Wilson, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1945, Ser. No. 589,228
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 M **19 Claims**



1. In a pressure responsive mine having a casing and an arming and firing circuit therein, a pressure responsive device mounted in the casing and exposed to the pressure of the sea water, a second pressure responsive device mounted in the casing, a fluid connection between the first and second pressure responsive devices, a third pressure responsive device mounted in the casing, a restricted fluid pressure responsive connection between the second and third pressure responsive devices, and a circuit making and breaking device positioned in the restricted connection between the second and third pressure responsive devices and connected in the arming and firing circuit.

4,187,780

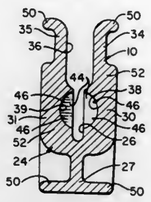
DETONATING CORD AND BLASTING CAP CONNECTOR BLOCK

Guy S. Petruccelli, Simsbury, Conn., assignor to Ensign-Bickford Company, Simsbury, Conn.

Filed May 10, 1978, Ser. No. 904,393
Int. Cl.[2] F42B *3/10*
U.S. Cl. 102—28 R **9 Claims**

1. An elongated connector block for mounting an elongated blasting cap and a detonating cord in side-by-side association for intimately connecting them for side initiation, comprising a

longitudinally extending body of generally U-shaped transverse cross section having an intermediate longitudinally extending slot the full length thereof and a pair of opposed sides on opposite sides of the slot contoured to provide an enlarged elongated blasting cap cavity extending longitudinally from a front end of the body along at least a portion of said slot for longitudinally inserting and receiving an elongated blasting

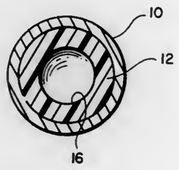


cap therein from the front end of the body, and an upward integral extension of at least one side of the body forming a pinch-cleat for longitudinally positioning a flexible detonating cord along the slot in intimate parallel side-by-side association with and above a blasting cap inserted in said cavity and for retaining the detonating cord in said position by winding it about the pinch-cleat extension.

4,187,781
CASELESS AMMUNITION

Joseph E. Flanagan, Woodland Hills, and George A. Lo, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1972, Ser. No. 306,960
Int. Cl.[2] E21B *43/06*
U.S. Cl. 102—38 CC **9 Claims**



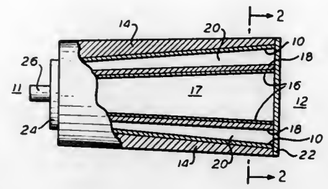
1. In caseless ammunition comprising:
a projectile,
a hollow cylinder disposed about the sides of said projectile and extending rearwardly therefrom and formed of a layer composed of a conventional propellant and an outer layer covering the exterior surface of said inner layer, and
a primer closing the rear end of said cylinder;
the improvement consisting of forming said outer layer of a polynitroaromatic material with a phosphorus-containing hydroxy-terminated polyether binder.

4,187,782
SHAPED CHARGE DEVICE

Fred I. Grace, York, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,225
Int. Cl.[2] F42B *13/10*
U.S. Cl. 102—56 SC **8 Claims**

1. A shaped charge device for a projectile comprising:
a flared sheath formed of ductile material;
a body of explosive material having a hollow formed therein for operatively holding said sheath which includes;
an annular cross section disposed upon the surface of said sheath, wherein said sheath has a forward and an aft end, said body of explosive material having a thickness which decreases from said aft to said forward end;
an elongated casing formed of ductile material coaxially mounted within and spaced from said sheath, said sheath providing a diverging interspace between said casing and said sheath; and

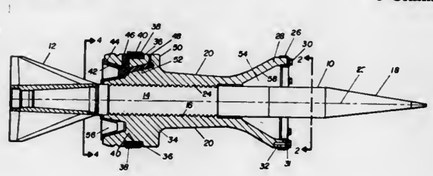


a layer of material interposed between said sheath and said casing which includes;
explosive material disposed upon said casing and spaced from said sheath;
a compressible spacer mounted between said sheath and said casing.

4,187,783
DISCARDING SABOT MUNITION

Ralph F. Campoli, Mine Hill; Elie L. Barrieres, Morris Plains; John W. Bannat, Lake Hopatcong, all of N.J.; Edwin G. Steiner, Jesup, Iowa; Thomas A. Lynch, Waterloo, Iowa, and Gary M. Miller, Waterloo, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1978, Ser. No. 885,715
Int. Cl.[2] F42B *13/16*
U.S. Cl. 102—93 **5 Claims**

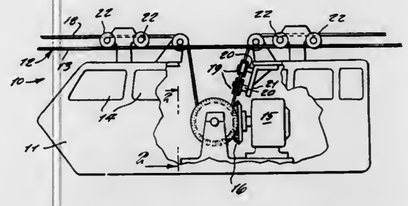


1. A discarding sabot munition which comprises:
a subcaliber projectile having an ogive front end, a tail end and a tubularly shaped midsection, said midsection having a plurality of external concentric buttress grooves circumferentially disposed therein;
segmented sabot means, for acting as a full caliber carrier for said subcaliber projectile, for efficiently obturating propellant gases during projectile launch, for transmitting only part of the spin imparted by gun rifling, for preventing inbore balloting during launch and for discarding swiftly and cleanly from said subcaliber projectile after launch, which includes;
a plurality of saddle shaped undercut arcuate sabot segments peripherally positioned around the circumference of said tubularly shaped midsection of said projectile and circumambient to a longitudinal axis of said subcaliber projectile, each of said sabot segments having a tubular internally concentrically grooved surface therein meshing with said external concentric buttress grooves of said subcaliber projectile, each of said sabot section having a forward bourrelet end and an aft bourrelet end, said forward bourrelet end having a plurality of longitudinally peripherally positioned threaded bolt holes therein and a conically shaped section disposed on an inner surface of said forward bourrelet end, said aft bourrelet end of each sabot segment having an arcuate obturator groove circumferentially disposed therein, and an annular seal groove disposed in an aft face, said seal grooves forming a scoop area for said propellant gases, and a pair of seal holes communicating with said seal groove and said obturator groove by means of an elastomer passageway located therebetween;
a slip ring fixedly disposed in said arcuate obturator grooves;
an obturator band, rotatably disposed in said obturator groove of said aft bourrelet ends of said sabot segments, slidably fitting upon said slip ring;
compliant seal means operatively disposed in said annular seal groove intermediate said sabot segments for preventing propellant gases from entering the space between said sabot segments and between said sabot segments and said projectile; and
forward bourrelet flange means fixedly attached to a lip of said forward bourrelet end for releaseably holding said sabot segments together during launch and for releasing said sabot segments from said projectile after launch.

4,187,784
SELF PROPELLED CABLE CAR

Arthur A. Fernandez, c/o George Spector 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Mar. 7, 1977, Ser. No. 774,906
Int. Cl.[2] B61B *7/06*
U.S. Cl. 104—235 **1 Claim**



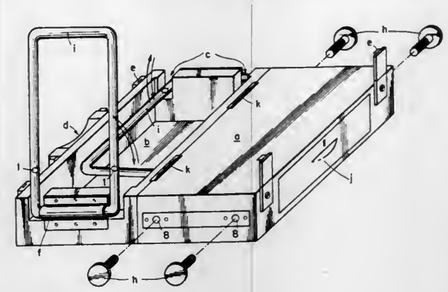
1. A self propelled cable car, comprising a combination, a cable car having an enclosed body including flanged wheels mounted on top to be adapted for travel on a cable way, including a motor mounted in said car rotating a drum adapted to receive a hawling cable wound thereon, said drum being designed to receive multiple adjacent coils to increase frictional engagement therebetween, including means for varying the diameter of the drum engaged by said hawling cable, wherein said drum is of conical shape, said drum being engaged by splines to a splined shaft extending therethrough, said splined shaft being rotated by said motor, a flange on said drum being guided in a groove of a nut threadingly engaged on a threaded shaft which through gearing is rotated by a second motor for axially sliding said drum on said splined shaft.

4,187,785
PORTABLE TABLE

Yang R. Juh, 193 Ta-Lung St., Taipei City, Taiwan

Filed Oct. 20, 1977, Ser. No. 844,054
Int. Cl.[2] A47B *3/08*
U.S. Cl. 108—36 **4 Claims**

1. A collapsable table comprising: a first table body having a bottom and side walls each extending upward from the interior surface of said bottom to an edge;
a second table body having a bottom and side walls each extending upward from the interior surface of the bottom of said second body to an edge;
hinge means pivotably connecting said first and second bodies along an edge of each for movement between an open position in which the interior of said first body is accessible for receiving leg members to be stored, and a closed position in which respective edges of said first and second bodies are in contact;
first and second leg members pivotably connected to opposite side walls of said first body along the outside thereof for movement between a position supporting said bodies in said closed position to a position substantially within said first body, said opposite side walls having slots

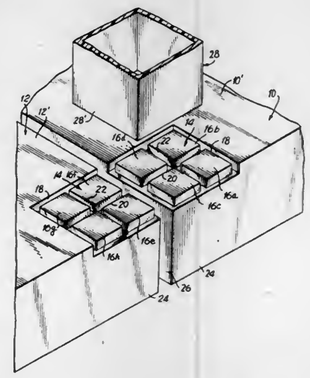


therein for permitting said pivotable movement of said leg members into said first body and said leg members each comprising two separated and downwardly extending legs connected together along their pivotal connection to said side walls; and
removable fastener means for fastening each of said legs to a side wall of said second table body along the outside thereof when said bodies are in closed position.

4,187,786
INTERLOCKING ETAGERE SYSTEM

Stephen Feig, Dix Hills, N.Y., and William T. Vincent, Leominster, Mass., assignors to Plascor Incorporated, Woodbury, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,164
Int. Cl.[2] A47B *96/00*
U.S. Cl. 108—64 **2 Claims**



1. An interlocking etagere system having shelves and legs comprising a shelf including depending aprons and corners, each corner defining a topside segmented shelf block defining block grooves dividing said shelf blocks into a plurality of segments; and each leg including first and second ends, said first end defining a first leg hollow and said second end defining a leg shoulder upstanding from which is a plurality of right angle leg segments separated by bifurcations, said leg segments defining a second leg hollow of lesser dimensions than said first leg hollow, all adapted and arranged such that said first leg hollow fits over block segments from more than one shelf and

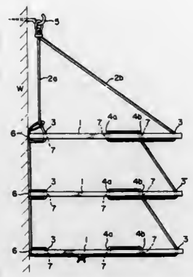
said aprons of more than one shelf fit within said bifurcations to interlock said more than one shelf.

4,187,787

ROPE-SUSPENDED SHELVING UNIT

Daniel T. Nakatsu, 117 Westwood Dr., San Francisco, Calif. 94112

Filed Jun. 19, 1978, Ser. No. 917,107
Claims priority, application Japan, Oct. 5, 1977, 52/134175[U]
Int. Cl.² A47B *57/00*
U.S. Cl. 108—96 **10 Claims**



1. A suspended shelving unit for hanging a set of shelves downwardly along a wall from a hook assembly at adjustable spacing intervals comprising in combination, at least two shelves each having an edge disposable away from said wall and a wall engaging edge and defining a first set of apertures for receiving a first flexible line at the wall engaging edges and a second set of apertures for receiving a second line at the edge away from said wall, a first line fed through the first apertures at the wall engaging edges and looped about the shelf edge at each aperture to support and space the shelves a predetermined distance apart forming a generally parallel relationship to the wall, a second flexible line fed through the second set of apertures and looped about the shelf edge at each edge away from said wall to support and space the shelves said predetermined distance apart, a hook assembly engaging both lines at their uppermost extremities with said second line defining an acute angle with said wall toward the uppermost shelf thereby to provide a force by weight of the shelves on said second line tending to hold the shelves against the wall, whereby the loops of said flexible lines about said shelves may be rearranged to change said predetermined distance between adjacent shelves.

4,187,788

TUFTING MACHINE

James T. Cobble, Dalton, Ga., assignor to B & J Machinery Company, Inc., Dalton, Ga.

Filed Oct. 26, 1978, Ser. No. 954,937
Int. Cl.² D05C *15/00*
U.S. Cl. 112—79 R **24 Claims**

1. A tufting machine for forming pile fabric or the like, and characterized by relative pivotal movement between its components as opposed to relative sliding movement, to thereby minimize frictional resistance and the need for lubricating oil, and comprising

means for feeding an elongate backing fabric longitudinally along a predetermined path,

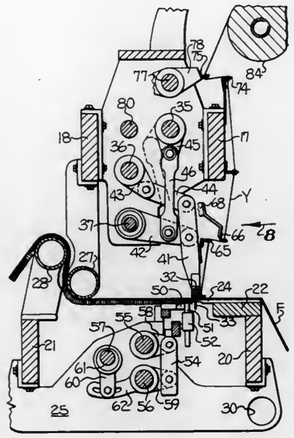
an elongate needle bar extending in a direction transverse to the path of the backing fabric, and mounting a longitudinal row of spaced tufting needles which are adapted to carry yarns through the backing fabric,

means for mounting said needle bar and needles for reciprocation in a direction transverse to the path of the backing material and such that the needles cyclically penetrate and withdraw from the backing fabric, said reciprocating means comprising

(a) a push rod arm having one end fixed to said needle bar and extending therefrom in a direction generally perpendicular to the backing fabric,

(b) a first mounting arm having one end pivotally connected to said push rod arm and extending in a direction generally transverse therefrom, and a second end pivotally connected to a first support member,

(c) a support mounting arm having one end pivotally connected to said push rod arm and extending in a



direction generally transverse therefrom, and a second end pivotally connected to a second support member,

(d) means operatively connected to said push rod arm for cyclically reciprocating the same in a direction toward and away from said backing fabric and as controlled by the pivotal movement of said first and second mounting arms, and resulting in a corresponding reciprocation of said needle bar and needles, and

looper mean disposed on the side of said backing fabric opposite said needle bar and operatively associated with each of said needles for forming rows of tufts in the moving backing fabric from the yarns carried by said needles.

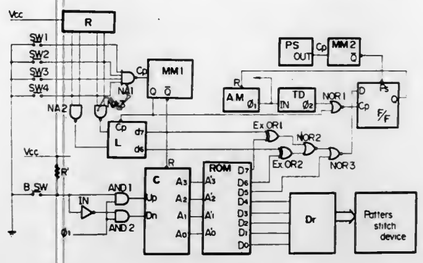
4,187,789

SEWING MACHINE WITH AN ELECTRONIC PATTERN STITCH CONTROL SYSTEM

Hideaki Takenoya, Hachioji, and Machiro Makabe, Fussa, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,359
Claims priority, application Japan, Apr. 4, 1977, 52/37516
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 E **4 Claims**

1. In a cyclically operating sewing machine, in combination, a static pattern memory having address inputs, data outputs and comprising a plurality of addressable storage locations storing pattern data for the constituent stitches of a plurality of selectable patterns; user-operated pattern-selector means operative when the user selects one of the selectable patterns for generating a pattern-identifying signal identifying the pattern thusly selected; addressing means connected to the address inputs and operative for addressing successive storage locations of the pattern memory by the application of successive address signals to the address inputs of the memory at a frequency greater than the frequency of the cycles of machine operation, whereby to cause the pattern data stored in successive storage locations of the memory to be produced at the data outputs of the memory, and including comparing means connected to the data outputs of the memory and to the pattern-selector means and operative for comparing the data successively produced at the data outputs of the memory against the pattern-identifying signal to automatically ascertain whether the data at the data outputs does or does not belong to the selected pattern and, if the data does not belong to the selected pattern, causing the addressing to continue until data which



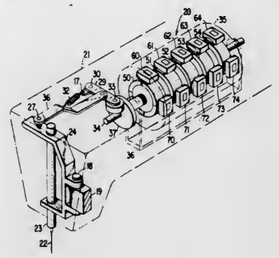
does belong to the selected pattern is produced at the data outputs, whereby during individual cycles of machine operation successive address signals are applied to the address inputs at high speed until data which does belong to the selected pattern appears at the data outputs; and stitching-forming means connected to the data outputs and responding to the data produced at the data outputs.

4,187,790

STEPPER DISK ADDER FOR PATTERN STITCH SEWING MACHINES

John D. Vogel, Brecksville, Ohio, assignor to The Singer Company, New York, N.Y.

Filed Apr. 4, 1979, Ser. No. 27,117
Int. Cl.² D05B *3/02*; F16H *21/44*
U.S. Cl. 112—158 E **12 Claims**



1. A stepper disk adder comprising:

a plurality of adjacent, rotatable, disk like rotors having a common longitudinal axis of rotation;

each rotor having at least a pair of opposite polarity magnetic poles spaced apart on the periphery thereof;

a pair of spaced apart magnetic field producing coils located adjacent the periphery of each said rotor;

threaded means having an axis of rotation along said longitudinal axis threadedly coupling adjacent rotors to one another; and

a source of actuating signals coupled to each said pair of magnetic field producing coils;

each said source of signals including means to alternately actuate the coils in at least some of the pair of coils to cause the associated rotor to oscillate between a first and second position whereby at least some of the plurality of rotors reciprocate along said longitudinal axis by way of said threaded means.

4. The stepper disk adder according to claim 2 further including:

a sewing machine having a frame;

stitch-forming instrumentalities in said frame;

an actuating mechanism for imparting stitch-forming movement to said stitch-forming instrumentalities;

control linkage in said sewing machine frame operatively associated with said stitch-forming instrumentalities for selectively influencing the production of a variety of patterns of stitches; and

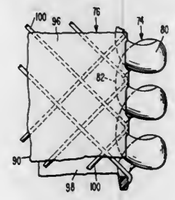
means connecting the rotor at the other end of said plurality of adjacent rotors that is not restrained from reciprocating along said longitudinal axis to said control linkage.

4,187,791

METHOD OF MANUFACTURING SLIDE FASTENER STRINGERS

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 648,428, Jan. 12, 1976, Pat. No. 4,100,656, which is a continuation-in-part of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application Feb. 15, 1978, Ser. No. 878,094
Int. Cl.² D05B *3/18*; A44B *19/40*
U.S. Cl. 112—265.2 **26 Claims**



1. A method of forming a stringer for a slide fastener comprising

cutting a row of spaced transverse slits in a strip along a longitudinal section intermediate the edges of the strip;

applying a row of reinforcing sections of fiber on one side of the strip transversely across the intermediate longitudinal section of the strip;

assembling a continuous coupling element onto the one side of the strip such that head portions of the continuous coupling element protrude from the respective slits on the other side of the strip and such that interconnecting portions of the coupling element between successive head portions extend on the one side of the strip under strap portions of the strip defined between the slits; and

folding the strip longitudinally along the intermediate section such that the strap portions and the reinforcing sections of fiber form loops around the interconnecting portions.

4,187,792

THREAD TRIMMER

Ronald J. Boser, Dix Hills, N.Y.; Walter P. Siegel, Lebanon, N.J., and Michael F. Picciotti, Jackson Heights, N.Y., assignors to Union Special Corporation, Chicago, Ill.

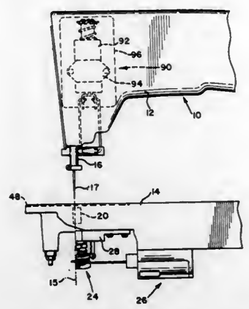
Filed Mar. 27, 1978, Ser. No. 890,346
Int. Cl.² D05B *65/00*
U.S. Cl. 112—286 **6 Claims**

1. A thread severing assembly means or use with a sewing machine assembly comprising:

a thread severing means including an actuating means, a cutter means having a housing means, a supporting means securing said housing means to said sewing machine assembly, a stripper means and a picker-knife means carried by said housing means and capable of movement with respect thereto and a means operative for transfering force

to said stripper means and said picker-knife means from said actuating means;

a thread tensioning means having an actuating means, means operative for periodically immobilizing a portion of thread means and means operative for transfering force



from said actuating means to said immobilizing means; said

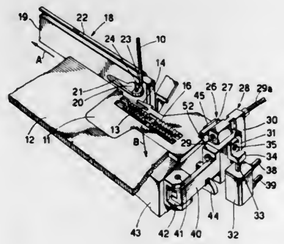
a thread wiper means having an actuating means, means operative for wiping said thread and means operative for transfering force from said actuating means to said wiping means.

4,187,793

AUTOMATIC STITCH CUTTING DEVICE

Emilio Fletta, Milan, and Giancarlo Della Torre, Biassono (Monza), both of Italy, assignors to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Jul. 31, 1978, Ser. No. 929,380
Claims priority, application Italy, Sep. 22, 1977, 27829 A/77
Int. Cl.² D05B *65/06*
U.S. Cl. 112—288 **6 Claims**



1. A device for controlling a chain of stitches when starting a seam in a sewing machine of the type having at least one stitch forming needle and feed mechanism defining the sewing axis and a needle plate with an integral tongue on which the chain of stitches is formed with a chain cutter mounted adjacent the needle plate for receiving the chain formed on the tongue, sad controlling device comprising:

(a) an orienting element (**23**) mounted on the machine for removing a chain of stitches severed from a workpiece from the chain cutter and extending the same in a generally forwardly direction,

(b) a slide block (**30**) mounted on the machine forwardly of the feed mechanism with means for effecting vertical sliding movement thereof which includes:

(i) a suction intake element (**28**) for receiving the severed end of the chain positioned by said orienting element;

(ii) a clamping device (**26**) for receiving and gripping the chain adjacent said suction intake element; and

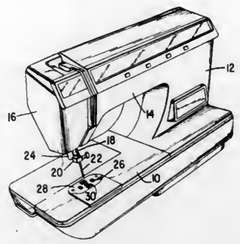
(iii) a cutting means (**54–55**) operatively associated with said suction intake element for severing that portion of the chain extending from the latter to said clamping device.

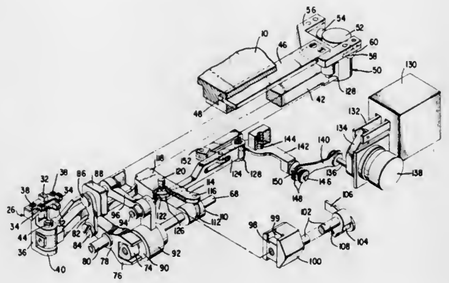
4,187,794

SEWING MACHINE WORK FEEDING MECHANISM

Roger J. Ross, Mont St-Gregoire, Canada, and Edward J. Tullman, Union, N.J., assignors to The Singer Company, New York, N.Y.

Filed May 18, 1979, Ser. No. 40,021
Int. Cl.² D05B *27/00*
U.S. Cl. 112—308 **7 Claims**





1. A work feeding mechanism for a sewing machine having a work supporting bed with an axis along its length, a throat plate having a set of mutually orthogonal feed dog accommodating slots defining mutually perpendicular directions of work feeding along the surface of said bed, said directions comprising a longitudinal direction of feeding extending in a direction transverse to the axis along the length of said bed, and a lateral direction of fabric feeding perpendicular to said longitudinal direction, an elongated feed bar carried beneath said bed and extending substantially along the length of said work supporting bed, a feed dog pivotally supported at one extremity of said feed bar and having a set of mutually orthogonal work engaging teeth positioned to be accommodated within said feed dog accommodating slots,

gimbal means fastened to said feed bar and supporting the extremity of said feed bar opposite the extremity having said feed dog pivotally fastened thereto to permit said feed dog to be driven in said longitudinal direction transversely across said bed and in a direction above and below said throat plate,

slidable means constrained to said bed to slide along a line extending parallel to the axis of said bed,

means fastened to said slidable means for suspending said gimbal means from said slidable means,

a feed bar drive mechanism operable in timed relation to said sewing machine for imparting oscillations to said feed bar about said gimbal means in mutually perpendicular directions, including said longitudinal direction transversely across said bed to provide work advancing and return movements to said feed dog, and in said direction above and below said throat plate to raise said feed dog to a position above said throat plate during work advancing movement and to drop said feed dog below said throat plate during the return movement thereof,

means driven by said feed bar drive mechanism for imparting oscillatory motion to said slidable means along said axis along the length of said bed, and

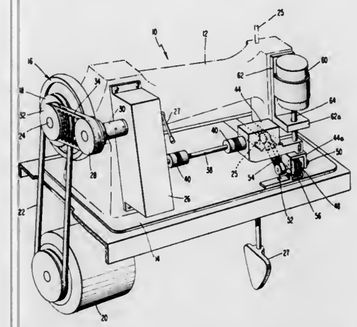
adjustable control means responsive to electrical signals for varying the amplitude and direction of oscillatory motion impated to said slidable means by said oscillatory drive means.

4,187,795

DRIVE MECHANISM FOR A SEWING MACHINE PULLER WHEEL

Charlie L. Norton, Danville, Va., assignor to Dan River Inc., Danville, Va.

Filed Jan. 5, 1978, Ser. No. 867,097
Int. Cl.² D05B *27/10, 27/04, 27/12, 27/14*
U.S. Cl. 112—318 **4 Claims**



1. A puller wheel drive mechanism for use in association with a sewing machine having a pedestal provided with a horizontally projecting arm spaced above a work surface sufficiently to allow unobstructed movement beneath said arm of material being sewed, said arm supporting a reciprocable needle and presser foot assembly at a distance from the pedestal and a horizontal main shaft connected with a motor to drive said needle assembly, said drive mechanism comprising:

(a) a variable speed gearbox positioned behind said pedestal having an input shaft, an output shaft, and external control means to vary the rotational speed of the output shaft with respect to the rotational speed of the input shaft;

(b) toothed endless belt and pulley means drivingly connecting said input shaft to said main shaft;

an idler puller wheel rotatably mounted at the level of said work surface and behind said reciprocable needle assembly;

(d) a yoke assembly having a driven puller wheel disposed above said idelr puller wheel;

(e) second drive means drivingly connecting said output shaft to said driven puller wheel comprising horizontal flexible shaft means connected at one end with said output shaft of the gearbox and supported at the other end by said yoke assembly at a distance above said work surface sufficiently to allow unobstructed movement of sewed material beneath said shaft, and toothed endless belt and pulley means drivingly connecting said driven puller wheel with the other end of said shaft and

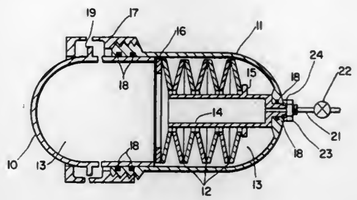
(f) pneumatic means to raise and lower said yoke assembly including said driven puller wheel independently of said reciprocable presser foot assembly.

4,187,796

SPECIFIC GRAVITY EQUALIZER SYSTEM

John O. Ess, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 591,210, Jun. 27, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,752
Int. Cl.² B63G *8/00*
U.S. Cl. 114—312 **11 Claims**



1. A system for maintaining the specific gravity of a submersible vessel at approximately the same specific gravity at any depth as the specific gravity of the fluid medium in which the vessel is immersed comprising:

a plurality of fluid-activated means carried in said vessel, each fluid-activated means comprising:

a casing,

movable enclosure means mounted at one end of and within said casing, said movable enclosure means having a cylindrical end and a semispherical end, said semi spherical end exposed to pressures of said fluid medium with said cylindrical end lying within said casing and forming with said casing a closed chamber,

a fluid in said closed chamber at normal pressure,

biasing means within said closed chamber for acting against said movable enclosure means to cause it to oppose an inward pressure of said fluid medium, the normal pressure in some of the fluid-activated means being different for operation of said fluid-activated means at different pressure levels of the surrounding medium so that, when the depth of the fluid medium is divided into a series of consecutive depth ranges, the biasing means in each fluid-activated means will exhibit a pressure vs volume characteristic which is roughly the same as the pressure vs volume characteristic of the external fluid medium over the range of depths for which the container is designed,

fluid-sealing means mounted to seal against passage of fluid along the contact area between said casing and said movable enclosure means so that none of the fluid medium can enter into said closed chamber and fluid under pressure cannot leak from said closed chamber, the pressure in said fluid medium, when it is higher than the pressure in said closed chamber, acting to force the movable enclosure means inward to proportionately decrease the volume of the closed chamber so as to increase the vessel's specific gravity, and the pressure in said chamber when it is higher than the pressure in said fluid medium, acting to force the movable enclosure means outward to proportionately increase the volume of the closed chamber so as to decrease the vessel's specific gravity.

4,187,797

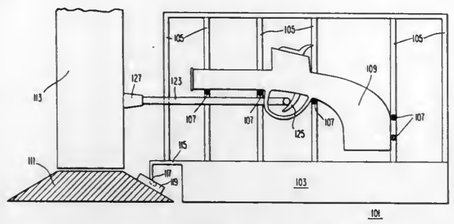
THRESHOLD PLATE DOOR ALARM

Walter W. Hoinski, Norristown, Pa., assignor to Power Systems Development Corporation, Wilmington, Del.

Filed Apr. 20, 1978, Ser. No. 898,422
Int. Cl.² G08B *13/08*
U.S. Cl. 116—87 **9 Claims**

1. A door threshold alarm apparatus for use in combination with a door and the threshold plate thereof, comprising:

elongated means for sensing door movement, said sensing means being in contact with said door when closed;
an alarm component operatively connected to said sensing means;
anchoring means attachable to said door threshold plate; and

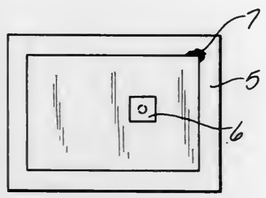


support means for securedly holding said alarm component, said support means having an extended portion being slidably connectable to and removeable from said threshold plate anchoring means, for selectively securedly positioning said alarm component at a predetermined spacing from said door when closed.

4,187,798
METHOD OF DETECTING DEFECTIVE PORTION OF SEALING

Tetsuya Yoshimura, Yokohama, Japan, assignor to Nagatanien Honpo Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1978, Ser. No. 896,888
Claims priority, application Japan, Jun. 29, 1977, 52-76576
Int. Cl.[2] B65B *31/02*; G01N *31/22*
U.S. Cl. 116—206 **5 Claims**

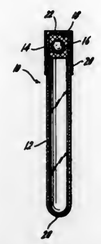


1. A method of detecting a defective sealed portion of a sealed container, said method comprising the steps of:
(a) injecting into a sealed container a colored detection liquor consisting essentially of a coloring material giving color to said liquor and a liquid organic compound, said liquor having a surface tension lower than that of water and a permeability into small clearances greater than that of water such that the surface tension and permeability properties of said liquor permit said liquor to exude into a defective sealed portion of the sealed container;
(b) resealing the container where the colored detection liquor was injected; and
(c) inspecting said container for the presence of colored detection liquor, whereby a defective sealed portion of said sealed container may be detected by the visible presence of colored detection liquor in the area of a defective sealed portion.

4,187,799
TEMPERATURE INDICATOR

Andrew A. Zwarun, Albertson, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,789
Int. Cl.[2] G01K *11/06*
U.S. Cl. 116—217 **1 Claim**

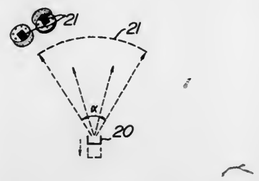


1. A temperature indicator for providing a permanent indication that a given predetermined temperature has been reached, comprising a transparent tube of substantially uniform cross-section, one end of said tube having an opaque coating thereon, a ball of dense material having a diameter occupying a substantial portion of the cross-section of said tube positioned within said tube, a temperature responsive wax positioned within said tube at the opaque end thereof, said wax being in contact with said opaque end and in contact with said ball so as to retain said ball at said opaque end when ambient temperature is below a predetermined level, said wax being adapted to melt at a predetermined temperature releasing said ball, a dye in said wax imparting a distinctive color to said wax, and means for securing said tube to an object in operative position with said opaque end up so that, upon attainment of said predetermined temperature, said ball moves promptly and positively into the transparent portion of said tube, the passage of said ball in said transparent portion depositing portions of said dyed wax on the interior of said tube to provide an indication that said temperature has been attained.

4,187,800
DEVICE FOR MANUFACTURING PHOTOSENSITIVE SCREEN

Toshio Nakatsubo; Masaji Nishikawa, both of Hachioji, and Eiichi Sato, Tama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1977, Ser. No. 796,481
Claims priority, application Japan, May 18, 1976, 51-56015
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—724 **4 Claims**

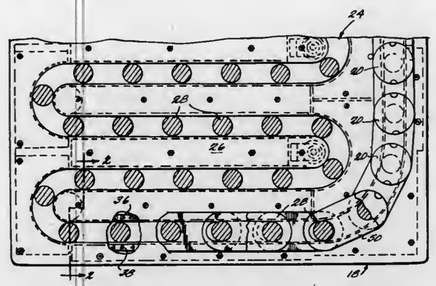


1. A device for manufacturing a photosensitive screen comprising a vacuum vapor deposition means for forming on a mesh-shaped electrically conductive substrate a photosensitive layer by vapor deposition under vacuum in said means, said vapor deposition means comprising a vapor supply source, means for supporting said mesh-shaped electrically conductive substrate above said vapor supply source along at least one portion of a circular plane having a center located at said vapor supply source, and a bell jar, said vapor supply source being arranged substantially at the center of said bell jar, said mesh-shaped substrate being supported by the supporting means substantially in the form of a cylinder with its surface to be vapor deposited facing inwards and rotatably supported about the center of the cylinder as a horizontal rotational axis.

4,187,801
METHOD AND APPARATUS FOR TRANSPORTING WORKPIECES

Gaines W. Monk, Alexandria, Va., assignor to Commonwealth Scientific Corporation, Alexandria, Va.

Filed Dec. 12, 1977, Ser. No. 859,965
Int. Cl.[2] C23C *11/00*
U.S. Cl. 118—729 **14 Claims**

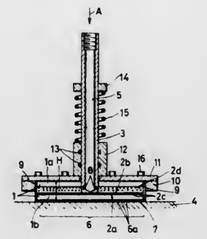


1. An apparatus for transporting workpieces along a closed, non-circular path in a treatment chamber for treatment which alters a surface of the workpieces, comprising:
a plurality of workholders for each mounting at least one workpiece;
means defining said closed non-circular path for guiding movement of said workholders along said path including a base plate along which said workholders slide in direct contact with said plate for effective heat transfer;
means for controlling the temperature of said base plate; and
means for engaging said workholders to drive said workholders along said path and rotating each of said workholders about its axis during movement along said path so that all of the workpieces follow the same path and are treated identically.

4,187,802
DEVICE FOR APPLYING FLOWING MASSES TO THE SURFACE OF A WORKPIECE

Max Thimm, Rhienscher Berg 10, D-5810 Witten, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 837,045
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643279; Sep. 14, 1977, 2741239
Int. Cl.[2] B05C *1/00*
U.S. Cl. 118—708 **6 Claims**



1. A device for applying flowing masses, such as pastes or viscous liquids, to the surface of a workpiece, comprising a hollow chamber containing the mass, a conduit for conveying said mass to said hollow chamber and an outlet in said hollow chamber turned to the surface of the workpiece, wherein: a piston (2) having passages therethrough is arranged in the hollow chamber (1), through the front side (2a) of which piston (2) the mass is forced toward the outlet (6), the front side (2a) of the piston is parallel to the outlet (6), the surface of the outlet (6) is subdivided into several openings (6a) and slots; and said conduit (5) conveying the mass is formed by a longitudinal boring in piston rod (3) and transverse borings (8) are arranged in the piston rod (3) adjacent the rear side (2b) of the piston (2), said borings (8) connecting the longitudinal boring to that part (1a) of the chamber which is positioned on the rear side of the piston, said hollow chamber containing only said piston, a portion of said piston rod, and said mass.

4,187,803
PROCESS FOR PELLETIZING SORPTIVE MINERAL FINES

Rudolph C. Valenta, Elmhurst, Ill., assignor to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 668,637, Mar. 19, 1976, Pat. No. 4,036,928, which is a continuation of Ser. No. 170,270, Aug. 9, 1971, abandoned. This application May 16, 1977, Ser. No. 797,544
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] A01K *1/015*
U.S. Cl. 119—1 **7 Claims**

1. In a process utilizing absorbent pellets for the purpose of absorbing liquids and then handling or disposing of such liquids through the medium of such pellets, said pellets being identified by the process of manufacturing the same, which said latter process takes sorptive mineral fines having open pore spaces and including fine particles that will pass through a 20 mesh screen to make pellets which have a liquid absorption capacity substantially equal to that of said fines, said manufacturing process for said pellets comprising mixing said fines with water to moisten the same and substantially fill said open pore spaces with water, then forcing said moistened fines through a die in pelletizing apparatus to compactly form the moistened fines into a coherent mass of material while avoiding the forcing of water from said pore spaces, cutting said coherent mass of material to form pellets, and the step of evaporating the water from said pellet pore spaces to render said pore spaces open for subsequent absorption of liquid when it is applied to said pellets,
said utilizing process comprising the steps of bringing together said absorbent pellets produced from said fines and a liquid to be absorbed, permitting said pellets to absorb said liquid, and thereafter handling the pellets in a manner which takes care of said liquid absorbed thereby.

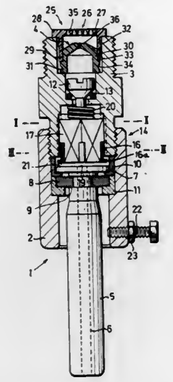
4,187,804
WATER DISPENSER FOR LIVESTOCK

Rainer von Taschitzki, Cologne, Fed. Rep. of Germany, assignor to Aratowerk Walter von Taschitzki, Cologne, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,600
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632734; Jun. 2, 1977, 7717393[U]
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—72.5 HRC **8 Claims**

1. A water dispenser for livestock, said dispenser comprising a casing, said casing being tubular and having a connecting portion at one end for attachment to a water line, said casing having an axial bore therethrough opening into said connecting portion for receiving water therefrom, a valve seat surrounding said bore, an axially movable valve member cooperable with said valve seat for closing said bore, a foot member connected to said valve member and disposed in said bore beyond said valve seat, a resilient member constantly resiliently urging said valve member toward said valve seat, a hollow mouthpiece extending axially out of said casing remote

from said connecting portion, mounting means mounting an end portion of said mouthpiece in said casing in sealed relation to said bore for receiving water therefrom and for tilting relative to said casing axis, said mouthpiece having a relatively large radially outwardly directed flange adjacent said mounting means, said casing having a support ledge receiving said flange and forming a fulcrum for said mouthpiece, said foot member having a relatively large radially outwardly directed flange adjacent and engageable by said mouthpiece flange to



axially shift said foot member and said valve member to an unseated position in response to tilting of said mouthpiece, a first ring insert defining said support ledge a second ring insert carried by said casing and having seated thereon the first ring insert, said second ring insert having a second ledge spaced from the support ledge, and said mounting means including a flexible annular member carried by said mouthpiece in sealed relation, and an outer portion of said flexible annular member being clamped between said ledges in sealed relation to said casing.

4,187,805

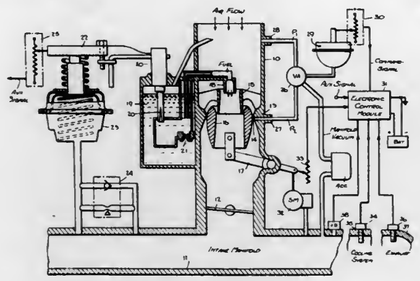
FUEL-AIR RATIO CONTROLLED CARBURETION SYSTEM

Harold G. Abbey, 11 Goldsmith Dr., Holmdel, N.J. 07733

Continuation-in-part of Ser. No. 919,541, Jun. 27, 1978. This application Nov. 22, 1978, Ser. No. 962,883

Int. Cl.[2] F02M *9/14*

U.S. Cl. 123—28 **17 Claims**



12. An automatic control system for supplying a fuel-air mixture to the inlet of the intake manifold of the internal combustion engine of a vehicle for regulating the ratio of air to fuel so that this ratio is optimized for prevailing conditions of engine speed and load, said system comprising:

A. a variable Venturi structure whose input is coupled to a source of combustion air and whose output is coupled to the inlet of said intake manifold, said structure including a throat and a mechanism to adjust the effective area thereof;

B. a signal-responsive closed process control loop including a servo motor coupled to said mechanism to adjust the effective area of said Venturi throat;

C. means to sense the velocity of air passing through said Venturi structure to produce an air velocity command signal which is applied to the input of said loop to cause said servo motor to effect an adjustment in accordance therewith;

D. means including a metering valve to feed fuel into said Venturi structure to be intermixed with said air therein;

E. means to adjust said valve in accordance with the degree of vacuum in said intake manifold; and

F. means responsive to the valve adjustment to produce a signal that reflects said degree of vacuum and to modulate said command signal with said vacuum signal to provide the desired air-to-fuel ratio.

4,187,806

FUEL-AIR MIXTURE CONTROL APPARATUS

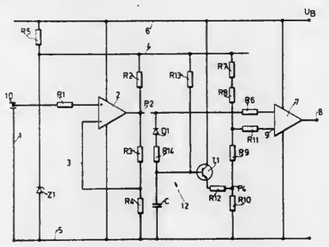
Hans Schnurle, Walheim; Rudi Mayer, Vaihingen, and Bernd Kraus, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,489

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623113; Oct. 29, 1976, 2649456

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **10 Claims**



1. An apparatus for controlling the composition of the combustible mixture supplied to an internal combustion engine, said engine including variable means for fuel supply and an exhaust system, and said apparatus including an oxygen sensor in said exhaust system, an oxygen sensor circuit including the oxygen sensor for generating an electrical signal related to the composition of said combustible mixture, said signal having a defined upper and lower limit which occur as a function of the oxygen content of the engine exhaust gas, said limits increasing in amplitude with decreasing temperature of said sensor, a comparator circuit for comparing said electrical signal with a variable threshold signal, a detector circuit for receiving the output from said oxygen sensor, a threshold signal adjusting circuit connected to said comparator circuit and said detector circuit, and circuit means for processing the output from said comparator circuit and for engaging said variable fuel supply means to thereby control the composition of the combustible mixture, the improvement in said detector circuit comprising:

a detector circuit for receiving the output from said oxygen sensor and

a set-point generator circuit connected to said detector circuit; whereby said detector circuit engages said set-point generator to maintain the voltage of said set-point signal to be higher than the minimum oxygen sensor signal

a charging circuit; and

discharging means connected thereto and responsive solely to the lower limit of said oxygen sensor signal for causing an adjustment of said threshold adjustment circuit thereby maintaining the voltage of the threshold signal to be higher than the lower limit of the signal generated by the oxygen sensor circuit.

4,187,807

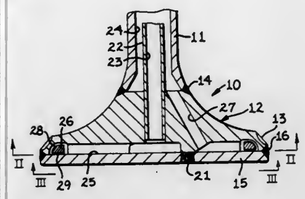
COOLED ENGINE VALVE WITH IMPROVED HEAT TRANSFER

Richard A. Cemenska, Edelstein, and Alexander Goloff, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 22, 1978, Ser. No. 879,843

Int. Cl.[2] F01P *3/14*

U.S. Cl. 123—41.34 **18 Claims**



1. A valve comprising

an elongated stem,

a head disposed at an end of said stem and defining an annular valve face thereon

circulating means in said valve for circulating a coolant therethrough, including an inlet passage, an outlet passage and annular chamber means defined in said head to communicate with said inlet and outlet passages and disposed closely adjacent to said valve face, and

agitating means disposed in said chamber means for vibrating therein during valve operation for forcing oil back and forth in said chamber means for improving heat transfer from said valve face to said coolant.

4,187,808

ENGINE HAVING A VARIABLE COMPRESSION RATIO

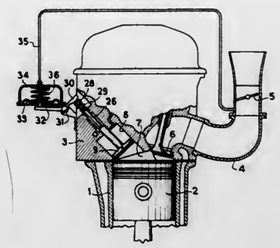
Guy Audoux, Adainville par Conde sur Vesgres, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Jul. 10, 1978, Ser. No. 923,106

Claims priority, application France, Jul. 11, 1977, 77 21259

Int. Cl.[2] F02B *75/04*

U.S. Cl. 123—48 AA **5 Claims**



1. A cylinder-type explosion engine having a variable compression ratio and comprising for each of the cylinders thereof, a cylinder head defining with the cylinder a combustion chamber, a cavity in the cylinder head and opening onto the combustion chamber, an auxiliary piston provided with a piston rod and movable in said cavity, the cavity defining with the auxiliary piston an annular chamber around said rod, a passageway communicating with said annular chamber for connection to a source of liquid under pressure, a check valve in said passageway, the rod of the auxiliary piston having a wall defining an axial bore therein, a slide valve member slidable in said bore, means for controlling the position of the slide valve member in said bore in accordance with a parameter which represents the conditions of operation of the engine, at least one throughway escape port in said wall defining the bore of the rod so as to constitute a liquid discharge path for said chamber, the slide valve member being cooperative with said escape port, a second cavity of smaller diameter than the cavity for the auxiliary piston and extending the cavity for the auxiliary piston, a second auxiliary piston fixed to a free end of the rod of the auxiliary piston and movable in said second cavity, said two cavities being defined by two bores, a shoulder between said two bores, a partition wall which is in bearing relation to said shoulder and separates said two cavities, said rod of the auxiliary piston extending through said partition wall, the auxiliary pistons and the partition wall defining with said cavities and the rod of the auxiliary piston two chambers escape ports in said rod of the auxiliary piston respectively putting the two chambers in communication with the bore of the rod of the auxiliary piston, the second auxiliary piston defining in said second cavity a chamber communicating with the fluid return conduit, an actuting rod extending the slide valve member and defining a shoulder which defines an operative portion of the slide valve member.

4,187,809

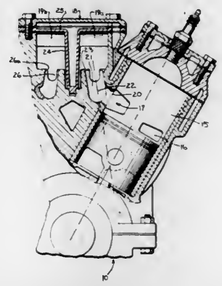
EXHAUST SYSTEM FOR MULTIPLE CYLINDER TWO-STROKE ENGINES

Richard A. Lanpheer, and David W. Kusche, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sep. 12, 1977, Ser. No. 832,197

Int. Cl.[2] F02B *77/00;* **F01N** *7/08*

U.S. Cl. 123—65 EM **13 Claims**



1. A two stroke internal combustion engine having at least three cylinders comprising:

(a) an exhaust means having an exhaust cavity therein,

(b) individual exhaust port means connected to each cylinder and to said exhaust means including

(1) a port at the wall of a cylinder and

(2) an outwardly projecting wall means defining a chamber as an extension of said port, said wall means terminating in said exhaust cavity, and

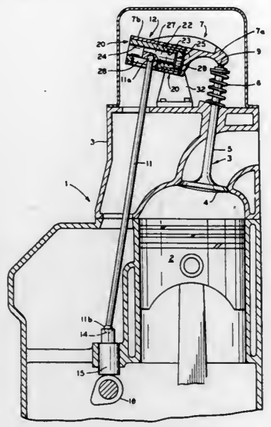
(c) exhaust pulse transmission wall means connected to the projecting wall means and connecting the port means of an exhausting cylinder and the port means of a charging cylinder and said transmission wall means including a pulse transmission passageway of a proper length to cause the exhaust pulse from an exhausting cylinder to arrive at the exhaust port means of a charging cylinder prior to the complete closing of the exhaust port whereby the air-fuel mixture which escaped from the exhaust port of the charging cylinder which is within the exhaust port means is forced back into the charging cylinder prior to the closing of said exhaust port.

4,187,810

POPPET VALVE STROKE ADJUSTING DEVICE FOR, AND COMBINATION WITH, AN INTERNAL COMBUSTION VALVE IN HEAD ENGINE

Joseph F. Buehner, 6750 State Rd., Wadsworth, Ohio 44281

Filed Feb. 17, 1978, Ser. No. 878,800
Int. Cl.² F01L *1/34*
U.S. Cl. 123—90.16 **10 Claims**



1. A valve stroke control device for an overhead poppet valve internal combustion engine having a removable head, a poppet valve mounted in the head, a return spring for returning the valve from open to closed position, a timing gear train, a rotatable cam driven by the train, a reciprocable tappet carried by the engine and movable axially in opposite directions, respectively, and driven by the cam in one of said directions for opening the valve, and returned to starting position by the return spring;

a rocker mounted on the engine head for rocking about a fixed axis from a starting closed valve position, in one direction in which said rocker opens the valve, and in an opposite direction in which said rocker permits returning of the valve to closed position by the spring;

said rocker having a valve engaging portion spaced a fixed distance from its rocking axis and by which the driving force imparted by the tappet is applied to the valve for opening the valve, and having a drive force receiving portion on said rocker and spaced at the opposite side of the rocking axis from the valve engaging portion;

adjustment means fixedly mounted on said force receiving portion of the rocker for rocking therewith and including an adjustment element movable relative to the rocker transversely of said rocking axis in opposite directions from a long stroke position spaced a predetermined distance from said rocking axis to a short stroke position which is a different distance from said rocking axis than said predetermined distance;

an elongated push rod;

first connecting means connecting one end of the rod to the driving end of the tappet so that the rod is driven by the tappet in the valve opening direction, and so that the rod is swingable about said one end as a center toward and away from said rocker axis;

additional connecting means connecting the other end of the push rod to said element for movement of said other end with the element in said opposite directions for swinging the rod transversely of its axis about said one end of the rod by the element, to said long stroke and short stroke positions, respectively, of said element and for concurrent movement of the rod along the rod axis with the element in said long stroke and short stroke positions, respectively, as the element rocks with the rocker in each of said positions;

said adjustment means further including driving means for driving said element in said opposite positions, selectively, independently of the rotated position of said cam and for holding the element in the selected one of the positions, thereby to move said other end of the rod to said long stroke and short stroke positions, selectively;

said element being arranged so that said starting position of the valve is the same in both said long stroke and short stroke positions of the element and rod and while the timing relation between the cam and the initation of valve opening remains unchanged; and

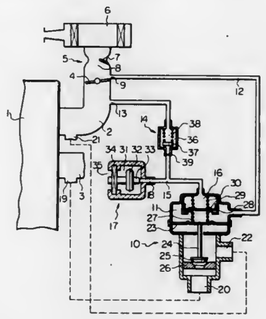
power means for supplying power to the driving means, and remotely controllable means operable to control the delivery of power to the driving means in a manner to drive said element to said long stroke and short stroke positions, selectively, and to hold the element in the selected one of said positions.

4,187,811

EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Kenji Katoh, and Tamotu Ogita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 14, 1978, Ser. No. 915,560
Claims priority, application Japan, Nov. 7, 1977, 52-132463
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **7 Claims**



1. An exhaust gas recirculation system of an internal combustion engine having an intake passage, an exhaust passage and a throttle valve disposed in said intake passage, comprising:

an exhaust gas feedback passage for feeding a part of the exhaust gas extracted from said exhaust passage to said intake passage;

a feedback control valve for controlling the amount of the exhaust gas passing through said feedback passage, said feedback control valve being actuated so as to pass the exhaust gas therethrough when the absolute level of the vacuum pressure fed from a first vacuum port opening into said intake passage at a position adjacent to said throttle valve exceeds a set level;

an atmospheric pressure sensing means for generating a pressure signal when the level of the atmospheric pressure is lowered to less than a predetermined level, and;

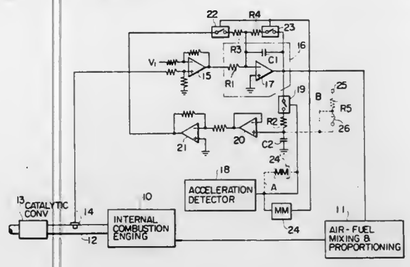
a correcting means for decreasing said set level for actuating said feedback control valve, in response to said pressure signal generated by said atmospheric pressure sensing means.

4,187,812

CLOSED LOOP FUEL CONTROL WITH SAMPLE-HOLD OPERATIVE IN RESPONSE TO SENSED ENGINE OPERATING PARAMETERS

Akio Hosaka, Yokohama, and Shigeo Aono, Seki, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 12, 1977, Ser. No. 815,049
Claims priority, application Japan, Jul. 13, 1976, 51/82568
Int. Cl.² F02M *7/00*
U.S. Cl. 123—119 EC **15 Claims**



1. A closed loop fuel control system for an internal combustion engine including means for supplying air and fuel thereto at a variable ratio and exhaust means, comprising:

means for sensing the concentration of a predetermined constituent of the gases in said exhaust means and sensing the deviation of the air-fuel ratio within said exhaust means from a reference value to provide a correction signal to said air-fuel supplying means;

means for detecting a variation of an operating condition of said engine;

means for sampling said correction signal in response to the detection of said variation of said engine operating condition and storing said sampled signal, said storing means having a characteristic of decreasing the value of the stored signal as a function of time so that said stored signal assumes a value corresponding to an average value of the correction signal generated when said engine operating condition is varied; and

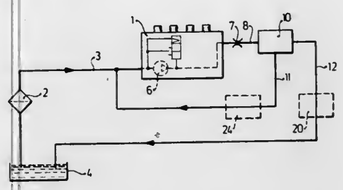
means for providing said stored signal to said air-fuel supplying means in response to the detection of a subsequent variation of said engine operating condition.

4,187,813

FUEL SUPPLY DEVICE

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 894,210
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715587
Int. Cl.² F02B *77/00*; F02M *31/00*
U.S. Cl. 123—136 **6 Claims**



1. In combination with a fuel injected internal combustion engine having a fuel injection pump, a fuel feed pump and a fuel tank, a fuel temperature control system comprising:

means connecting said fuel feed pump to supply fuel from said tank to the inlet of said fuel injection pump;

fuel relief conduit means including throttle means connected to said fuel injection pump; and

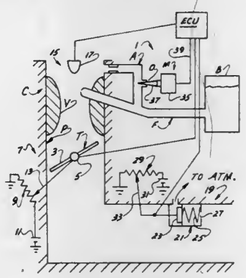
temperature controlled valve means operable in response to fuel temperature connected between the outlet of said throttle means and at least said tank and operable to conduct fuel from said throttle means to said fuel tank if the fuel temperature is above a predetermined value and to block flow to said tank if the fuel temperature is below said predetermined value.

4,187,814

ALTITUDE COMPENSATION APPARATUS

Michael B. Phelan, and Jack M. White, both of Florissant, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,244
Int. Cl.² F02M *11/00*
U.S. Cl. 123—119 EC **8 Claims**



1. Altitude compensation apparatus for use with a carburetion system for an internal combustion engine, said system having a passage through which air is drawn into said engine, a throttle valve positioned in said passage and movable between an open and a closed position to control the flow of air therethrough and a fuel circuit through which fuel is delivered to said passage for mixing with air to form an air-fuel mixture combusted in said engine, the apparatus comprising:

means for sensing the position of said throttle valve and for supplying an electrical signal representative thereof;

means for sensing the flow rate of air through said passage and for supplying an electrical signal representative thereof;

means for sensing the vacuum level in said engine and for supplying an electrical signal representative thereof;

means for metering the quantity of fuel supplied by said fuel circuit to said passage thereby to maintain the air-fuel ratio of the mixture produced at a preselected value; and

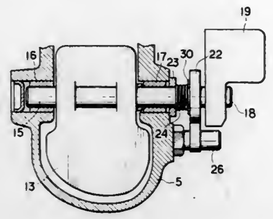
means responsive to the aforesaid signals for calculating the density of air being drawn into said engine and for generating a control signal which is supplied to said metering means to control the metering of fuel thereby, the air density calculated by said signal responsive means being a function of the altitude at which said engine is operated and said control signal having characteristics which are a function of the calculated air density.

4,187,815

INTAKE FUEL MIXTURE HEATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshihiko Kobayashi, and Toshinari Oonishi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 6, 1978, Ser. No. 913,053
Claims priority, application Japan, Mar. 27, 1978, 53/34105
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 H **6 Claims**



1. A system for heating the intake fuel mixture of an internal combustion engine having an intake manifold comprising means for delivering exhaust gases of said internal combustion engine into heat exchange relationship with said intake manifold to heat intake fuel mixture flowing therethrough, a valve for controlling flow of said exhaust gases, a rotatably mounted shaft having said valve secured thereto, a counterweight secured to said shaft to induce rotation thereof, stopper means located to be engaged by said counterweight in order thereby to limit the extent of rotation of said shaft induced by said counterweight, a spiral bimetallic member having an inner end and an outer end, said inner end being secured to said shaft to effect rotation thereof in response to ambient temperature conditions, said outer end being adapted to engage said stopper means to limit movement of said outer end of said bimetallic member in a first direction during engine warm up condition at relatively low ambient temperatures, and engagement means secured to said bimetallic member and adapted to engage said stopper means at relatively higher ambient temperature conditions in excess of a given temperature level to limit movement of said outer end of said bimetallic member in a direction opposite to said first direction.

4,187,816

AIR-FUEL RATIO CONTROLLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi, all of Toyota; Junzo Uozumi, Nagoya; Tsuneo Ando, Chiryu; Yuzo Takeuchi, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Ohbu, both of, Japan

Filed Jul. 10, 1978, Ser. No. 923,307
Claims priority, application Japan, Jul. 20, 1977, 52-87156
Int. Cl.[2] F02M *39/00;* **F02B** *33/00*
U.S. Cl. 123—139 AW **3 Claims**

1. An air-fuel ratio controlling system for an internal combustion engine having an intake duct with a throttle valve disposed therein, said system comprising:

an air valve disposed in said intake duct upstream of said throttle valve to cooperate therewith to define an air pressure chamber therebetween;

an air valve controlling means responsive to variation in the air pressure in said air pressure chamber normally to maintain a substantially constant air pressure difference across said air valve;

a fuel circuit having at its downstream end a fuel discharge port open to said intake duct;

a fuel metering means including means defining a fuel-metering variable orifice disposed in said fuel circuit and means for maintaining a substantially constant fuel pressure difference across said fuel-metering variable orifice;

said fuel-metering orifice defining means being operatively associated with said air valve so that the fuel-flowing area of said fuel-metering orifice is varied in proportion to the variation in the air-flowing opening area defined between said air valve and said intake duct;

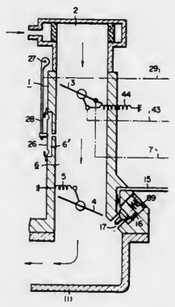
said air valve controlling means and said fuel metering means being cooperative to control the air-fuel ratio of an air-fuel mixture to be fed into the engine such that the air-fuel ratio is normally kept substantially constant;

an O_2 sensor for detecting the oxygen content of the engine exhaust gases; and

means responsive to signal from said O_2 sensor to adjust the air-fuel ratio; wherein:

said fuel circuit includes a high pressure fuel source kept at a substantially constant first pressure level higher than the atmospheric pressure and a low pressure fuel source kept at a substantially constant second pressure level higher than the atmospheric pressure but lower than said first pressure level;

said air valve controlling means includes a cylinder, a piston slidably disposed in said cylinder to cooperate therewith to define a first fuel pressure chamber capable of being communicated with said high and low pressure fuel



sources, a link means operatively connecting said piston to said air valve, a bore and a spool slidable in said bore and having a valve portion, said spool being movable in said bore in response to variation in the pressure in said air pressure chamber to cause said valve portion to control the communication between said first fuel pressure chamber and said high and low pressure fuel sources thereby to vary the pressure in said first fuel pressure chamber; and

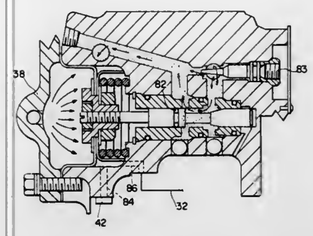
said O_2 sensor responsive means includes a second fuel pressure chamber defined by the cooperation of said bore and one end of said spool and communicated through a first restriction with said high pressure fuel source, a first fuel passage connecting said second fuel pressure chamber to said low pressure fuel source, and a valve means disposed in said first fuel passage and operative in response to variation in the output of said O_2 sensor to control the flow of the fuel from said second fuel pressure chamber through said first fuel passage to said low pressure fuel source thereby to vary the fuel pressure in said second fuel pressure chamber, the variation in the pressure in said second fuel pressure chamber moving said spool to vary the pressure in said first fuel pressure chamber so that said piston is moved to vary the degree of opening of said air valve and thus vary the air pressure difference across said air valve whereby the air-fuel ratio is adjusted.

4,187,817

APPARATUS AND METHOD FOR AVERTING THE EFFECTS OF SEAL FAILURE IN AN I.C. ENGINE FUEL SUPPLY SYSTEM

Harry L. Wilson; David E. Shultz, and George L. Muntean, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 5, 1978, Ser. No. 948,872
Int. Cl.[2] F02M *39/00;* **F02D** *1/04;* **F02B** *77/00;* **F16K** *31/365*
U.S. Cl. 123—139 AW **23 Claims**



1. A fuel supply system for an internal combustion engine which is operationally controlled by the pressure of fuel supplied to the engine from a fuel source and which has an intake manifold for supplying air to the engine, comprising

(a) air pressure responsive means for modulating mechanically the flow of fuel into the engine in response to the pressure of air within the intake manifold, said air pressure responsive means including

(1) first and second chambers,

(2) pressure responsive actuating means disposed between said chambers for normally preventing fluid flow between said chambers and for transforming changes in intake manifold pressure operating said air pressure responsive means, and

(3) an air line connecting said intake manifold with said first chamber;

(b) fuel leakage drain means for returning fuel which may leak into said second chamber back to the fuel source, said fuel leakage drain means including a drain line connected to form a return path from said second chamber to the fuel source; and

(c) flow restriction means connected with said air line for permitting air flow in both directions between the intake manifold and said first chamber and for preventing substantially all flow of fuel from said air pressure responsive means to the air intake manifold, whereby restriction or blockage of said drain line cannot cause substantial flow of fuel from said air pressure responsive means to the intake manifold even if said pressure responsive actuating means were to malfunction and permit fuel to flow from said second chamber into said first chamber.

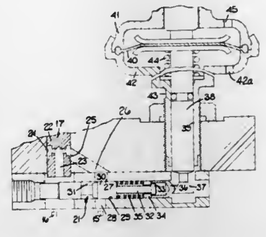
4,187,818

FUEL INJECTION PUMPING APPARATUS FOR INTERNAL COMBUSTION ENGINES INCLUDING MANIFOLD PRESSURE DEVICE

Ronald Phillips, Northolt, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 19, 1978, Ser. No. 926,121
Claims priority, application United Kingdom, Sep. 15, 1977, 38467/77
Int. Cl.[2] F02D *1/06*
U.S. Cl. 123—140 R **6 Claims**

1. A fuel injection pumping apparatus comprising an injection pump operable to deliver fuel in timed relationship with an engine to which fuel is supplied by the apparatus, a feed pump for supplying fuel under pressure to the injection pump, valve means for controlling the output pressure of the feed pump so that it varies in accordance with the speed at which the apparatus is driven, an operator adjustable throttle means for varying the quantity of fuel supplied to the injection pump, a valve disposed in the fuel flow path between the feed pump and the injection pump, said valve including a valve element which is subjected to the outlet pressure of the feed pump to urge the valve element in a direction to reduce the throttling effect of the valve, means responsive to the pressure of air supplied to the engine, an abutment movable by said last-mentioned means and engagable by a part connected to said valve element, said abutment being shaped so that with an increase in the pressure



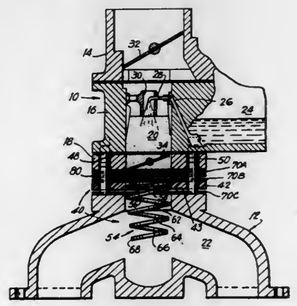
of air supplied to the engine, the valve element is moved to reduce the throttling effect of the valve, and pre-stressed resilient means interposed between said valve member and said part whereby at low engine speeds the movement of the valve element is determined solely by the means responsive to the air pressure and at a predetermined higher engine speed the output pressure of the feed pump acts to move the valve element against the action of the resilient means, in a direction to reduce the throttling effect of the valve.

4,187,819

FRUSTO-CONICAL, SPIRAL FUEL ECONOMIZATION AND POLLUTION REDUCTION DEVICE FOR USE WITH CARBURETORS OF INTERNAL COMBUSTION ENGINES

Roberto Longobardi, Viale Europa 2/E, Castellammare di Stabia, Prov. Naples, Italy

Filed Jan. 26, 1978, Ser. No. 872,627
Claims priority, application Italy, Apr. 5, 1977, 48838 A/77; France, Sep. 27, 1977, 77 28983
Int. Cl.[2] F02M *29/00*
U.S. Cl. 123—141 **5 Claims**



1. In a fuel economization and pollution reduction device for use with the carburetor of an internal combustion engine having an intake manifold, the improvements comprising, a frusto-conical spiral mixing element having an unobstructed, generally frusto-conical flow passage extending therethrough, and means to mount said element in the fuel-air mixture passage from the carburetor to the intake manifold with the axis of said element being in general alignment with the axis of said passage whereby, the fuel-air mixture from said carburetor will

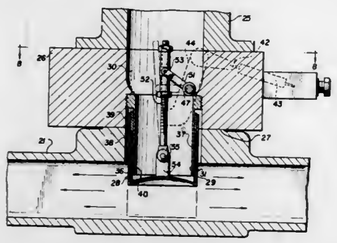
flow through said element and a vortex-like or whirling motion will be thereby imparted to said fuel-air mixture to further admix the same said frusto-conical spiral mixing element extending into said intake manifold whereby, contact by said fuel-air mixture with the heated walls of said manifold, and attendent heating thereby of said mixture, will be reduced due to the centripetal forces generated within said mixture by said vortex-like motion, said frusto-conical spiral mixing element comprising a plurality of coils of decreasing diameter in the direction of flow of said fuel-air mixture, and wherein said mounting means comprises a mounting body having a generally frusto-conical aperture formed therein, said aperture being complementally sized and shaped with regard to the largest diameter of said coils and being in general alignment with the fuel-air mixture passage from said carburetor for the flow of said fuel-air mixture therethrough, and wherein said frusto-conical mixing element is mounted in said mounting body by the disposition of said largest diameter coil in said aperture.

4,187,820

INTAKE MANIFOLD VARIABLE ATOMIZING VALVE

Sherwood F. Webster, 7832 Via Marina, Scottsdale, Ariz. 85258, and Richard L. Heise, 133 E. Garfield, Tempe, Ariz. 85281

Filed Oct. 11, 1978, Ser. No. 950,470
Int. Cl.[2] F02M *29/04*
U.S. Cl. 123—141 **12 Claims**



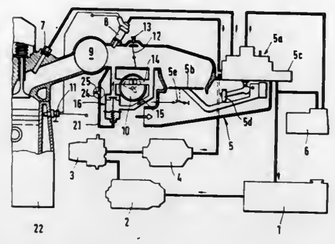
1. In an internal combustion engine having an intake manifold to receive a fuel charge from a carburetor for delivery through said manifold to engine cylinders, said manifold having a main inlet opening for the fuel charge, the improvement comprising a mounting element adapted for interposition between said manifold and said carburetor and having a bore in communication with said main inlet opening, a fixed sleeve on the mounting element depending therefrom and extending into the intake manifold through said main inlet opening, an atomizing screen assembly telescopically engaged with the fixed sleeve and being extensible and retractable relative thereto in said manifold, said screen assembly comprising a relatively rigid cage, first and second concentric screens fixed within the cage and being in circumferential contact, bearing means between the fixed sleeve and the screen assembly and maintaining a radial space around the fixed sleeve and between it and the innermost of said concentric screens, the innermost screen being relatively coarse mesh screen and the outermost screen being a finer mesh screen, and automatically variable resistance biasing means connected with the screen assembly and resiliently urging it toward a retracted position on the fixed sleeve and yielding in response to the increased demand of an engine for fuel and increasing engine speeds to allow automatic gradual extension of the screen assembly on the fixed sleeve to progressively uncover greater screen areas through open spaces of said cage relative to the fixed sleeve.

4,187,821

INTERNAL COMBUSTION ENGINE WITH A BYPASS LINE SKIRTING THE LOAD-CONTROL ORGAN OF THE INTERNAL COMBUSTION ENGINE

Roland-Detlev Zebli, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c. F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,937
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704456
Int. Cl.[2] F02N *17/00*; F02M *7/00, 1/10*
U.S. Cl. 123—179 G **3 Claims**



1. In an internal combustion engine of the type having an air supply line for supplying air to a combustion chamber, a load-regulating member disposed in said supply line, a bypass line extending in bypassing relationship to said load-regulating member from a position upstream of said load-regulating member to a position downstream thereof, and an auxiliary air valve disposed in said bypass line, said auxiliary air valve having a valving member connected to and movable with a membrane which is displaceable under action of the suction pressure in said air supply line to control air flow through said bypass line, the improvement comprising:

a valve line interconnecting said air supply line and one side of said membrane, a condition responsive valve means located in said valve line, said condition responsive valve means being shiftable from a first position communicating said one side of the membrane with the atmosphere to retain said valving member in a position opening said bypass line and a second position communicating said one side of the membrane with said air supply line to obtain said displacement under action of the suction pressure in said air supply line and means for shifting said condition responsive valve means between said first and second positions for opening said auxiliary air valve during a warm operating phase of the engine.

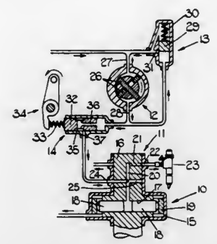
4,187,822

LIQUID FUEL PUMPING APPARATUS

John Craven, and Thomas H. M. Reilly, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 10, 1978, Ser. No. 876,940
Claims priority, application United Kingdom, Nov. 25, 1977, 49084/77
Int. Cl.[2] F02N *17/00*; F02M *39/00*
U.S. Cl. 123—179 L **6 Claims**

1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine and comprising an injection pump operable in use, in timed relationship with an associated engine, a feed pump for supplying fuel under pressure to the injection pump, valve means operable to control the outlet pressure of the feed pump in a manner so that it increases with speed, an adjustable throttle for varying the rate of fuel supply to the injection pump from the feed pump, a cylinder, a piston in said cylinder, conduit means through which one end of said cylinder communicates with the outlet of the feed pump so that one end of the piston is subject to said pressure, resilient means operable at low engine speeds to oppose movement of the piston by said pressure, the position of said piston determining the setting of the throttle, and a bimetal member responsive to the temperature within a housing part of the apparatus, the apparatus in use being mounted in close proximity to the engine so that the temperature within the housing part is representative of the temperature of the engine, said bimetal member being positioned between the piston and the resilient means so that the force generated by the fuel under pressure acting on the piston is transmitted to the resilient means through the bimetal member.

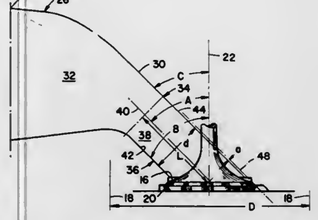


4,187,823

HIGH SWIRL INLET PORT

William L. Brown, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1978, Ser. No. 883,103
Int. Cl.[2] F01L *3/00*
U.S. Cl. 123—188 M **7 Claims**



1. In an internal combustion engine which comprises at least one cylinder bore and a corresponding number of generally circular inlet valves, each of said valves opening to a head of a respective cylinder bore, each of said valves having a periphery thereof substantially tangent to said respective cylinder bore and each of said valves having an axis thereof substantially parallel to an axis of said respective cylinder bore, an improved swirl-type air flow entry passage configuration, comprising:

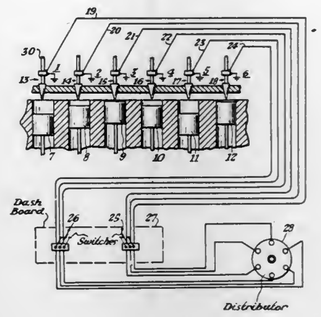
a generally straight duct serving as said air flow entry passage to deliver air to said valve, said duct leaving said valve at such an angle that a centerline of said duct forms an angle, A, of 30° to 50° with said valve axis, an inner wall of said duct, which comprises that portion of said duct nearest to the cylinder bore, forms an angle, B, of at least about 40° with said valve axis and an outer wall of said duct, which comprises that portion of said duct farthest from the cylinder bore, forms an angle, C, of 30° to 50° with said valve axis, said duct having a generally circular or oval cross-section, said outer wall if extended in the direction of air flow clearing, on the inside, a seat of said valve.

4,187,824

ELECTRICAL FUEL CUT OFF SWITCH

Joseph C. Connolly, 871 SW. 64th. Ave., North Lauderale, Fla. 33063

Filed Dec. 19, 1977, Ser. No. 861,634
Int. Cl.[2] F02D *17/00*
U.S. Cl. 123—198 F **2 Claims**



1. In a fuel injected internal combustion engine in a vehicle with a control board adjacent the driver, the injected internal combustion engine including solenoid valves distributing fuel under pressure to the engine cylinders of the internal combustion engine which engine cylinders have a prescribed firing order, at least one solenoid valve connected to each engine cylinder, the solenoid valves and the engine cylinders are divided into at least a first bank and a second bank of different solenoid valves and engine cylinders, and the injected internal combustion engine includes a solenoid valve control distributor with electrical lines connecting said distributor between the solenoid valves and the electric power, said distributor sequentially supplies electrical power to each solenoid valve for opening and closing each solenoid valve, a manual switching device for the driver that is easily and selectively used to cut off fuel to each particular bank of different solenoid valves and engine cylinders comprising:

a plurality of manual switching means including at least a first manual switching means and a second manual switching means for disconnecting and connecting electrical power to said solenoid valves, said switching means for controlling fuel to the engine cylinders and placement adjacent the driver for manual operation by the driver,

said switching means connected in said electric lines, said first manual switching means for connecting and disconnecting electrical power in said electrical lines connected solely to said first bank to prevent fuel flow, and

said second switching means for connecting and disconnecting electrical power in said electrical lines connected solely to said second bank to prevent fuel flow,

a first electrical connecting means for separately connecting said solenoid valves in said first bank to said distributor solely through said first switching means, and

a second electrical connecting means for separately connecting said solenoid valves in said second bank to said distributor solely through said second switching means, whereby the fuel to said first bank of engine cylinders is controlable separately and apart from the fuel to said second bank of engine cylinders.

4,187,825

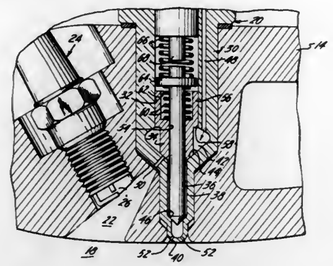
PILOT FUEL IGNITED STRATIFIED CHARGE ROTARY COMBUSTION ENGINE AND FUEL INJECTOR THEREFOR

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Division of Ser. No. 842,472, Oct. 17, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,074

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—205 **7 Claims**



1. A pilot-ignited stratified charge rotary internal combustion engine comprising:

(a) housing having a cavity therein;

(b) a rotor supported for planetary rotation within the cavity and defining with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor and housing rotate relative to each other;

(c) an inlet port and an exhaust port for respectively passing at least air into the working chambers and gaseous products of combustion from the working chambers;

(d) a fuel injector having spaced first and second nozzle means and sequentially operable valves for controlling fuel flow therethrough;

(e) said injector being connected to a source of pressurized fuel so that fuel flows through each nozzle means when said valves are operable to an open position;

(f) a passage in said housing for communicating said first nozzle means with the working chambers;

(g) an opening in said housing for communicating said second nozzle means with the working chambers so that fuel is substantially directly emitted into the working chamber when its associated valve opens; and

(h) ignition means in the passage to ignite the fuel-air mixture therein so that the burning fuel passing from the passage into the working chamber ignites the fuel-air mixture in the working chamber.

4,187,826

FOLDING LIMB COMPOUND ARCHERY BOW

Gerald I. Killian, 16016 SE. 82nd Dr., Clackamas, Oreg. 97015

Filed Apr. 15, 1977, Ser. No. 787,860

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—24 R **9 Claims**

1. A compound archery bow comprising:

(a) a handle member,

(b) a pair of bow limbs projecting from opposite ends of the handle member and terminating in a tip to receive a bow string,

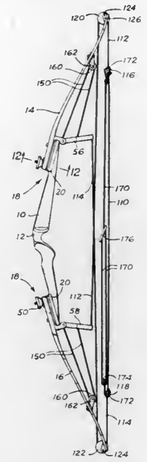
(c) a hinge means pivotally joining each limb to the handle in a manner allowing movement of the limbs between an operative position extending outwardly of the handle and a folded position inwardly adjacent of the handle wherein said tip lies on the same side of and adjacent to the belly of said handle member,

(d) releasable latching means interengaging the handle and limbs for securing the limbs to the handle member releasably in their operative position, said latching means being quickly releasable for permitting said limbs to be folded about their respective hinge means to said folded position inwardly adjacent said handle,

(e) a pair of cam members pivotally mounted eccentrically one adjacent the outer end of each limb,

(f) a bow string for projecting an arrow, the bow string extending between the cam members and forming an intermediate working stretch and a pair of opposite end segments,

(g) a pair of elongated levers mounted pivotally on the bow, each of the levers being positioned adjacent the inner end of its associated limb, the outer end of each lever being connected to the end segment of the bow string which is secured to the cam member on the opposite limb, and



(h) a pair of secondary tension control cables each operatively interconnecting one of the limbs and its associated lever and adjustable for pretensioning the associated limb,

(i) the cam members each having a diametric bore for receiving therethrough an intermediate portion of the associated bow string end segment, said end segment extending from each end of the bore being wrapped about the periphery of one of the cam members sufficiently to permit rotation of one of the cam members in one direction to full draw and in the opposite direction to relaxation of one of the limbs.

4,187,827

PROCESS FOR MULTIPLE LAP CUTTING OF SOLID MATERIALS

Dieter Regler, Burghausen; Erhard Sitrl, Marktl, and Alfred Moritz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic fur Elektronic Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,514

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722782

Int. Cl.[2] B28D *1/02*

U.S. Cl. 125—16 R **4 Claims**

1. A process for the multiple lap cutting of solid semiconductor materials, using a set of parallel, spaced apart blades mounted on the frame of a gang-saw for reciprocal movement over the solid materials to be cut, in a suspension of a lapping abrasive, comprising the steps of

exerting a force of from 100 to 1000 gf per blade on the solid material;

maintaining the free working length of the blades between 110 to 250 mm, wherein the force applied to the blades is inversely proportional to the length of the blades; and moving said blades through the solid material at a mean lateral speed of from 30 to 150 meters per minute.

4,187,828

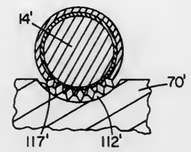
CUTTING

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems, Inc., Salem, Mass.

Continuation-in-part of Ser. No. 767,809, Feb. 11, 1977, Pat. No. 4,092,972. This application Mar. 13, 1978, Ser. No. 886,036

Int. Cl.[2] B28D *1/06*

U.S. Cl. 125—18 **12 Claims**



1. In a longitudinally-extending blade charged with abrasive particles, that improvement wherein:

said blade includes a longitudinally-extending abrasive-holding portion of metallic material having a hardness less than that of said abrasive particles and overlying a blade core of greater tensile strength;

said blade and said blade core are circular in transverse cross-section and said abrasive-holding portion comprises an annular layer overlying the peripheral surface of said core;

said abrasive holding portion defines a cutting surface extending between the opposite sides of said blade and defining less than one-half the total outer surface of said blade;

the thickness of said abrasive-holding portion is in the range of not less than about one-half the normal size of said particles to less than the nominal size of said particles; and

said particles are embedded into a longitudinally-extending segment of said cutting surface of said abrasive-holding portion but not into the sides of said blade, said longitudinally-extending segment into which said particles are embedded defining in transverse cross-section an arc of less than 180° whereby said particles do not project substantially beyond the sides of said blade.

4,187,829

FIREPLACE HEAT EXCHANGER ASSEMBLY

Eugene E. Pauley, 45 Coral Dr., Belleville, Ill. 62221

Division of Ser. No. 692,570, Jun. 3, 1976, Pat. No. 4,103,669. This application Apr. 27, 1978, Ser. No. 900,658

Int. Cl.[2] F24B *7/00;* **F24C** *15/12*

U.S. Cl. 126—121 **6 Claims**

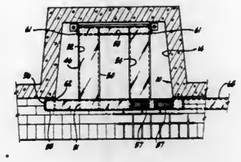
1. In a fireplace heat exchanger assembly:

(a) a conduit having an air inlet and an air outlet located outwardly of the fireplace, the conduit including:

1. a duct frame disposed externally at the top and sides of the fireplace, the air inlet and air outlet being located in the duct frame, and

2. a passage communicating with the duct frame and air inlet and extending rearwardly into the fireplace, and thence extending forwardly of the fireplace and communicating with the duct frame and air outlet, and

(b) blower means introducing air through the air inlet, into and through the duct frame, and passing the air through the passage and back into and through the duct frame, and discharging the air from the duct frame through the air outlet.



4,187,830

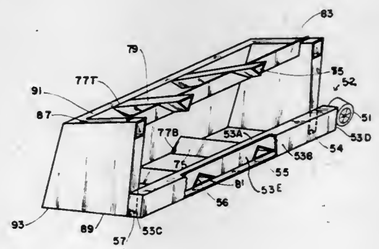
FIREPLACE INSERT

Leon D. Creasey, 5750 Hoffman La., Fair Oaks, Calif. 95828

Filed Jan. 23, 1978, Ser. No. 871,194

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **13 Claims**



1. An air heating device for a fireplace comprising a hollow central section constructed and arranged to fit adjacent the rear wall of said fireplace in an upstanding manner, said central section having a front and rear wall, and two openings at the bottom of the front wall, and two openings at the top of the front wall thereof,

two side hollow sections each attached to said central section and in fluid communication therewith, each of said side sections having a front wall comprising top and bottom openings with a solid panel therebetween, and, an inside wall and an outside wall, thereby defining a generally U-shaped hollow chamber,

two lower air delivery tubes secured to the front wall of said central section at the bottom openings therein, said tubes being in fluid communication with said hollow central section,

whereby air will pass into the lower openings of each of said side sections and out of the top openings of each of said side sections, and air will enter said hollow chamber through said air delivery tubes;

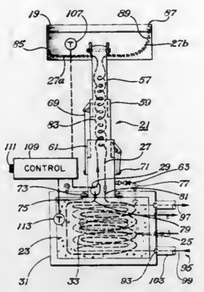
two top air delivery tubes secured onto the front wall of said central section, one at each opening at the top of said front wall, each top air delivery tube being in fluid communication with the hollow chamber.

4,187,831

SELF CONTAINED SOLAR HEATING SUPPLEMENTAL UNIT

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Filed Jun. 21, 1978, Ser. No. 917,567
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—419 **10 Claims**



1. A self contained solar heating supplemental unit comprising:

a. at least one solar collector having at least one conduit through which a first heat conducting fluid can be circulated to carry away heat energy;

b. a mast carrying said solar collector above the surface of the earth;

c. a dual function base carrying said mast and said solar collector; said base having sufficient mass to serve as an anchor to keep said mast and collector upright and having sufficient mass and heat capacity to serve as a thermal storage unit for storing heat energy; said base having lifting means for being lifted and transported to a site for use; said base being small enough to be moved to said site;

d. a first heating coil containing said first heat conducting fluid and disposed in said base for circulating said first heat conducting fluid through said base for storing heat from said collector in said base;

e. first interconnecting conduits sealingly interconnecting said collector conduits with said first heating coil;

f. first circulating means interposed in series fluid connection with said first interconnection conduits, solar collector conduit and first heating coil for periodically circulating said first heating fluid for transferring heat from said solar collector to said base;

g. said first heat conducting fluid being disposed also in said first interconnecting conduits and said first circulating means;

h. insulation surrounding said base to minimize heat leakage therefrom; and

i. at least one second heat withdrawal coil disposed in said base and having connection means for connection with a second heat withdrawal circuit means and circulating a heat withdrawal fluid for withdrawing heat from said base.

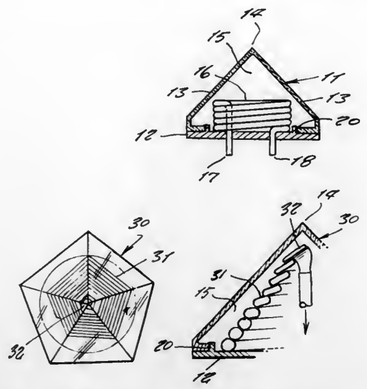
4,187,832

COSMIC AND SOLAR RAY HOT WATER HEATER

Robert H. Tregoning, 57 Foxon Hill Rd., East Haven, Conn. 06513

Filed Jun. 7, 1978, Ser. No. 913,577
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—443 **4 Claims**

1. A cosmic and solar ray hot water heater, comprising, in combination, a pentagonal-shaped container, mounted upon a base, and enclosing a tubular coil having an inlet and an outlet at opposite ends; said container being made of pyrex glass from five flat panels which are three times the thickness of ordinary window glass, and said container tapering upwardly at a 45 degree angle to an apex center; said coil being pentagonal in shape and tapering upwardly pyramidically to an apex; and said coil being circular in cross section at one end and flattened at its opposite end, and an entire length of said coil between



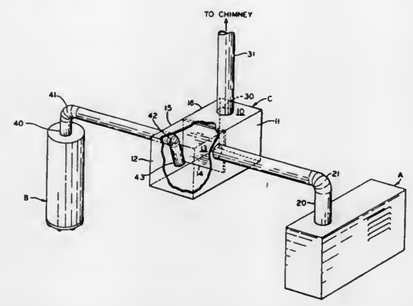
said ends being gradually changed between said circular and flattened configurations.

4,187,833

VENTING SYSTEM FOR GAS-FIRED HEATING PLANTS

Edward P. Zahora, and Edward Zahora, Jr., both of Naperville, Ill., assignors to Kinetics, Inc., Naperville, Ill.

Filed Apr. 19, 1978, Ser. No. 897,586
Int. Cl.[2] F23J *11/00*; F23L *3/00*
U.S. Cl. 126—312 **4 Claims**



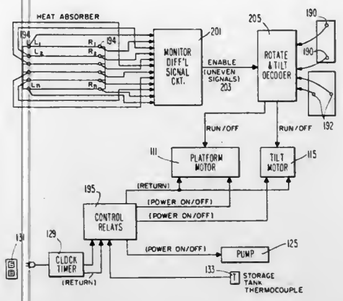
1. In combination with a first gas-fired heating plant, a second gas-fired heating plant, each of said plants having a combustion chamber and a chimney for receiving gaseous products of combustion from both said plants, the improvement comprising: a diverter box having an inlet end portion and an outlet end portion and having a partition between said portions, the bottom of said partition being above the bottom of said box to permit passage of gases from the inlet end portion to the outlet end portion while within the box, first conduit means for conducting gases from the combustion chamber of said first plant with the upper portion of said inlet end portion of said box, outlet conduit means for conducting gases from the upper portion of the outlet end portion of said box to said chimney, a second conduit means for conducting gases from the combustion chamber of said second plant to the upper portion of the inlet portion of said box and downwardly within said inlet end portion to about the level of the lower edge of said partition, the bottom of said box being open to the atmosphere surrounding said plants to thereby admit air and establish a pressure forming a heat lock to restrict the flow of air from the combustion chamber of said second plant through said first conduit means.

4,187,834

SOLAR HEATING SYSTEM

Walter W. Hoinski, Norristown, Pa., assignor to Power Systems Development Corporation, Wilmington, Del.

Filed Dec. 15, 1977, Ser. No. 860,707
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—425 **14 Claims**



1. In a solar heating system having a fluid conducting heat absorbing panel extending in a plane and mounted on a support for rotation in two directions, a lens system mounted in front of said panel for concentrating solar rays thereupon, and a storage tank for holding heated fluid, said tank being connected to said absorbing panel, the improvement comprising:

first means for rotating said absorbing panel in a first said direction, said first rotating means being attached to said support;

second means for rotating said absorbing panel in a second said direction, said second rotating means being attached to said support; and

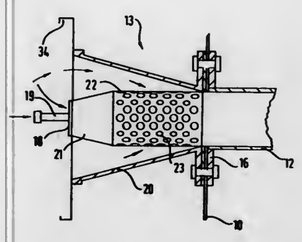
means for controlling the operation of said first and second rotating means including a plurality of electrical heat sensitive monitors located upon said heat absorbing panel in the plane of said panel and a plurality of electrical heat sensors located apart from said heat absorbing panel in a plane perpendicular to the plane of said heat absorbing panel.

4,187,835

INDIRECT HEAT TRANSFER APPARATUS

Geoffrey L. Finney, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Feb. 1, 1978, Ser. No. 874,317
Claims priority, application United Kingdom, Feb. 4, 1977, 4589/77
Int. Cl.[2] F24H *1/20*
U.S. Cl. 126—360 R **14 Claims**



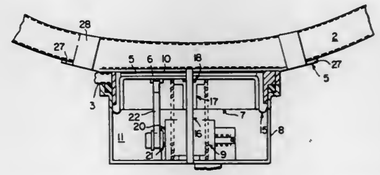
1. Indirect heat transfer apparatus in which fuel is progressively mixed with air in a high intensity burner assembly and burning gases are discharged directly into a tube of relatively smaller diameter immersed in a fluid to be heated whereby heat is transferred through the tube wall from the combustion gases to the fluid, and combustion air is admitted under pressure through a casing connected directly to the tube which at a position near the burner is of greater cross-sectional area than the tube but which progressively reduces in cross-sectional area toward the tube in such a way that the velocity of the combustion air is progressively increased between the burner and the tube, in a manner so that said velocity is low enough to provide flame stability at the burner but progressively increases in such a way that a higher proportion of the combustion takes place within the tube than within the casing.

4,187,836

FLOATING PISTON RESPIRATING PUMP

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Inc., Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,653
Int. Cl.[2] G01N *1/22*; A61B *5/02*
U.S. Cl. 128—2.08 **15 Claims**



1. A floating piston respirating pump device adapted for support upon the thoracic cavity, which comprises in combination:

(a) a belt defining an enclosed air space, and adapted for support against the thoracic cavity; and,

(b) a pump housing mounted upon said belt, and including inlet means to allow ambient air to enter, and outlet means to allow ambient air to leave, said housing in response to a pumping action; wherein,

(c) said pump housing further includes a diaphragm which is movably supported therewithin to define, with an inner end of said housing, a free volume space, which space being communicated with the enclosed air space within said belt; and,

(d) a piston operably connected to said diaphragm, and movable within said housing upon movement of said diaphragm, to define a pumping chamber with an outer end of said housing, wherein when said free volume space is expanded, said piston defines a minimized pumping volume whereby, the expansion and contraction of the thoracic cavity, during respiration, is operable to actuate said piston within said housing to cause ambient air to enter and leave said housing; and,

(e) a linear counter means is further mounted within said housing, in operative connection to the piston, so as to count the piston movements within said housing, which movement being a function of respiration of one wearing said device.

4,187,837

FINGERNAIL STIMULATING APPARATUS

Joseph M. Braun, 1025 E. 13th N., Mountain Home, Id. 83647

Filed Oct. 16, 1978, Ser. No. 951,457
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—32 **8 Claims**

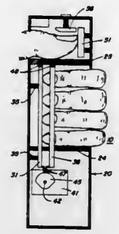
1. Fingernail stimulating apparatus comprising:

a substantially cylindrical housing adapted to be held in the palm of the hand, said housing having a first side opening operable to receive four fingers from a cupped hand and a second side opening oppositely disposed from the first side

opening, the second side opening operable to receive the thumb of the cupped hand;

a first fingernail contacting beam having a flat resilient surface adapted to contact the ends of fingernails placed within the first side opening;

a second fingernail contacting beam having a flat resilient surface adapted to contact the top surfaces of fingernails placed within the first side opening;



a first thumbnail contacting beam having a flat resilient surface adapted to contact the ends of a thumbnail placed within the second side opening;

a second thumbnail contacting beam having a flat resilient surface adapted to contact the top surface of a thumbnail placed within the second side opening; and

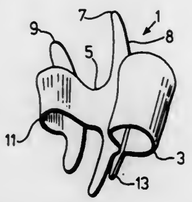
drive means mounted within said housing drivingly connected to said beams to vibrate said beams whereby the thumbnail and fingernails are stimulated.

4,187,838

EAR CLIP FOR FLATTENING OF PROTRUDING EARS

John Dubrowski, 515 Lakeshore Rd. West, Oakville, Ontario, Canada

Filed Aug. 15, 1977, Ser. No. 824,539
Int. Cl.[2] A61F *11/00, 5/01*
U.S. Cl. 128—76 R **5 Claims**



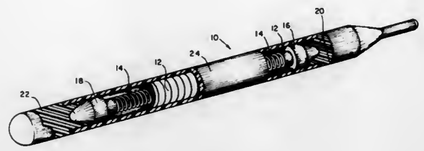
1. An ear clip for flattening of a protruding human ear, said ear clip being adapted to fit on an ear auricle of a human ear and comprising a resilient clip portion sized such that it may be clipped around the auricle helix of an ear auricle, a first elongated section having two ends, said first section being sized to fit against the inner surface of the auricle helix of an ear auricle, a second section sized to fit in the auricle concha of an ear auricle, said resilient clip portion being connected to said first section, between said ends such that first section will be positioned against the inner surface of the auricle helix of an ear auricle when said clip portion is clipped around the auricle helix of an ear auricle, a narrow bent section sized to fit over the auricle antihelix of an ear auricle, said bent section joining said first and second sections such that said second section will be positioned in the auricle concha of an ear auricle when said clip portion is clipped around the auricle helix of an ear auricle and said resilient clip portion being provided with hair securing means for flattening a protruding ear.

4,187,839

IMPLANTABLE PENILE PROSTHESIS

Elie S. Nuwayser, Wellesley, and James E. Barrington, Woburn, both of Mass., assignors to Abcor, Inc., Wilmington, Mass.

Filed Jun. 5, 1978, Ser. No. 912,327
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—79 **9 Claims**



1. A penile prosthesis adapted for surgical implantation in the penis for the treatment of erectile impotence, which penile prosthesis comprises:

(a) an elongated, tubular, gooseneck-type, shell element comprising a strip-wound material wherein the edges of adjacent strips are in a contacting relationship to provide internal friction to form the shell element sufficiently stiff in character to retain its position and which resists flexure, but which shell element may be overridden manually to overcome the resistance to flexure by lateral movement thereof;

(b) means at each end of the gooseneck-type shell element to protect such element; and

(c) an outer sheathing means surrounding the gooseneck-type shell element and integral with the end means to form a unitary integral penile prosthesis, whereby on implantation the penis may be moved from a flaccid penile position to an erect penile position through the user manually overcoming the resistance to flexure of the gooseneck-type element within the prosthesis.

4,187,840

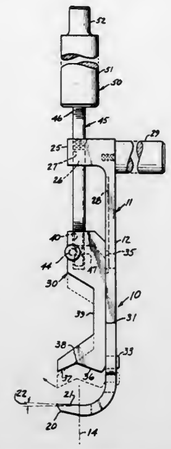
BONE PLATE CLAMP

Robert S. Watanabe, 321 Second St., Suite 1002, Los Angeles, Calif. 90012

Filed Aug. 14, 1978, Ser. No. 933,285
Int. Cl.[2] A61B *17/18;* **A61F** *5/04*
U.S. Cl. 128—92 EA **8 Claims**

1. A bone plate clamp comprising: a base member; a guideway on said base member having an axis; an abutment member carried by said base plate; an abutment face on said abutment member; a jaw member slidably fitted to said base member by said guideway for axial movement along said axis; a first jaw face and a second jaw face on said jaw member, both of said jaw faces facing said abutment face, said jaw faces making an obtuse angle with one another, and the abutment face making an acute angle with the normal to said axis; an internal thread in a passage through said base member, parallel to said axis; a leadscrew rotatably engaged to said thread and projecting from said base member at each end of said passage; releasable coupler means coupling the leadscrew to the jaw member for relative rotational movement and simultaneous axial movement; grip means on said leadscrew, said grip means having a

relatively larger diameter section and a relatively smaller diameter section, both exposed to be engageable by the hand; and a



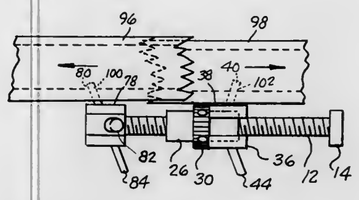
handle attached to the base member extending laterally therefrom on a side opposite from the jaw member.

4,187,841

BONE COMPRESSION OR DISTRACTION DEVICE

Richard A. Knutson, c/o Delta Orthopaedic Clinic, 130 N. Shelby St., P.O. Box 633, Greenville, Miss. 38701

Filed Jul. 7, 1978, Ser. No. 922,786
Int. Cl.[2] A61F *5/04;* **A61B** *17/18*
U.S. Cl. 128—92 E **16 Claims**



1. A bone compression or distraction tool, which comprises:

a threaded shaft;

a cap member secured to one end of said shaft, said cap member having at least one relatively short pin projecting therefrom;

a threaded sleeve rotatably engaged about said threaded shaft;

a knob means secured to and extending outwardly from said sleeve for enabling rotation of same and forming a shoulder; and

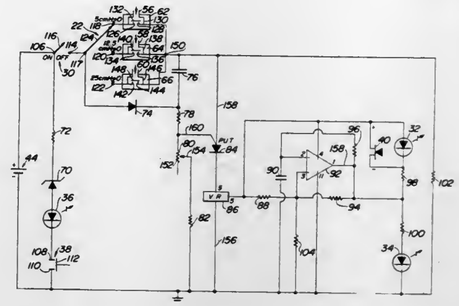
a pin carrying member removably fittable about said sleeve and having at least one relatively short pin projecting therefrom, one end of said pin carrying member being engagable by said shoulder so as to move towards or away from said cap member upon rotation of said knob means.

4,187,842

PRESSURE MONITOR FOR BREATHING SYSTEM

Peter J. Schreiber, Zionsville, Pa., assignor to N.A.D., Inc., Telford, Pa.

Filed Dec. 6, 1977, Ser. No. 858,041
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—202.22 **5 Claims**



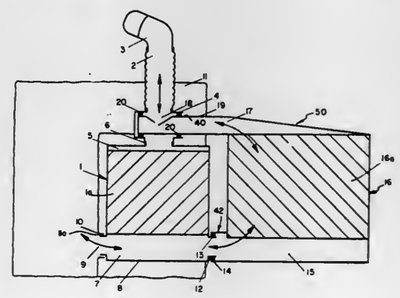
1. A pressure monitor for a breathing system, said monitor including a plurality of pressure responsive switches each of which is connected to pressure in said breathing system, each of said switches being preset to be changed in state when said switch is connected to a pressure which is in excess of a predetermined threshold pressure, each of said switches having a different predetermined threshold, said monitor further including signal means, timing means and selector means, said selector means connecting one of said switches at a time to said timing means, said timing means being responsive to said one selected switch and said signal means being connected to said timing means, said signal means being activated by said timing means whenever said system pressure does not exceed the threshold of said switch connected to said selector means within a predetermined time interval.

4,187,843

RESPIRATOR HAVING AN OXYGEN-RELEASING CHEMICAL CARTRIDGE AND MEANS FOR ATTACHING AN ADDITIONAL CARTRIDGE

Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

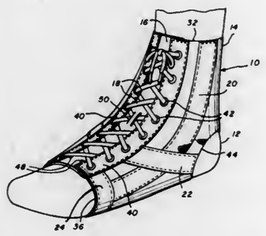
Filed Jan. 19, 1978, Ser. No. 870,635
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1977, 2702673
Int. Cl.[2] A62B *7/08*
U.S. Cl. 128—202.26 **4 Claims**



1. A respirator comprising a respirator air hose having a mouthpiece connection at one end and an opposite end, a first cartridge housing having an oxygen-releasing chemical

therein, said housing having a tubular inlet portion connected between and extending transversely to said air hose and said first cartridge housing with a through flow air passage therein from said air hose to said first cartridge housing, said tubular inlet portion having a first receiving opening intermediate the air passage, said first cartridge housing having a bottom wall spaced from the oxygen-releasing chemical with an air bag opening and a second receiving opening spaced from the air bag opening, an air bag adjacent said first cartridge housing connected to said air bag opening, a second cartridge housing having one end with a laterally extending tubular connecting piece defining an air flow passage and being removably inserted into the first receiving opening of said tubular inlet portion and blocking the flow passage therethrough, said tubular connecting piece having an opening disposed in the air flow passage for receiving the air flow from the passage of the air into the interior of said second cartridge housing, said second cartridge housing having an oxygen-releasing chemical therein spaced upwardly from the bottom of said second cartridge housing to define an air space below the chemical, coupling means removably coupling said second cartridge housing to said first cartridge housing when said tubular connecting piece is inserted into the first receiving opening and communicating in the air space below the oxygen-releasing chemical in the second cartridge housing with the space below the oxygen-releasing chemical in said first cartridge housing through said second receiving opening, said respirator being for swinging respiration in which respirator gases are exhaled through said air hose and through the air passage of said tubular inlet portion through the chemical of the first cartridge housing to the space in the first cartridge housing below the chemical and then to the air bag and flows in the reverse direction during inhaling when the second cartridge housing is not connected to said first cartridge housing, and when said second cartridge housing is removably connected to said first cartridge housing, the flow of respiratory gases during exhalation being from the air hose through the tubular connection of said second cartridge housing which blocks the flow passage to said first cartridge housing, and then to the second chemical in the second cartridge housing to the air space in the second cartridge housing below the chemical and through the coupling means to the air space below the chemical in the first cartridge housing and into the air bag and, during exhaling, with the flow being in the reverse direction, said tubular connecting piece of said second cartridge housing having an outer closed end which engages in said tubular inlet portion of said first cartridge housing and a top wall with an opening therethrough disposed in said air flow passage for receiving the air flow therethrough.

4,187,844
ANKLE SUPPORTER
Louis W. Caprio, Jr., 132 Eustis St., Revere, Mass. 02115
Filed Nov. 13, 1978, Ser. No. 959,998
Int. Cl.[2] A61F *13/06*
U.S. Cl. 128—166 **4 Claims**



1. An ankle supporter adapted to be fastened about a foot and ankle, comprising:

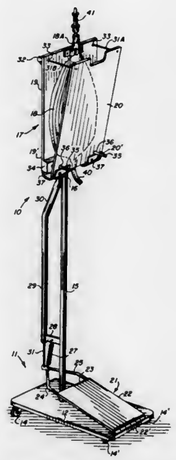
a flexible fabric sleeve having a lower peripheral edge and two facing edges,

means for fastening said facing edges together,

a longitudinal reinforcing strip stitched to a side of said sleeve, passing over the lateral malleolus of the foot and extending below the ankle to parallel the metatarsal bones of the foot, and

a transverse reinforcing strip intersecting said longitudinal reinforcing strip between the lateral malleolus and said lower peripheral edge.

4,187,845
APPARATUS FOR FEEDING ANESTHETIC AND/OR LIFE SUSTAINING GASES DURING A SURGICAL PROCEDURE
Leon L. Dror, 922 W. Culver St., Phoenix, Ariz. 85007
Filed Jul. 12, 1978, Ser. No. 923,899
Int. Cl.[2] A61M *17/00*
U.S. Cl. 128—205.13 **6 Claims**



1. An apparatus for feeding life sustaining gases to a patient during a surgical procedure comprising:

a platform for resting on a supporting surface,

a shaft mounted on said platform and extending laterally therefrom,

a bellows,

a supporting means mounted on one end of said shaft for holding a bellows,

said supporting means comprising a pair of relatively movable arms hingedly connected at a common end thereof, one of said arms being stationary to said shaft, the other of said arms being movable with respect to said one of said means,

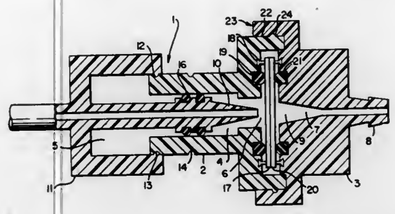
said bellows being positioned between said arms and having means connectable at one point to a source of gas under pressure and having an outlet at another point for supplying gas under pressure,

pedal means hingedly mounted at one end thereof on said platform,

spring means connected to the free end of said pedal means for biasing said pedal means away from said platform, and

cord means connected to the free end of said pedal means at one end and to the free end of said other of said arms for pivotally moving said other of said arms relative to said one of said arms to selectively compress said bellows and to remove said pressure thereon upon pivotal movement of said pedal means.

4,187,846
STERILE CONNECTORS
Houshang Lolachi, Westport, Conn., and Robert N. Carminucci, Purdy, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Jun. 22, 1978, Ser. No. 918,025
Int. Cl.[2] A61M *05/00*
U.S. Cl. 128—214 R **24 Claims**



1. A sterile connector having enhanced sterility protection and simplified operating capability comprising:

(a) a male connector member having a conduit extending therethrough, said conduit adapted to position a male luer fitting section therein;

(b) a female connector member having a conduit extending therethrough, said conduit comprising a companion female luer fitting section;

(c) means to secure said male connector member to said female connector member in matingly engaged position with the conduits in said members in alignment so as to permit communication therebetween;

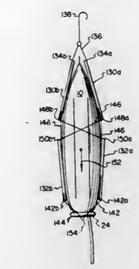
(d) shield plates positionable so as to cover and isolate the conduits in said male and female connector members from the atmosphere, said shields being positioned intermediate the male and female connector members when said members are in said matingly engaged position, with one shield plate being affixed to the male connector member and the other shield plate being affixed to the female connector member, said shield plates being movable so as to uncover the respective conduits in said male and female connector members;

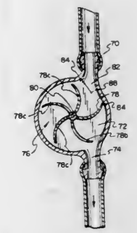
(e) a male luer fitting section positioned in the conduit of the male connector member, said section being adapted to isolate the end of the male connector member conduit opposite that covered by said male member shield plate from the atmosphere, said male luer fitting section being movable so as to engage and lock with female luer fitting section when said shield plates are positioned so as to uncover said conduits in the male and female connector members; and

(f) compressible seals positioned intermediate said male and female connector members and their respective shield plates, said seals being adapted to maintain isolation of said conduits from the atmosphere as said shield plates are moved so as to uncover said conduits, said seals expanding and contacting one another behind the trailing edge of said shield plates, thus forming a seal-line that advances as the shield plates are moved and preventing the sterile conduits within said male and female connected members from being exposed to the atmosphere,

whereby said luer fittings may be readily and effectively engaged and locked in a sterile environment preserved by the seal-line of said compressible seals during the convenient moving of said shield plates to expose the conduit openings through which said luer fittings are engaged, said seals providing an added assurance against contamination of fluid passing through the engaged luer fitting within the connector without exposure of said seals to contact by said fluid passing through the connector.

4,187,847
AIRLESS INTRAVENOUS FLUID SYSTEM
Edward A. Loeser, 8646 Oak Valley Dr., Sandy, Utah 84070
Filed Jul. 11, 1977, Ser. No. 814,185
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **3 Claims**





1. An intravenous fluid therapy system comprising:

a non-vented source of intravenous fluid which is an intravenous-fluid-filled container having deformable side walls, an upper part, and a lower part with a mouth;

pressure means adapted to said source to pressurize said intravenous fluid, said pressure means including: said side walls, said surface members having edges with a plurality of attachment means affixed thereto along said edges and being sized in surface area dimensions proximate the size of the side walls of said container, and

tensioning means adapted to said surface members to cause said surface members to exert a force against said side walls, said tensioning means being an elastic member which is an elongated rubber strip removably positioned about and secured to selected attachment means in a pattern to tension said surface members together, and wherein

said spaced apart surface members are comprised of an upper pair of spaced apart surface members hingedly secured to each other along first edges thereof with means secured to said pair at said first edges to suspend said pair, and a lower pair of spaced apart surface members hingedly secured to each other along first edges thereof with an aperture formed along said edges wherein said upper pair of surface members are positioned about the upper part of said source and said lower pair of surface members are positioned about the lower part of said source with its mouth in said aperture and wherein said tensioning means is adapted to extend between the second edges of said upper pair opposite said first edges thereof and the second edges of said lower pair opposite said first edges thereof;

an airless flow meter to indicate the flow of intravenous fluid comprised of:

inlet connection means for connection with said tube means to receive said fluid from said source;

a chamber connected to receive said fluid from said inlet connection means, said chamber having flow indication

means positioned therein, which is a plurality of fins symmetrically secured to a hub rotatably mounted within said chamber;

outlet connection means connected to said chamber for connection to said tube means to receive fluid from said chamber and to supply fluid to said tube means;

wherein said fluid flows from said inlet to said outlet connection means to impinge on said fins to cause said fins to rotate proportionally to the flow rate of said fluid, said fins having magnetic means adapted thereto;

catheter means for insertion into the vein of a patent; and

tube means to connect said source to said flow meter and said flow meter to said catheter means.

4,187,848

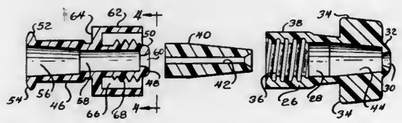
ADAPTER ASSEMBLY

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 816,553, Jul. 18, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,961

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—247 **7 Claims**



1. An adapter assembly, comprising:

a syringe having a tip;

a catheter; and

a connector comprising, a body member having an elongated bore and an opening adjacent a distal end portion of the body member communicating with said bore, an elongated plug of elastic material received in said bore in a relatively uncompressed condition of the plug, said plug having a channel extending through the plug with a distal portion of the channel being aligned with the body member opening and with the internal dimensions of at least a distal portion of the channel being slightly larger than the outer dimensions of said catheter to receive the catheter through said body member opening, a compression member having a nipple adjacent a distal end of the compression member and receivable in a proximal end portion of the body member, said compression member having a port adjacent a proximal end portion of the compression member to receive the syringe tip, and a passageway communicating between the port and the distal end of said nipple, with a distal portion of said passageway being aligned with the plug channel when the nipple is received in the body member bore, and means for releasably attaching the compression member to the body member with said nipple received in said bore, and for controlling the distance said nipple projects into said bore such that the nipple compresses said plug in the bore and releasably secures the catheter in said plug channel, said compression member including a distal gripping element defining a space intermediate the gripping element and said nipple to receive the proximal end portion of the body member when the nipple is received in the body member bore.

4,187,849

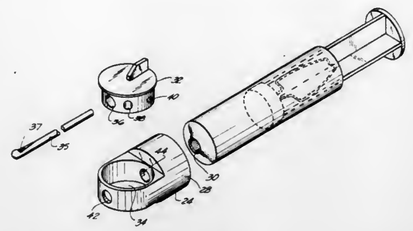
SUCTION CURETTAGE DEVICE WITH VALVE CONTROL AND SUPPORT MEANS FOR DIFFERING DIAMETER TUBES

Edward M. Stim, 1120 Lexington Ave., New York, N.Y. 10021

Filed Jul. 28, 1978, Ser. No. 928,806

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 **22 Claims**



1. A device for use in performing suction curettage procedures including a housing having at least one port therein through which the interior of the housing may communicate with a source of suction and a diametrically opposed opening therein, and a suction tube support member rotatably mounted in said housing; said tube support member having a plurality of intersecting and generally radially extending tube support bores of different diameters formed therein adapted to be selectively aligned between said housing port and opening, each of said bores being adapted to receive at least one differently sized suction tube therein through the housing opening whereby different tubes may be selectively connected to the housing and the source of suction.

4,187,850

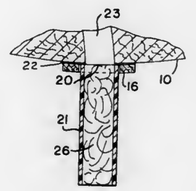
STOMA CENTERING APPARATUS

Charles F. Gust, Sky Harbor Estates Corp., 2959 Gulf Tobay Blvd., #422, Clearwater, Fla. 33515

Filed Dec. 12, 1977, Ser. No. 859,554

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **6 Claims**



1. The method of replacing a full or used ostomy appliance on a person having a stoma for the excretion of waste material from the body, comprising the steps of:

a. removing said used ostomy appliance from the stoma;

b. initially cleaning the skin area about the stoma;

c. centering a hollow cylinder having an inside diameter slightly greater than the diameter of the stoma about the stoma and retaining said cylinder in a centered position;

d. inserting an absorbent material into said cylinder for absorbing waste material excreted from said stoma;

e. preparing the skin by cleaning and drying the skin area about the stoma with a skin prep agent while maintaining the cylinder in a sealing relationship about the stoma;

f. applying an adhesive substance to said prepared skin;

g. inserting a sealing ring over said cylinder and onto the skin for adherence to the skin; and,

h. withdrawing said cylinder from the skin and adhering another ostomy appliance to said sealing ring.

4,187,851

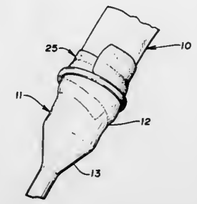
SHEATH ARRANGEMENT FOR MALE URINAL DEVICE AND METHOD OF FORMING THE SAME

Thomas M. Hauser, St. Paul, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Aug. 20, 1976, Ser. No. 716,112

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—295 **2 Claims**



1. The method of applying a urinal sheath to a penis which comprises:

providing a liner pad of resiliently compressible, deformable waterproof material in the form of a thin strip of such material having a width substantially less than the portion of the sheath intended to extend over the penis and of a length at least one and a half times the circumference of a normal flaccid penis, the inner and outer surfaces of the liner pad both being adhesive.

winding said strip spirally around said penis over a length of the penis much greater than the width of the strip and applying sufficient pressure during winding that the overlapping portions of the spirally wound strips adhere to each other,

providing a urinal sheath having an upper portion of thin flexible material designed for application to a penis for covering a substantial portion thereof lengthwise and having a lower thicker portion for connection through a suitable conduit to a urine receptacle, the thinner portion being rolled up until the rolled portion is adjacent the conical portion;

applying the rolled sheath to the penis with the lower thicker portion adjacent the glans of the penis and unrolling said sheath until the sheath extends over and beyond the uppermost edge of the spirally wound pad, and

applying squeezing pressure to the outer surface of the sheath to cause it to adhere circumferentially to the spirally wound liner pad, and to press the various elements into closely adhering contact including the contact between the sheath and the overlapped portions of the spirally wound pad to effect a liquid tight seal.

4,187,852

SYNTHETIC ELASTOMERIC INSOLUBLE CROSS-LINKED POLYPENTAPEPTIDE

Dan W. Urry, Bestavia Hills, and Kouji Okamoto, Birmingham, both of Ala., assignors to The University of Alabama, Birmingham, Ala.

Division of Ser. No. 704,088, Jul. 9, 1976, Pat. No. 4,132,746. This application Aug. 14, 1978, Ser. No. 933,598

Int. Cl.[2] A61B *17/04;* **A61F** *1/00, 1/20*

U.S. Cl. 128—334 R **3 Claims**

1. A method of forming and repairing bone structure in animals, comprising implanting in the animal body as a calcifiable matrix a synthetic elastomeric water-insoluble polypentapeptide prepared by cross-linking a first linear polypentapeptide and a second linear polypentapeptide, said first linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the amino acid residues of said first pentapeptide units is replaced by the residue of an amino acid having more than one amino function and said second linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the amino acid residues of said first



pentapeptide unit is replaced by the residue of an amino acid having more than one carboxyl function, said cross-linking being effected by the presence of an effective amount of an agent which causes reaction between free amino functions of said first linear polypentapeptide and free carboxyl functions of said second linear polypentapeptide.

4,187,853

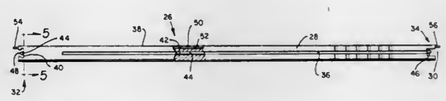
ELECTRODE IMPLANTING APPARATUS WITH OPTIMUM LOCATION PROBE

Steven A. Barton, 401 S. Brazosport Blvd., Freeport, Tex. 77541, and Sidney M. Barbanel, 2265 River Valley Dr., West Columbia, Tex. 77486

Filed Nov. 6, 1978, Ser. No. 957,916

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—419 PT **6 Claims**



1. Apparatus for implanting an electrode, said apparatus comprising:

an elongate body having a tip;

means for temporarily securing said electrode to said tip;

means operatively associated with said body for contacting body tissue adjacent said electrode with a signal probe while said electrode is temporarily secured to said tip; and

means operatively associated with said body for selectably dislodging said electrode from said tip.

4,187,854

IMPLANTABLE DEMAND PACEMAKER AND MONITOR

Dennis G. Hepp, Coon Rapids; Robert A. Neumann, Blaine, and Paul Citron, New Brighton, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 17, 1977, Ser. No. 842,389

Int. Cl.[2] A61N *1/36*

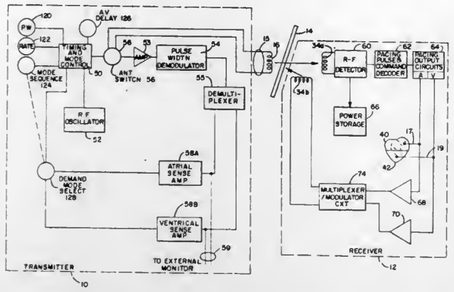
U.S. Cl. 128—419 PG **10 Claims**

7. Cardiac monitoring and stimulating apparatus for monitoring the activity of and for applying respectively first and second stimulating pulses to the atrial and ventricular portions of a patient's heart, said apparatus comprising:

(a) a first unit disposed externally of the patient's body and including means for transmitting electromagnetic energy within the patient's body;

(b) a second unit adapted to be surgically implanted within the patient's body, said second unit including means re-

sponsive to the externally generated energy for providing the sole energization of said second unit, second means including first and second electrodes coupled to sense the atrial and ventricular activity of the patient's heart for providing first and second electrical signals indicative of the atrial and ventricle conditions of the patient's heart, third means for sequentially transmitting said first and second signals externally in first and second time slots, respectively, and fourth means for respectively applying



the first and second stimulating pulses to the atrial and ventricular portions of the patient's heart; and

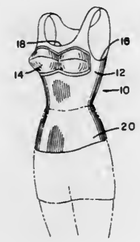
(c) said first unit comprising decoding means responsive to the transmitted first and second electrical signals indicative of the atrial and ventricle conditions of the patient's heart for providing decoded third and fourth output signals, and means responsive to said third and fourth output signals means for providing manifestations of the atrial and ventrical activity of the patient's heart.

4,187,855

GARMENT FOR USE AFTER BREAST SURGERY

Cornelia A. Paulus, and Nancy E. Paulus, both of 6719 Briargate, Downers Grove, Ill. 60515

Filed Jun. 22, 1977, Ser. No. 808,973
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—427 **8 Claims**



1. A garment to be worn after breast surgery having brassier-type mammary prosthesis to emulate a natural breast appearance of a wearer, the improvement comprising:

a body hugging, seamless shirt having a front and a back and a smooth interior adapted to fit snugly and comfortably about a person's body;

said shirt having expandable fabric means adapted to cling to and firmly hold the shirt in place on the wearer;

said shirt having a pair of enlarged arm openings and shoulder strap means associated with each arm opening;

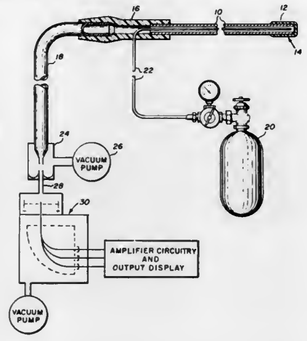
an elongated bodice with an extension with an open body for extending beyond and around the wearer's waist to assist in holding the shirt in place; prosthesis type bra means with means attached to the top front outside of said shirt leaving the bottom of said bra unattached without obstructing the smooth interior of the seamless outside shirt and said bra means having filler mean and then attaching the bottom of the bra means to said shirt providing a two-breast natural appearance garment to the wearer which will not ride up and stays in place on the wearer and cannot be easily observed through or be otherwise visible under outer garments.

4,187,856

HIGH-SPEED TRANSMISSION OF BLOOD STREAM GASES

Lawrence G. Hall, Creve Ceour, Mo., and Wayne J. Whistler, Glendora, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 3, 1978, Ser. No. 893,032
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—635 **1 Claim**



1. A system for providing blood gas specimens from blood vessels to a gas analyzer comprising:

a catheter having an outside diameter of approximately three millimeters comprising a distal end and a proximal end, said distal end being sufficiently sharp to enter a human blood vessel, said distal end having an opening sealed with a membrane impervious to blood,

a first conduit interconnecting the proximal end of said catheter and the gas analyser,

a capillary tube extending through the lumen of said catheter,

a carrier gas source containing a carrier gas substantially lighter than said blood gas,

one end of said capillary tube terminating at the distal end of said catheter,

a second conduit connecting said carrier gas source to the other end of said capillary for admitting a carrier gas into said capillary tube extracting means connecting to said first conduit for causing said carrier gas to expand substantially more than said blood gas,

said extracting means including a vacuum pump for carrying away said carrier gas.

4,187,857

ULTRASONIC WAVE DIAGNOSTIC APPARATUS TO CONCURRENTLY DISPLAY AN ECHO SIGNAL AND A REFERENCE SIGNAL

Shigeru Sato, Yamato, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 29, 1977, Ser. No. 855,808
Claims priority, application Japan, Nov. 29, 1976, 51-143142
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—660 **12 Claims**

1. An ultrasonic diagnostic apparatus for examining an object by concurrently displaying an M-mode ultrasonic echo signal and a representation of a reference signal comprising:

means for generating a fundamental pulse having a first frequency,

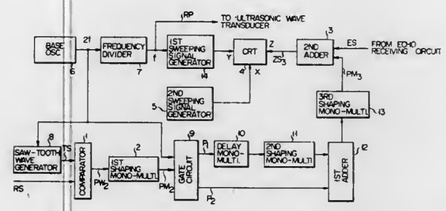
means coupled with said generating means for converting said fundamental pulse into a rate pulse having a second frequency 1/n times said first frequency, n being an integer $\geqq 2$,

an ultrasonic wave transducer coupled with said converting means and driven by said rate pulse to emit ultrasonic waves through the object at a rate equal to said second frequency,

means for detecting the reflected portions of the ultrasonic waves and forming an echo signal,

means coupled with the reference signal for pulse-position-modulating said reference signal in response to said fundamental pulse to produce n pulse-position-modulated pulses during the period of each rate pulse,

means coupled with said modulating means for rearranging



said n pulse-position-modulated pulses produced during a period of each rate pulse to fit within only a predetermined portion of each rate pulse,

means coupled with said detecting means and said rearranging means for combining the rearranged pulse-position-modulated pulses of said reference signal and said echo signal to form a combined signal,

means for generating a first sweep signal having the same frequency and being synchronous with said rate pulse,

means for generating a second sweep signal having a selected third frequency, and

display means coupled with said combining means, first sweep signal generating means and second sweep signal generating means for receiving and processing said combined signal, said first sweep signal and said second sweep signal to concurrently display a M-mode ultrasonic echo signal and the pulse-position-modulated pulses representing said reference signal.

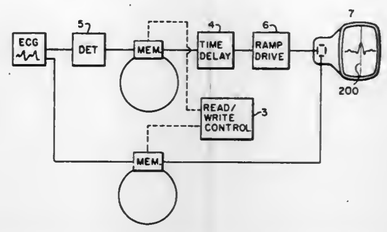
4,187,858

METHOD AND APPARATUS FOR ORIENTING THE DISPLAY OF INFORMATION FROM A RECIRCULATING MEMORY

Christopher C. Day, Newtonville, and Robert A. McEachern, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 17, 1978, Ser. No. 896,835
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—710 **9 Claims**

1. In apparatus having a recirculating memory means and a CRT means to display the ECG wave from a patient stored in the recirculating memory means, and means for detecting the R-wave of the ECG wave, the improvement comprising second recirculating memory means, clocking means responsive to the output of said R-wave detector to enter a single bit marker into said second recirculating memory means, time delay means responsive to said bit marker of said second memory means, the time delay of said time delay means corresponding to the predetermined interval prior to an upcoming full ECG wave, said time delay means outputting a trigger signal, and sweep circuit means responsive to said trigger signal for



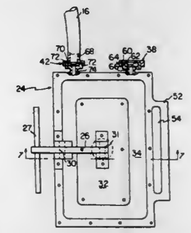
initiating the ramp signal applied to one axis of said CRT means.

4,187,859

RESPIRATING PUMP

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Inc., Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,861
Int. Cl.[2] G01N *1/22*
U.S. Cl. 128—725 **11 Claims**



1. A respirating pump adapted for support upon the thoracic cavity and comprising:

(A) A housing, having an inlet and outlet;

(B) A diaphragm flexibly supported in one wall of said housing;

(C) A lever pivoted upon said housing, so as to movably engage said diaphragm at its inner end and abut the thoracic cavity at its outer end, such that expansion and contraction of said cavity during respiration moves said diaphragm as a pump; and

(D) An air pollution sampler attached to said inlet, such that movement of said diaphragm as a pump draws air through said sampler and into said housing and exhausts air through said sampler.

4,187,860

ARTERIAL BLOOD COLLECTION DEVICE

Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 1, 1977, Ser. No. 829,851
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—763 **9 Claims**

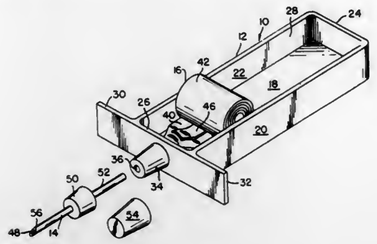
1. An arterial collection device, comprising:

an elongated housing having a proximal end, a distal portion, an elongated bottom wall having a pair of opposed sides, and a pair of elongated spaced sidewalls extending upwardly from the sides of said bottom wall and having a pair of upper edges, said bottom wall and sidewalls defin-

ing an elongated retention space and an elongated opening at the upper edges of said sidewalls;

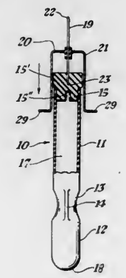
a hollow needle connected to a distal portion of the housing; and

an elongated longitudinally expansible collection bag supported by said bottom wall in said housing space, said bag having elongated flexible sidewalls defining a collection chamber communicating with said needle, said bag having means to cause said bag to take a first normally rolled sidewall configuration, said bag being movable responsive to normal arterial pressure while guided by said sidewalls in said retention space between said first sidewall configu-



ration of longitudinally reduced bag dimensions with air substantially removed from said chamber, and a second sidewall configuration of longitudinally extended bag dimensions with said chamber enlarged to receive arterial blood and with said bag sidewalls unrolling during movement from said first to second configuration, said means having sufficient resistance against movement from said first to second configurations to prevent significant extension of the bag under normal venous pressure while simultaneously permitting extension of the bag under arterial pressure, and said bag having an anti-coagulate of blood in said chamber.

4,187,861
BLOOD SAMPLE HANDLING APPARATUS AND METHOD
Bart T. Heffernan, 26 Saranac Rd., Sea Ranch Lakes, Fla. 33308
Filed Feb. 21, 1978, Ser. No. 879,123
Int. Cl.² A61B *10/00*
U.S. Cl. 128—764 **10 Claims**



1. A specimen handling device, comprising:

a body,

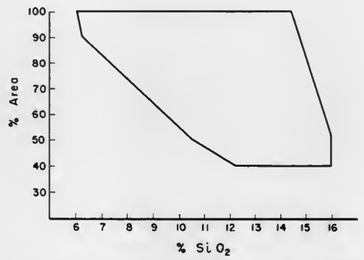
a first relatively rigid body portion, said first body portion being shaped and structured having a first volume within said first portion, said first body portion including an entrance, said first body portion constructed of material to provide a said first volume that may be evacuated,

a second relatively rigid body portion connected to said first body portion, said second body portion being shaped and structured having a second volume, said second body portion constructed of material to provide a said second volume that may be evacuated,

at least one mid portion connected between said first body portion and said second body portion and providing an operable connection between said first volume and said second volume, each said mid portion having flexible walls movable toward one another for sealing shut and separating said first volume from said second volume, and

a first means for sealing shut said entrance, said first means composed of a resilient material whereby at least a portion of said walls lie in contact with adjacent walls when said first volume and said second volume are evacuated, and when clamping means are connected across said mid portion it will separate said first volume of said first body portion from said second volume of said second body portion.

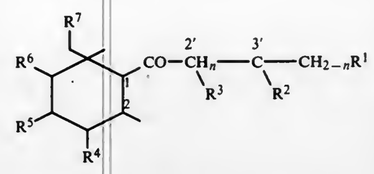
4,187,862
TREATMENT OF CIGARETTE PAPER
Charles C. Cohn, 123 S. New Hampshire Ave., Atlantic City, N.J. 08401
Filed Jul. 17, 1978, Ser. No. 925,224
Int. Cl.² A24D *1/00, 1/10, 1/12*
U.S. Cl. 131—15 R **3 Claims**



3. The process of making a cigarette in which a paper covering is formed into a cylinder to produce a cigarette wrapper, comprising the step of soaking at least part of the surface of the paper with an aqueous alkali metal silicate solution to impart a coating to the paper, the SiO_2 concentration by weight in the coating solution, and the coated area of said surface in any selected three millimeter long section of said cylinder being substantially within the boundaries of an area, on a rectangular plot, defined by straight lines joining the points 100, 6; 100, 14.5; 52, 16; 40, 16; 40, 12.2; 50, 10.5; and 90, 6.2, wherein the first number of each pair is the percentage ratio of the coated area to the total area, and the second number is the percentage of SiO_2 in the silicate solution by weight.

4,187,863
CYCLOALIPHATIC UNSATURATED KETONES AS ODOR AND TASTE MODIFYING AGENTS IN TOBACCO PRODUCTS
Ervin Kovats, Lausanne; Edouard Demole, Geneva; Günther Ohloff, Bernex, all of Switzerland, and Max Stoll, deceased, late of Lully, Switzerland (by Suzanne Stoll, executrix), assignors to Firmenich SA, Geneva, Switzerland
Division of Ser. No. 676,505, Apr. 13, 1976, abandoned, which is a division of Ser. No. 503,738, Sep. 6, 1974, Pat. No. 3,975,310, which is a division of Ser. No. 35,594, May 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 774,179, Nov. 7, 1968, abandoned. This application Mar. 29, 1977, Ser. No. 782,536
Claims priority, application Switzerland, Nov. 9, 1967, 15667/67; Nov. 1, 1968, 16309/68; May 7, 1969, 6976/69; Aug. 8, 1969, 12065/69; Apr. 4, 1970, 5559/70; Apr. 17, 1970, 5725/70
Int. Cl.² A24B *3/12*
U.S. Cl. 131—17 R **3 Claims**

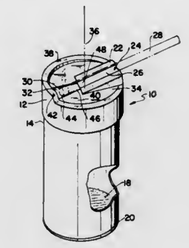
1. A tobacco product having incorporated therein as a taste- and flavour-modifying agent a substantially pure compound having the formula



I $\alpha, \beta, \gamma, \delta$

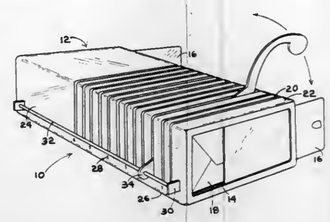
containing one double bond in position 2'- or 3'- of the acyl side-chain and either one double bond in position 1- or 2- or two conjugated double bonds in position 1- and 3- of the cycle, the double bonds being represented by dotted lines, and wherein n is zero or 1, R^1, R^2 and R^3 represent hydrogen or one of them a lower alkyl radical and the others hydrogen, and R^4, R^5, R^6 and R^7 represent hydrogen or one of them a lower alkyl radical and the others hydrogen.

4,187,864
CIGARETTE HOLDER FOR ASH RECEPTACLES
Michael Taddeo, 35-07 205th St., Bayside, N.Y. 11361
Filed Sep. 14, 1977, Ser. No. 833,090
Int. Cl.² A24F *19/00*
U.S. Cl. 131—242 **4 Claims**



1. A cigarette holder for ash receptacles comprising a cylindrical tube, said cylindrical tube having an interior surface and upper and lower marginal edges, a plate, said plate having an upper lateral surface and a lower lateral surface, said plate being disposed fixedly secured to said interior surface of said tube at a location intermediate said upper and said lower marginal edges and extending substantially perpendicularly to the longitudinal axis to said tube, said tube having a passageway, said passageway having one end thereof located in said interior surface and intermediate said upper marginal edge and said upper lateral surface of said plate, the other end of said passageway located in said lower marginal surface of said tube, said plate having an opening therein, one end of said opening being disposed adjacent said one end of said passageway, said plate having a ramped surface, said ramped surface extending upwardly and outwardly from said upper lateral surface of said plate, said ramped surface having an elongated groove therein, said elongated groove having one end thereof disposed the other end of said opening, said opening having an elongated shape.

4,187,865
CIGARETTE CLIPPER
Johnny A. Burton, 1440 S. West Blvd., Rohnert Park, Calif. 94928
Filed Oct. 30, 1978, Ser. No. 956,262
Int. Cl.² A24F *13/24*
U.S. Cl. 131—250 **5 Claims**



1. A cigarette clipping device comprising:

an open-ended casing of relatively rigid material and of a size and shape in cross-section to accommodate closely a package of cigarettes;

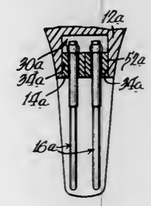
a plurality of parallel main slots in said casing from adjacent one end thereof, each of said main slots extending fully across the top of said casing and from said top down both sides thereof to levels near the bottom thereof;

a rail shaft mounted along one of said sides parallel to and adjacent the bottom of said casing;

a lever slidably and rotatably carried at onc end thereof on said rail shaft and extending beyond the other of said sides; and

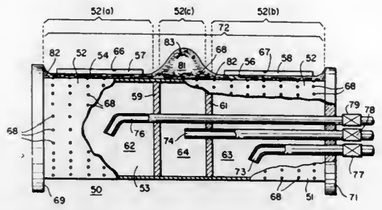
a knife edge along the bottom of said lever.

4,187,866
COMB WITH ROTATABLE TEETH
Jan M. Zwiren, Chicago, Ill.; Selma M. Casper, and Norman Sinclair, both of New York, N.Y., assignors to Helene Curtis Industries, Inc., Chicago, Ill.
Filed May 19, 1978, Ser. No. 907,789
Int. Cl.² A45D *24/00*
U.S. Cl. 132—151 **8 Claims**



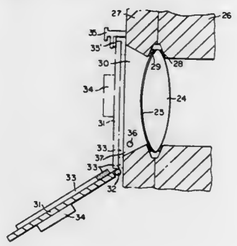
1. A comb comprising an elongated body having integral end portions extending generally perpendicular, said body having a substantially rectangular recess extending from a surface thereof between said end portions, said recess having a base wall, opposed sidewalls and opposed end walls, each end wall having a stepped configuration to produce a shoulder spaced from said base wall, an insert located in said recess and having opposite ends engaging said shoulder to produce a space between said base wall and an adjacent surface of said insert, said insert having a plurality of spaced circular openings with rotatable teeth located in the respective openings and extending from an opposed surface of said insert, each of said teeth having an enlarged head located between said base wall and said adjacent surface, each enlarged head having an axial dimension less than the spacing between said base wall and said adjacent surface to accommodate axial movement of said teeth in said openings.

4,187,867
FLUID BEARING
Charles J. Sherman, Frenchtown, N.J., assignor to Western Electric Company, Inc., New York, N.Y.
Division of Ser. No. 786,512, Apr. 11, 1977, Pat. No. 4,138,047. This application Oct. 2, 1978, Ser. No. 947,925
Int. Cl.[2] B65H *17/32, 23/24*
U.S. Cl. 134—64 P **6 Claims**



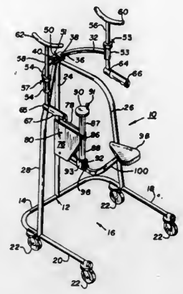
1. A web treating apparatus which comprises:
a tank containing a treating liquid; and
at least one liquid bearing capable of supporting a plurality of webs in spaced relationship in said liquid, said bearing comprising:
(a) a housing for containing said treating liquid within its interior, said housing having an outer surface for cooperating with a surface of each web to be supported;
(b) a guide means provided on said outer surface, defining with said outer surface a support channel, for maintaining each web to be supported within the boundaries of said defined support channel; and
(c) means for passing said treating liquid from said interior of said housing through said outer surface within said channel to the exterior, to form a treating liquid layer thereover having at least one liquid spike therein in a central portion of said channel, said liquid layer supporting each web to be supported and said liquid spike restricting each supported web to a specified area over said channel and in spaced relationship from adjacent supported webs in said channel when more than one such web is supported.

4,187,868
METHOD AND DEVICE FOR CLEANING A SLOPING OR VERTICAL SURFACE ON AN OPTICAL ELEMENT
Kjell Rudolphi, Ektorp, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden
Filed Mar. 3, 1978, Ser. No. 883,282
Claims priority, application Sweden, Mar. 7, 1977, 7702537
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—184 **10 Claims**



1. In an optical device comprising an optical element mounted therein, the improvement which comprises means for cleaning a surface of said optical element, said cleaning means being mounted on said optical device and comprising means for storing a cleaning liquid, means for applying cleaning liquid from said storing means onto said surface of said optical element, means comprising a closure member moveable to a closure position adjacent said optical surface and forming therewith a vessel for containing cleaning liquid applied from said storing means onto the surface of said optical element, and means for vibrating said liquid in said vessel at an ultrasonic frequency to effect cleaning of said optical surface.

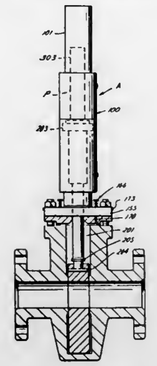
4,187,869
ORTHOPEDIC DEVICE
Pasquale F. Marchetti, 10 Fenway, Hastings on Hudson, N.Y. 10706
Filed Nov. 3, 1978, Ser. No. 957,143
Int. Cl.[2] A61H *3/04*
U.S. Cl. 135—67 **8 Claims**



1. An orthopedic device comprising:
a frame;
caster means for supporting the frame;
a pair of rotatable support arms;
a pivot plate affixed to the frame for supporting the pair of rotatable support arms in a substantially horizontal position for rotation in a substantially horizontal plane;
a crutch staff mounted intermediate the ends thereof to each support arm extending substantially above and below the support arm;
a shoulder support member affixed to the upper end of each crutch staff; and
a hand grip mounted to the lower end of each crutch staff.

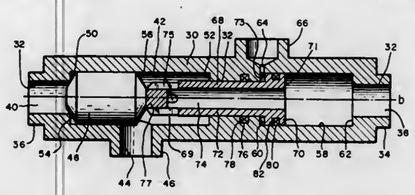
4,187,870
VALVE ACTUATOR AND PILOT ASSEMBLY THEREFOR
Neil H. Akkerman, New Orleans, La., assignor to Baker International Corporation, Orange, Calif.
Division of Ser. No. 794,571, May 6, 1977, Pat. No. 4,157,167. This application Aug. 3, 1078, Ser. No. 930,462
Int. Cl.[2] G05D *7/00;* **F16K** *31/124*
U.S. Cl. 137—102 **17 Claims**

1. A flow line valve actuator respondable to a source of fluid pressure for moving an operative means of a valve between open and closed position, comprising: a housing defining a bore therethrough; a shaft carried in said housing and engagable with said operative means; piston means carried by one of said shaft and said housing and sealingly slidable along the other of said shaft and said housing and longitudinally movable within said cylindrical bore; first and second fluid chamber means companionly associated with said piston means yielding a differential force across said piston means upon increase of fluid pressure within one of said chamber means, said shaft being selectively shiftable longitudinally in a first direction to move said operative means to one of open and closed position by increase in fluid pressure within one of said first and second fluid chamber means, said shaft being selectively shiftable longitudinally in a second direction to move said operative means to the other of said open and closed position upon subsequent decrease in fluid pressure in one of said first and second chamber means and upon increase of fluid pressure within the other of said first and second chamber means; pilot means within said housing having valve seat means thereon; normally free traveling spherical members immediate said pilot means defining valve head means and selectively sealingly engagable on said pilot means to open and close said pilot means to control fluid flow therethrough; and pilot spool means within said housing immediate said pilot means and operably associatable with said pilot means and said spherical members to permit selective engagement of said spherical



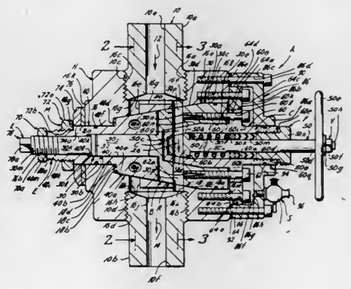
members onto said valve seat means of said pilot means, said spool means being selectively shiftable in one of linear and rotational directions within said housing immediate said valve head and seat means and not constrained against the other of linear and rotational directions to permit said fluid pressure to act within said actuator to manipulate said operative means between open and closed position upon only one of linear and rotational shifting of said spool means, the selective engagement of said head and seat means being sealingly insensitive to the other of linear and rotational shifting of said spool means.

4,187,871
PRESSURE-BIASED SHUTTLE VALVE
Richard C. Hendrickson, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 13, 1978, Ser. No. 877,200
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—112 **8 Claims**



1. An improved shuttle valve apparatus comprising:
an elongate valve body;
a bore extending through said body;
first and second counterbores axially spaced within said valve body along said bore,
first and second ports communicating with said bore at opposite ends thereof;
a third port intersecting said bore between said first and second ports;
a shuttle slidably disposed within said first counterbore and cooperating in such manner as to allow selective communication between one of said first and second ports and said third port in response to fluid pressure at said first and second ports, and
means for biasing said shuttle in a first position to allow initial fluid flow from one of said first and second ports to said third port, said means for biasing including a bias piston disposed within said second counterbore and coupled to contact said shuttle and responsive to fluid pressure at one of said ports to move said shuttle to said first position, and
a channel in said valve body communicating with said second counterbore and cooperating in such manner as to provide a differential pressure to a portion of the bias piston which enables the bias piston to move the shuttle to said first position in response to fluid pressure from one of said first and second ports.

4,187,872
CONTROL VALVE ASSEMBLY
Murray E. Freeman, and Harmon E. Shipper, both of Pasadena, Tex., assignors to Tapco International, Inc., Houston, Tex.
Continuation of Ser. No. 737,509, Nov. 2, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,817
Int. Cl.[2] F16K *11/12*
U.S. Cl. 137—454.6 **29 Claims**

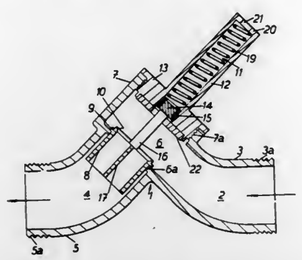


1. A control valve assembly for controlling fluid flow in a flowline, comprising:
a housing adapted to be mounted with the flowline;
a normally operative flow control means and a movable element mounted substantially within said housing forming a first flow path to allow the passage of fluid from the flowline through said housing;
said normally operative flow control means normally controlling flow through said first flow path;
said movable element being for controlling flow through said first flow path independently of said normally operative flow control means;
said movable element having a second flow path formed therein to allow the passage of fluid from the flowline through said housing as desired; and,
safety means mounted with said movable element and in communication with said first flow path for releasing fluid pressure trapped in said first flow path between said movable element and said housing.

4,187,873
PRESSURE REGULATORS
Raphael Mehoudar, 36 Yehuda Hanassi St., Tel Aviv, Israel
Filed Jan. 29, 1973, Ser. No. 327,631
Claims priority, application Israel, Feb. 9, 1972, 38733
Int. Cl.[2] F16K *31/122*
U.S. Cl. 137—505.13 **1 Claim**

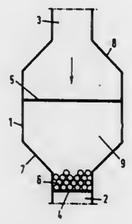
1. A liquid pressure regulator comprising:
(a) a body having a liquid flow inlet chamber connected to a liquid flow outlet chamber by an intermediate zone;
(b) an inwardly directed flange on the body establishing an axially narrow cylindrical guide surface, and a piston cylinder in the body opposite to and coaxial with the

guide surface, one end of the cylinder being vented and the other end being open to the intermediate zone;
(c) a valve seat surrounding the open end of the piston cylinder and exposed to the intermediate zone;
(d) a movable member having a tubular sleeve with an upstream edge, a coaxial piston opposite the upstream edge, and coupling means interconnecting the sleeve and the piston so that both move axially as a unit;
(e) the member being mounted in the body so that the sleeve slidably engages the guide surface and the piston slidably engages the piston cylinder, the sleeve being movable in the intermediate zone between a fully open position at which the upstream edge is maximally spaced from the



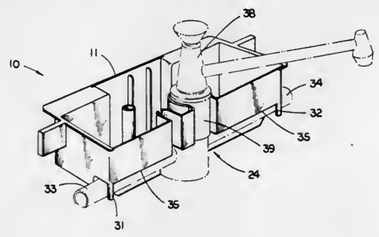
valve seat, and a substantially closed position at which the upstream edge is in substantially end-on line contact with the valve seat;
(f) a resilient seal on the piston sealingly engaged with the cylinder and sealingly separating the vented end of the cylinder from the open end;
(g) a spring acting on the piston for resiliently urging the member toward its maximally open position; and
(h) the upstream edge of the sleeve being coaxially bevelled and inwardly tapering from a maximum diameter substantially equal to the external diameter of the sleeve to a minimum diameter substantially equal to the internal diameter of the sleeve.

4,187,874
FLUID DIODE
Jan Essebaggers, Nieuwerkerk aan de Ijssel, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands
Filed Nov. 1, 1977, Ser. No. 847,441
Claims priority, application Netherlands, Nov. 8, 1976, 7612384
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—533.11 **4 Claims**



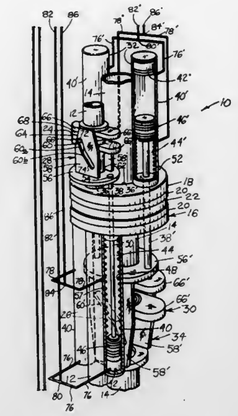
1. A fluid diode for permitting fluid flow in a normal direction while substantially preventing reverse flow in the opposite direction, said fluid diode comprising:
a chamber having an inlet end adapted to be connected to a fluid supply pipe and an outlet end adapted to be connected to a fluid discharge pipe;
a first substantially flat pervious grid mounted adjacent to the inlet end of the chamber such that all fluid flowing through the chamber between the inlet and the outlet passes through said first grid;
a second substantially flat pervious grid mounted in the chamber and spaced from the first grid in the direction of the outlet end, the cross-sectional area of the chamber being larger at the location of the second grid than the cross-sectional area at the location of the first grid, and the area of the second grid being substantially greater than the area of the first grid; and
a multiplicity of balls confined in the chamber between said first and second grids, the balls being freely movable from one grid to the other grid in response to changed direction of fluid flow through the chamber, and the aggregate volume of the balls being such that the balls can shut off the first grid against reverse fluid flow from the outlet end to the inlet end but cannot shut off the second grid in the case of normal flow from the inlet end to the outlet end.

4,187,875
LIQUID DETERGENT RESERVOIR
Eugene R. Flynn, Farmington Hills, Mich., assignor to Manville Manufacturing Corporation, Pontiac, Mich.
Filed Aug. 15, 1977, Ser. No. 824,520
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—576 **5 Claims**



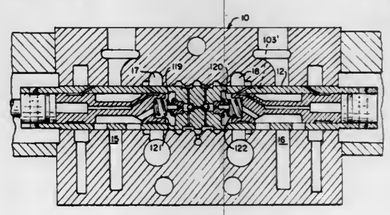
1. A liquid detergent reservoir for the retention and delivery of liquid detergent mixture which comprises:
a main body portion open at the top and having a bottom wall and side walls providing a bottom surface and sides respectively defining a cavity within said main body portion;
an air intake duct integrally a part of said main body portion and extending upwardly from the bottom surface to the open top, said duct having a passageway therethrough;
a hollow outlet tube integrally a part of said main body portion and opening at one end into said duct, said hollow outlet tube outwardly extending beyond one of said walls;
said duct having an aperture therethrough in said cavity adjacent the bottom surface of said main body portion, said aperture providing a path for fluid to flow from said cavity into said passageway;
said reservoir being of a single piece, molded plastic construction;
said side walls including upwardly extending elongate structural support features whereby said reservoir is structurally configured such that the reservoir is self-supporting in an upright, free-standing manner;
one of said sides being molded with a part cylindrical recess adapted to fit around a riser fitting of a dishwashing apparatus and being adapted with an offset shelf to fit over hot and cold manifold pipes connecting to said riser of said dishwashing apparatus.

4,187,876
SUB-SURFACE GATE VALVE
Heinrich Lang, Spring, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed May 8, 1978, Ser. No. 903,661
Int. Cl.[2] F16K *3/02, 31/524*
U.S. Cl. 137—594 **13 Claims**



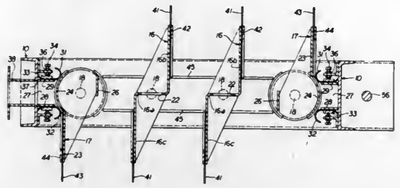
1. A gate valve device, comprising:
a tubular housing having opposite end walls, enclosing at least one valve cavity;
an internal bulkhead extending crosswise of the housing, said at least one valve cavity being defined between a respective one of said end walls and said bulkhead;
means providing a longitudinal throughbore extending axially between the opposite end walls of said housing;
a gate valve interposed in said longitudinal throughbore within said one valve cavity, said gate valve including a valve gate transversally slidably disposed between two respectively confronting, full skirted valve seats;
the valve gate including a drive pin means having end portions laterally extending therefrom in two opposite directions and means journalling said drive pin on said valve gate for rotation about its own longitudinal axis;
means in said housing but isolated from said one valve cavity by said internal bulkhead defining a pair of longitudinally extending hydraulic cylinders, arranged laterally adjacent one another but on at least generally diametrically opposite sides of said longitudinal throughbore;
means defining a pair of piston rod-passing openings through the bulkhead coaxially with the respective ones of said cylinders;
a piston slidingly received in each cylinder and having a respective piston rod connected thereto and extending therefrom slidingly, sealingly through the respective one of said piston rod-passing openings and into said one valve cavity;
first hydraulic line means communicated through the housing with each hydraulic cylinder in such sense as to drive the pistons toward the internal bulkhead when hydraulic pressure is admitted to the hydraulic cylinders therethrough;
second hydraulic line means communicated through the housing with each hydraulic cylinder in such sense as to drive the pistons away from the internal bulkhead when hydraulic pressure is admitted to the hydraulic cylinders therethrough;
a cam assembly disposed within said one valve cavity and including:
(a) end plate means connecting between both piston rods; and
(b) two laterally spaced cam plate means flanking said gate valve, each cam plate means having a cam surface means maintained in contact with a respective end portion of said drive pin means, so that said drive pin means may roll thereupon as said cam assembly is axially moved by axial extension and retraction of said pistons;
said cam surface means being obliquely oriented relative to the longitudinal axis of said housing, for converting longitudinal movement of said pistons into transverse movement of said valve gate.

4,187,877
COMPENSATED WORK PORT FLUID VALVES
Robert F. Hodgson, and John D. Petro, both of Youngstown, Ohio, assignors to Commercial Shearing Inc., Youngstown, Ohio
Continuation-in-part of Ser. No. 540,402, Jan. 13, 1975, abandoned. This application Jul. 25, 1978, Ser. No. 927,767
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—596 **9 Claims**



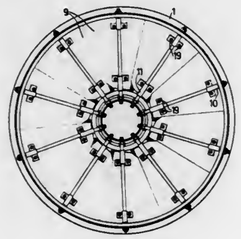
1. A compensated work port fluid valve comprising a directional control valve having a housing with inlet and outlet ports, a bore extending through said housing, a valve member movable in said bore, a pair of spaced inlet chambers intersecting said bore generally centrally thereof and connected to the inlet port, a pair of work chambers spaced from and on opposite sides of said inlet chambers, a pair of outlet chambers intersecting on opposite sides of said work chambers from the inlet chambers, said work chambers being adapted to be alternatively connected to one of said inlet chambers in one position of the valve member and to one of the outlet chambers in a second position of said valve member, an axial bore in each end of said valve member extending from one end to a point adjacent the center thereof and forming two spaced axial chambers, selectively communicating with one another and with a first pressure sensing passage in the housing intermediate the inlet chambers, a compensator spool movable in each said axial bore, each compensator spool having a groove intermediate its ends, spaced apart radial passages in each chamber communicating through the valve member to said bore, said passages being spaced so as to connect alternatively the work chamber with one of the adjacent inlet and outlet chambers, a second pressure sensing passage through the valve member to each said axial bore adjacent the end of the valve member, resilient means in each said axial bore urging each compensator spool toward one end of each said axial bore in the valve member and passage means connecting each compensator spool groove with the axial bore at the end adjacent the center of the valve member whereby pressure in the compensator spool groove acts on the compensator spool end and on the first pressure sensing passage and the selective communication between the chambers to connect the spaced radial passages and to meter flow therethrough.

4,187,878
VALVE HAVING INTERNALLY PRESSURIZED SEALING ELEMENTS
John E. Hughey, Birmingham, Ala., assignor to Zurn Industries, Inc., Birmingham, Ala.
Filed Dec. 23, 1977, Ser. No. 863,803
Int. Cl.² F16K *1/22*
U.S. Cl. 137—601 **5 Claims**



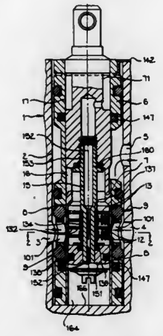
1. In a valve,
(a) a plurality of plate-like closure elements generally Z-shaped in cross section and of a size substantially to span an opening in an enclosure containing fluid under pressure different from atmospheric pressure,
(b) means mounting the closure elements for movement from sealing position with the legs of the Z-shapes thereof substantially normal to the flow path of the fluid being controlled to open position with the legs of the Z-shapes thereof substantially parallel to said flow path,
(c) said closure elements being constructed and relatively arranged when closed to form a continuous chamber substantially spanning said opening, and
(d) means to maintain the chamber formed by the closure elements under pressure greater than the pressure of fluid being controlled.

4,187,879
FLOW REGULATOR
Karl-Erik Fermér, and Leif Hulthe, both of Jönköping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden
Filed Mar. 24, 1978, Ser. No. 889,976
Claims priority, application Sweden, Mar. 31, 1977, 7703730
Int. Cl.² F16K *1/22*
U.S. Cl. 137—601 **10 Claims**



1. A flow regulator for controlling a gas flow, a tubular casing having a gas-flow passage therethrough, a plurality of radial shafts in said casing, an adjustable blade mounted for pivotal movement on each shaft axis, each blade extending from said casing inwardly and ending adjacent the geometrical center axis of said tubular casing, a hub located concentrically in said casing adjacent said center axis, an adjusting ring concentrically located on one side of said hub and having an adjusting mechanism, said ring being connected to all blades and being operable to pivot said blades simultaneously and uniformly, the improvement wherein said shafts are fixedly secured to both said casing and said hub, and that each blade is pivotally mounted on its shaft by means of an outer bearing adjacent said casing and by means of an inner bearing adjacent said hub, said outer bearing being positioned on said shaft at least indirectly by said casing, and said inner bearing being positioned independently of said hub and that each blade has a protruding crank connected to said adjusting ring for displacement thereby.

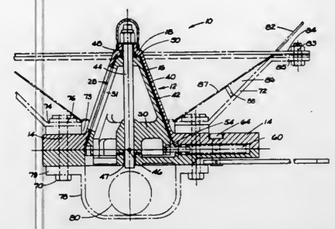
4,187,880
SINGLE-HANDLE MIXING VALVE
Jürgen Humpert; Hans-Joachim Eckel, both of Hemer, and Rolf Behrenberg, Schwerte, all of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.
Filed Jun. 29, 1978, Ser. No. 920,369
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731809
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.17 **9 Claims**



1. A single-handle mixing valve comprising:
a valve casing having a central bore, a pair of first fluid inlets and a first fluid outlet;
a cylindrical sleeve within said bore and including a pair of radially disposed inlet bores in communication with said first fluid inlets and a fluid outlet bore in communication with said first fluid outlet;
a hollow piston disposed within said sleeve, said piston being rotatable to control the fluid mixing ratio and axially shiftable to control the fluid flow volume;
a pair of sealing elements, each sealing element being carried in a corresponding one of said inlet bores;
each of said sealing elements comprising:
a rim-type molded body having a central aperture and arcuately formed to correspond to the outer surface curvature of said piston, and a sealing cord ring buttoned on said molded body, said sealing cord ring providing a seal between said sleeve and said casing and between said sleeve and said piston;
said piston having a plurality of longitudinal slots radially arranged along the axial direction of said piston, each of said slots having a length and a width of smaller dimension than the cross-sectional diameter of said sealing cord ring; and
noise silencing means disposed within said piston.

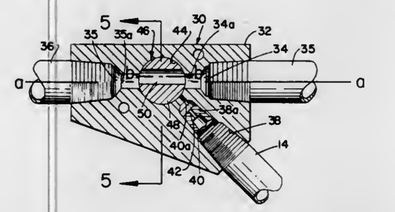
4,187,881
CONE VALVE ASSEMBLY
George A. Kull, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Jun. 23, 1978, Ser. No. 918,231
Int. Cl.² F16K *31/53, 31/54*
U.S. Cl. 137—625.31 **9 Claims**

1. A container outlet valve assembly comprising: a generally cone-shaped housing surrounding a container opening; said housing extending upwardly into the container, and including radially spaced outer openings in the cone housing for lading to flow out of the container; a cone valve located within the housing containing spaced valve openings which align with the housing outer openings when the cone valve is in open position; a liner of low-friction material attached to one of the outer surface of the cone valve and/or the inner surface of the



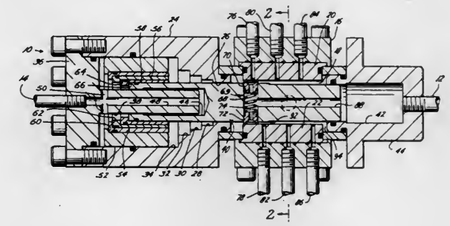
cone housing; said cone valve being rigidly attached to a vertically extending shaft which is journaled for rotation in a bearing in the cone housing; said cone valve being rotatable between a closed position in which the valve body closes the openings located in the cone valve housing, and an open position wherein the valve openings align with the housing openings to allow lading to flow out of the container.

4,187,882
DIVERTER-VALVE APPARATUS
John D. Watson, 906 E. Harmony La., Fullerton, Calif. 92631
Filed Aug. 18, 1978, Ser. No. 935,028
Int. Cl.² F16K *11/085*
U.S. Cl. 137—625.47 **4 Claims**



1. A diverter-valve apparatus adapted to be operably positioned between a pump means within a high-pressure system and the working device operated by said system, the system having a reservoir, wherein said diverter valve comprises:
a main housing;
an inlet port longitudinally disposed in said body;
an outlet port longitudinally disposed in said body and oppositely positioned to said inlet port on a commonly aligned axis therewith;
a bore formed in said body transversely thereof, and interposed between said inlet and outlet ports, said ports communicating with said bore;
a bypass port formed in said body and angularly disposed relative to said inlet port, and communicating with said bore; and
a flow-control means operably disposed in said bore of said body, wherein said means in an open mode allows fluid flow from said inlet port to said outlet, and wherein said means in a closed mode diverts fluid flow from said inlet port to said bypass port when said outlet port is closed thereby, said flow-control means comprising a cock-stem member rotatably disposed in said bore of said body, and a flow-control diverter passage having a longitudinal axis positioned in said cock stem so as to allow fluid flow between said inlet port and said outlet port, and to divert fluid flow from said inlet port to said bypass port without substantially affecting the pressure within said pressure system, said longitudinal axis of said flow-control passage, when in a communicating open position between said inlet and outlet ports, is eccentrically disposed to the axis of said inlet and outlet ports and in a parallel alignment therewith, and when said axis of said flow-control passage is rotated to a closed position one end of said passage is closed to prevent fluid flow to said working device, and the opposite end thereof is positioned to overlap said inlet port and said bypass port to divert fluid flow back to said reservoir within said system;
means within said bypass port for metering the flow of fluid therethrough and regulating the pressure thereof to simulate the pressure drop of said working device,
wherein said metering means comprises a removable plug member having an orifice formed therein, the size of said orifice being determined by the pressure drop provided by its associated working device.

4,187,883
MULTIPLE POSITION VALVE
George R. Webster, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Jan. 31, 1978, Ser. No. 873,931
Int. Cl.² F16K *11/06, 45/00*
U.S. Cl. 137—625.68 **4 Claims**



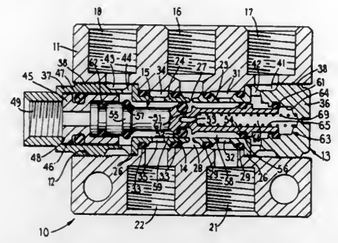
1. A multiple position valve, comprising
a body having an internal bore, and a plurality of stepped counterbores coaxial with said bore and forming a series of stepped shoulders,
a first piston mounted for reciprocation in said bore,
means for introducing supply fluid at a reference pressure into said bore at one end of said piston,
a plurality of nested pistons connected to the opposite end of said piston,
each one of said nested pistons being of a diameter to enter one of said counterbores and engage its shoulder so that as said nested pistons progressively engage the shoulders of their respective counterbores the smaller of said nested pistons are free to move toward their counterbores' shoulders,
a plurality of control ports, a supply port and an exhaust port through said body,
means for delivering said supply fluid to one of said control ports and establishing communication to said exhaust port from the remainder of said control ports, and
means for introducing a pilot pressure fluid into said counterbores to urge said nested pistons and said first piston in the opposite direction from the direction in which said first piston is urged by said supply fluid,
said nested pistons having preselected areas whereby preselected fluid pressure exerted on said nested pistons moves said nested pistons to positions at which communication is established with preselected ones of said control ports.

4,187,884

FOUR-WAY VALVE EMPLOYING FLUID SPRING

Stanley M. Loveless, Oshtemo Township, Kalamazoo County, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Jun. 12, 1978, Ser. No. 914,795
Int. Cl.[2] F15B *13/042*
U.S. Cl. 137—625.69 **6 Claims**



1. In a valve assembly including housing means having elongated bore means formed therein, a plurality of ports formed in said housing means and communicating with said bore means, said plurality of ports including inlet, outlet, and load ports, and valve means movably positioned within said bore means and disposed in sealed slidable engagement with said housing means for controlling the flow of a compressible pressure fluid between said ports, said valve means being axially movable between a first operational position wherein said inlet and load ports are in communication with one another and a second operational position wherein said load and exhaust ports are in communication with one another, the improvement comprising:

seal means mounted on said valve means and disposed in sealing engagement with said housing means in the vicinity of said inlet port, said seal means being axially shiftable across said inlet port in response to shifting movement of said valve means between said first and second operational positions;

said seal means including an annular groove encircling said valve means and an elastomeric seal ring mounted on said valve means in encircling relationship within said groove, said seal ring being disposed in sealing engagement with said housing means, said annular groove having an axial width substantially greater than the axial width of said seal ring so that the seal ring can be shifted axially along said groove relative to said valve means, said annular groove being in substantially continuous communication with said inlet port, and said seal ring being shifted axially relative to said groove by the pressure fluid supplied through the inlet port when the valve means is shifted between said first and second operational positions; and

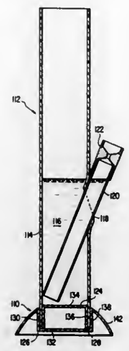
fluid spring means coacting between said valve means and said housing means for normally urging said valve means toward said first operational position, said fluid spring means including a spring chamber defined between one end of said valve means and the adjacent portion of said housing means, said spring chamber being defined within a closed end of said bore means, and passage means extending interiorly of said valve means for providing substantially continuous communication between said chamber and said inlet port, said passage means terminating in a hole which opens through the bottom of said groove substantially midway between the opposite axial ends thereof, said seal ring being disposed at one axial end of said groove when said valve means is in said first operational position, said seal ring being disposed adjacent the other axial end of said groove when said valve means is in said second operational position, whereby said hole is closed by said seal ring only momentarily during the axial displacement of said seal ring during the shifting thereof between the opposite ends of said groove in response to shifting of said valve means between said first and second operational positions so that pressure fluid supplied through the inlet port continuously communicates with said spring chamber.

4,187,885

THREE-POINT, PLUG TYPE SEALING MEANS FOR A HOLLOW, CYLINDRICAL CONTAINER, PARTICULARLY A LIQUID-FILTERED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Filed Nov. 22, 1977, Ser. No. 854,033
Int. Cl.[2] B65D *59/06;* **A24F** *1/14, 1/30*
U.S. Cl. 138—89 **5 Claims**



1. A sealing device for closing an open end of a hollow, tubular member comprising:

three-point, plug type sealing means, mounted upon an open end of a hollow, tubular member, for engaging at least two primary surfaces of said tubular member and thereby closing said open end thereof;

said sealing means comprising a first, inverted cup-shaped member having an inverted substantially U-shape in cross-section, and a second cup-shaped member having a portion substantially U-shaped in cross-section housing said first member therewithin;

said first inverted member having a radially outwardly projecting annular flange means radially spacing the peripheral side wall of said first member from the peripheral side wall of said second member for defining an annular recess within which said open end of said tubular member is disposed for enhancing the sealing characteristics of said sealing means; and

said tubular member being seated within said recess and in frictional contact with said peripheral side wall of said first member and said peripheral side wall of said second member, said annular recess having a width substantially equal to the thickness of the wall of said tubular member, said wall of said tubular member being beadless.

4,187,886

DOBBY FOR THE FORMATION OF THE SHED ON LOOMS

Joseph Palau, Duingt, France, assignor to S.A. des Etablissements Staubli, Faverges, France

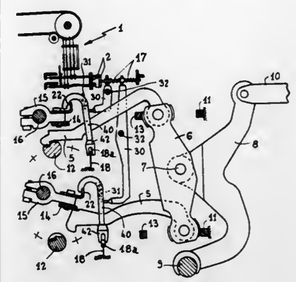
Filed Jul. 28, 1978, Ser. No. 929,140
Claims priority, application France, Oct. 14, 1977, 77 31678
Int. Cl.[2] D03C *1/26*
U.S. Cl. 139—68 **4 Claims**

1. In a loom dobby having a frame supporting multiple double swinging levers each coupled to a heddle frame, each lever being displaceable by two pulling hooks pivotally connected thereto, the dobby having pulling knives operative to displace the pulling hooks when the latter engage the pulling knives, the dobby having lowering knives operative when contacting the hooks to move them into engagement with the pulling knives, and the dobby having a pattern mechanism,

improved means for raising the pulling hooks out of engagement with the pulling knives under the control of the pattern mechanism, comprising:

a crosspiece coupled with each lowering knife and moving through a path therewith;

a stirrup associated with each pulling hook and having a first portion located to engage the pulling hook and having a second portion located adjacent to a crosspiece;



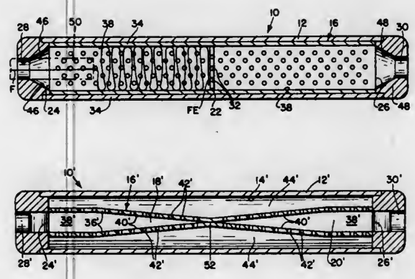
a rocking lever associated with and coupled to each stirrup and carried by the frame, each rocking lever being coupled with the pattern mechanism and selectively actuated thereby to move the second portion of the stirrup selectively out of the path of the crosspiece or into the path of the crosspiece whereby to raise the stirrup and move the associated pulling hook away from the engagement with the pulling knife.

4,187,887

LOOM PROJECTILE

Petras Cyvas, Worcester, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,344
Int. Cl.[2] D03J *5/06*
U.S. Cl. 139—196.2 **16 Claims**



1. A projectile for use in a loom in which filling picks are inserted from an outside supply source, the projectile comprising:

(a) an elongated body having an inlet opening at one end and outlet opening at the opposite end thereof,

(b) an outer wall defining the outer shape of the body,

(c) a perforated inner wall defining a generally flat filling storage chamber within the body, said storage chamber being connected to the inlet opening, and

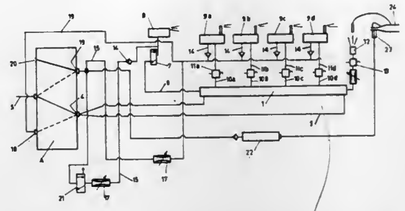
(d) a passageway located between the inner and outer walls, said passageway being connected to the outlet opening and to the storage chamber by the perforations in the inner wall.

4,187,888

SUPPLY SYSTEM FOR A PNEUMATIC WEAVING MACHINE

Hubert P. van Mullekom, Deurne, Netherlands, assignor to Ruti-te Strake B.V., Deurne, Netherlands

Filed Sep. 3, 1978, Ser. No. 939,708
Claims priority, application Netherlands, Aug. 25, 1977, 7709425
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **2 Claims**



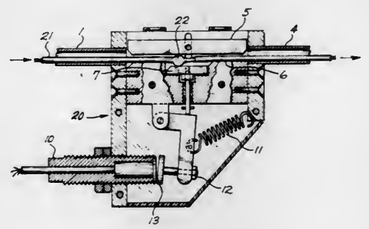
1. A supply system for a pneumatic weaving machine comprising a source of air under pressure, a pressurized air container, main air conduit means, a main control valve, the main air conduit means connecting the container to the main control valve and the main control valve connecting the main air conduit means to the source of air, blowing nozzles operatively connected to the air container, auxiliary air conduit means connecting the main control valve to the blowing nozzles, and reduction valve means in the auxiliary air conduit means for supplying air of reduced pressure to the nozzles to insert weft yarn into the machine when starting the machine, the main control valve venting the auxiliary air conduit means and connecting the main air conduit means to the source of air under operational conditions and venting the container and connecting the auxiliary air conduit means to the source of air when the machine is stopped.

4,187,889

WIRE PINCH MARK DETECTOR FOR USE IN METHOD AND APPARATUS FOR SEMIAUTOMATICALLY MANUFACTURING ELECTRICAL WIRE HARNESS

Albert L. Hametner, Seattle, Wash., and Mark S. Soderberg, Ketchum, Id., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 14, 1978, Ser. No. 933,244
Int. Cl.[2] B21F *23/00*
U.S. Cl. 140—92.1 **5 Claims**



1. In the method of assembling electrical wire harnesses wherein an elongate wire segment having two pinch marks representative of the end thereof is withdrawn from a storage zone and laid onto a formboard along a predetermined path toward a formboard pin, the steps of detecting and compensating for excess wire segment length of said elongate wire segment comprising:

enabling a length encoder for measuring said elongate wire

segment while said wire segment is laid onto the formboard along a predetermined path toward said formboard pin;

providing pinch mark detector detection when enabling said length encoder; and then,

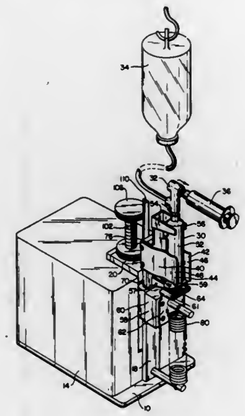
making one or more wraps of the end of said elongate wire segment around said formboard pin when said length encoder and pinch mark detector are indicative of said elongate wire segment having an end thereof exceeding a predetermined distance beyond said formboard pin.

4,187,890

FILLING APPARATUS FOR PHARMACEUTICALS

Paul E. Stach, and Thomas P. Sherrin, both of Columbus, Ohio, assignors to Mono-Med, Inc., Columbus, Ohio

Filed Dec. 4, 1978, Ser. No. 966,364
Int. Cl.[2] B65B *3/32*
U.S. Cl. 141—27 **6 Claims**



1. An apparatus for use in filling relatively smaller containers with measured amounts of a liquid from a bulk container, the apparatus including a support frame, a motor drive means mounted to the support frame, a motor drive control circuit, a pumping syringe, a first check valve connected to permit fluid flow from said bulk source to the Luer fitting of said pumping syringe and a second check valve connected to permit fluid flow from said Luer fitting to said relatively smaller receiving container, said apparatus comprising:

(a) clamping means mounted to said support frame for releasably retaining the outer cylinder member of a pumping syringe in a vertical orientation with its Luer connector uppermost;

(b) gripper means slideably mounted to said frame below said clamping means for linear reciprocation parallel to the axis of said pumping syringe and releasably attachable to the piston member of said pumping syringe;

(c) a cam follower attached to said gripper means;

(d) biasing means attached to said frame and said gripper means for urging said piston member downwardly toward increasing the volume of said syringe;

(e) a rotatable cam drivingly connected to said motor drive means and engagable with said cam follower for cyclically, alternately raising said piston member against the urging of said biasing means to a top dead center position and permitting it to be lowered by the urging of said biasing means; and

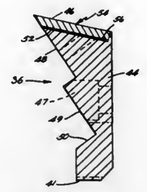
(f) adjustable stop means for being engaged by said gripper means at a selected level below said top dead center position for controlling the stroke of said syringe.

4,187,891

WEAR PART

Theodore C. Weill, 110 Carol Cir., Tylertown, Miss. 39667

Division of Ser. No. 614,494, Sep. 18, 1975, Pat. No. 4,059,884.
This application Jun. 16, 1977, Ser. No. 807,235
Int. Cl.[2] B27C *1/14*
U.S. Cl. 144—162 R **3 Claims**



1. A repaired knife holder for use in a wood chipper of the type having a rotating knife supporting disc, comprising:

a repaired knife holder having a recess along a wear surface;

a surface hardened steel insert having a thickness between ⅛ and ¼ inch and a width between 1 and 1½ inches slip fit within said recess, said insert having a coefficient of thermal expansion substantially equal to that of the knife holder, said recess and insert having grit blasted enlarged mating surfaces; and

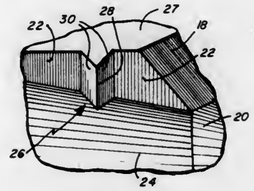
a silver alloy filler material within said recess bonding said insert to said knife holder at said grit blasted enlarged mating surfaces, said filler material having a flow point of approximately 1120° F. and said insert being induction brazed within said recess at a temperature of approximately 1200° F. for a period of one to two minutes.

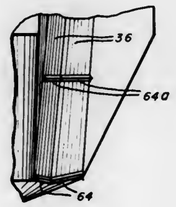
4,187,892

RECESSED SCREW HEADS AND DRIVERS

Frederick A. Simmons, Framingham, Mass., assignor to Phillips Screw Company, Gloucester, Mass.

Division of Ser. No. 505,324, Sep. 12, 1974, Pat. No. 4,084,478.
This application Oct. 31, 1977, Ser. No. 846,987
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 A **10 Claims**





1. A driving tool for engagement with a recess in an end of a screw comprising:

a shank portion and a recess-engaging portion formed at an end of said shank portion, said recess-engaging portion comprising a central core and a plurality of blades radiating from said core, said core being defined in part by an intermediate wall extending between each pair of adjacent of said blades; and

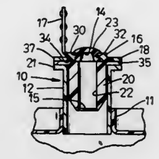
a rib formed along the lower edge of each of said intermediate walls and extending between each of said pairs of adjacent blades.

4,187,893

COMBINED ADDITIVE AND ADMINISTRATION PORT FOR A CONTAINER

Albert F. Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 19, 1978, Ser. No. 925,919
Int. Cl.[2] B65D *33/16*
U.S. Cl. 150—8 **22 Claims**



1. A combined additive and administration port for a container for I.V. liquids comprising:

a tubular walled port in communication with the inside of said container;

an inner diaphragm member forming a portion of said port and sealing the inside of said container to outside atmosphere;

an outer resealable and pierceable member removably secured to said port and positioned from said diaphragm member in a direction opposite the inside of said container; and

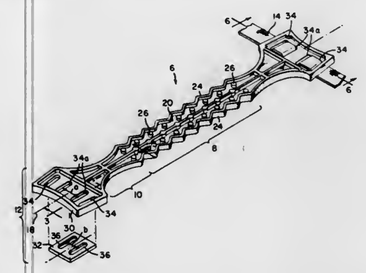
a tab portion operatively associated with said resealable member for removing said resealable member from said port separately from said diaphragm member.

4,187,894

TIRE TRACTION DEVICE

Ted S. Peterson, 1908 SE. 16th Pl., Renton, Wash. 98055

Filed Mar. 6, 1978, Ser. No. 883,702
Int. Cl.[2] B60C *27/02*
U.S. Cl. 152—222 **3 Claims**



1. A traction device for a tire, said tire having a tread surface and a circumferential axis extending around and along said tread surface, said traction device being adapted to engage said tire along said circumferential axis, said traction device comprising:

a. a plurality of cross members, each having a lengthwise axis and adapted to engage said tread surface with its lengthwise axis generally perpendicular to said circumferential axis, each cross member having an outer surface adapted to engage a road surface and an inner surface adapted to engage said tread surface,

b. a pair of elongate straps adapted to be positioned on opposite sides of the tread surface so as to extend circumferentially around side portions of said tire, with said straps positioning said cross members at spaced locations along said circumferential axis,

c. a plurality of pairs of connecting members, each pair of connecting members being located on opposite ends of a related cross member, each connecting member having a first connecting portion defining slot means to receive a related strap in threaded through relationship, and a second locking portion adapted to engage its related strap at selected locations there-along so as to lock that strap to said connecting members at such selected locations,

d. the first connecting portion of the connecting member being provided with a first pair of spaced slots, and its related second locking portion being provided with a second pair of locking slots spaced in offset relationship with respect to the first pair of slots, whereby with a related strap threaded through both pairs of slots, when tension is applied to said strap, said first and second portions of the connecting member press that strap in locking wedging engagement with the connecting member,

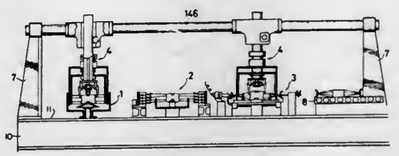
whereby said cross members may be moved to selected locations along said straps to first desired locations along said tire and locked in place, and said cross members can be moved to second desired locations and again locked in place at said second locations, so that tires of different sizes can be fitted with said traction device, and so that in the event one cross member is broken and removed from said straps, the remaining cross members can be repositioned along the circumferential axis of said tire in proper location.

4,187,895

METHOD AND APPARATUS FOR AUTOMATICALLY ASSEMBLING SPOKED WHEELS

Teturo Saruwatari, 2 of 22, Shinsayama 2, Sayama-shi, Saitama-ken, and Yositaka Mukai, 10 of 3243, Kaminanbata, Fujimishi, Santama-ken, both of Japan

Filed Jun. 23, 1976, Ser. No. 699,087
Claims priority, application Japan, Jun. 24, 1975, 50-77783
Int. Cl.[2] B21K *1/34*
U.S. Cl. 157—1.55 **7 Claims**



1. Apparatus for inserting spokes in a wheel, said wheel including a hub having a plurality of holes, ech hole for pivotably receiving an individual spoke, a rim concentric with said hub having a plurality of rim holes, each hole to receive therethrough an individual spoke, and a plurality of spokes of extended length, one end of said spokes connecting to said hub, the other end of said spokes passing through said rim holes after said spokes have been twilled, comprising:

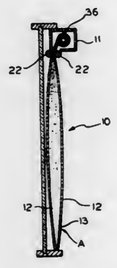
a support structure including:

(a) primary support means for retaining said hub with twilled spokes attached, the axis of rotation of said hub being vertical;

(b) spoke support means for retaining and supporting said twilled spokes near the other ends of said spokes away from said hub, said other ends of said spokes aligned to a single circle, said single circle being substantially of the same diameter as the inner circular surface of said rim;

(c) and deflection means for deflecting the middle section of said spokes while the opposite ends of said spokes are retained one end in said hub and said other end by said spoke support means;
(d) means for retaining said rim concentric with said axis of said hub, said rim having spoke receiving holes therein, said rim holes arranged in a circle on the inner circular surface of said rim, and each of said rim holes in said rim in substantial alignment with the other end of one of said spokes;
(e) and means for withdrawing said spoke deflection means whereby said spokes unflex and said other ends enter said rim holes; and
(f) means for releasing said primary support means and said spoke support means, whereby a twilled arrangement of spokes on a hub have the remote other ends of the spokes retained while said spokes are flexed, the release of said flexure causing said other spoke ends to simultaneously enter and pass through said aligned rim holes to thereby ready said wheel for application of spoke fasteners.

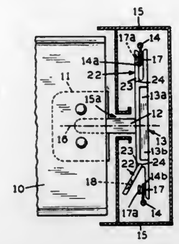
4,187,896
SELF-INFLATING SOLAR CURTAIN
Ronald H. Shore, P.O. Box 130, Snowmass, Colo. 81654
Continuation of Ser. No. 833,581, Sep. 15, 1977. This application May 19, 1978, Ser. No. 907,707
Int. Cl.² E06B *9/08*
U.S. Cl. 160—121 R **15 Claims**



1. A dynamic process for insulating an interior side of a surface, said process comprising the steps of:
(a) implacing or removing a curtain, including an entrapped air space, in a position adjacent a side of said surface which is to be insulated responsive to sensed temperatures in the area of the surface;
(b) self-inflating said curtain means, including said entrapped air space, through at least one opening near the bottom thereof responsive to expansion or contraction of air in the air space of the curtain as ambient temperature heats or cools the surrounding area;
so that any air entrapped therein rises within said curtain responsive to a heating of said entrapped air by increases in temperatures adjacent said curtain, the heated air expanding the volume of said air space whereby fresh air is drawn through said opening by an inhalation process.

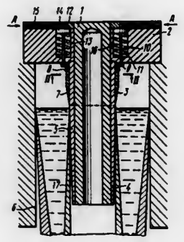
4,187,897
TILTING CONNECTOR FOR VENETIAN BLIND SLAT ENDS
Kurt H. Frentzel, Zevenhoven, Netherlands, assignor to Hunter Douglas International, N.V., Netherlands Antilles
Filed Jun. 2, 1978, Ser. No. 911,825
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725601
Int. Cl.² E06B *9/38*
U.S. Cl. 160—177 **6 Claims**

1. In a slat guiding and tilting connector for the slats of a venetian blind having a plurality of slats each with opposite end portions connected by a connector to a flexible tilt member and in which the connector includes a fastening portion for fastening the same to the end of a slat, a pivot portion and a pair of tilting arms extending radially from the pivot portion for connection to the flexible tilt member, the improvement in which the point of connection of the tilt member to one of said arms is such that in the closed position of the slats such point of connection is offset laterally of the blind with respect to the plane containing the axes of the pivot portions of the slats



whereby the weight of each slat acting through the axis of its pivot portion tends to rotate the respective slat to and maintain the slat in the closed position, said lateral offset being achieved by arms extending from said pivot portion at an acute angle with respect to said plane, each of said arms has a pin extending outwardly therefrom adjacent the terminus thereof and in which there is a locking tongue on each arm for each pin, and each of said locking tongues being pivotable with respect to its associated arm into locking engagement with its associated pin.

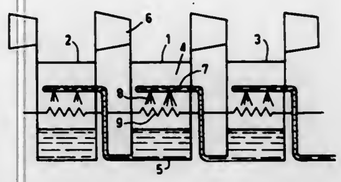
4,187,898
MANDREL FOR USE IN CONTINUOUS CASTING OF HOLLOW INGOTS
Anatoly I. Manokhin, ulitsa Metallurgov, 4, kv. 44; Anatoly G. Sitnov, ulitsa Metallurgov, 80a, kv. 42, both of Tula; Vitaly Y. Genkin, Sirenevy bulvar, 27, korpus 3, kv. 27, and Anatoly L. Liberman, mikroraion Teply Stan, korpus 65, kv. 259, both of Moscow, all of U.S.S.R.
Filed Mar. 1, 1978, Ser. No. 882,901
Claims priority, application U.S.S.R., Mar. 3, 1977, 2458622
Int. Cl.² B22D *11/04*
U.S. Cl. 164—421 **8 Claims**



1. The combination of a continuous casting mold, a support member associated with said mold for supporting a mandrel and a mandrel supported by said support member and depending into said mold to define a hollow casting cavity for continuously casting hollow ingots, said mandrel comprising: a hollow rod having one end fixed in said support member; a collar formed around said hollow rod including an upper portion and a tapered lower portion; said tapered lower portion being tapered in narrowing fashion in the direction along the length of said hollow rod and travelling away from said fixed end; a protective sleeve mounted around said collar for movement along the axis of said hollow rod; and drive means associated with said support and said sleeve for displacing the sleeve

relative to the hollow rod and the collar and tapered portion combination.

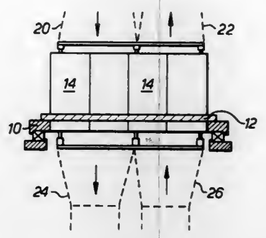
4,187,899
METHOD AND APPARATUS FOR EXCHANGING HEAT BETWEEN FLUIDS
Jacques Sterlini, Paris, France, assignor to CEM-Compagnie Electro-Mecanique, Paris, France
Filed Mar. 7, 1978, Ser. No. 884,125
Claims priority, application France, Mar. 9, 1977, 77 07041
Int. Cl.² F28C *3/08*; F25B *7/00, 1/10*
U.S. Cl. 165—1 **24 Claims**



13. A method of exchanging heat in a balanced system between a plurality of circuits carrying fluids at different temperatures ranging from T_o to T_N with a minimum expenditure of work, comprising the steps of:
providing a plurality of stages arranged in series, each stage operating in a corresponding one of a corresponding plurality of bounded temperature intervals T_o to T_1, T_1 to T_2, ... T_{N-1} to T_N, the temperature intervals covering all of the range from T_o to T_N, the stage operating in the interval T_o–T_1 being of lowest rank, the stages operating in the intervals in the range T_1–T_{N-1} being of intermediate rank, and the stage operating in the interval T_{N-1}–T_N being of highest rank, each stage including at least one cell communicating with adjacent stages of higher and lower rank for transferring the liquid and vapor between the cells of stages of higher and lower rank;
circulating a transfer fluid as both a liquid and a vapor between the plurality of stages;
maintaining a pressure differential between each pair of adjacent stages;
heating the transfer fluid in at least one cell with at least a first working fluid circuit;
cooling the transfer fluid in at least one cell with at least a second working fluid circuit;
adjusting a fluid flow in a third circuit to control overall thermodynamic equilibrium of the heat exchanges.

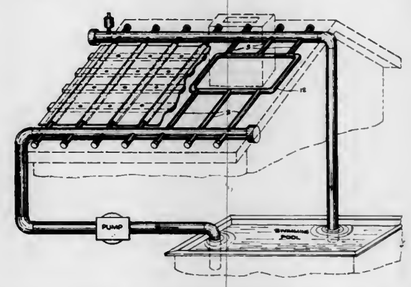
4,187,900
REGENERATORS
Joseph K. Pereira, and Martin White, both of Kingston-upon-Thames, England, assignors to British Steel Corporation, London, England
Filed Oct. 26, 1977, Ser. No. 845,670
Int. Cl.² F28D *19/04*
U.S. Cl. 165—8 **12 Claims**

1. A heat exchanger of the regenerative type for transfering heat from a hot gas to a cooler gas, said heat exchanger comprising: a matrix of heat storage elements having an under face for exposure to the cooler gas and an upper face for exposure to the hot gas, each element of the matrix comprising a ceramic heat storage block having a plurality of gas flow passages extending therethrough from end to end in the block; and a support structure including support bars and a frame member surrounding the matrix, the support bars passing through the matrix adjacent to, but behind, the under face of the matrix which in use is exposed to the cooler gas, said support bars being in turn supported by the frame member surrounding the matrix, the arrangement being such that in use the bars of the



support structure are protected from damage by the hot gas which is supplied to the matrix.

4,187,901
FLAT PLATE SOLAR HEAT COLLECTOR
Robert A. Coleman, 753 Hanover St., Livermore, Calif. 94550, and Larry D. Beard, 256 Manitoba Green, Fremont, Calif. 94538
Filed Nov. 2, 1977, Ser. No. 847,707
Int. Cl.² F28F *1/22*; F24J *3/02*
U.S. Cl. 165—47 **4 Claims**

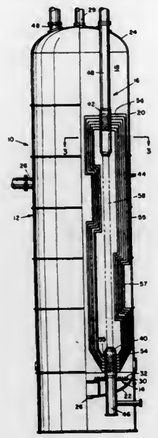


1. A heat exchanger for conveying heat energy to or from a fluid, comprising:
a panel which absorbs or emits heat, and which is cut to partially or completely surround an area which is not covered by the panel;
a plurality of tubes through which the fluid flows, the tubes being in thermally conductive contact with the panel;
means for constricting the fluid flow through each of the tubes, thereby regulating the flow rate in each tube;
channel means for conducting the fluid to and from the tubes;
means for impelling the fluid through the tubes; and
a common pipe running along the boundary of the uncovered area, the pipe being connected to each tube section which intersects this boundary.

4,187,902
HEAT EXCHANGE APPARATUS
Clarence S. Miller, Jr., Kennett Square, Pa., and Richard A. Hager, Wilmington, Del., assignors to Hercofina, Wilmington, N.C.
Filed Oct. 13, 1971, Ser. No. 188,834
Int. Cl.² F28F *9/00*
U.S. Cl. 165—76 **3 Claims**

1. A transportable integral heat exchanger tube assembly for the interior of a chemical reactor for continuously carrying out a highly thermic chemical reaction involving liquid material, copious quantities of a gas and a reaction mixture comprising a readily precipitable substance that tends to deposit on heat

exchange tubes in contact with the reaction mixture under normal operative conditions, which reactor comprises vessel means for containing a body of said reaction mixture, which assembly comprises: heat transfer fluid feed header means; heat transfer fluid discharge header means axially aligned on a normally vertical longitudinal axis with and longitudinally spaced from said discharge header means; a plurality of heat conductive tubes from said feed header means to said discharge header means, said heat conductive tubes (a) having such high length to diameter ratio as to be flexible and vibratable by currents of gas and liquid in said body to thereby minimize deposition of precipitate on said tubes under normal operative conditions, and (b) being in longitudinally disposed radial planes about said axis in an arc substantially less than 360°, whereby space is provided for access to the back side of said



tubes; for conveying heat transfer fluid to and from said header means and in combination with vessel means for supporting and anchoring in position in said vessel means said integral tube assembly, longitudinally and laterally rigid longitudinally outwardly extending feed conduit means in combination with said feed header means, and longitudinally and laterally rigid longitudinally outwardly extending discharge conduit means in combination with said discharge header means; and rigid support means on said axis between and fastened to said feed header means and said discharge header means for minimizing longitudinal and transverse stressing of said heat conductive tubes in the fabrication, transportation and installation of said assembly, said rigid support means being removable from said feed header means and said discharge header means after said assembly has been installed in said vessel means.

4,187,903

CONDENSERS

Philip N. Judson, 27 Fincham's Close, Linton, Cambridge, England

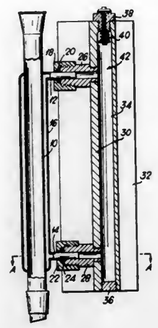
Filed Dec. 6, 1977, Ser. No. 857,969

Claims priority, application United Kingdom, Dec. 15, 1976, 52244/76; Jan. 14, 1977, 1613/77

Int. Cl.[2] F28B *1/02*

U.S. Cl. 165—76 **4 Claims**

1. Apparatus for condensing hot vapours and the like comprising an inner cylindrical member at least part of which comprises a condensing region including at least one surface on which hot vapours and the like may condense; an outer cylindrical member bonded at opposite ends to the said inner cylindrical member; the said inner and outer cylindrical members defining an annular region therebetween; at least one thermally conductive heat sink comprising a central web, having a fluid passage extending from one end to the other end thereof, and a plurality of cooling fins extending transversely therefrom to improve the cooling thereof; two connecting tubes communicating with the two opposite ends of the fluid passage in the central web and extending laterally therefrom to constitute pipe receiving members; inlet and outlet pipes extending laterally from the said outer cylindrical member and sealingly fitted



into the said pipe receiving members and the said annular region; the said inlet and outlet pipes, the said connecting pipes and the said fluid passage through the central web constituting a closed circuit adapted to be filled with a heat transfer liquid.

4,187,904

HEAT TRANSFER INSTALLATION HAVING STORAGE RESERVOIR CONTAINING A SALT AS A HEAT CARRIER

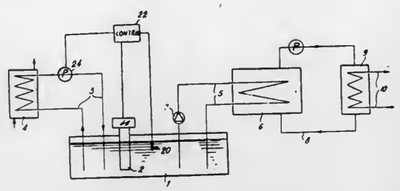
Hans Kühnlein, Füllinsdorf, Switzerland, assignor to Hch. Bertrams Aktiengesellschaft, Switzerland

Filed Oct. 27, 1977, Ser. No. 845,938

Claims priority, application Switzerland, Nov. 2, 1976, 13787/76

Int. Cl.[2] F28D *13/00;* **F24H** *7/00;* **F24D** *11/00*

U.S. Cl. 165—104 S **9 Claims**



1. A heat transfer apparatus, comprising a storage reservoir, salt heat carrier disposed in said reservoir, heater means connected into said reservoir to heat said salt heat carrier so as to maintain it above its freezing point, a remote intermediate heat exchanger, means for circulating said salt heat carrier from said reservoir through said intermediate heat exchanger, intermediate heat carrier disposed in said intermediate heat exchanger, a remote consumptive heat exchanger, means for circulating said intermediate heat carrier through said consumptive heat exchanger and through said intermediate exchanger in heat exchange relationship with said salt heat carrier, a consumptive heat carrier disposed in said consumptive heat exchanger, and means for circulating a consumptive heat carrier through said consumptive heat exchanger in heat exchange relationship with said intermediate carrier.

4,187,905

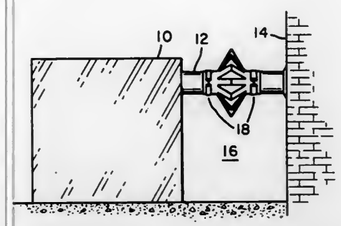
ATTACHABLE PIPE RADIATOR

Raymond C. Isenberg, R.R. #1, Box 89, (Covedale) Williamsburg, Pa. 16693

Filed Nov. 14, 1977, Ser. No. 851,460

Int. Cl.[2] F28F *1/20*

U.S. Cl. 165—181 **8 Claims**



1. A portable radiator device adapted to be adjustably attached to a thin-walled flue pipe, consisting of a single sheet of thin metal having a plurality of parallel diamond-shaped slits centrally positioned therein, comprising in combination:

a thin-walled flue pipe;

two mounting bases adapted to wrap circumferentially about said flue pipe perpendicularly to the mid-line of said flue pipe, said mounting bases comprised of the end portions of said single sheet of thin metal;

a plurality of fins extending outwardly and continuously between said mounting bases, said fins having an inwardly disposed V-shaped space therebetween;

securing means extending circumferentially about said mounting bases, perpendicularly to the mid-line of said flue pipe and adapted to secure said mounting bases to said flue pipe.

4,187,906

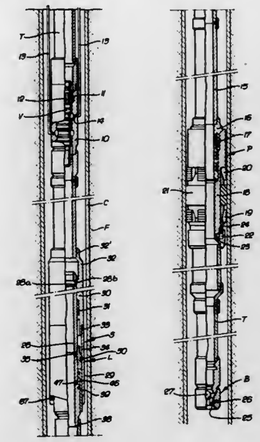
WELL BORE APPARATUS WITH ANNULUS PRESSURE RELEASABLE TUBING SEAL UNIT

Jozsef P. Kovacs, Lafayette, La., assignor to Baker International Corporation, Orange, Calif.

Filed May 8, 1978, Ser. No. 903,787

Int. Cl.[2] E21B *23/04, 17/02*

U.S. Cl. 166—120 **13 Claims**



1. Well bore apparatus adapted to be installed in a well casing for conducting produced well fluid to the top of the well, comprising: a tubing string extending into the casing; packer means in said tubing string having normally retracted expansible casing engaging anchor means and resilient packing deformable into sealing engagement with the casing; and a releasable sealing connector in said tubing string above said packer means; said connector including a pair of telescopically interengaged inner and outer tubular sealing bodies; one of said bodies being connected with said packer means and the other of said bodies being connected with the upwardly extended tubing string; releasable latching means retaining said bodies in a telescopically contracted condition; fluid pressure responsive release means operable responsive to the pressure of fluid in the casing above said packer means to release said latching means enabling telescopic extension of said bodies; and means responsive to manipulation of said tubing string to release said latching means.

4,187,907

WATERFLOOD METHOD USING SURFACTANTS

H. Robert Froning; William W. Owens, both of Tulsa, Okla., and Duane L. Archer, Dallas, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 810,129, Jun. 27, 1977, abandoned.

This application Aug. 21, 1978, Ser. No. 935,412

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—275 **22 Claims**

1. A method for improving the sweep efficiency of an oil recovery waterflood comprising injecting into an earth formation having at least one stratum of the formation which contains water-sensitive clays and has a higher permeability than another stratum of said formation that does not contain water-sensitive clays by means of an injection well a slug of floodwater having salinity substantially the same as native formation water and containing surfactant in an amount less than that required to cause a substantial reduction in interfacial tension between water and oil.

4,187,908

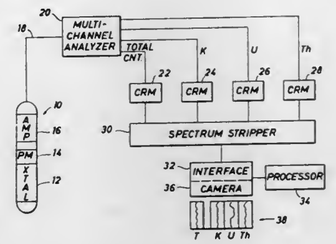
METHOD FOR ASCERTAINING OPTIMUM LOCATION FOR WELL STIMULATION AND/OR PERFORATION

Walter H. Fertl, Houston, and Donald B. Vaello, San Antonio, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 29, 1978, Ser. No. 947,132

Int. Cl.[2] E21B *47/00, 47/05;* **G01V** *5/00*

U.S. Cl. 166—254 **5 Claims**



1. A method for determining the optimum location along the length of a borehole penetrating an earth formation for instituting well stimulation operations, comprising the steps of:

transversing the borehole penetrating the earth formation with a logging instrument having a gamma ray detector;

detecting natural gamma radiation occurring in the earth formation in the vicinity of the borehole and generating signal functionally and depth-point related to the energy and frequency of occurrence of such gamma radiation;

separating said signals into at least three energy regions corresponding to gamma radiation produced by naturally occurring radioactive isotopes of potassium, uranium and thorium occurring in said earth formations at said related depth-point.

processing said separated signals for producing individual count signals each representative of radiation occurring in each of said at least three energy regions at said relative depth-point;

combining the count signals representative of at least one of such energy regions corresponding to gamma radiation produced by radioactive isotopes of potassium and thorium with said remaining energy region count signals corresponding to gamma radiation produced by radioactive isotopes of uranium for deriving a differential signal; and

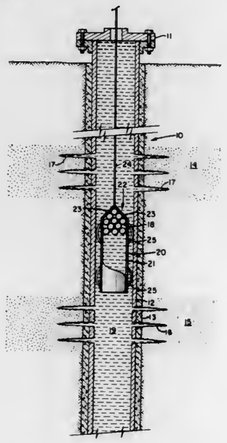
comparing said differential with a preselected reference signal for determining optimum stimulation locations and at said depth-point location as indicated by said differential signal exceeding said preselected reference signal.

4,187,909

METHOD AND APPARATUS FOR PLACING BUOYANT BALL SEALERS

Steven R. Erbstoesser, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 16, 1977, Ser. No. 852,173
Int. Cl.[2] E21B *33/10, 33/13*
U.S. Cl. 166—284 **6 Claims**



1. A method of treating a formation penetrated by a well provided with casing having perforations at a plurality of levels wherein a ball sealer is used for restricting flow through a lower perforation while leaving an upper perforation open to fluid flow comprising

lowering to a level between said upper perforation and said lower perforation a ball sealer having a size sufficient to plug the lower perforation and having a density less than the density of a treating fluid used in treating said formation;

lowering screen means between said upper perforation and said lower perforation and above said ball sealer adapted to keep said ball sealer below the screen means and to permit downward flow of fluid through said screen means to carry said ball sealer downward with said fluid; and

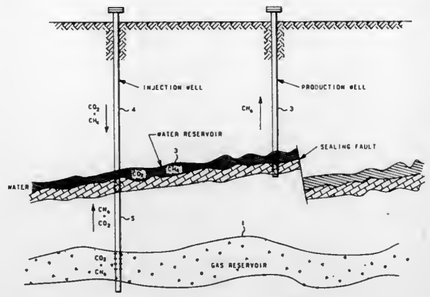
injecting a treating fluid into the casing to cause fluid flow through said upper perforation and through said screen means to carry said ball sealer to said lower perforation.

4,187,910

CO_2 REMOVAL FROM HYDROCARBON GAS IN WATER BEARING UNDERGROUND RESERVOIR

Archie J. Cornelius, and Riley B. Needham, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1978, Ser. No. 893,364
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—305 R **8 Claims**



1. A method for decreasing the CO_2 content of hydrocarbon gas, said method comprising:

(1) injecting hydrocarbon gas containing CO_2 into a water bearing zone of an underground formation,

(2) dissolving CO_2 in the water zone,

(3) collecting CO_2-depleted hydrocarbon gas in another permeable portion of the formation, and

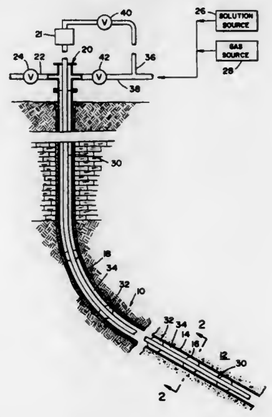
(4) producing hydrocarbon gas reduced in CO_2 content from said other permeable portions of the formation.

4,187,911

SLANT HOLE FOAM CLEANOUT

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1978, Ser. No. 891,417
Int. Cl.[2] E21B *21/00*
U.S. Cl. 166—312 **5 Claims**



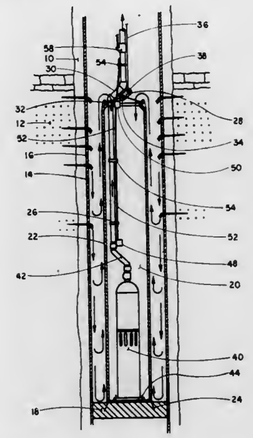
1. A method of cleaning out a directional well, said well having more than about 15° deviation from the vertical over a substantial portion of its depth comprising running into a directional well having well conduits positioned therein a string of clean-out tubing of smaller outside diameter than the inside diameter of the well conduits, centralizing said clean-out tubing in coaxial alignment within said well conduits in said well to provide an inner passageway from the surface through the interior of said clean-out tubing and an annular passageway between the outside of said clean-out tubing and said well conduits in said well, injecting a gas and liquid foam having a gas-to-liquid ratio of between 10 SCF/m and 30 SCF/m per gallon down one of said passageways and continuing to inject said foam down said one of said passageways and up the other of said passageways at a circulation rate of at least 30 feet per minute to remove material from said well.

4,187,912

METHOD AND APPARATUS FOR PUMPING FLUIDS FROM BORE HOLES

Robert L. Cramer, Rising Star, Tex. 76471

Filed Nov. 17, 1977, Ser. No. 852,463
Int. Cl.[2] E21B *43/00, 47/04, 47/12*
U.S. Cl. 166—314 **20 Claims**



1. Pumping apparatus for pumping fluid from a bore hole in a fluid producing formation to the surface comprising: sump means for receiving said fluid from the bore hole positioned in said bore hole; production tubing through which fluid in the bore hole travels to the surface; pumping means positioned in said sump means for pumping fluid entering said sump means through said production tubing to the surface for recovery; and pump actuating means activated by the fluid level in said sump means for starting and stopping the operation of said pumping means; whereby fluid entering said bore hole from the formation passes through the sump means on its way to the surface and the liquid level in the bore hole is controlled by the vertical positioning of said sump means.

15. A method for recovering fluid from a bore hole into which said fluid is entering from a formation while controlling the level of fluid in the bore hole, which comprises:

(a) flowing said fluid into a vertically adjustable container for said fluid positioned in the bore hole and having a pump positioned therein;

(b) pumping said fluid from said container to the surface at a rate at least equal to the rate at which the fluid is entering the bore hole;

(c) controlling the pumping of said fluid to begin the pumping at a first level of the fluid in the container and to cease the pumping when said fluid has sunk to a second level in said container below said first level, and

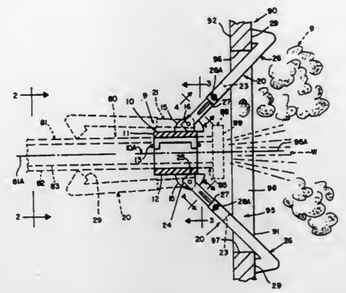
(d) vertically positioning said container in the bore hole to provide a substantially optimum level of fluid in the bore hole.

4,187,913

FIREHOSE-ASSEMBLY STEADYING DEVICE

Dwight E. Wilcox, Omaha, Nebr., assignor to Wilcox Silent Nozzle Man, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 791,785, Apr. 28, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,063
Int. Cl.[2] A62C *33/04*; F16L *5/00*
U.S. Cl. 169—51 **13 Claims**



1. In combination with the leadward portion of a firehose-assembly including a firehose tubularly surrounding a hose-axis and a nozzle for the directionally forward emission of a waterstream from the nozzle front-side, a firehose-assembly steadying device adapted to constructionally employ waterstream backpressure for stably maintaining the nozzle aptly located at a wall opening for the intended firemanship task, said steadying device comprising:

A. collar means surrounding the hose-axis and secured to the firehose-assembly rearwardly of the nozzle front-side;

B. a plurality of elongate wings associated with the collar means and each wing having a near-end and a far-end, each wing having an inoperative ready-condition and an operative abutment-condition, each wing at ready-condition lying generally parallel to the hose-axis whereby the near-end and the far-end are alongside the firehose leadward-length, each wing at abutment-condition being markedly oblique the hose-axis and having its near-end at the collar means and its far-end positioned remotely radially outwardly from the collar means, and at least one of said wings comprising a pair of movably associated elongate segments including a near-length terminating at the wing near-end and a far-length extending to the wing far-end, there being movement arresting means to temporarily maintain the selected spatial relationship between the near-length and far-length segments; and

C. forwardstop means to prevent the wing at abutment-conditon from being moved toward the firehose, said forwardstop means actuatably extending from the wing nearward portion to the collar means and thereat remaining effective so long as waterstream backpressure tends to force the firehose-assembly and the secured collar means in the rearward direction.

4,187,914

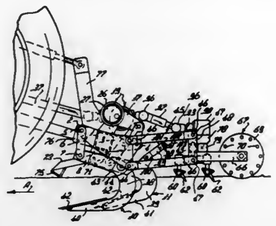
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Sep. 26, 1977, Ser. No. 836,774
Claims priority, application Netherlands, Oct. 1, 1976, 7610861
Int. Cl.[2] A01B *11/00, 19/06*
U.S. Cl. 172—53 **14 Claims**

1. A soil cultivating implement comprising a frame and a plurality of soil working members pivoted on said frame in a row that extends transverse to the direction of travel, said members having tools located adjacent one another in working positions and driving means connected to said members to

repetitively pivot said tools upwardly and downwardly to work adjoining strips of soil, said driving means comprising a central gear box and respective eccentric mechanisms engaged by shaft means turned by gears in said box, said mechanisms being mounted on separate shafts which are drivenly intercon-



nected by sleeves, those mechanisms located adjacent opposite sides of said gear box being mounted on output shafts from said box and said output shafts being in driving connection with the separate shafts to which the other mechanisms are connected, said gears being connectable to a power take-off shaft of a tractor to which said implement can be coupled.

4,187,915

SOIL CULTIVATING IMPLEMENTS

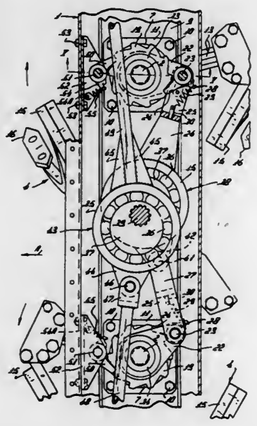
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 27, 1977, Ser. No. 864,471

Claims priority, application Netherlands, Dec. 29, 1976, 7614518

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **17 Claims**



1. A soil working implement comprising a frame and a plurality of soil working members being supported on the frame, said members each being rotatable about respective shafts and a transmission having intermittent drives connected to periodically rotate said shafts, said transmission comprising a common rotary input shaft and reciprocable drive connectors extending to each side of eccentric mechanisms mounted on said input shaft, one above the other, the respective shaft of each working member mounting a ratchet wheel and a drive pawl that interconnects one of the connectors to said ratchet wheel, a non-return pawl being pivotally mounted adjacent said wheel to prevent rotation of said shaft in one direction.

4,187,916

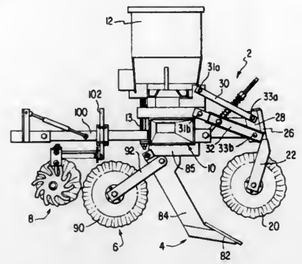
SOIL CONDITIONING AND SEED BED PREPARING APPARATUS

Jerrell W. Harden, Banks, and William P. Brown, Ozark, both of Ala., assignors to Brown Manufacturing Corporation, Ozark, Ala.

Filed Oct. 13, 1977, Ser. No. 841,954

Int. Cl.[2] A01B *13/08, 49/02*

U.S. Cl. 172—146 **83 Claims**



1. Soil preparing and conditioning apparatus, comprising:
a main frame,
soil loosening means coupled to the main frame for cutting and loosening compacted soil along a relatively narrow track, including:
a rotatable cutting member, cutter mounting means for mounting said rotatable cutting member to said frame for pivotable movement of said cutting member about a generally upright axis relative to the ground plane, and
means coupling said cutter mounting means to said main frame for pivotal movement of said cutter mounting means and said rotatable cutting member toward and away from the ground through an arc whose center of curvature lies forward of said mounting means in a direction away from said main frame;
subsoiler means coupled to said main frame behind and in substantial axial alignment with said soil loosening means for breaking and shattering hard pan beneath the surface of the ground;
slot filler means coupled to said main frame behind and in substantial axial alignment with said subsoiler means for filling a slot in the soil left by the forward motion of said subsoiler means therethrough; and
seed bed preparation means coupled to said main frame behind said slot filler means for pulverizing the soil in and adjacent the region of the filled in slot behind the slot filler means, said seed bed preparation means including:
soil chopping means, and
means mounting said soil chopping means to said main frame for substantially universal axial, angular and lateral adjustment relative to said filled in slot.

4,187,917

PILE DRIVER

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,059

Int. Cl.[2] B25D *9/00*

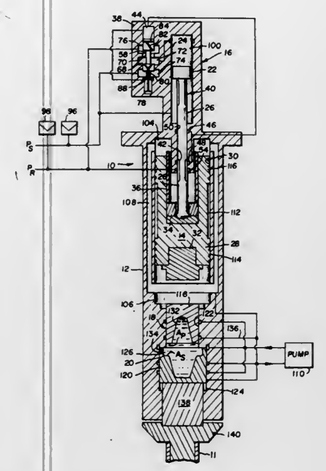
U.S. Cl. 173—131 **14 Claims**

1. In a pile driver having a housing adapted to be placed upon the pile to be driven, a ram mounted for reciprocating movement in said housing with means for repetitively driving said ram in forward and return strokes toward and away from said pile, apparatus which permits the ram weight to be reduced, the ram velocity to be increased and the driving power applied to the pile, expressed as the product of the blow energy and repetition frequency of the ram, to be increased without increasing the force tending to lift the housing off the pile during the downward acceleration of said ram, said apparatus

comprising a hydraulic spring-transformer disposed in said housing between said ram and said pile for receiving repetitive impacts from said ram and transferring force pulses due to said impacts to said pile and for transforming the higher impact velocity of said ram to a lower impact velocity as imparted to said pile, said hydraulic transformer comprising a first piston and a second piston which define a variable volume chamber, said chamber containing hydraulic fluid and providing said hydraulic spring, said first piston being disposed adjacent said ram for receiving said impacts therefrom and said second piston being disposed between said first piston and said pile for transferring said impacts received from said first piston via said hydraulic spring to said pile, said chamber having such a volume that the Q of said spring, loaded by the characteristic impedance of the pile, is less than about 1 where

$$Q=R_{AP}\omega_P C,$$

and



$$R_{AP}=(P_L c_L A_L/A_S^2)$$

where P_L is the density of the pile, c_L is the velocity of sound in the pile, A_L is the area presented by the pile to the housing, and A_S is the said area presented by said second piston to said chamber,

$$C=V/B,$$

where
V is the volume of the chamber and B is the bulk modulus of the hydraulic fluid in said chamber, and ω_P is the resonant frequency in radians per second where

$$\omega_P^2=(B/V)(A_P^2/M_R[1+(M_R/M_H)(A_S/A_P-1)^2]$$

where A_P is said area presented by said first piston to said chamber, M_R is the mass of the ram and M_H is the mass of the housing.

4,187,918

DOWN-HOLE EARTH DRILLING MOTOR CAPABLE OF FREE CIRCULATION

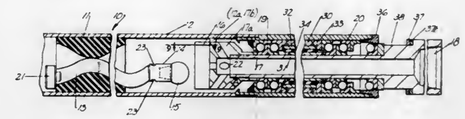
Wallace Clark, 1830 S. German Church Rd., Indianapolis, Ind. 46239

Filed Jun. 12, 1978, Ser. No. 914,776

Int. Cl.[2] E21B *13/00, 1/06*

U.S. Cl. 175—39 **12 Claims**

1. In a hydraulic down-hole earth drilling motor of the helical gear pair type, having a transmission from said motor to a drill bit, comprising an extension from the inner helical gear having a socket on the lathe axis thereof, and a ball having a shank secured in said socket, and a half-tube associated with the drill bit and being diametrically disposed with respect to the hole, said ball extending into said half-tube, means for



withdrawing said motor and ball to the extent that said ball comes out of engagement with said half-tube to permit fluid to be pumped through said motor for clean-out mud density build-up and like purposes without producing rotation of said bit and its associated parts.

4,187,919

CABLE-TYPE CORE BARREL

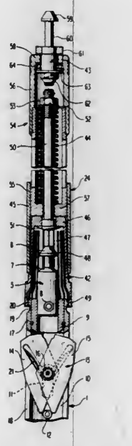
Honore J. Lambot, Wauthier-Braine, Belgium, assignor to Diamant Boart, Brussels, Belgium

Filed May 3, 1978, Ser. No. 902,603

Claims priority, application Belgium, May 3, 1977, 177239

Int. Cl.[2] E21B *9/20*

U.S. Cl. 175—246 **9 Claims**



1. A cable-type core barrel comprising:
a set of outer tubes,
a drilling bit provided on the lower end of the set of outer tubes,
an annular suspension ledge provided on the set of outer tubes,
an annular locking groove provided on the set of outer tubes,
an inner tube,
an extractor cone provided at the lower end of the inner tube,
an annular rim provided on the inner tube and bearing against the annular suspension ledge in a lower boring position of said inner tube,
a hooking head provided at the upper end of the inner tube,
an upper cone frustum provided on the hooking head,
a release cone provided on the hooking head,
a latch with tongues provided on the inner tube for locking it in the set of outer tubes by engaging said tongues in the annular locking groove,
a tubular latch support for carrying the latch, said latch

support being rigid with the inner tube and having no effect on the release of said inner tube,

a release slide provided rigid on the hooking head,

a release pin provided on the release slide and sliding in the latch support and relative thereto, said release pin disengaging the latch tongues from the annular locking groove by the effect of traction exerted on the cone frustum hook of the hooking head,

an operating cable,

an overshot comprising:

a lower clamp comprising nose pieces which are urged resiliently towards the axis of the set of outer tubes, and upper hooking head provided with a circumferential hooking groove and comprising mounting means for a cable connector,

an inshot comprising:

a lower bell member slotted longitudinally to form radially flexible strips, the ends of which are provided with hooking projections, the bell member being mechanically connected to a rod or the like extending axially upwards,

an upper hooking head comprising an upper cone frustum hook, the hooking head being rigid with an intermediate tube or the like which extends axially downwards about the axial rod connected to the lower bell member,

a helical spring housed in the intermediate tube about the axial rod and resting against an upper support provided on the axial rod and a lower support provided on the intermediate tube, the axial rod and intermediate tube being thus able to slide axially relative to each other both with and against the helical spring, and

a threaded ring screwed on to the intermediate tube and surrounding the flexible strips of the bell member to selectively prevent or allow their radial extension by bending,

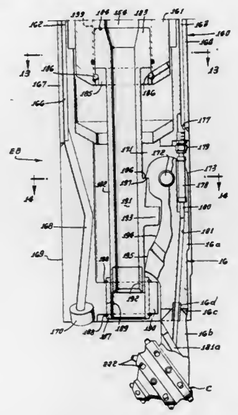
the inner tube being lowered into the core boring position by being suspended from the inshot alone or from the inshot which itself is suspended from the overshot, the inshot being hooked at the surface to the latch support of the inner tube by means of the flexible strips of its bell member, the lower projections of which are engaged in a circumferential hooking groove in the latch support, said flexible strips then being prevented from bending towards the set of outer tubes and releasing their hooking projections from the latch support because of the threaded ring disposed in its lower position, the overshot being hooked at the surface to the inshot by means of the nose pieces and its clamp, which hook onto the cone frustum hook of the hooking head of the inshot, the inner tube, when brought into the core boring position and locked therein, being released from the overshot by traction exerted upwards on the inshot, or on the inshot and the overshot and thus transmitted to the inshot, said traction firstly lifting the hooking head from the inshot together with the intermediate tube and threaded ring without lifting the bell member and axial rod and compressing the helical spring, the threaded ring on being raised releasing the flexible strips of the bell member, the lower projections of which disengage from the hooking groove of the latch support, while not affecting the release, so as to cause the inner tube to disengage and the inshot to be subsequently raised while remaining suspended from the operating cable or from the overshot, while leaving the inner tube in place, the inner tube, when provided with a core and released, being raised from its core boring position by being suspended from the overshot which is itself suspended from the inshot, the overshot being hooked inside the set of outer tubes to the hooking head of the inner tube by means of the nose pieces and of its clamp, which are hooked onto the cone frustum hook of the hooking head of the inner tube, the inshot being previously hooked at the surface to the overshot by the flexible strips of its bell member, the lower projections of which are engaged in a circumferential hooking groove in the hooking groove of the overshot, said flexible strips then being prevented from releasing their lower projections from the hooking groove by the threaded ring which is then placed in its lower position, the inshot not causing its helical spring to deform to any extent capable of releasing its bell member from the overshot during the lifting of the inner tube except in the case of accidental resistance to said lifting, in which case the inshot disengages from the overshot without breaking the operating cable.

4,187,920

ENLARGED BORE HOLE DRILLING METHOD AND APPARATUS

Gary R. Johnson, Yorba Linda, Calif., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Nov. 23, 1977, Ser. No. 854,132
Int. Cl.[2] E21B *9/26*
U.S. Cl. 175—267 **28 Claims**



1. Apparatus for enlarging a bore hole drilled into an earth formation comprising: a rotatable dual drill pipe string having an inner pipe and an outer pipe defining an inner fluid path and an outer fluid path between the pipes; a bit body having normally retracted expansible cutter arms having rotary cutters on the free ends of said arms, said body being connected to said drill pipe string and having an opening for communicating between the bore hole and said inner fluid path; fluid pressure actuated means for expanding the cutter arms of said bit; passage means for communicating said fluid pressure actuated means and said bore hole with said outer fluid path; and means for connecting said outer fluid path to a fluid source while permitting rotation of said drill pipe string; said passage means including first passage means leading from said fluid pressure actuated means through said expansible cutter arms to said cutters and second passage means leading from said fluid pressure actuated means through said body and having nozzles directed towards said cutters.

4,187,921

ROCK BIT COMBINATION TO ENHANCE CUTTINGS REMOVAL

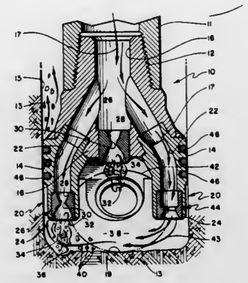
Lloyd L. Garner, San Clemente, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 1, 1978, Ser. No. 965,647
Int. Cl.[2] E21B *9/08;* E21C *7/06*
U.S. Cl. 175—340 **2 Claims**

1. In a two cone extended nozzles rock bit, said bit comprising a pair of extended nozzle legs attached to said bit with a third center jet nozzle in the dome of said bit, wherein said rock bit utilizes the hydraulic action of circulating drilling mud by directing the mud through said nozzles toward the bottom

of a hole to aid the process of advancing the bit in said hole, the improvement which comprises:

at least one cavitating jet nozzle body in said rock bit, said body having a first upstream opening formed by said body smaller than a second downstream exit opening, the axis of said nozzle being substantially aligned with the axis of said bit, said body further defining a throat section positioned between said first and second opening, said throat having an opening smaller than said first upstream opening, said throat section being positioned closer to said upstream opening than said downstream exit opening, the diverging walls formed by said nozzle downstream of said throat form a



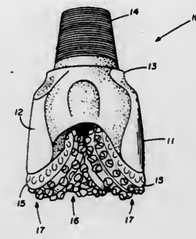
chamber thereby, said at least one nozzle body when subjected to said circulating drilling mud induces cavitation of the mud as it exits past said throat of said nozzle, one of said pair of extended nozzle legs contains said cavitating jet nozzle while the opposing extended nozzle leg contains a non-cavitating nozzle which emits liquid at a higher pressure than the cavitating liquid that passes through said cavitating nozzle, the lower pressure adjacent said cavitating nozzle induces the liquid from said non-cavitating nozzle to move across the rock-tooth interface toward said low pressure area thereby aiding the removal of cuttings from said hole bottom.

4,187,922

VARIED PITCH ROTARY ROCK BIT

Francis E. Phelps, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 12, 1978, Ser. No. 905,256
Int. Cl.[2] E21C *13/02*
U.S. Cl. 175—374 **10 Claims**



1. A method of constructing a rotary rock bit having a bearing pin and at least one rolling cutter member rotatably mounted on said bearing pin for forming a borehole in the earth, said rolling cutter member having at least one annular row of cutting elements on the cutter member for cutting portions of the borehole, comprising the steps of:

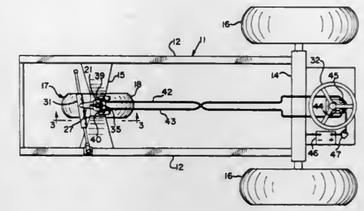
providing at least one annular row of cutting elements encircling said cutter member for cutting portions of the borehole with spaces between adjacent cutting elements, and positioning said cutting elements on said cutter member in said annular row so that substantially all of said spaces between adjacent cutting elements are unequal.

4,187,923

GUIDE WHEEL POSITION INDICATING APPARATUS

Maxwell D. McClure, III; William D. Lester, both of Memphis, Tenn., and Robert M. Fachini, Naperville, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 17, 1978, Ser. No. 896,865
Int. Cl.[2] B60Q *1/42*
U.S. Cl. 180—215 **3 Claims**



1. In a cotton harvester having a main frame including a rearwardly located transversely extending bolster beam integral therewith, a forwardly located operator's compartment mounted on said frame, including a steering wheel, a pair of laterally spaced front driving wheels supporting the forward portion of said main frame, a rear steerable guide wheel having a vertical pivot shaft pivotally mounted to said bolster beam near the transverse center thereof, and hydrostatic steering means for controlling the relative position of said guide wheel assembly relative to the line of travel of said cotton harvester, the position of said guide wheel assembly being mechanically independent of that of said steering wheel, the improvement comprising a member mounted against rotation on said vertical pivot shaft above said bolster beam, said member including a horizontal segmental portion axially displaced from but in electrical contact with the adjacent structure of said member, first and second contact arms mounted to but electrically insulated from said frame, said arms having contact tip portions located respectively adjacent the circumferential ends of said segmental portion such that upon said steerable guide wheel being in fore-and aft alignment with said line of travel, no contact is made between either of said contact arms and said segmental portion, and upon said steerable guide wheel being turned a predetermined amount out of fore-and-aft alignment, said segmental portion contacts only one of said first and second contact arms, and first and second lamps mounted at said operator's station and being electrically connected respectively independently to said first and second contact arms, said lamps further being electrically connected to a frame grounded vehicle battery located on said vehicle in such a manner that upon said steerable wheel being turned said predetermined amount out of fore-and-aft alignment and contacting one of said contacting one of said contact arms, the electrical circuit from the lamp associated with said one contact arm will become grounded through said pivot shaft to said frame whereby said lamp will be lit to indicate the direction in which said harvester will steer.

4,187,924

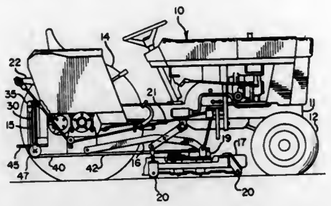
ROTARY MOWER BELT DRIVE

Joseph P. Deschamps, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 947,685
Int. Cl.[2] B60K *17/28, 25/06*
U.S. Cl. 180—53 R **4 Claims**

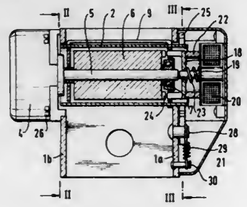
1. In a tractor having a rearwardly extending, clockwise-turning, power take off shaft and a rotary mower mounted by linkage to said tractor forwardly of said power take off shaft,

said mower having a clockwise rotating input pulley for receiving power from the tractor, the improvement wherein the apparatus for driving said mower from said power take off shaft comprises a drive pulley mounted on said power take off shaft, a pair of upper idler pulleys mounted on said tractor on horizontal axes above the axis of the drive pulley respectively on each side thereof, a pair of lower idler pulleys rotatably



mounted on the tractor on generally transverse horizontal axes below said drive pulley axis, and an endless belt entrained about the lower side of said drive pulley and having its advance and return runs extending upwardly respectively to loop around said upper idler pulleys, downwardly respectively from said upper idler pulleys to said lower idler pulleys, and then forwardly respectively from said lower idler pulleys to entrain about said mower input pulley.

4,187,925
DEVICE FOR STRETCHING A BAND FORMING PART OF A SAFETY BELT FOR VEHICLES
Oskar L. Lindblad, Vargarda, Sweden, assignor to Autoliv AB, Vargarda, Sweden
Filed Jul. 21, 1977, Ser. No. 817,866
Int. Cl.[2] B60R *21/10*; A62B *35/00*
U.S. Cl. 180—268 **10 Claims**



1. In a device for tightening a safety belt for vehicles having power means activated by means for sensing abnormal changes in the movement of the vehicle, which power means upon activation will tighten the belt, the improvement comprising an inertial body member forming part of the power means, which body member under normal operating conditions of the safety belt is in a rotating condition, rotatable tightening means to tighten said belt upon abnormal changes in the movement of the vehicle, coupling means activated by said sensing means for connecting said rotating inertial body to said rotatable tightening means to tighten the safety belt when said abnormal changes in movement take place, thereby utilizing the energy of the rotating inertial body member for tightening of the belt.

4,187,926
LOUDSPEAKER HORN
Clifford A. Henricksen, Yorba Linda, and Mark S. Ureda, Woodland Hills, both of Calif., assignors to Altec Corporation, Anaheim, Calif.
Continuation-in-part of Ser. No. 810,642, Jun. 27, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,739
Int. Cl.[2] G10K *11/00*
U.S. Cl. 181—192 **6 Claims**

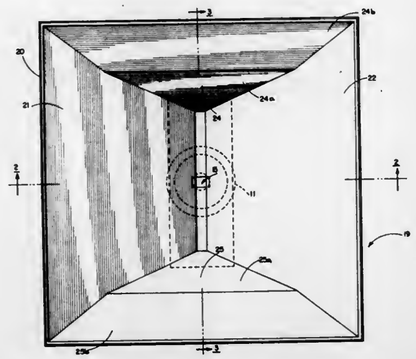
1. A loudspeaker horn for receiving and radiating acoustical energy with directivity control from an acoustical driver comprising:

a throat section connected to said driver having a rectangular transverse cross section and including a first pair of walls which are substantially parallel to each other, and a second pair of walls which diverge outwardly from each other from said driver at a predetermined angle,

the acoustical energy output of the driver being coupled to said throat section,

a rectangular mouth portion having a substantially greater perimeter than that of the greatest transverse cross section of said throat section,

a first pair of bell section walls which interconnect the first pair of walls of the throat section and the mouth portion,

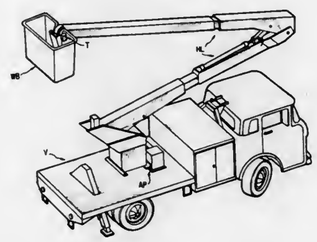


and which diverge outwardly for the entire distance between said throat section and said mouth portion, and

a second pair of bell section walls which interconnect the second pair of walls of the throat section and the mouth portion and which diverge outwardly between the throat section and a point proximate to the mouth portion at the same angle as the second pair of throat section walls, the portions of said second pair of interconnecting walls connected to the second pair of throat section walls forming a continuum thereof,

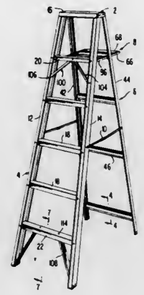
said first and second pairs of interconnecting walls being joined together along the edges thereof to form a flared bell section of said horn, said first pair of walls of said bell section diverging outwardly at a substantially greater angle than said second pair of bell section walls.

4,187,927
REMOTELY ACTUATED AUXILIARY PRESSURIZATION SYSTEM
James E. Byrne, Oklahoma City, Okla., assignor to UEC Manufacturing Company, Oklahoma City, Okla.
Filed Aug. 12, 1977, Ser. No. 824,231
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **12 Claims**



1. A remotely actuated, battery-powered, auxiliary pressurization system for the operation of the hydraulic circuit of a device having at least one hydraulically extensible arm independently of the major pressurizing means for said circuit, such means is the major power plant of the device, said arm having a work platform on one end with controls for said circuit, the other end of said arm being movably mounted on said device, said pressurizing system comprising an electrically powered motor/pump assembly connected to said circuit, a controller assembly for said motor/pump assembly and means in said controller assembly to receive activation and de-activation signals from a wireless transmitter mounted on said platform and having a self-contained power source to control the operation of said pressurizing system.

4,187,928
STEPLADDERS
Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling & Stamping Corp., Brooklyn, N.Y.
Continuation-in-part of Ser. No. 775,850, Mar. 9, 1977, Pat. No. 4,079,814. This application Mar. 6, 1978, Ser. No. 883,578
Int. Cl.[2] E06C *1/18, 1/393, 7/14*
U.S. Cl. 182—124 **5 Claims**



1. A metal stepladder comprising a front section including left and right side rails, a top step and a plurality of spaced apart lower steps fixed between said side rails, each of said side rails and steps being channels having a face portion and two legs, the legs of the side rail channels extending inwardly of the sides of the ladder and the legs of the channels of the steps all extending downwardly relative to the upright position of the ladder,

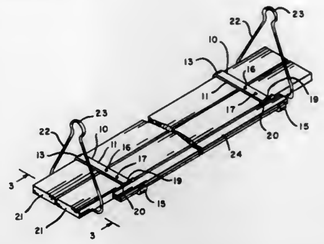
a rear section pivoted to the front section comprising left and right side rails, each of said side rails being channels having a web portion and legs, and a plurality of spaced apart, horizontal brace members,

a pair of brackets fixed upon said rear section, each bracket comprising a flat base portion, a cylindrical bearing portion offset from said base portion and a connecting web portion integral with the base portion and bearing portion, the base portion of each bracket being fastened to one of the legs of a rear section side rail with the cylindrical bearing portion of the bracket between the legs of said rear section side rail and extending normally and inwardly of the face portion thereof,

a bucket rack comprising a pair of spaced apart, longitudinal members, said rack being pivoted on said rear section by a part of said cylindrical bearing portions of said brackets extending through openings in said longitudinal members, and

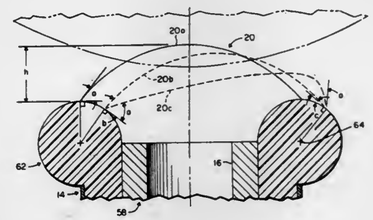
brace means on said front section comprising a pair of channel struts each having an angled lug at each end, one of said angled lugs being fixed to the undersurface of the lowermost step of the ladder and the opposed angled lug being fixed to the innersurface of the respective front section side rail at the lower end of such rail.

4,187,929
SCAFFOLD STABILIZER
Leonide A. Cyr, 912 Howard Ave., Bridgeport, Conn. 06605
Filed Aug. 3, 1978, Ser. No. 930,764
Int. Cl.[2] E04G *5/08, 7/28*
U.S. Cl. 182—222 **7 Claims**



1. A scaffold stabilizer adapted for use on a scaffold platform consisting of a multiplicity of longitudinal planks of uniform thickness assembled in side-by-side contact, said attachment comprising a generally C-shaped unitary metallic clamping member comprising elongate upper and lower plate members rigidly attached to a shorter end plate member so as to define an opening sufficiently wide and long to receive a multiplicity of planks in side-by-side contact with each other, said upper and lower plate members being provided with means for securing the ends thereof together at a point beyond the outer edge of the outermost plank contained therebetween, said upper plate member being longer than said lower plate member to provide an extension beyond said securing means adapted to support workpieces adjacent said scaffold, and said lower plate member being provided with an upward bow towards said upper plate member, said bow being adapted to provide an area of increased pressure on planks within said stabilizer attachment when said securing means is tightened.

4,187,930
DISPENSING METHOD AND SYSTEM FOR LUBRICATING OIL AND OTHER LIQUIDS
Gordon E. James, Rancho Palos Verdes, Calif., assignor to TRW Inc., Systems & Energy, Redondo Beach, Calif.
Filed Apr. 27, 1978, Ser. No. 900,672
Int. Cl.[2] B05C *3/12*; F01M *9/00*
U.S. Cl. 184—1 R **22 Claims**



8. A liquid dispensing system comprising:

a liquid delivery head containing a liquid dispensing orifice opening at one end through the front end of said head,

a convex toroidal formation at said front end of said head about and having a toroidal surface circumferentially bounding said one end of said orifice,

liquid delivery means for supplying liquid to be dispensed to said orifice to form at said one end of the orifice a liquid droplet perimetrically contacting said toroidal surface, and

said toroidal surface being non-wettable by said liquid,

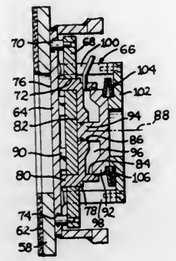
whereby said droplet and toroidal surface coact to produce on said droplet a self-centering action which resists displacement of said droplet laterally of said orifice.

4,187,931

BRAKE HOUSING AND ACTUATING MECHANISM

David J. Balzer, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 816,789, Jul. 18, 1977, Pat. No. 4,134,478.
This application Oct. 30, 1978, Ser. No. 955,865
Int. Cl.[2] F16D *65/32*
U.S. Cl. 188—72.1 **3 Claims**



1. In a brake apparatus of the type including a case having a wall, a disc rotatably mounted in the case on an axis, and a braking member located between the disc and the wall, the improvement comprising:

a brake actuating assembly connected to the wall and having a second axis radially offset from the axis of said disc, said brake actuating assembly having a brake engaging member, a housing member, a piston and a support member;

said brake engaging member having a projection extendable through said wall against said braking member;

said housing member having an axially facing recess opening in a direction away from said wall and a through passage opening on said recess;

said piston having a cylindrical extension, said piston being received in said recess and defining a chamber therebetween, said piston having a retracted position against said support member and an extended position with said extension extending through said passage against said brake engaging member; and

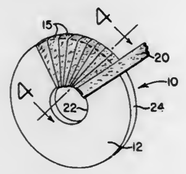
said housing member being contactable with said wall and of a construction sufficient for nonrotatably containing said brake engaging member and permitting axial movement thereof.

4,187,932

RIBBON-WRAPPED CARBON BRAKE DISK

Robert L. Zarembka, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 1, 1978, Ser. No. 874,182
Int. Cl.[2] F16D *65/12*
U.S. Cl. 188—73.2 **12 Claims**



1. A process for fabricating an annularly strengthened integral brake disk, comprising the steps of:

fabricating a brake disk core, having core faces;

impregnating a pyrolyzed carbon-containing ribbon of continuous uniform width with a bonding agent;

continuously wrapping said pyrolyzed carbon-containing ribbon completely about said core faces of said core in a sequential overlapping manner to form an outer layer; and

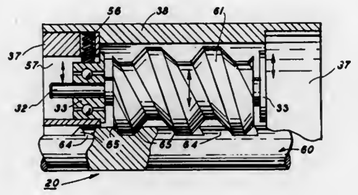
pyrolyzing said bonding agent to form an annularly strengthened integral brake disk.

4,187,933

MECHANICAL SNUBBER ASSEMBLY

Richard A. Calabrese, Newtown, and Robert E. Fandetti, New Milford, both of Conn., assignors to Anchor/Darling Industries, Inc., Bala Cynwyd, Pa.

Filed Apr. 17, 1978, Ser. No. 897,101
Int. Cl.[2] B60T *7/12*
U.S. Cl. 188—134 **5 Claims**



1. A mechanical snubber comprising:

(A) a housing incorporating

(a) a first portion

(b) a second portion slidably engaged with the first portion, and

(c) mounting means secured at the ends of both the first and second portions;

(B) a longitudinally-extending rack member

(a) fixedly mounted at one end thereof to the first portion of the housing,

(b) positioned for axial translation in response to relative movement between the first portion and the second portion of the housing, and

(c) incorporating a plurality of drive teeth axially arrayed along the rack member,

(d) each of said drive teeth being formed in the outer peripheral surface of the rack member, substantially parallel to adjacent drive teeth and extending in a direction substantially skewed to the central axis of the rack member, and

(e) each of said drive teeth having ramped, sloping sidewalls converging in the direction of the tooth apex;

(C) a worm gear

(a) rotationally mounted in the second portion of the housing,

(b) incorporating ramped, sloping sidewalls formed along the worm drive thread, with said sidewalls converging from bottom to top,

(c) radially moveable between a first position and a second position, and

(d) controllably engaged with the rack member for induced rotational movement and induced radial outward movement in response to the axial translation of the rack member, and

(D) biasing means

(a) engaging the worm gear,

(b) positioned for biasingly maintaining the worm gear in its first position for forces below a set level,

(c) responsive to forces exceeding the set level to allow the worm gear to move radially outwardly,

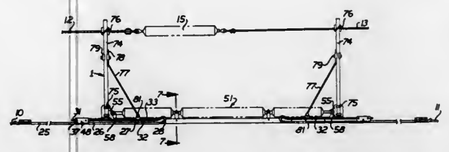
whereby relative axial sliding movement of the housing portions is converted into both rotary motion as well as radial outward movement of the worm gear when the biasing force maintaining the worm gear in its first position is exceeded.

4,187,934

SECTION INSULATOR FOR CATENARY SYSTEMS

John W. Senften, Mansfield, Ohio, assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Jan. 13, 1978, Ser. No. 869,036
Int. Cl.[2] B60M *1/18, 1/22, 1/225*
U.S. Cl. 191—39 **14 Claims**



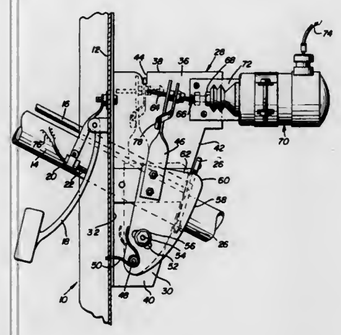
1. A section insulator assembly for mounting between spaced aligned ends of two contact wires of an overhead power supply of an electrified transportation system, there being a supporting cable above said contact wires, said assembly comprising main strain insulator means extending between the ends of the two contact wires at a level above the level of the contact wires, rigid means secured to each contact wire and to the adjacent ends of the strain insulator means, the strain insulator means being secured at a level above the level of the contact wires to the rigid means thereby to maintain the tension in the contact wires, a runner supported by and disposed at a level lower than said strain insulator means, and means extending downwardly from said supporting cable adjacent each end of said strain insulator means for supporting said assembly, said supporting means comprising a rigid supporting member rigidly secured to each of said rigid means and fixed to said supporting cable, whereby said rigid supporting members support said assembly and resist the turning moment imposed on the rigid means by reason of the offset between the axes of the contact wire and the strain insulator means, a pair of glider arms mounted at the ends of the contact wires, the glider arms in each pair extending laterally outwardly from the adjacent contact wire and extending longitudinally to overlap the ends of said runner, there being lateral air gaps between said runner and said glider arms.

4,187,935

BRAKE OPERATED SHIFT LOCK

Thomas R. O'Hern, 714 Glenridge Dr., West Palm Beach, Fla. 33405

Filed Feb. 28, 1978, Ser. No. 882,276
Int. Cl.[2] G05G *5/10;* **B60K** *29/02*
U.S. Cl. 192—4 A **6 Claims**



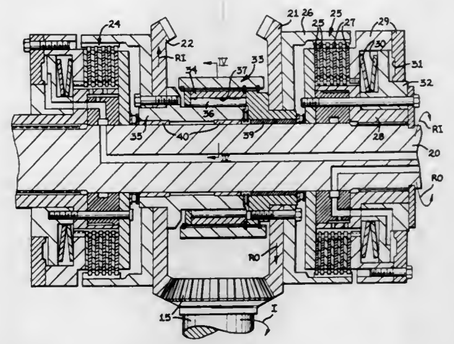
1. In combination with a vehicle including a steering column and gear selector means mounted on said column for movement between a non-drive position and a forward drive position, wheel brake operating means shiftable between brake applied and brake release positions, brake light operating electrical circuit means for actuating a brake light when closed and terminating operation of said brake light when open, means operatively connecting said wheel brake operating means and said electrical circuit means for closing the latter upon shifting of said wheel brake operating means from said brake release position toward said brake applied position, gear selector movement lock means shiftable between locked and unlocked positions and operative to lock and unlock said gear selector means against movement from said non-drive position to said forward drive position when in said locked and unlocked positions, respectively, and lock means shifting means operative to shift said lock means to said unlocked position and locked position in response to said circuit means being closed and opened, respectively, said lock means shifting means including means yieldingly biasing said lock means to said locked position and solenoid means operative to shift said lock means from said locked position to said unlocked position, latch means operative, independent of said lock means shifting means, for manually releasably latching said lock means in said unlocked position thereof, said gear selector means and said lock means including coacting means operative to cam said lock means from said locked position to said unlocked position and thereafter release said lock means for movement to said locked position upon movement of said gear selector means from said forward drive position to said non-drive position.

4,187,936

WINCH ASSEMBLY WITH ANTI-FALLBACK CLUTCH

Richard G. Davenport, Lowpoint, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1978, Ser. No. 918,233
Int. Cl.[2] F16D *11/04*
U.S. Cl. 192—21 **8 Claims**



1. A winch assembly (**11**) comprising:

a rotary input shaft (**15**),

a rotary output shaft (**20**),

a pair of first (**21**) and second (**22**) gear means rotatably mounted on said output shaft and connected to said input shaft for rotating in first and second opposite directions, respectively, upon rotation of said input shaft,

first (**23**) and second (**24**) clutch means for selectively connecting said output shaft to said first and second gear means, respectively, for establishing drive from said input shaft to said output shaft to rotate said output shaft in said first or second direction, respectively, and

means (**33**) interconnected between said first and second gear means (1) for permitting said first and second gear means to rotate in said opposite directions when said first clutch means is actuated to rotate said output shaft in said first direction, and (2) for normally permitting said first

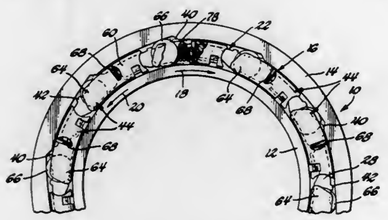
and second gear means to rotate in said opposite directions when said second clutch means is actuated to rotate said output shaft in said second direction, but for preventing said first and second gear means from rotating in said opposite directions when a torque load imposed on said output shaft tending to rotate said output shaft in said first direction exceeds a torque load imposed on said input shaft tending to rotate said second gear means in said second direction.

4,187,937

UNIT HANDLED ROLLER CLUTCH SUBASSEMBLY

Oscar G. Kitchin, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1978, Ser. No. 929,327
Int. Cl.² F16D *41/06*
U.S. Cl. 192—45 **3 Claims**



1. In a unit handled roller clutch subassembly having a sheet metal cage with a single end ring portion and a plurality of circumferentially spaced, integral tab portions extending in cantilevered fashion therefrom in an axial direction, a plurality of bearing blocks of low friction material having inner and outer bearing surfaces mounted on respective tab portions for centering inner and outer clutch races with respect to each other, each of said bearing blocks having a circumferential slot receiving an associated tab portion for securement to the cage and a circumferential extension spaced from the end ring portion for retaining a roller in the axial direction, the improvement comprising:

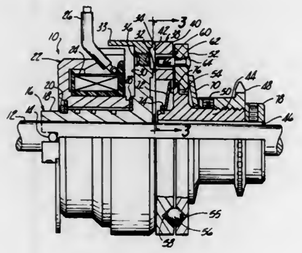
each of said bearing blocks having a second slot for mounting a tickler spring to engage a roller and urge it toward an adjacent bearing block.

4,187,938

ELECTROMAGNETIC CLUTCH WITH ANTI-JAM CAM ACTUATION

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Nov. 28, 1977, Ser. No. 855,114
Int. Cl.² F16D *27/10, 7/00*
U.S. Cl. 192—54 **7 Claims**



1. In an electromagnetic clutch including a rotatable first clutch member, an axially moveable ferromagnetic armature member, a rotatable second clutch member drivingly connected to said armature, and an electromagnetic coil means adapted to be energized to draw said armature axially into clutching engagement with said first clutch member, and also including torque responsive cam means mounted between said armature and said second clutch member to augment the electromagnetic engagement force between said armature and said input member upon engagement of said armature, the improvement comprising:

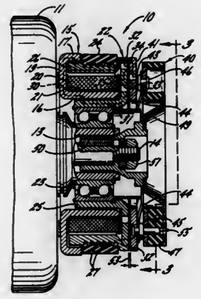
cam torque limit means mounted between said armature and second clutch member, said limit means preventing relative rotational movement between said armature and second clutch member above a predetermined torque limit through said clutch to prevent an increase in camming force above the cam force existing at said predetermined torque limit.

4,187,939

ARMATURE ASSEMBLY FOR ELECTROMAGNETIC COUPLING

Richard L. Silvestrini, Rockton, Ill., and Paul P. Newton, Beloit, Wis., assignors to Warner Electric Brake & Clutch Company, South Beloit, Wis.

Filed Dec. 14, 1977, Ser. No. 860,154
Int. Cl.² F16D *27/10*
U.S. Cl. 192—84 C **6 Claims**



1. An electromagnetic coupling comprising an annular electromagnet and a relatively rotatable armature, said armature being drawn axially into engagement with said magnet when the latter is excited, resilient means acting on said armature and biasing said armature toward a position in which the armature is spaced from the magnet, and elastomeric means fixed axially relative to said magnet for frictionally retarding movement of said armature to reduce the force with which the armature strikes said magnet when the latter is excited, said elastomeric means frictionally retarding movement of said armature each time said armature is drawn into engagement with said magnet.

4,187,940

FREE FLOATING, SELF-ALIGNING SHAFT COUPLING DEVICE

William K. Ratliff, and Charles P. Warman, both of Wichita Falls, Tex., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 7, 1977, Ser. No. 766,234
Int. Cl.² F16D *25/04*
U.S. Cl. 192—88 A **2 Claims**

1. A device which compensates for mis-alignment between drive and driven shafts, which device comprises;

(a) a rotary drive shaft,

(b) a rotary drive shaft alignment coupling fixedly secured to said rotary drive shaft,

(c) a rotary driven shaft,

(d) a portion of a fluid actuated, axially expansible clutch member secured to said driven shaft and being rotatable therewith,

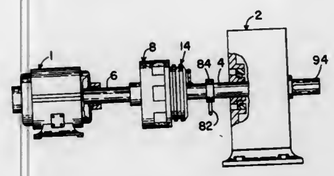
(e) a clutch friction disc member interposed between said

rotary alignment coupling unit and said axially expansible, fluid actuated clutch portion,

(f) said clutch portion of said fluid actuated, axially expansible clutch member being adapted to selectively engage said clutch disc member,

(g) a tubular member within said rotary shaft alignment coupling unit,

(1) a pair of inwardly extending hubs each secured respectively to said rotary shaft alignment coupling unit and to said clutch portion, each said hub being substantially in alignment with the respective drive and driven shafts, when in one position,



(h) said tubular member having at least one bearing seat formed therein,

(1) at least one self-aligning bearing within said bearing seat in said tubular member intermediate one of said hubs and said tubular member,

(i) said friction disc clutch member and said tubular member interconnecting said driven shaft and said drive shaft so as to compensate for limited mis-alignment between said driven shaft and said drive shaft, without

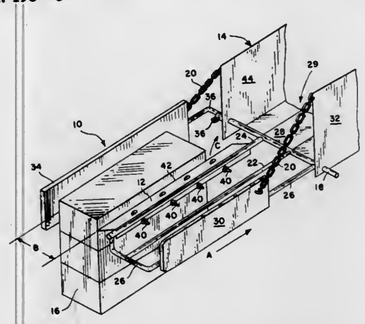
permitting longitudinal movement of one shaft relative to the other of said shafts, while permitting full torque to be transmitted from said drive shaft to said driven shaft.

4,187,941

BALE RESTRICTIVE FLAP

E. Joel Martin, Narvon, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 5, 1979, Ser. No. 1,115
Int. Cl.² B65G *11/12*
U.S. Cl. 193—5 **4 Claims**
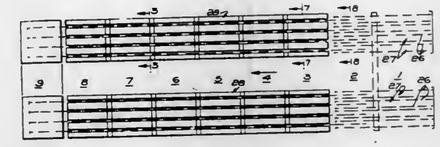


1. In a quarter-turn bale chute attachable to a hay baler, wherein an extension of a bale chamber is constructed with a partial support ledge from which a bale drops to the ground while rotating sideways off of the partial support ledge, and the bale is prevented from further rotation on the ground by an outrigger deflector positioned on the side of the quarter-turn bale chute remote from the partial support ledge, the combination thereof with a restrictive flap attached to and rotatable about the innermost upper edge of the partial support ledge.

4,187,942

TRANSFER BEAM CONVEYOR

Frederick G. Ward, Loughborough, England, assignor to Herbert Morris Ltd., Loughborough, England

Continuation of Ser. No. 743,655, Nov. 22, 1976, abandoned.
This application Jun. 23, 1978, Ser. No. 918,425
Claims priority, application United Kingdom, Nov. 27, 1975, 48825/75
Int. Cl.² B65G *25/02*
U.S. Cl. 198—345 **7 Claims**



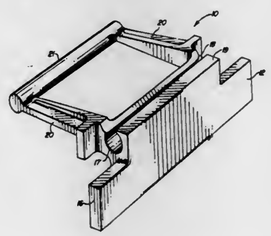
1. Apparatus for progressively fabricating relatively heavy articles comprising a stationary work supporting grillage having a series of successive work stations spaced therealong and divided longitudinally into a plurality of side by side passageways, rail means extending along each of said passageways, at least one carriage mounted for movement along each of said rail means, each carriage comprising a body mounting at least two adjustable jacks and a beam supported by the jacks, said beam extending along the associated passageway, means for actuating said jacks for vertically displacing said beam between a lowered position wherein it lies below an article structure in a work station and a raised position wherein it lifts that article structure up from the grillage at the work station preparatory to movement of the carriage to the next work station for further work thereon and means on each carriage body for guiding vertical movement of the associated beam, means on each carriage body providing fairing jacks adjustable for positionally engaging the article structure on the beam, individual drive means on each carriage body for driving the carriage along said rail means, whereby each carriage in a passageway may be positioned at a work station having article structure thereon, operated to engage and raise that article structure up off the fairing jacks and up from the grillage at that station, then driven to a succeeding station along the grillage and then lowered to deposit the article structure on the grillage for further work at that succeeding station.

4,187,943

DRAG CHAIN LINKS

Edward J. Horkey, 835 W. 22nd St., Tempe, Ariz. 85282

Filed Nov. 15, 1978, Ser. No. 960,947
Int. Cl.² B65G *19/24, 19/08*
U.S. Cl. 198—730 **9 Claims**



1. A link for a drag chain comprising:

a material pushing blade having a substantially flat material engaging surface extending perpendicularly away from a supporting surface,

a connecting bar journal extending substantially parallel to and rearwardly of the supporting surface,

a journal slot extending upwardly and opening outwardly of said journal for receiving and guiding a connecting bar of an associated link into said journal,

said slot tilted rearwardly from said pushing surface to prevent accumulation of abrasive materials in said journal, and for easy removal of abrasive materials in links making up the return portion of the loop,

means comprising support arms extending rearwardly from said pushing surface out of contact with the supporting surface,

a connecting bar formed integral with the free ends of said support arms, the longitudinal axis of which is substantially parallel with said pushing surface, and

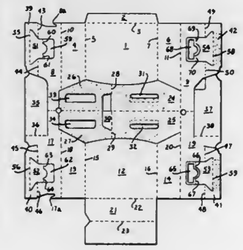
the longitudinal axis of said journal being spaced from and on the opposite side of the longitudinal axis of the link from the supporting surface for increasing the shear strength of the link.

4,187,944

ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 19, 1979, Ser. No. 21,456
Int. Cl.[2] B65D *5/48, 75/00*
U.S. Cl. 206—187 **10 Claims**



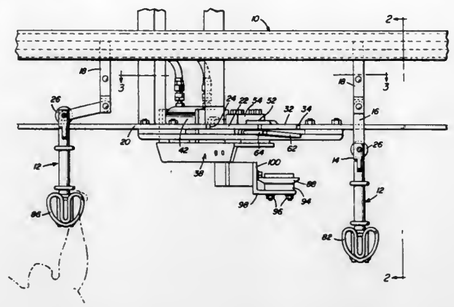
1. A collapsed article carrier comprising handle structure (**24,25**), medial partition structure (**8,9,17,19**) extending downwardly from said handle structure, a first pair of end wall panels (**6,14**) foldably joined to one end of said medial partition structure and disposed in overlapping relation therewith, a pair of side walls (**1,12**) foldably joined respectively to said first pair of end wall panels and being coplanar therewith, a second pair of end wall panels (**4,13**) foldably joined respectively to said pair of side walls remote from said first pair of end wall panels and disposed in overlapping relation therewith and being foldably joined to said medial partition structure along the edges remote from said pair of side walls, a bottom wall (**21**) folded in half and secured along the side edges thereof respectively to the lower edges of said pair of side walls, a first pair of transverse partition panels (**39,40,41,42**) foldably joined to said medial partition structure on one side of the carrier, a second pair of transverse partition panels (**51,52,53,54**) foldably joined respectively to said first pair of transverse partition panels and disposed in overlapping relation therewith, a pair of anchoring tabs (**59,62,65,68**) foldably joined respectively to said second pair of transverse partition panels and secured to the associated one of said side walls, and characterized in that one of said second pair of transverse partition panels is disposed in overlapping relation with the one of said anchoring tabs foldably joined to the other of said second pair of transverse partition panels.

4,187,945

PLURAL PATH WEIGHT SORTING SYSTEM

William F. Altenpohl, and Paul J. Altenpohl, both of High Point, N.C., assignors to W. F. Altenpohl, Inc., High Point, N.C.

Filed Jun. 29, 1978, Ser. No. 920,255
Int. Cl.[2] B07C *5/22*
U.S. Cl. 209—592 **21 Claims**



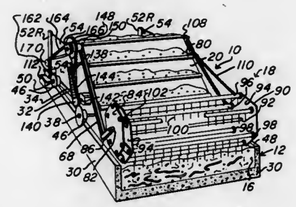
1. In combination with a conveyor moving a plurality of carriers through at least one monitoring station along a first path of travel, a weight sorting system including sensing means for detecting those of the carriers at said station loaded above a predetermined value, path changing means rendered operative for establishing a second path of travel along which the loaded carriers may be moved by the conveyor at said station, and control means responsive to said detection of the loaded carriers by the sensing means for rendering the path changing means operative to transfer movement of the loaded carriers from the first path to the second path of travel.

4,187,946

WORM HARVESTER

Walter A. Stevenson, R.F.D., Box 41, Oakley, Kans. 67748

Filed Nov. 1, 1978, Ser. No. 956,637
Int. Cl.[2] B07C *5/12*
U.S. Cl. 209—674 **10 Claims**



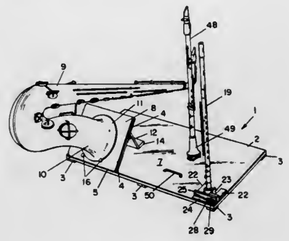
1. Apparatus for harvesting a mixture of worms and bedding from a trough-like bed and separating the large size worms from the mixture thus harvested comprising: an open-bottomed wheeled carriage having a front and a rear end mountable atop the bed for movement therealong; a forwardly-extending boom attached to the front end of the carriage for pivotal movement about a horizontally-disposed transverse axis between an elevated inoperative position and a lowered operative one riding in the bottom of the trough; reel means mounted on the end of the boom remote from the carriage for rotational movement about a horizontally-disposed transverse axis, said reel means having tines projecting therefrom effective upon rotation in a selected direction to rake a worm-bedding mixture laying in the bed rearwardly toward the carriage; first conveyor means carried by the boom positioned and adapted to receive the bedding mixture raked back by the reel means and raise same upwardly and rearwardly to a superimposed position above the front end of the carriage; a downwardly and rearwardly inclined screen extending from the front of the carriage to the rear thereof in position to receive the mixture delivered thereto by the first conveyor; means carried by said carriage and connected to said screen operative upon actuation to vibrate the latter, said screen and vibrator means being effective to return the small worms and small particles of bedding therethrough to the bed therebeneath while retaining the larger worms and bedding particles atop thereof; and second conveyor means on the rear end of the carriage extending transversely thereof in position to receive the worms and bedding retained atop the screen as they gravitate toward the lower end thereof.

4,187,947

COMBINATION MUSICAL INSTRUMENT STAND

Robert J. Dunn, 4495 Terrell Ln., Colorado Springs, Colo. 80908, and Sigifred Martinez, 3815 Vaquero Cr. North, Colorado Springs, Colo. 80918

Filed May 12, 1978, Ser. No. 905,390
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—13 **9 Claims**



1. A combination musical stand for various woodwinds including saxophone, flute, and clarinet, comprising a flat base, platform means on said base, said platform including means to support said saxophone, said platform being hingedly mounted on said base for angular tilting movement relative thereto for angularly and generally vertically supporting a saxophone, said platform being foldable against said base for storage, peg means on said base and spaced from said platform, said peg means being hinged at its lower end to said base so as to project vertically for receiving a flute thereon and being foldable to a horizontal position relative to said base for storage, and pyramidal shaped means removably positioned on said base in spaced relation to said platform and peg for vertically receiving a clarinet thereon, and said pyramidal shaped means being removed for flat stacking on said base for storage of the stand.

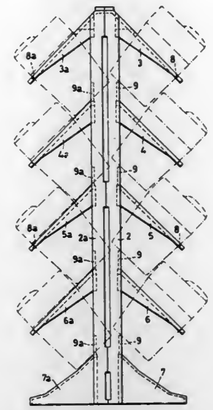
4,187,948

PILL-BOX DISPLAY STAND

Emilio Perrella, Viale S. Carlo, Segrate, Italy

Filed Mar. 1, 1978, Ser. No. 882,355
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 7706644
Int. Cl.[2] A47F *7/28*
U.S. Cl. 211—71 **3 Claims**

1. A display stand, including two stand-halves for attachment to one another in back-to-back arrangement, said stand-halves each comprising two side posts and of a plurality of superimposed tiers arranged between said side posts and projecting forwardly and downwardly therefrom, each tier having a row of perforations for housing individual articles intended to rest on the underlying tier, said underlying tier being provided with upwardly extending tabs arranged below alternate perforations of the overlying tier to maintain corresponding articles housed in said alternate perforations at a higher level than those housed in the adjacent perforations, the locations of the tabs of one stand-half being alternated with the locations of the tabs of the other stand-half, the rear of the posts of each stand-half having projections and recesses arranged to engage with corresponding recesses and projections



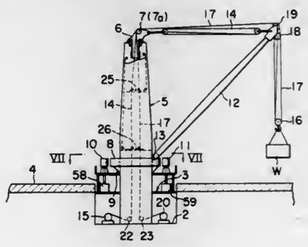
of the other stand-half when the two stand-halves are brought together in back-to-back arrangement.

4,187,949

DERRICK CRANE WITH WIDE HORIZONTAL SWINGING RANGE OF BOOM

Tadaomi Komatsu, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 10, 1978, Ser. No. 923,638
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—58 R **6 Claims**



1. A derrick crane comprising: an upright derrick post having a hollow interior; a turning ring rotatably supported to rotate around a lower part of the derrick post about a vertical axis; a derrick boom pivotally supported at the inner proximal end thereof on the turning ring in a manner permitting up-and-down derricking movement of the boom; a swivel pulley rotatably supported at the top of the post to swivel freely about a vertical axis and rotatably supporting a plurality of sheaves; a derricking tackle connected between the swivel pulley and the top end of the boom and including a derricking cable passed around a sheave of the swivel pulley, extended downward therefrom to and around a stationary sheave, and wound around a powered winch; a cargo hoisting tackle connected between the top end of the boom and means for suspending a cargo article therefrom and including a hoisting cable passed around another sheave of the swivel pulley, extended downward therefrom to and around another stationary sheave, and wound around a powered winch; a mechanism for preventing mutual contacting of the derricking and hoisting cables comprising a plurality of vertically spaced-apart intermediate turntables rotatably supported in the hollow interior of the post to

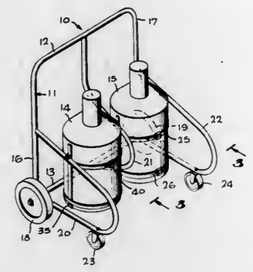
freely rotate about a vertical axis and located between the swivel pulley and the stationary sheaves, said turntable having spaced-apart sheaves for guiding and maintaining apart the derricking and hoisting cables, and means for so intercoupling the swivel pulley and the turntables that each of the differences between the rotational angles of the swivel pulley and the nearest turntable and between adjacent turntables does not exceed a specific angle thereby to prevent mutual contacting and rubbing of the derricking and hoisting cables; and a mechanism for controllably driving the turning ring comprising at least one slewing drum, motive power means for driving said drum in forward and reverse directions, and cables wound around the turning ring and the slewing drum and operating to transmit torque therebetween.

4,187,950

GAS CAN TRANSPORTER

Gale P. Peet, 6960 Yarmouth Ave., Reseda, Calif. 91335

Filed Jun. 27, 1977, Ser. No. 810,428
Int. Cl.[2] B65G *65/24;* F17C *13/08;* B65G *65/00*
U.S. Cl. 414—421 **1 Claim**



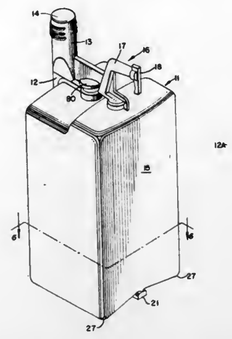
1. A transporter for liquid containers comprising:
a pair of liquid containers;
a wheeled frame having a vertical brace portion and a frontal portion extending outwardly from said brace portion;
said frontal portion having a plurality of bars defining storage areas between adjacent ones of said bars intended to be occupied by a liquid container;
pivot means secured to said frontal bars;
strap means detachably secured to each of said liquid containers for rotatably mounting said liquid containers onto said bars via said pivot means;
said wheeled frame includes a pair of wheels carried on said vertical brace portion and a pair of castered wheels carried on selected ones of said frontal bars;
said strap means includes a pair of vertically disposed straps associated with each container and a pair of removable bands trained about said straps and said associated container;
said pivot means includes laterally projecting pivots carried from each of said vertical straps rotatably engageable with a respective sleeve secured to each of said frontal bars;
at least three frontal bars are provided and wherein the center frontal bar is of shorter length than the adjacent side front bars; and
said pivot means permit said liquid containers to rotate in a fore and aft orientation with respect to said wheeled frame.

4,187,951

BLOW MOLDED BOTTLE WITH DIFFUSER AND METHOD FOR MAKING SAME

Orlando D. Cambio, Jr., Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed May 11, 1978, Ser. No. 904,980
Int. Cl.[2] B65D *01/04;* B05B *07/32*
U.S. Cl. 215—6 **5 Claims**



1. A blow molded bottle with diffuser comprising:
(a) an upper chamber for containing a fluid and having a bottom;
(b) a lower portion comprising a manifold;
(c) said lower portion being integrally formed with said chamber and being separated from each other by a relatively narrow band of thermoplastic material having a plurality of small conduits of like configuration therethrough whereby there is communication between the said chamber and the said manifold through said bottom;
(d) said small conduits have an internal diameter smaller over a majority of their length and increasingly larger diameter at said manifold thereby diminishing audible emission of gas therethrough;
(e) second conduit means;
(f) said second conduit means being integrally molded along a side of said chamber;
(g) one end of said conduit means terminating and communicating with the said manifold;
(h) the other end of said second conduit means terminating above said chamber with a breachable sealing means;
(i) said chamber having a neck portion thereabove;
(j) said neck portion terminating in a port means having an integral sealing means.

4,187,952

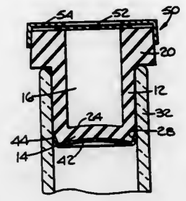
CANNULA PIERCEABLE, SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, and a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 942,056
Int. Cl.[2] B65D *39/04*
U.S. Cl. 215—247 **2 Claims**

1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;
(a) a tubular elastomeric body having
(i) flexible, elastic sidewalls;
(ii) an open first end; and
(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls;
(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end;

(c) a protective cap adhered to the outside of said closed second end; and
(d) a puncturable diaphragm closing the open first end;
said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;



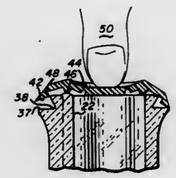
whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,187,953

SECURITY CONTAINER AND CLOSURE APPARATUS

Lloyd S. Turner, Los Gatos, Calif., assignor to Basic Products Development Company, Inc., Hayward, Calif.

Filed May 18, 1978, Ser. No. 906,970
Int. Cl.[2] B65D *17/00, 39/00, 43/04*
U.S. Cl. 215—301 **18 Claims**



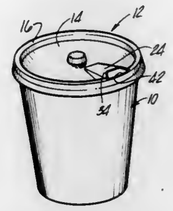
1. An improved security container and closure apparatus comprising:
container means including
a neck portion having a circumscribing first locking means formed in its outer surface proximate a mouth-forming end thereof,
a circumscribing flange means provided adjacent and beneath said first locking means and having a first outside diameter,
means projecting radially inwardly from a relatively small circumferential segment of said neck portion and forming a bearing surface that extends into said mouth; and
resilient closure means including a top portion having an upper surface and a lower surface, and a circumscribing, downwardly-depending skirt portion having a second locking means formed on an inside surface thereof for matingly engaging said first locking means, said skirt portion having a lower extremity of a second outside diameter equal to or less than said first diameter and lying in a single plane, whereby when said closure means is positioned to lockingly close said mouth, said first locking means mates with said second locking means to lock said closure means to said container means, and whereby removal of said closure means from said container means is effected by applying a downward force to a central part of said upper surface sufficient to deform said top portion downwardly such that only the part thereof lying over said bearing surface engages said bearing surface and pivots thereabout to lift a contiguous relatively small circumferential segment of said skirt portion upwardly and out of said single plane such that the resiliency of said skirt portion causes the unlifted portion thereof to cam upwardly over said first locking means as said downward force is relieved.

4,187,954

BEVERAGE CONTAINER LID

Lewis J. Striggow, 450 Demode Rd., Holly, Mich. 48442

Filed Jan. 19, 1979, Ser. No. 4,677
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—90.4 **5 Claims**



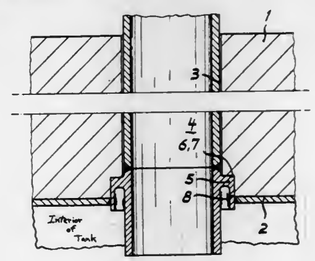
1. A lid for a cylindrical beverage container comprising: a disc-shaped horizontal wall member, means adjacent the circumferential edge of said wall member adapted to detachably secure said wall to said container to close the opening therein, a spout member formed in said wall and extending above the surface of said wall, a covered portion formed in the top of said spout member, said covered portion having a perimeter defined by a line of weakening, said cover portion being removable from said spout member upon separating said cover portion at said line of weakening to form an opening in said spout for drinking through said spout from said container, a tab formed on the top of said cover portion and being deflectable to rupture said line of weakening with fingers or teeth to remove said cover portion from said spout member.

4,187,955

ARMORED PIPE CONNECTED TO A STEEL LINING OF A PRESTRESSED CAST PRESSURE TANK

Rolf Dörling, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,592
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710176
Int. Cl.[2] B65D *25/14*
U.S. Cl. 220—435 **2 Claims**



1. A pressure vessel having a cast iron wall fitted with a steel

lining on the inner surface of said wall and having an opening through the wall and lining, said opening in said cast iron wall being enlarged at its inner end to provide an inwardly facing, radial shoulder on said wall, a pipe extending through the opening in said lining and into said wall, a circumferential collar L-shaped in cross section having a cylindrical portion with a free end, said cylindrical portion and free end being spaced from said pipe, the site end of said collar spaced axially and radially from said free end and integrally connected to said pipe, the cylindrical portion of said collar being welded to said lining so that the weld is spaced from the pipe and from said opposite end of said collar to allow expansion of said lining without affecting the diameter of said pipe, said pipe being in engagement with said radial shoulder on said cast iron wall to prevent outward movement of said pipe.

4,187,956

SAFETY INSERT FOR STORAGE VESSELS OF LOW-BOILING LIQUIFIED GASES

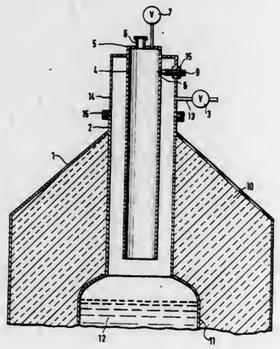
Rolf Schrawer, Bruchkobel; Werner K. Diehl, and Hans M. Ringelstein, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,153

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747492

Int. Cl.[2] B65D *25/00*; F17C *13/04*

U.S. Cl. 220—465 **3 Claims**



1. In a safety insert for storage vessels for low boiling, liquified gases wherein the vessel has a neck, a safety tube disposed longitudinally within said neck in flow communication with the contents of the vessel, an annular space being formed between said neck and said safety tube, a flange closing off the outer end of said neck and said safety tube, a fill and extraction opening in said flange for the liquified gas, a safety valve in said flange, a vent pipe having a stop cock in said neck communicating with said annular space and the atmosphere, a gas outlet hole in said safety tube, said gas outlet hole having its flow cross-section adjustably by manipulating means external of said vessel, and said gas outlet hole communicating with said annular space and by way of said pipe also communicating with the atmosphere whereby a portion of vaporized gas flows through said annular space and exits from said vent pipe and a remaining portion of vaporized gas flows through said safety tube and exits from said outlet hole so as to prevent any stationary column from being in either said annular space or said safety tube and thus reducing heat transfer to the liquified gas and minimizing evaporation losses.

4,187,957

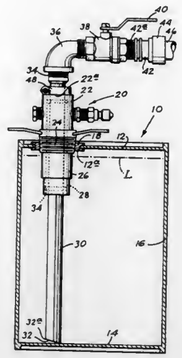
METHOD AND APPARATUS FOR MEASURING LIQUID VOLUME TO BE WITHDRAWN FROM A CONTAINER

Calvin J. Butler, 20189 Cheyenne Rd., Bend, Oreg. 97701

Filed Feb. 13, 1978, Ser. No. 876,893

Int. Cl.[2] B67D *5/08, 5/44*

U.S. Cl. 222—1 **5 Claims**



4. Apparatus for use in predetermining volume of liquid to be withdrawn from a container having top, bottom and side walls comprising:

conduit means insertable through an opening in the top wall selectively shiftable within the container for providing a liquid conducting passage;

external measuring means including a graduated scale which is calibrated over a length substantially equal to the depth of liquid when the container is full positionable adjacent an external portion of said conduit means for displaying liquid volume withdrawable through said conduit means when it is linearly shifted to a preselected position; and,

indicating means releasably secured to said conduit means, said indicating means being secured to said conduit means and shiftable therewith for indicating on said measuring means a length corresponding to the amount of the shifting, said indicating means also being repositionable on said conduit means for fixing said conduit means relative to the container.

4,187,958

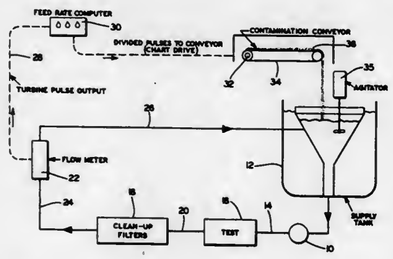
FLOW PROPORTIONAL CONVEYOR DRIVE SYSTEM

Donald A. King, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Sep. 12, 1978, Ser. No. 954,701

Int. Cl.[2] B65G *43/00*

U.S. Cl. 222—57 **1 Claim**



1. An open loop, low speed conveyor drive system comprising a conveyor; a mechanical, wound spring drive for advancing the conveyor, said spring drive including an escapement mechanism which advances the conveyor in discrete increments; an electrically operated solenoid which operates the escapement mechanism; a fluid conduit; a turbine flow meter in the conduit; a transducer which senses the passage of the turbine blades and generates voltage pulses proportional to the flow of fluid in the conduit; an amplifier which receives the voltage pulses from the transducer and conditions them; a pulse divider which receives the conditioned pulses, the pulse divider having means for dividing the incoming conditioned pulses by a set integer and providing divided output voltage pulses; a second amplifier for conditioning the divided voltage pulses; means conducting the second conditioned voltage pulses to the solenoid, wherein the solenoid is actuated once to operate the escapement mechanism once to advance the conveyor one increment each time the solenoid receives a second conditioned voltage pulse.

4,187,959

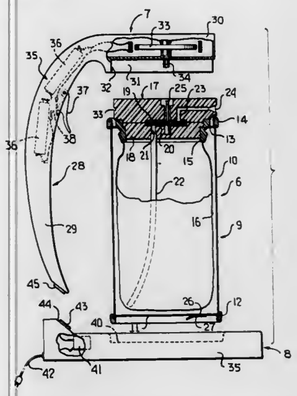
PROPELLANTLESS AEROSOL DISPENSING SYSTEM

Peter G. Pelton, St. Louis, Mo., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,568

Int. Cl.[2] B67D *5/40*

U.S. Cl. 222—94 **12 Claims**



1. A propellantless aerosol dispensing assembly comprising a support container including a body and a bottom end, a partial top end in the form of an annular closure element, a product container carried by said annular closure element and disposed within said support container, a dispensing unit closing said support container and said product container, and single sealing means sealing said product container to both said dispensing unit and said closure element, said product container being in the form of a collapsible bag.

4,187,960

DISPENSER WITH CAP AND PROTECTIVE MEMBER

Joseph P. Bonk, Des Plaines, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 27, 1978, Ser. No. 928,757

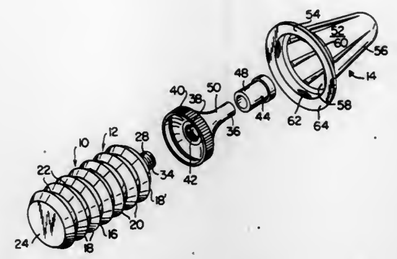
Int. Cl.[2] B65D *35/08*

U.S. Cl. 222—107 **3 Claims**

1. A dispenser, comprising:

a receptacle comprising, a container having a plurality of contiguous bellows defining a chamber and an outer annular edge, a hollow nipple extending distally from said container, a cap for releasably closing a distal end of said nipple, and means for releasably attaching a proximal end of said nipple to a distal end of said container; and

a protective member having sidewalls defining a cavity to receive said nipple and cap in a closure position of the protective member with a proximal end portion of the protective member extending peripherally around the container, and means for releasably connecting said proximal end portion of the protective member to said container at a location proximal the attaching means in said closure position and for substantially closing the cavity about the container to prevent leakage from the dispenser,



said connecting means comprising a plurality of inwardly directed bosses on said annular member for placement over the outer edge of one of said bellows in said closure position of the protective member.

4,187,961

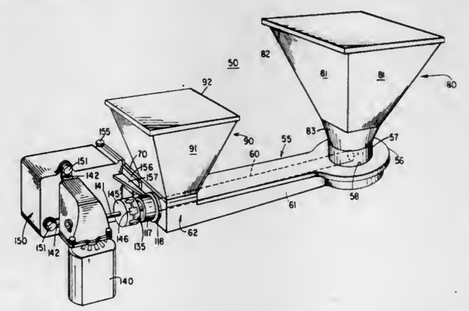
DYE METERING SYSTEM

Ronald L. Voller, 1265 Franklin La., Buffalo Gove, Ill. 60090

Filed Mar. 20, 1978, Ser. No. 888,332

Int. Cl.[2] B65G *33/14*

U.S. Cl. 222—133 **13 Claims**



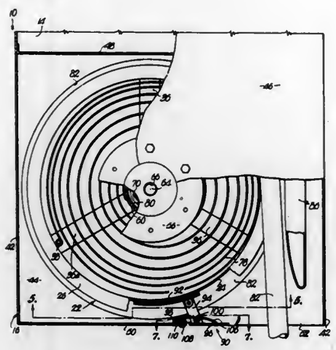
1. A system for introducing a predetermined amount of particulate matter to a continuous flowing stream of material flowing in a first path from a source thereof, said system comprising a hopper having a storage area for storing the particulate matter and having a downwardly extending neck defining an opening in communication with said hopper storage area, a frame member, a sleeve supported by said frame member extending to the first path and having an opening therein complementary in size to the opening defined by said neck and in registry therewith, said opening defined by said hopper neck and said opening in said sleeve cooperating with said hopper and said sleeve to define a closed second path from said hopper through said sleeve to the first path, said hopper and said sleeve being frictionally mounted with respect to each other and to said frame for easy removal and replacement, and means for transporting particulate matter from said hopper along the second path to the first path at a predetermined rate.

4,187,962

FUEL SERVICE TANK WITH SELF-RETRACTING HOSE REEL

Elbert C. Henry, Concordia, Kans., assignor to Henry Enterprises, Inc., Concordia, Kans.

Filed Mar. 17, 1978, Ser. No. 887,653
Int. Cl.[2] B67D *5/365*
U.S. Cl. 222—173 **8 Claims**



1. Liquid-dispensing apparatus, comprising: a tank adapted to hold a liquid to be dispensed; a liquid delivery assembly, including

a rotatable reel;

a length of flexible liquid delivery conduit having an inner liquid-receiving end and an outer liquid-delivery end, said conduit having a retracted position wherein the conduit is wrapped about said reel, there being means operatively coupling said reel and conduit for rotation of the reel in a first direction when the conduit is grasped adjacent said delivery end thereof and pulled from the reel in order to extend the conduit for use thereof;

means for biasing said reel in a second rotational direction opposite to said first direction, when said conduit is extended;

brake mechanism including a brake element adjacent said reel and located in a rest position thereof lightly engaging a peripheral surface of the reel for permitting movement of said reel in said first direction during extension of said conduit to a desired use position,

said mechanism serving in response to rotation of said reel in said second direction, to press said element against said reel in order to prevent further significant rotation of said reel in said second direction;

selectively operable release structure coupled to said brake mechanism for movement of said element from said reel-pressing position and permitting rotation of said reel in said second direction, said means coupling said reel and conduit serving to retract said conduit and rewrap the latter about said reel;

means for coupling said tank and said delivery end of said conduit for flow of said liquid through the latter; and

means for selectively pumping said liquid from said tank and through said conduit for delivery thereof,

said mechanism including an arm swingable relative to said reel about an axis substantially parallel to the axis of rotation of said reel,

said element being attached to an inner end of said arm and said release structure including a rigid actuating member fixedly attached to an outer end of said arm in normally spaced proximity to said conduit,

said arm and said element having a dimension measured radially from said swinging axis of the arm that exceeds the radial distance from said axis of the arm to said surface of the reel, and said arm and said element being disposed with said dimension thereof located behind a center line intersecting said axes with respect to said second direction of rotation of the reel.

said surface tending to swing said element away from the same during said extension of the conduit and rotation of the reel in said first direction and tending to swing the element into progressively tighter engagement with said surface in response to attempted rotation of the reel in said second direction,

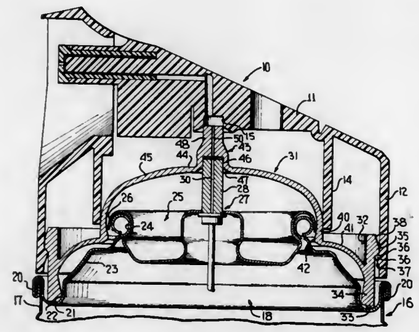
said conduit being selectively shiftable laterally of its longitudinal axis into actuating engagement with said member when the conduit is in an extended, use position for swinging the member, the arm and said element in a direction to swing said element away from said surface, thereby rendering said biasing means operable to rotate said reel in said second direction and retract said conduit.

4,187,963

ADAPTER RING FOR DISPENSING OVERCAP

Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,954
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 **10 Claims**



1. An adapter ring for adapting a dispensing overcap to a dispensing end unit of an aerosol and the like container having a valve stem, said adapter ring comprising an annular support ring having first means on a lower portion for seating engagement with a dispensing end unit and second means on an upper portion for interlocking engagement with a dispensing overcap, an axially extending valve stem adapter centered relative to said support ring and axially spaced relative thereto for providing a fluid connection between a valve stem and a dispensing cap, and connecting means between said support ring and said valve stem adapter mounting said valve stem adapter on said support ring for limited axial movement relative to said support ring.

4,187,964

COMBINED CLOSURE CAP AND POUR-OUT FITMENT

Burton S. Bogart, Columbus, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 1, 1978, Ser. No. 929,998
Int. Cl.[2] B65D *41/04, 41/28*
U.S. Cl. 222—546 **14 Claims**

1. In combination a closure cap and pour-out firment:

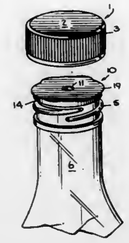
said closure cap including a cover and a depending skirt with container engaging means;

a projecting plug at the center of the underside of said closure cover;

a pour-out fitment having a disc-like membrane with closure cap engaging means at its edge frictionally engaging the inner surface of said closure skirt between the closure cover and the container engaging means;

a pour-out aperture at the center of said membrane for receiving said plug;

means at the outer edge of said membrane for frictionally engaging a container at its rim when the combination is applied to the container; and



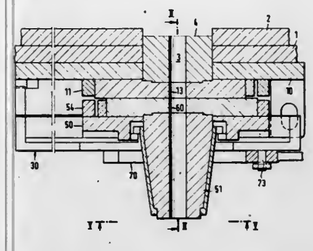
a plurality of sealing ribs near the outer edge of the underside of said closure cover for sealing engagement with the facing surface of said fitment membrane.

4,187,965

BOX DISCHARGER COMPRISING RELOADABLE REFRACTORY PLATES, WITH WEDGE LOCKING

Giovanni Aliprandi; Roberto Ricci, and Giovanni Timossi, all of Genoa, Italy, assignors to SANAC Societa per Azioni Refrattari Argille e Calolini, Italy

Filed Apr. 21, 1978, Ser. No. 898,774
Claims priority, application Italy, Jun. 6, 1977, 12627 A/77
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—600 **8 Claims**



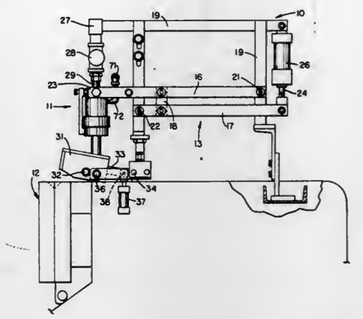
1. A box discharger particularly for ladles and the like, of the type comprising, a first metal stationary upper plate fastened onto the bottom of said ladle or the like; a second metal lower plate connected to said upper plate so as to be tiltable from a work position, wherein said tilting plate parallel to said stationary plate to a maintenance position wherein said tilting plate defines with said stationary plate an angle sufficient to allow access to the inside of said discharger; a third metal plate slidable between the first two plates; wherein said three plates each comprises a bore for the passage of a flow of liquid metal when said discharger is in an open position; flattened refractory bricks fastened against the lower face of said upper stationary plate and the upper face of said sliding plate, said flattened refractory bricks sealingly sliding against each other during the discharger movement, said bricks being provided with holes for the passage of the liquid metal when said holes are in registry; the lower face of said tilting lower plate being mounted turnably, a section of annular crown provided on an outer edge of said tilting lower plate with at least two wedge-shaped wings projecting outwards to engage grooves provided on two uprights projecting from the lower face of said stationary upper plate, laterally to the outer profile of said tilting plate; said two uprights, and and driving means provided for rotating said section of annular crown.

4,187,966

METAL DISPENSING VALVE ASSEMBLY FOR BATTERY GRID CASTING MACHINE

Basil R. Van Linder, Oshtemo Township, Kalamazoo County; Ronald C. Van Linder, Watervliet Township, Berrien County, and Fredrick G. McLane, Portage, all of Mich., assignors to Kalamazoo Manufacturing Company, Kalamazoo, Mich.

Filed Aug. 23, 1978, Ser. No. 936,099
Int. Cl.[2] B22D *41/10*
U.S. Cl. 222—601 **10 Claims**



1. In a battery grid casting machine having a mold, a movable filling ladle for supplying a preselected quantity of molten metal to said mold, a nozzle member connected to a source of molten metal, and valve means for dispensing said preselected quantity of molten metal from said nozzle member into said ladle, said valve means including a housing cooperating with said nozzle member and defining therein a valve member adapted for movement between open and closed positions relative to said nozzle member, said housing defining a discharge passage for supplying molten metal into said ladle, and means for moving said valve member relative to said nozzle member between said open and closed positions, comprising the improvement wherein said valve member includes an upwardly opening cup member defining therein an upwardly opening compartment, said nozzle member having a lower discharge end which projects downwardly into said compartment, said valve member also including a valve portion associated with said cup member and positioned for engaging the lower discharge end of said nozzle member when said valve member is in said closed position, said discharge passage communicating with said compartment at an elevation above said valve portion so that said cup member continuously contains therein a predetermined quantity of molten metal in surrounding relationship to said valve portion.

4,187,967

SWIVEL HOOK ATTACHMENT FOR ARTICLE HANGERS

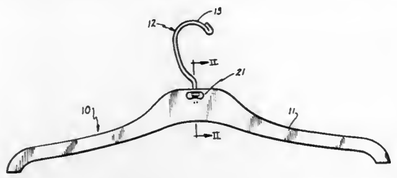
Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Jun. 8, 1978, Ser. No. 913,841
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—92 **22 Claims**

1. A molded plastic hanger, said hanger having a molded body, said body having a hook-receiving opening extending vertically into said hanger from the top thereof and means for securing a hook thereto, said means comprising:

an aperture formed in said hanger body aligned with said hook-receiving opening and spaced from the top of said hanger to form a bridge integral with said body between the top of said aperture and the top of said hanger body; said aperture spaced from the bottom of said body to form a second bridge-like portion forming the bottom wall of said aperture; an anchor ring in said opening detachably

secured to said hanger body; said anchor ring having an opening therein to receive said hook; said opening being of a size to provide an interference fit with said hook to



bind said anchor ring to said hook with sufficient interengagement that force applied to said hook can forcibly detach said anchor ring from said hanger body.

4,187,968

APPARATUS FOR THREADING A PAPER WEB INTO THE FOLDING MECHANISM OF A ROTARY PRINTING PRESS

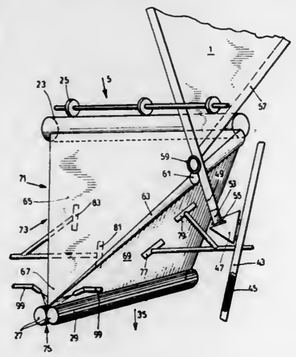
Johann Winterholler, Hugelshart; Josef Plantsch; Herbert Stockl, both of Augsburg, and Siegfried Gunther, Munich, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.), Augsburg, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,966

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657789

Int. Cl.[2] B65H *23/32*

U.S. Cl. 226—92 **11 Claims**



1. Apparatus to thread a paper web into the folding mechanism of a rotary printing press having
a folding former (5,65);
driven supply rollers (23,25) upstream of the folding former to supply a web of paper (1) thereto;
two take up rollers (27) downstream of the folding former and having their axes located at right angles to the supply rollers (23,25), and forming a nip (75) there between;
and comprising, in accordance with the invention
two paper guide baffles (69,71) located at the back side of the folding former (5,65) extending in converging direction from the edges of the former to the tip (67) of the former and up to the nip (75) between the take-up rollers (27);
air pressure differential generating means (77,79, 81,83) generating an under pressure adjacent to the surfaces of the guide baffles (69,71) of sufficient intensity to pull the paper web (1) over the edges (63,73) of the former and into the nip (75) between the take-up rollers (27);
and means (29,99) acting on the take-up rollers providing rotational force thereto to provide for driving force by said take-up roller on the paper web (1) introduced in the nip between said rollers upon threading of the web over the former.

4,187,969

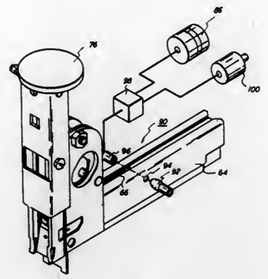
FIXED STAPLER HEAD

Charles W. Spehrley, Jr., Quechee, Vt., assignor to Xerox Corporation, Stamford, Conn.

Filed May 15, 1978, Ser. No. 905,665

Int. Cl.[2] B27F *7/06*

U.S. Cl. 227—2 **6 Claims**



1. An apparatus for driving a staple through a stack of sheets, including:
a housing having a passageway for storing therein at least one staple, said housing being mounted stationarily and having a clamping surface;
means for moving the stack of sheets into contact with the clamping surface of said housing to hold the stack of sheets securely during the stapling operation;
means for driving the staples stored in the passageway of said housing through the stack of sheets;
means for storing a plurality of staples, said storing means being stationary and in communication with the passageway in said housing for periodically advancing a supply of staples thereto; and
means, in communication with said housing, for detecting the quantity of staples remaining in the passageway of said housing and actuating said storing means to advance staples therefrom into the passageway of said housing when the quantity of staples contained within the passageway of said housing is less than a pre-determined number.

4,187,970

APPARATUS FOR ATTACHING TAG PIN

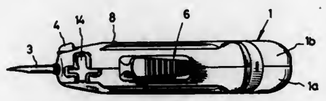
Akira Furutu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Japan

Continuation of Ser. No. 836,706, Sep. 26, 1977, abandoned, which is a continuation of Ser. No. 699,572, Jun. 24, 1976, Pat. No. 4,090,653. This application May 9, 1978, Ser. No. 904,297

The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.[2] B65C *5/06*

U.S. Cl. 227—8 **8 Claims**



1. An apparatus for attaching a tag-pin comprising:
a pistol-shaped body;
a lever supported on said body for rocking movement;
a rod driven by means of said lever;
a ratchet wheel mounted near a slot for inserting tag pins;

a ratchet for preventing the inverse rotation of the ratchet wheel and adaptable for disengagement therewith:
a feeding knob for driving said ratchet wheel;
a grooved needle provided at one end of said pistol-shaped body, said rod being located for movement on the axis of said needle;
a piston supporting said rod;
a trigger-like lever means directly driving said piston;
a free lever provided in relation to said ratchet for preventing inverse rotation of the ratchet wheel, said free lever being operated from the side of said body to produce disengagement of the ratchet from said ratchet wheel; and
an adjusting means removably attached at the forward portion of said pistol-shaped body to adjust the length of insertion of said grooved needle into an article.

4,187,971

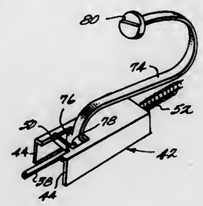
STAPLER FOR AN IMPROVED FLEXIBLE PUSHER RETRACTING MEMBER

Raymond A. Prew, Jr., Foster, R.I., assignor to Textron Inc., Providence, R.I.

Filed Jun. 29, 1978, Ser. No. 920,195

Int. Cl.[2] B25C *5/16*

U.S. Cl. 227—125 **9 Claims**



1. In a staple driving device comprising
a magazine structure having means defining a drive track and means defining an elongated open top chamber leading to said drive track of a size to receive and support a staple stick therein,
a staple stick pusher disposed within said chamber,
means mounting said pusher within said chamber for generally rectilinear movement toward and away from said drive track, said mounting means including an elongated rod fixedly mounted in said magazine structure, said pusher having a sliding connection with said rod,
spring means resiliently biasing said pusher in a direction toward said drive track,
a top cover member mounted for pivotal movement between an operative position disposed in closing relation with the open top of said magazine chamber and a staple stick loading position displaced from said magazine chamber an arcuate extent sufficient to expose the open top thereof for convenient loading of a staple stick therein,
a lever member having a staple driving element,
means mounting said lever member for pivotal movement through (A) staple driving cycles each of which includes (1) a drive stroke during which a staple in said drive track is driven by said staple driving element from said drive track and (2) a return stroke, and (B) staple stick loading cycles each of which includes (1) a magazine opening stroke during which said cover member is moved with said lever member from the operative position thereof to the staple stick loading position thereof and (2) a magazine closing stroke during which said cover member is moved with said lever member from the staple stick loading position thereof to the operative position thereof,
and elongated flexible pusher retracting means operatively connected with said pusher and said cover member for (A) effecting movement of said pusher in a direction away from said drive track into a stick loading position in response to the movement of said cover member with said lever member through said magazine opening stroke and (B) permitting said pusher member to be moved by the resilient bias of said spring means toward said drive track when said cover member is in said operative position,
the improvement in combination therewith which comprises said pusher retracting means having one end portion thereof abuttingly engaging said pusher and formed with an aperture through which said rod extends.

4,187,972

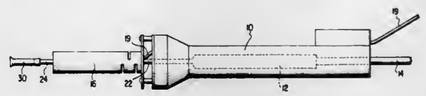
APPARATUS INCLUDING GENERAL PURPOSE DESOLDERER AND MEANS FOR CONVERTING THE GENERAL PURPOSE DESOLDERER TO EITHER A SOLDERING IRON OR A SPECIAL PURPOSE DESOLDERER

Alexander J. Vella, Bethesda, Md., assignor to Pace Incorporated, Silver Spring, Md.

Filed Mar. 28, 1978, Ser. No. 891,041

Int. Cl.[2] B23K *3/02*

U.S. Cl. 228—20 **31 Claims**



1. Apparatus including a general purpose desolderer and converting means for converting the general purpose desolderer to either a soldering iron or a special purpose desolderer, said apparatus comprising
a handle;
solder collection means disposed within said handle and being adapted for connection to a vacuum source;
heating means connected to said handle, said means having an opening extending therethrough in communication with said solder collection means;
a desoldering tip in thermal contact with said heating means and having an opening extending therethrough in communication with the opening in said heating means so that when said device is employed as said desolderer, molten solder or the like may be sucked through said tip and said heater assembly into said solder collection chamber, said handle, solder collection means, heating means and desoldering tip comprising said general purpose desolderer; and
said converting means including a further tip removably mounted on said desoldering tip and in heat contact therewith so that heat flows from the desoldering tip to the further tip whereby said general purpose desolderer may be converted to either said soldering iron or said special purpose desolderer depending on the configuration of said further tip.

4,187,973

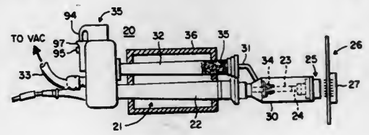
DESOLDERING SYSTEM FOR USE WITH A SOLDERING INSTRUMENT

William S. Fortune, 14250 Dearborn Street, Panorama City, Calif. 91402

Filed Feb. 6, 1978, Ser. No. 875,569

Int. Cl.[2] B23K *3/00*

U.S. Cl. 228—20 **6 Claims**



1. A desoldering attachment for a soldering instrument of

the type having a heater sleeve with a heater element disposed therein and an outer, externally threaded end portion, said desoldering attachment comprising:

(a) a desoldering sleeve surrounding the heater element and heater sleeve;

(b) a desoldering tip having internal threads to mate with the external threads of the heater sleeve, said desoldering tip having at least one solder suction aperture extending therethrough, said desoldering sleeve having an internal surface to provide a reservoir for the sucked in solder at a level below that of the termination of said aperture;

(c) a desoldering filter barrel having a suction correction to said desoldering sleeve;

(d) a solder trap in said desoldering sleeve at said suction connection; and

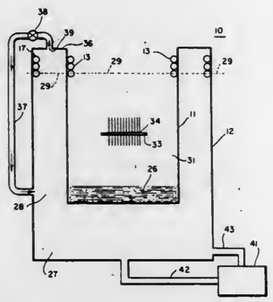
(e) a three-way valve connected to said desoldering barrel for connecting at will a source of vacuum to said barrel or for connecting said valve to the ambient atmosphere, or for closing the air access opening of said valve.

4,187,974

CONDENSATION SOLDERING FACILITY

Roop L. Mahajan, Lawrenceville, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,930
Int. Cl.[2] B23K *3/00*
U.S. Cl. 228—242 **9 Claims**



1. A method of soldering an article having previously applied solder thereon, comprising the steps of:

condensing a portion of a first vapor on a first vessel, having a primary heat transfer liquid therein, to transfer the latent heat of vaporization of the first vapor to the vessel to boil the heat transfer liquid therein and generate a primary vapor therefrom;

generating the first vapor, having a temperature greater than the melting temperature of the solder, in a second vessel, having at least a portion of the first vessel mounted therein, wherein the volume between the first and second vessels is sealed from the atmosphere;

controlling the pressure within the sealed volume by adjusting the temperature of a cooling means, mounted therein;

condensing a portion of the primary vapor on the article and the solder to heat said article and solder to the melting temperature of solder by transferring the latent heat of vaporization thereto to melt the solder on the article; and

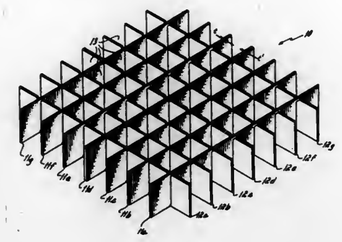
removing the article from the primary vapor to solidify the solder.

4,187,975

COMBINATION SLOTTED PARTITION SPACER

Charles J. Shepherd, Holland, Mich., assignor to W. J. Bradford Paper Company, Holland City, Mich.

Filed Jun. 21, 1978, Ser. No. 917,525
Int. Cl.[2] B65D *1/36, 5/48, 81/00*
U.S. Cl. 229—15 **3 Claims**



1. A multi-cell spacer for maintaining the spacing and separation of articles contained within cells of the spacer, said spacer comprising

a first set of identical, planar, generally rectangular partitions arranged in parallel spacial relationship, each of said partitions having parallel slots extending inwardly from one side edge,

a second set of identical, generally planar, rectangular partitions arranged in parallel spacial relationship, each of said partitions of said second set having parallel slots extending inward from a side edge opposite the one side edge of the partitions of said first set,

the partitions of said first set being perpendicular to the partitions of said second set when said partitions are assembled with said slots of the partitions of the first set interfitted and colinear with the slots of the partitions of said second set, and

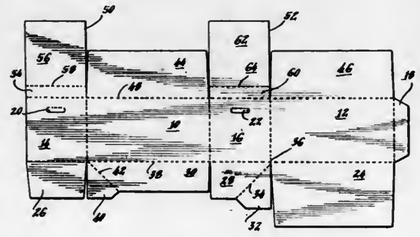
at least one of said partitions being constructed of multiple ply corrugated board and the remainder of said partitions being constructed of non-corrugated fiberboard, said corrugated partition being located at a preselected site within the assembled spacer such that it increases the vertical strength and crush resistance of the resulting combination fiberboard and corrugated board spacer.

4,187,976

COLLAPSIBLE CONTAINER WITH REINFORCING MEMBERS

George A. Mather, Foxboro, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 28, 1978, Ser. No. 937,208
Int. Cl.[2] B65D *5/36, 5/44*
U.S. Cl. 229—41 B **10 Claims**



1. A collapsible container comprising:

first and second generally rectangular side walls;

first and second generally rectangular end walls connecting said side walls to form a rectangular tube; and

a bottom wall assembly including -

(1) a generally rectangular bottom panel joined along a lower edge of one of said side walls,

(2) a first bottom flap joined along a lower edge of one of said end walls and including a single foldable segment integral therewith on one extremity thereof defined by a fold line in said first bottom flap extending diagonally outward from said one end wall,

(3) a second bottom flap joined along a lower edge of the side wall opposite said one side wall, portions of one extremity of said second bottom flap being sandwiched between said bottom panel and said first bottom flap, the opposite extremity of said second bottom flap including a single foldable segment integral therewith and defined by a fold line in said second bottom flap, said last mentioned fold line extending diagonally outward from said opposite side wall,

(4) a third bottom flap joined along a lower edge of the end wall opposite said one end wall and including portions thereof sandwiched between said bottom panel and said second bottom flap,

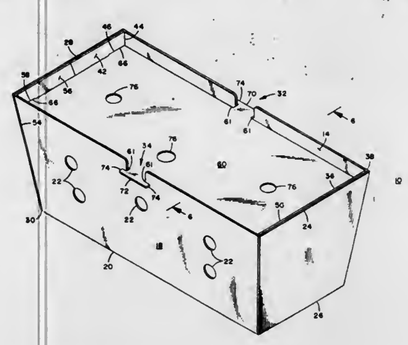
said first and second bottom flaps being respectively foldable into overlapping relationship with said one side wall and said opposite side wall when said container is in a collapsed condition.

4,187,977

TWO PIECE PRODUCE BOX

Richard A. Boykin, Virginia Beach, and Gordon A. Hamilton, Highland Springs, both of Va., assignors to Champion International Corporation, Stamford, Conn.

Filed Jul. 3, 1978, Ser. No. 921,747
Int. Cl.[2] B65D *5/64, 43/04*
U.S. Cl. 229—43 **5 Claims**



1. A two piece produce box comprising:

a base tray having a generally rectangular bottom panel and upstanding end walls and side walls, said end walls and said side walls being trapezoidal in shape with the narrow end of each trapezoidal wall being at the bottom of said base tray such that the perimeter of the top of said tray is larger than the perimeter of the bottom thereof, each said end wall having a pair of spaced slots therein adjacent the top edge thereof while each side wall includes a central recess in the top edge thereof and

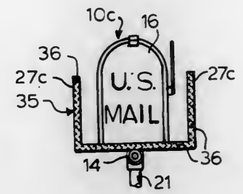
a generally rectangular lid of smaller width than the width of the base tray at the top thereof, said lid having two spaced extension fingers projecting from each end thereof for insertion into a corresponding pair of slots in each end wall of said base tray, said rectangular lid further including a central T-shaped projection extending horizontally from each side thereof for engagement with a corresponding one of said recesses in each side wall of said base tray whereby when said lid is removably locked in place in said base tray, with said T-shaped projections engaged in said recesses, the sides of the base tray apply pressure against the top of said T-shaped projections to hold said projections and the lid in place, and said T-shaped projections also function to support the intermediate span of the lid against collapse.

4,187,978

MAILBOX PROTECTIVE APPARATUS

Raymond A. Dowker, Rte. 3, Box 369, Charlotte, Mich. 48813

Filed May 19, 1978, Ser. No. 907,755
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—39 **5 Claims**



1. In a mailbox assembly having a vertically disposed support column, an arm cantilevered from the upper portion of said column, and a mailbox mounted upon the outer end portion of said arm, apparatus for protecting said assembly from collisional impacts by objects such as snow plows and propelled snow, comprising

means for hingedly securing said arm for lateral swinging movement about said column;

a shear pin for releasably locking said hinge and associated arm and mailbox against swinging movement;

said pin being shearable in response to a predetermined torsional stress about the axis of said hinge under the collisional impact of said objects to thereby release the hinge and box from locked position;

spring means for damping the initial impact of said collisional objects;

said spring means comprising a pair of upwardly extending plate shields respectively disposed on opposite sides and in spaced relation to said box;

means for fixedly anchoring the lower marginal portions of said plates to said arm whereby said collisional impact will deflect the shields inwardly toward the box, and

struts extending laterally of said box and connecting the upper marginal edges of said shields whereby a part of the impact upon one of the shields will be transmitted to the other.

4,187,979

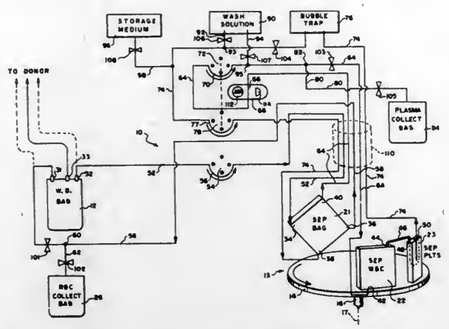
METHOD AND SYSTEM FOR FRACTIONATING A QUANTITY OF BLOOD INTO THE COMPONENTS THEREOF

Herbert M. Cullis, Silver Spring, Md.; Evelyn E. Dorsey, Washington, D.C., and James H. De Vries, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 21, 1978, Ser. No. 944,640
Int. Cl.[2] B04B *15/12*
U.S. Cl. 233—14 R **86 Claims**

1. A method for fractionating a given amount of whole blood into several of its components, including the steps of: separating the whole blood in a chamber, such as by centrifugation, into at least one cellular portion and a primarily fluid portion; withdrawing the primarily fluid portion from the chamber; passing the primarily fluid portion back through the

one separated cellular portion in the chamber at least once; and then removing the primarily fluid portion from the chamber



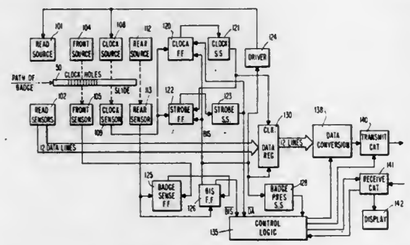
thereby to effect a more complete separation of the primarily fluid portion from the one cellular portion of the blood.

4,187,980

BADGE READER WITH RELIABLE DATA CLOCKING MEANS

John C. Schisselbauer, Southampton; John S. Garczynski; Richard J. Auchinleck, both of Norristown, and Henry J. LoFurno, Philadelphia, all of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Jun. 29, 1978, Ser. No. 920,283
Int. Cl.[2] G06K *7/016*
U.S. Cl. 235—474 **11 Claims**



1. Apparatus for reading a data encoded badge, comprising:
a channel for receiving said badge within said apparatus, said channel permitting said badge to move within it;
a slide having clock holes, adapted to move within said channel and normally located in a normal position and moveable;
means for maintaining said badge and said slide in abutting relation while said badge is being moved in a given direction within said apparatus;
means for reading data from said badge while said badge is moved in said given direction, said reading means incorporating means for synchronizing said data reading with the movement of said clock holes.

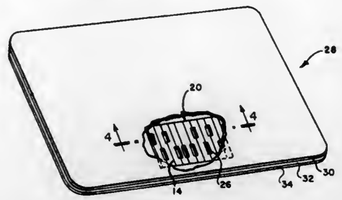
4,187,981

CODED MODULE FOR USE IN A MAGNETIC PULSE GENERATOR AND METHOD OF MANUFACTURE

Michael J. Sinko, Guilford, Conn., and Milton Velinsky, Atlantic Highlands, N.J., assignors to The Echlin Manufacturing Company, Branford, Conn.

Filed Nov. 30, 1978, Ser. No. 965,023
Int. Cl.[2] G06K *19/04, 7/08;* **G11C** *11/02*
U.S. Cl. 235—488 **9 Claims**

1. A module for use in a coded magnetically induced pulse generator comprising:
a support sheet, and
a set of bi-stable magnetic wires disposed in generally parallel and spaced apart relationship to one another, said wires being supported on said sheet, each of said wires when magnetized having first and second magnetic states and being switchable between said states in response to an external magnetic field passing through first and second threshold values respectively,
a portion of each of said wires being removed, a first subset



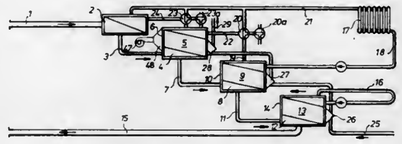
of said wires having said portion removed near a first end thereof thereby providing a first bit in a binary code and a second subset of said wires having said portion removed near a second end thereof thereby providing a second bit in a binary code,
said removed portion of each of said wires being spaced inboard from the end of each associated wire thereby leaving a small segment of said wire outboard of the removed portion to provide a degree of physical integrity for the module.

4,187,982

APPARATUS FOR INCREASING THE TRANSMISSION CAPACITY OF REMOTE HEATING GRIDS

Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, D 7141 Aldingen, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 813,064
Claims priority, application Austria, Jul. 9, 1976, 95061/76; Jan. 14, 1977, 206/77
Int. Cl.[2] G05D *23/00*
U.S. Cl. 237—2 B **6 Claims**



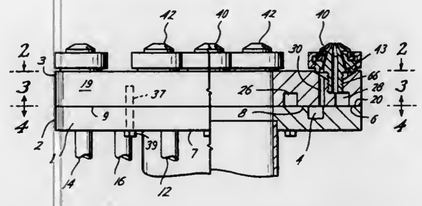
1. A heating circuit including a heat supply circuit of a predetermined transmission capacity adapted to be supplied with a heat carrier supply medium from a remote heating grid, a heat user circuit containing a heat carrier user medium for withdrawing heat from said heat supply circuit including a plurality of heating elements where the transmission capacity of the user circuit is greater than said predetermined transmission capacity of the supply circuit, at least one heat exchanger for exchanging heat between said supply circuit and said user circuit, a first latent heat storage device having a first heat storage mass in heat conducting contact with said one heat exchanger and where said first mass experiences a phase change at a temperature below the temperature of said heat carrier medium coming from the remote heat grid whereby heat supplied by said heat carrier medium may charge said heat storage mass during periods of low withdrawal of heat by said heat user circuit, a second heat exchanger for exchanging heat between said supply circuit and said user circuit and a second latent heat storage device containing a second heat storage mass in heat conducting contact with the second heat exchanger and where the second mass has a lower phase change temperature than the first mass and whereby said first heat exchanger is positioned upstream of said second heat exchanger with respect to the direction of flow of said heat carrier medium from said remote heating grid.

4,187,983

PLURAL COMPONENT-MULTI STATE MIXING AND ENCAPSULATING NOZZLE

Harold Boyer, Houston, Tex., assignor to National Cellulose Corporation, Houston, Tex.

Filed Oct. 17, 1977, Ser. No. 842,433
Int. Cl.[2] B05B *7/08, 7/14*
U.S. Cl. 239—9 **3 Claims**



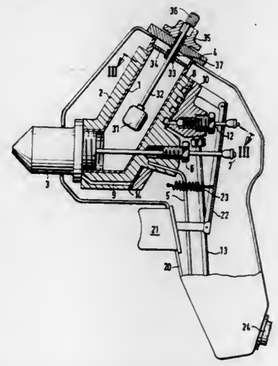
1. A plural component multi-state mixing and encapsulating nozzle comprising:
(a) a front plate and a back plate each having an inside surface and an outside surface, said inside surface of the front plate in registry with the inside surface of the back plate;
(b) separate inlet means on the outside surface of the back plate for receiving under pressure a first component, a second component, a base material and a gas;
(c) on the inside surface of the back plate:
(i) a first orifice communicating through the back plate with the inlet means for the first component;
(ii) a second orifice disposed inwardly to the first orifice (i) toward the center of the back plate and communicating through the back plate with the inlet means for the second component;
(iii) a third orifice communicating through the back plate with the gas inlet means;
(iv) a first continuous distribution channel disposed about the center of the back plate, said channel disposed between the first orifice (i) and second orifice (ii) and in communication with the third orifice (iii); and
(v) a fourth orifice disposed centrally of orifices (i), (ii), and (iii) in the recess (iv), said fourth orifice communicating through the back plate with the inlet means for the base material;
(d) on the inside surface of the front plate:
(i) a flat outer peripheral surface;
(ii) a second continuous annular distribution channel having an outer perimeter coinciding with the inner perimeter of said flat peripheral surface said channel communicating with the first orifice (c) (i);
(iii) a second surface having an outer perimeter coinciding with the inner perimeter of (d) (ii);
(iv) a third continuous distribution channel having an outer perimeter coindiging with the inner perimeter of (d) (iii) and communicating with the second orifice (c) (ii);
(v) a third surface having an outer perimeter coinciding with the inner perimeter of (d) (iv);
(vi) a centrally disposed orifice bounded by the inner perimeter (d) (v) communicating with and closely conforming to the orifice (c) (v);
(vii) a plurality of orifices disposed within the second surface (d) (iii) and in communication with the first continuous distribution channel (c) (iv);
(e) a means to secure the inside surface of the front plate to the inside surface of the back plate;
(f) on the outside surface of the front plate:
(i) an outer plurality of jet atomizers for atomizing the first component, each jet having a first inlet aperture communicating through the front plate with the channel (d) (ii) and a second inlet aperture communicating through the front plate and one of the orifices (d) (vii) with the channel (c) (iv) on the back plate;
(ii) an inner plurality of jet atomizers for atomizing the second component, each jet having a first inlet aperture communicating through the front plate with the channel (d) (iv) and a second inlet aperture communicating through the front plate and one of the orifices (d) (vii) with the channel (c) (iv) on the back plate; and
(iii) a centrally disposed orifice for communicating the base material through the front plate with the orifice (d) (vi) whereby the first and second components under pressure are atomized by the jets (f) (i) and (f) (ii) respectively and mixed externally of the nozzle and the resulting mixture is also applied to the fibrous material externally of the nozzle.

4,187,984

METALLIZING GUN FOR APPLYING SPRAYED METAL

Max Hugelshofer, Dietlikon, Switzerland, assignor to Etablissement Dentaire Ivoclar, Liechtenstein

Filed Apr. 17, 1978, Ser. No. 896,850
Claims priority, application Switzerland, Apr. 22, 1977, 5015/77
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—13 **10 Claims**



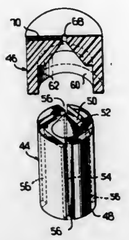
1. An improved metallizing gun for applying sprayed metal which has a melting point below 350° C., which is liquified by an electric heating means provided in the metallizing gun and which is atomized in droplet form by preheated compressed air, wherein the improvement comprises a thinwalled steel container (1) for the liquid metal which is surrounded by a massive block (2) of a thermally conductive metal alloy, which contains an electric heating element (30) narrowly disposed within an elongated recess which recess extends parallel and adjacent to the wall of said steel container and a temperature sensor (5), the external side of said massive block including air ducts (8,11,9) which connect to the spray nozzle (3) and which transmit heat to said block (2).

4,187,985

AEROSOL VALVE FOR BARRIER TYPE PACKAGES

Carl W. Goth, Downers Grove, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Dec. 8, 1978, Ser. No. 967,764
Int. Cl.[2] B05B *7/32*
U.S. Cl. 239—337 **8 Claims**



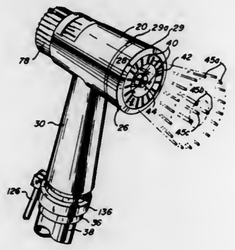
1. A discharge nozzle assembly for use in conjunction with a pressurized liquid product supply, said nozzle assembly comprising a supply tube and a cap, said supply tube and said cap being separately formed, said supply tube comprising a circular cross-sectional elongated member having recessed in one end thereof a spin chamber, said cap being telescoped over said supply tube one end and in conjunction therwith forming a conical extension of said spin chamber, a discharge orifice opening from said spin chamber extension through said cap, said elongated member having formed in the outer surface thereof axial liquid passages of a depth to enter into said spin chamber and a central air inlet passage opening from the atmosphere into said spin chamber extension in alignment with said discharge orifice, said spin chamber and said spin chamber extension in conjunction with pressurized liquid flowing through said liquid passages forming suction means for drawing air into said spin chamber extension for mixing with the liquid, said spin chamber conical extension being in part formed by a cone element projecting axially from the center of said spin chamber.

4,187,986

SPRAYER

John E. Petrovic, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Dec. 16, 1977, Ser. No. 861,166
Int. Cl.[2] B05B *1/16*
U.S. Cl. 239—449 **13 Claims**



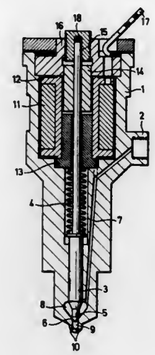
1. In a sprayer that includes:
a hollow housing having an inlet port and an outlet opening,
a cap closing said outlet opening and including a plurality of sets of discharge orifices with each set exhibiting an individually different characteristic of orifice flow of fluid from the interior of said housing, and
means for selectively opening respective orifice sets to the passage of flow out of said housing and for valving the flow of fluid through said housing,
the improvement comprising:
a first set of orifices in said cap circumferentially spaced apart individually and sized to define a fine-spray cone;
a second set of orifices in said cap circumferentially spaced apart individually and sized to define respective jet streams substantially larger than the spray elements from the orifices of said first set; and
another orifice in said cap independent of said first and second sets, including means defining and delivering a different flow characteristic in the form of a mist, said opening means selecting individually as between said first set, said second set and said other orifice.

4,187,987

FUEL INJECTOR

Reimund Raue, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 956,095
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751358
Int. Cl.[2] F02M *51/06*; F16K *31/06*
U.S. Cl. 239—585 **2 Claims**



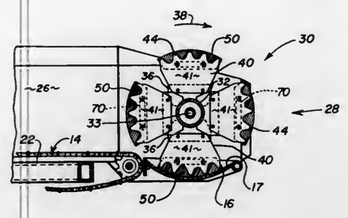
1. A fuel injector for internal combustion engines and comprising a controllable fuel injection pump and a fuel injection valve which includes:
a valve housing containing spray holes;
a valve spring mounted in said valve housing;
a valve needle axially displaceably mounted in said valve housing on one end of said valve spring in such a way as to open against the force of said valve spring in response to build-up of fuel pressure to allow fuel to pass through said spray holes, and in such a way as to close by the force of said spring in response to release of fuel pressure to prevent fuel from passing through said spray holes;
a lifting magnet comprising an armature and a tie bolt and mounted in said valve housing parallel to said valve spring in such a way as to act upon the spring side of said valve needle to work with said valve spring in the closure of said valve needle.

4,187,988

MANURE SPREADER PADDLE ATTACHMENT

Warren H. Brackbill, Paradise, and Loren G. Sadler, Stevens, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 4, 1978, Ser. No. 966,445
Int. Cl.[2] A01C *23/00*
U.S. Cl. 239—662 **25 Claims**



22. A manure spreader material engaging and distributing paddle comprising:
a base portion for detachably mounting said paddle to a manure spreader;
a main body portion integrally formed with said base portion;
an arcuate notched outer peripheral edge portion integrally formed with said main body portion, said notches forming teeth to engage and shred the material to be distributed;
a leading face superimposed over said base portion, said main body portion and said outer peripheral edge portion for striking, engaging and distributing said material;
a trailing face opposed to said leading face; and
a flexible extension attached to said trailing face, said extension having a body defined by a base edge and a remote arcuate peripheral edge substantially parallel to and at least partially coextensive with said notched outer peripheral edge portion, said body being attached to said trailing face adjacent said base edge, whereby said extension provides a structure for engagement of semi-liquid and liquid material while maintaining a capability to deflect when engaging more solidified material, thereby allowing said teeth to engage and shred said material.

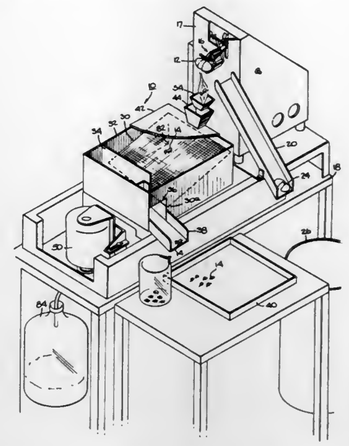
4,187,989

METHOD FOR RECOVERING EMBRYOS FROM EMBRYONATED EGGS

William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 742,401, Nov. 16, 1976, abandoned, which is a division of Ser. No. 572,584, Apr. 28, 1975, abandoned. This application Jun. 22, 1978, Ser. No. 917,811
Int. Cl.[2] B02C *19/18*
U.S. Cl. 241—2 **6 Claims**

1. A method for recovering an embryo from an embryonated egg comprising the steps of cracking an egg, separating the contents of the egg from the eggshell, moving the eggshell to discharge means, passing the contents of the egg onto a flat screen which is tilted at a compound angle from horizontal whereby one edge is lowermost, the impact with the screen being effective to rupture the membrane tissue surrounding and associated with the embryo, continuously shaking the screen to free the more liquid components of the egg plus the embryo itself from the membrane tissue, thereby causing the embryo to move in a random path gradually toward the lowermost edge of the screen while causing the more fluid portions



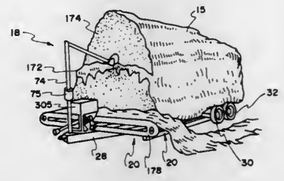
of the contents of the egg to pass through the screen, and collecting the embryo from one edge of the screen.

4,187,990

METERING STACK FEEDER AND METHODS

Ezra C. Lundahl, Providence, Utah, and J. Gordon Wiser, Kirkland, Wash., assignors to Ezra C. Lundahl, Inc, Logan, Utah

Filed Jun. 22, 1978, Ser. No. 917,994
Int. Cl.[2] B02C *18/06, 21/02*
U.S. Cl. 241—30 **18 Claims**



1. A method of strip slicing foliage from the end of a stack thereof comprising the steps of:
placing the stack of foliage upon a vehicle and causing one end thereof to be disposed generally above a lateral cut foliage conveyor and generally below a cantilevered cutting mechanism facing the stack and comprising rotatable blade means;
rotating the blade while biaxially pivoting without rotating the cantilevered cutting mechanism from at least one location remote from the blade in a predetermined two dimensional pattern to successively slice side to side arcuate strips of foliage from adjacent sites at the face of the stack thereby shaping said face into a convex surface, which strips are caused to fall upon the lateral conveyor.

4,187,991

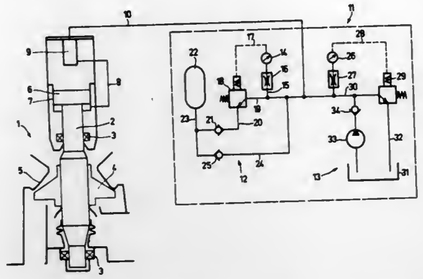
UNLOADING

Denis Petrini Poli, Chatou, France, assignor to Babbitless, Paris, France

Filed Aug. 28, 1978, Ser. No. 937,526
Claims priority, application France, Sep. 8, 1977, 77 27214
Int. Cl.[2] B02C *2/00*
U.S. Cl. 241—33 **9 Claims**

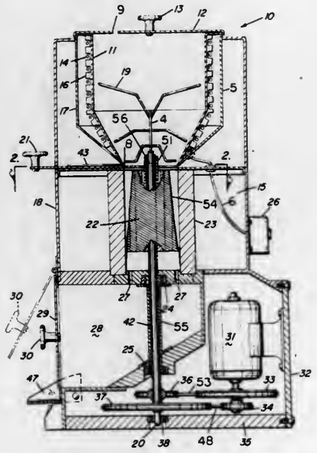
1. In a gyratory crusher incorporating a crushing hub fixed

to a shaft, and means adapted to be actuated by hydraulic fluid and thereby hold said shaft in position, an improved automatic unloading device comprising a hydraulic accumulator normally empty of hydraulic fluid and loaded to a predetermined pressure, a first line and a second line each between said means and said accumulator, a first normally-closed valve in said first line, a first detector adapted to measure the mean value of a



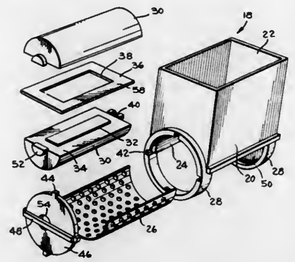
critical operating parameter of the crusher, and to cause opening of said valve whenever the measured valve exceeds a first determined limit, said limit being greater than the mean value of said parameter during normal operation of the crusher, and said predetermined pressure being substantially equal to that which exists in said means when said parameter is at said first limit, and a non-return valve in said second line, adapted to open towards said means.

4,187,992
DEVICE FOR RECONSTITUTING USED COFFEE GROUNDS
Leon Del Valle, 10924 Aletta Ave., Culver City, Calif. 90213
Filed May 3, 1978, Ser. No. 902,294
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—65 **7 Claims**



1. A device for reconstituting used coffee grounds for re-use, comprising:
(a) a cup having a rim thereabout with an opening in the bottom of the cup for receiving the coffee grounds and having an electrical heating element thereabout;
(b) a removable cover cooperatively associated with the rim of the cup having a vent therein for the escape of gases therethrough;
(c) stirring means for moving the coffee grounds within the cup and centrally disposed inside said cup and projecting upwardly therein through the opening in the bottom of the cup via a rotatable shaft;
(d) gate valve means disposed beneath the cup for controlling the flow of the coffee grounds from the bottom of the cup;
(e) frustro-conical grinding means arranged beneath the cup and the valve means for receiving the coffee grounds and for grinding the coffee grounds, said grinding means operably associated with the rotatable shaft of the stirring means;
(f) cylindrical housing means operably disposed about the grinding means and arranged beneath the gate valve means;
(g) sieve means disposed beneath the cylindrical housing means;
(h) driving means operatively coupled to the stirring means and the grinding means for driving the stirring means and the grinding means; and
(i) a receptacle disposed beneath the grinding means for receiving and storing the coffee grounds as the coffee grounds exit from the grinding means.

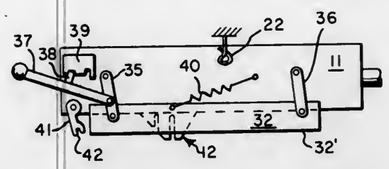
4,187,993
FOOD GRINDER
Esko J. Nopanen, Asheboro, N.C., assignor to General Electric Company, New York, N.Y.
Filed Oct. 10, 1978, Ser. No. 949,955
Int. Cl.[2] B02C *18/26*
U.S. Cl. 241—89.2 **5 Claims**



1. A self-feeding and self-emptying food grinder of a walled hopper with food receiving and bottom discharge openings, the improvement comprising,
a removable foraminated half-circular convex grate enclosing said discharge opening,
a driven cutter and mover assembly transporting food from the hopper,
said assembly including a cylindrical drum of smaller diameter than said grate and rotatably mounted in the bottom discharge opening,
said drum having removable closed end cap means and disposed to contact said grate at only one portion thereof,
a radially slidable blade mounted in said drum to alternately fully extend into the hopper and fully retract into the drum at said contact portion by sliding along the grate,
forming a constantly decreasing volume between the drum and grate on drum rotation to feed food into and squeeze it through said grate to empty the hopper.

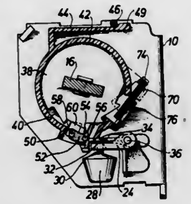
4,187,994
YARN WINDING APPARATUS
Thomas B. Lyons, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 16, 1979, Ser. No. 21,569
Int. Cl.[2] B65H *54/20, 54/42*
U.S. Cl. 242—35.5 R **3 Claims**

1. A windup including a source of at least two yarns, a fixed guide through which said yarns advance in a plane from said source to a traverse guide from which the yarns advance as they are being wound in a reciprocating stroke on respective package supports, said traverse guide comprising: a base, a guide plate embedded in and projecting outwardly from the base, said plate having an outer end generally parallel to said plane and said base and sides converging thereto from the base, said outer end and one of said converging sides being divided into spaced segments by two guide slots, one of said slots



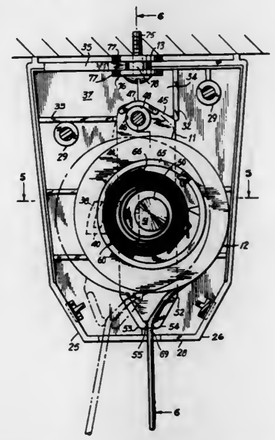
extending to said outer end, the other slot extending through a side of said plate and an elongated guide member positioned adjacent said traverse guide, said guide member having an edge parallel to said plane and extending the length of said stroke, the edge of said guide member being movable from one location exposing one of said slots to another location exposing both of said slots to said yarns, whereby one of said yarns is directed to one of said slots when the guide member is at said one location and the other of said yarns is directed to the other of said slots when the guide member is at the other location.

4,187,995
EMERGENCY LOCKING MECHANISM FOR SEAT BELTS
Gert I. Rex, Halmstad, Sweden, assignor to NYA AB Nyhems Mekaniska Verkstad, Sweden
Filed Oct. 6, 1978, Ser. No. 949,065
Claims priority, application Sweden, Oct. 17, 1977, 7711694
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **6 Claims**



1. In an emergency locking mechanism for seat belts having a casing adapted to be fixed to a vehicle, a rotatable spindle on said casing for reeling up a seat belt, a toothed ratchet wheel secured to said spindle for rotation therewith, and a locking bar mounted on said casing for tilting movement into and out of a locking position in which one edge thereof projects into a space between adjacent teeth on said wheel to prevent rotation thereof in a belt releasing direction, improved means for tilting said bar into its locking position, comprising
a transfer element surrounding at least a portion of said wheel and operatively connected to said bar,
a synchronizing arm movably mounted on said transfer element and actuatable to connect said element to said ratchet wheel for movement thereby, and
an inertia trigger on said casing for actuating said arm when the change in speed of said vehicle exceeds a predetermined g-value,
said synchronizing arm having spaced projections on opposite ends, respectively, thereof facing the teeth on the rim of said wheel, and being mounted on said element so that upon actuation thereof by said inertia trigger one of said projections is tilted in one direction into engagement with one tooth on said wheel and is forced thereby back in the opposite direction, whereby the tilting movement in said opposite direction causes the projection on the opposite end of said arm to be tilted into the space between a pair of adjacent teeth on said wheel, thereby connecting said transfer element to said wheel, and
said transfer element being operative upon movement thereof by said ratchet wheel to tilt said bar into its locking position only when said one edge of the bar registers with a space between adjacent teeth on the rim of said wheel.

4,187,996
HANGING PLANT ELEVATOR
Sol Ehrlich, 49 W. 53rd St., New York, N.Y. 10019
Filed Nov. 22, 1978, Ser. No. 962,930
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.4 R **1 Claim**

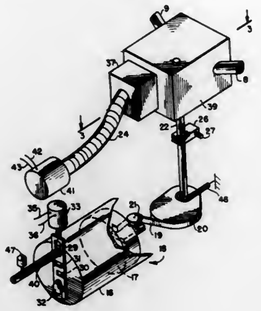


1. A hanging plant elevating device comprising: a housing element, a spring reel element rotatably mounted within said housing element, a cord carried by said reel element and projecting outwardly of said housing element, and engaging means on a free end of said cord; said reel element having at least one locking lug thereon, said housing element having lug engaging means thereon, which, in engaged condition, prevents rotation of said reel element in a direction in which said cord unwinds from said reel element; an elongated yoke element having a first end portion pivotally mounted within and with respect to said housing element, said reel element being rotatably mounted upon said yoke element at a point in spaced relation relative to said first end portion; said yoke element having a second end portion forming means slidably engaging a continuous segment of cord; whereby lateral movement imparted to said cord serves to pivot said yoke element relative to said housing element to selectively engage said lug engaging means with said locking lug.

4,187,997
VACUUM CONTROL SYSTEM FOR MAGNETIC TAPE HANDLER
Roger Mosciatti, 6 Wycomb Pl., Coram, N.Y. 11727; Thomas P. Foley, 12 Janes La., Lloyd Harbor, N.Y. 11743, and Frederick G. Moritz, 20 Aberdeen Rd., Hauppauge, N.Y. 11787
Filed Aug. 14, 1978, Ser. No. 933,438
Int. Cl.[2] G11B *15/58, 23/12*
U.S. Cl. 242—182 **3 Claims**

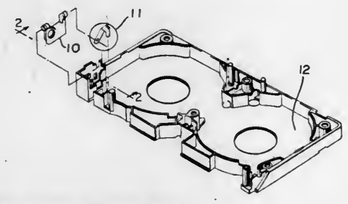
1. In a magnetic tape handler, the combination of;
a pair of servo controlled tape reels for winding magnetic

tape back and forth over a predetermined path between the two reels;
a capstan for drawing said tape across a play/record magnetic head;
a pair of vacuum chambers, one located along the tape path between said capstan and one of said reels and the other located along the tape path between said capstan and the other of said reels;
a vacuum blower for providing a vacuum in said vacuum chambers;
a closed vacuum path between said blower and said chambers;



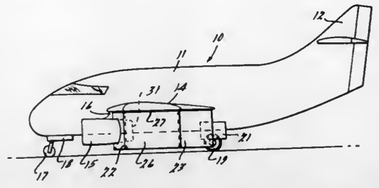
valve means within said path for controlling the vacuum in said chambers;
wherein said valve means includes a flapper valve;
a shaft attached to said flapper valve for rotating said flapper valve between a predetermined open position and a predetermined closed position;
means for adjusting said predetermined open position;
a piston in a third vacuum chamber coupled to a cam of decreasing radius which in turn is attached to said shaft for rotating said shaft in the presence of vacuum in said third vacuum chamber;
and a solenoid valve for controlling the vacuum in said third vacuum chamber.

4,187,998
TAPE CASSETTE
Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan
Filed Jul. 31, 1978, Ser. No. 929,503
Claims priority, application Japan, Nov. 24, 1977, 52-157730[U]
Int. Cl.² G03B *1/04;* G11B *23/06*
U.S. Cl. 242—199 **4 Claims**



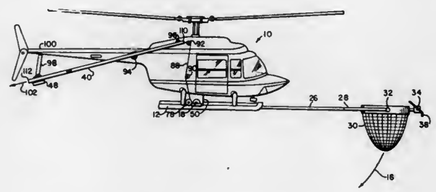
1. A tape cassette comprising:
a half case for housing a tape;
a rib mounted on the half case;
a lock plate;
means for attaching the lock plate to a cover for the half case;
a plate spring fixed to the rib and having one end engagable with the lock plate when the half case is closed by the cover.

4,187,999
VERTICAL ASCENDING AND DESCENDING AIRPLANE
John O. Black, 9607 Sturgeon Valley Rd., Vanderbilt, Mich. 49795
Filed Apr. 28, 1978, Ser. No. 901,209
Int. Cl.² B60V *3/08*
U.S. Cl. 244—12.5 **4 Claims**



1. In an airplane construction containing a fuselage and a pair of wings which aids in vertical ascent and descent and horizontal flight, a turbo-jet propulsion means beneath each said wing mounted for horizontal propulsion, and panels hinged to the underside of each said wing to form substantially rectangular areas at the discharge end of the engine, the panels are dimensioned to extend downwardly from said underside of each wing to substantially the level of the ground on which said airplane rests for confining the exhaust gases therefrom within said areas to provide pressurized confined cushions which engage the ground.

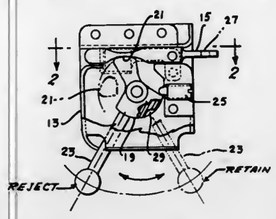
4,188,000
AIR RESCUE NET
David G. Dalziel, 83 E. Laurel Ave., Lake Forest, Ill. 60045
Continuation-in-part of Ser. No. 819,411, Jul. 26, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,376
Int. Cl.² B64D *9/00*
U.S. Cl. 244—137 P **6 Claims**



1. An air rescue device for use with a slowly moving aircraft comprising support means secured to the underside of an aircraft, a shaft, said shaft rotatably journalled to said support means, a pair of rigid longitudinal arms being secured to and extending from said shaft, a net pivotably supported at the end of said arms, drive means for raising said arms and net from a downward vertical position to a horizontal position, said drive means being coupled to said shaft, means for counterbalancing the weight of said arms and said net.

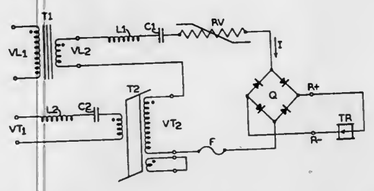
4,188,001
LATCH MECHANISM
Anthony Greger, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 31, 1978, Ser. No. 929,614
Int. Cl.² B64D *17/38*
U.S. Cl. 244—151 B **2 Claims**
1. A latch mechanism for use on an aircraft ejection seat and

the like to permit the optional rejection and retention of an attached package, comprising, a housing, a bolt slidably positioned in said housing, said bolt having a cam surface on the side thereof, a pair of detent springs in contact with said bolt for retaining said bolt in position in said housing, a two-position toggle pivotably mounted in said housing for rotation in



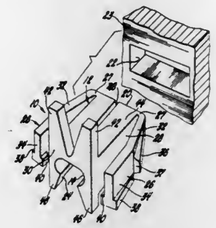
the central area thereof, a cam surface on said toggle for engaging the cam surface on said bolt when said latch is in the rejection mode, and a lever extending radially outward from said toggle to permit selective rotation of the toggle to disengage the cam from said bolt placing said latch in the retention mode and allowing said bolt to slide out of said housing thereby causing the attached package to eject with the ejection seat.

4,188,002
VITAL POWER VARISTOR CIRCUIT FOR RAILROAD SIGNALING SYSTEMS
Heinz Gilcher, Export, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Oct. 23, 1978, Ser. No. 953,527
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **11 Claims**



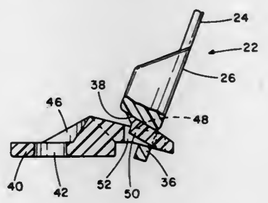
1. A vital frequency selective varistor circuit arrangement for registering the presence or absence of at least one of two received signals, comprising in combination,
(a) a first input means coupled for receiving a first input signal from a first source supplying an alternating current of a preselected frequency,
(b) a second input means coupled for receiving a second input signal from a second source supplying an alternating current signal normally of said preselected frequency and having a variable phase relationship with said first source,
(c) a varistor device,
(d) a registry means normally occupying a first position and operable to a second position, and
(e) a circuit network tuned to said preselected frequency and coupling said first and second input means, said varistor, and said registry means in series for operating said registry means to its second position to register the simultaneous input of both signals only when of said preselected frequency and within a predetermined phase relationship.

4,188,003
STRAIN RELIEF BUSHING
Charles W. Ramsey, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 20, 1978, Ser. No. 887,950
Int. Cl.² F16L *5/00*
U.S. Cl. 248—56 **2 Claims**
1. A one-piece molded plastic strain relief bushing of the type for mounting within a panel hole an electrical conductor or the like contained within the bushing, comprising:
a body portion having a longitudinal passage extending therethrough, and a transverse opening of reduced width and in communication with the longitudinal passage for sideways reception of an electrical conductor therein,
a pair of longitudinal levers connected to opposite sides of one end of the body portion and each formed to extend toward the other end thereof normally in spaced apart relation with said opposite sides, said levers being movable toward and away from said opposite sides of the body portion about said one end of the latter,



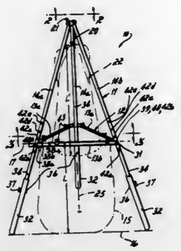
said levers having formed thereon abutment means juxtaposed to said other end of said body portion and means which, with an electrical conductor or the like loosely in place in the bushing, are operative upon insertion of the bushing and the conductor into a panel hole to cause movement of said levers toward said opposite sides, to thereby cause said abutment means to engage said opposite sides of said body portion and compress the latter for tight gripping thereby of the electrical conductor disposed in said longitudinal passage.

4,188,004
CABLE TIE MOUNT AND TIE FOR USE THEREWITH
Ronald T. Fulton, Tinley Park, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Oct. 12, 1978, Ser. No. 950,768
Int. Cl.² F16L *3/08*
U.S. Cl. 248—74 PB **12 Claims**



1. A mount for securing objects formed into a bundle by a cable tie to a support surface, said tie including a strap extending from a locking head which receives the free end of the strap and further including a frame extending from the locking head opposite the bundle and defining an opening, said mount comprising
a base adapted to be secured to said support surface;
a tongue extending from said base for reception into said opening; and
means for locking said tongue in said opening whereby said cable tie can be locked to said mount and the mount secured to said support surface prior to association of the tie and the objects and whereby no part of said mount is encircled by said strap.

4,188,005
BAG SUPPORT FRAME
Chun C. Lee, 10285 Gentlewind Dr., Cincinnati, Ohio 45242
Filed Dec. 20, 1978, Ser. No. 963,528
Int. Cl.[2] A63B *55/04*; F16M *11/00*
U.S. Cl. 248—97 **2 Claims**



1. A bag support frame comprising

a plurality of legs connected one to another at the top ends thereof, said legs being connected together one to another for permitting said bag support frame to be moved between use and storage positions,

a bag mouth frame connected with said legs, said bag mouth frame being adapted to support an open mouth primary bag in connected relation therewith, and said bag mouth frame comprising a plurality of rods each of which is connected between adjacent legs of said stand,

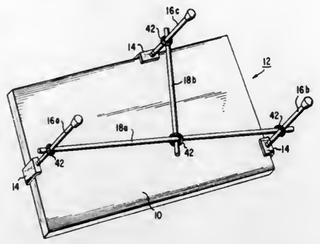
horizontal adjustment means connected with said bag mouth frame, said horizontal adjustment means permitting the mouth size of said bag frame to be varied as desired by the user depending on the mouth size of that primary bag being used with said bag support frame, and said horizontal adjustment means comprising connector means by which said rods can be connected at a plurality of locations to at least one of said legs for permitting the bag mouth frame's mouth size to be varied,

first vertical adjustment means connected with said bag mouth frame, said first vertical adjustment means permitting the vertical position of said bag mouth frame relative to the top ends of said legs to be varied as desired by the user, said first vertical adjustment means comprising a plurality of connector locations spaced along the length of each leg with each of said connector locations cooperating with said bag mouth frame for connecting said bag mouth frame to said legs at a plurality of different positions relative to the top of said stand,

a hook connected at the top of said stand for supporting a secondary bag to be emptied into said primary bag, said first vertical adjustment means permitting the position of said bag mouth frame to be varied relative to said hook depending on the length of said secondary bag to be hung from said hook, and

second vertical adjustment means connected with said legs, said second vertical adjustment means permitting said bag mouth frame to be adjusted vertically relative to ground as desired by by user, said second vertical adjustment means being structured so that adjustment of said bag mouth frame relative to ground is independent of adjustment of said bag mouth frame relative to the top of said stand, and said second vertical adjustment means comprising two sections for each leg with one section being telescopable relative to the other and with said sections being retainable in at least two different length telescoped positions relative one to another.

4,188,006
STEADYING REST TO AID IN STEADYING AN ARTIST'S HAND
Robert Karlin, 38106 Village #38, Leisure Village, Camarillo, Calif. 93010
Filed Feb. 6, 1978, Ser. No. 875,228
Int. Cl.[2] B43L *15/00*
U.S. Cl. 248—118.3 **7 Claims**



1. An apparatus for providing a steadying rest adjacent a work surface having at least two dimensions comprising:

at least one offset member;

attaching means for temporarily coupling said offset member to a selected position adjacent said work surface;

a first rest member;

adjustable coupling means for coupling said first rest member to said offset member and providing said steadying rest;

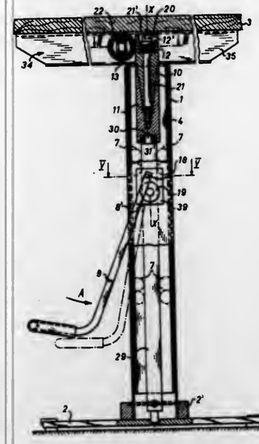
said coupling means frictionally engaging said offset member whereby said first rest member can be adjustably positioned by movement of said coupling means in the proximity of substantially any point of said work surface without the necessity of continued manual assistance;

said coupling means being adjustably positioned by a force overcoming the starting frictional resistance between said coupling means on said offset member;

said adjustable coupling means also frictionally engaging said first rest member permitting relative rotation and translation of said first member relative to said coupling means by a force overcoming the starting frictional resistance with said coupling means.

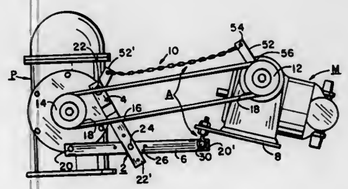
4,188,007
DRAFTING BOARD BASE
Lorenzo Ubezio, Dietikon, Switzerland, assignor to Reppisch-Werke Aktiengesellschaft, Dietikon, Switzerland
Filed Apr. 28, 1978, Ser. No. 901,210
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—411 **5 Claims**

1. A base for a table top, especially a drafting board, comprising first stationary hollow upright column means, second column means slidably supported in said first column means for vertical up and down adjustment of said column means relative to said first column means, substantially horizontally extending table top support means, means operatively connecting said table top support means to said second column means, and slip brake means operatively interposed between said first and second column means, said slip brake means comprising two openings arranged opposite each other in said first column means, brake plate means guided in said openings, U-shaped bail means having spring elastic legs operatively arranged for exerting pressure on said brake plate means, intermediate members operatively interposed between said brake plate means and spring elastic legs of said bail means, relatively flat conical disk means secured on each side below the rotational axis of said U-shaped bail means, said spring elastic legs of said U-shaped bail means running onto said conical disks when the U-shaped bail means is tilted inwardly toward said column means, whereby the load on said brake plate means is relieved for the elevational adjustment of the second column means and whereby the brake plate means are subjected to the full load



again when the U-shaped bail means is released to thus simultaneously tilt back into its normal position.

4,188,008
FARM PUMP MOUNTING BRACKET
Joseph A. Eagan, Sr., 539 Ford St., West Conshohocken, Pa. 19428
Filed Apr. 17, 1978, Ser. No. 896,718
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—544 **2 Claims**



1. A mounting bracket assembly for use in conveniently positioning a farm pump associated with a well head which comprises:

a split arm assembly fixed to said well head, said assembly comprising a pair of arms which are pivotally interconnected,

a mounting assembly having portions thereof rotatably associated with said split arm assembly,

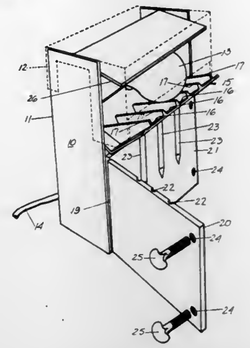
said mounting assembly comprising a fixed shaft and a mounting plate rotatable about the shaft;

safety retaining means to interconnect said farm pump and said well head;

eyelet means having a fixed end secured to the mounting plate and an eyelet end the size to overfit the shaft to facilitate rotation of the mounting plate about the shaft; and

sleeve members or collars on the shaft whereby the sleeve members serve to longitudinally position the mounting plate relative to the shaft by limiting movement of the eyelet means relative to the shaft.

4,188,009
APPARATUS FOR MOLDING CRAYONS AND THE LIKE
Albert C. Gillespie, Box 379 E. Salt Fork Rd. R#1, Lawrenceburg, Ind. 47025
Filed May 15, 1978, Ser. No. 906,116
Int. Cl.[2] B22D *27/02*
U.S. Cl. 249—78 **3 Claims**



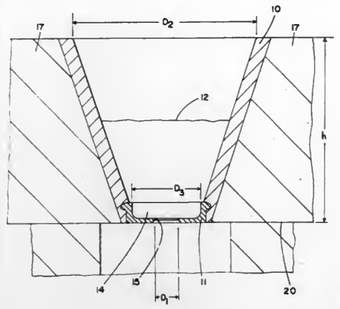
1. Apparatus for reclamation of broken and worn crayons and molding thereof into new crayons and the like comprising means for supplying radient and convection heat; a housing surrounding said heat supply means, said housing comprising a base portion and a removable top section; a plurality of reservoirs positioned beneath said heat supply means, each said reservoir comprising a plurality of inwardly and downwardly inclined feed chutes for said broken and worn crayons, the uppermost end of said chutes projecting outwardly from said housing; an orifice in the lowermost, inner end of each said chute; a heat reflective surface secured in said housing above said heat supply means, whereby to reflect heat downwardly into said reservoirs; a plurality of mold cavities arranged beneath said chutes, each said cavity having an open upper end positioned beneath and in communication with one of said orifices; said mold cavities being provided in a pair of releasable mold halves assembled in face-to-face opposed relation, each mold half having a plurality of cavity halves therein in registry with cavity halves in the opposed mold half, said base portion supporting said reservoirs and mold cavities, and said top portion enclosing said heat supply means, said chutes and mold cavities being in alignment and being secured across an open end of said base portion and said chutes being out of communication with one another; and means for opening said mold cavities for releasing new crayons from said mold cavities.

4,188,010
CASTING RISERS
Dennis J. Reiland, St. Paul, Minn., assignor to General Foundry Products Corporation, St. Paul, Minn.
Filed Aug. 26, 1977, Ser. No. 828,232
Int. Cl.[2] B22C *9/00*
U.S. Cl. 249—197 **6 Claims**

1. A riser liner operable for inserting into a mold containing a mold material said riser liner comprising an upper section formed from a material having a thermal conductivity less than the mold material; and

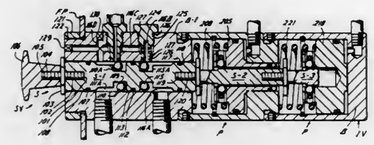
a lower section adjoining said upper section and having an opening therein, said lower section formed from a material which has a thermal conductivity which is greater than the thermal conductivity of said upper section with the thermal conductivity of said lower section being on the order of the thermal conductivity of molten metal poured into said riser liner, said lower section mounted partially in said upper section so that when said upper section is

placed in a mold only said upper section is in contact with the mold material in the mold to thereby prevent the rapid



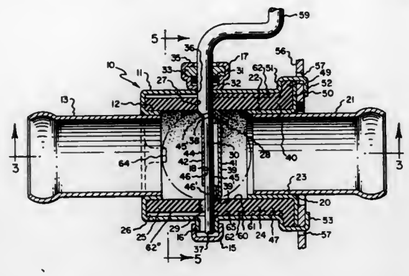
loss of heat from the molten metal to the mold material through said lower section.

4,188,011
SPOOL VALVE AND PILOT INTERFACE ASSEMBLY
Neil H. Akkerman, New Orleans, La., assignor to Baker Cac, Inc., Belle Chase, La.
Division of Ser. No. 841,951, Oct. 13, 1977. This application Sep. 18, 1978, Ser. No. 943,027
Int. Cl.² F16K *31/122*
U.S. Cl. 251—63.4 **6 Claims**



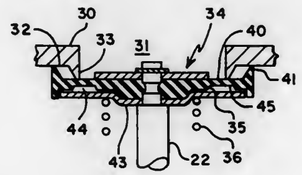
4. In a multi-positionable valve assembly for controling one of pneumatic and hydraulic fluid flow therethrough, said valve assembly comprising a housing, a shuttleable spool element shiftable to plural positions within said housing, valve head and seat means manipulatable relatively with respect to one another by positioning of said shuttleable spool element, the improvement comprising: means extendible to said spool, piston head means within said housing carried around said means extendible to said spool and shiftable with respect to said spool extension means in response to variation in fluid pressure across said piston head, spherical means securable on one of said piston head and said spool extension means; means for urging said spherical means toward the other of said spool extension means and said piston head means; first and second camways defined along one of said piston head means and said spool extension means for travel of said spherical means; and a shoulder on at least one of said piston head means and said spool extension means for definition between said first and second camway and for resistance of travel of said spherical means along one of said camways when said piston means is shifted relative to said spool extension means in one direction, said piston head being shiftable relative to said spool extension means in a first direction in response to one of increase and decrease of fluid pressure for travel relative to said spool extension means to transfer said spherical means from one of said camways to the other of said camways without relative movement between said spool and said housing, said piston head being shiftable relative to said spool extension means in a second direction in response to the other of increase and decrease of fluid pressure for travel relative to said spool extension means to interface said spherical means with said shoulder and carry one of said spool extension means and said piston means to shift one of said spool extension means and said piston head means to another position.

4,188,012
BUTTERFLY VALVE CONSTRUCTION
Jesse R. Johnson, Collins, N.Y., assignor to Coyle E. Knowles, Las Vegas, Nev., a part interest to each and Eugene L. Fisher, Gowanda, N.Y., a part interest to each
Filed Oct. 17, 1977, Ser. No. 842,451
Int. Cl.² F16K *25/00*
U.S. Cl. 251—173 **9 Claims**



1. A valve comprising a housing having an inner housing surface, a flexible tubular conduit in said housing having an inside surface and an outside surface and having an inlet portion and an outlet portion, butterfly valve means proximate said inside surface for selectively engaging said inside surface, mounting means mounting said butterfly valve means for movement between a closed position in engagement with said inside surface and an open position spaced from said inside surface, chamber means between said outside surface and said housing for receiving pressurized fluid, means for providing pressurized fluid to said chamber means to thereby enhance the seating engagement between said butterfly valve means and said inside surface when said butterfly valve means is in said closed position, and rib means extending circumferentially about said outer surface for providing engagement between said inner housing surface and said flexible tubular conduit substantially at an area opposite to the area of engagement between said butterfly valve means and said inner surface for limiting expansion of said flexible tubular conduit when said butterfly valve means is in engagement with said inner surface in said closed position, said rib means comprising a plurality of ribs on said flexible tubular conduit and wherein said chamber means are located between said ribs.

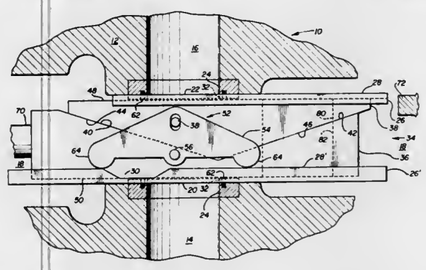
4,188,013
GAS VALVE SEATING MEMBER
Robert J. Battersby, San Pedro, and Paul Dietiker, Redondo-Beach, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 8, 1977, Ser. No. 822,978
Int. Cl.² F16K *1/34*
U.S. Cl. 251—175 **1 Claim**



1. A gas valve comprising
a valve body having an inlet opening adapted to be connected to a source of gas under pressure, an outlet opening

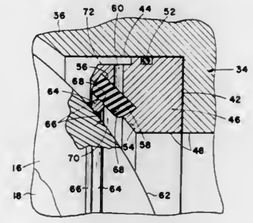
adapted to be connected to a gas burning apparatus, and a passageway through the body interconnecting said inlet opening and said outlet opening,
a valve seating surface around an opening forming said passageway between said inlet opening and said outlet opening, said valve seating surface having a flat portion around a periphery of said opening with a first lip in close proximity to said flat portion, said lip surrounding said opening and projecting in a first direction parallel to a center of said opening, and
a flexible valve member attached to a shaft for movement of said valve member, said valve member having a second lip around its periphery, said second lip of said valve member projecting opposite said first direction,
said valve member having a flat surface intermediate said second lip and said shaft whereby upon said valve member engaging said valve seating surface, said first lip of said valve seating surface engages said flat surface of said valve member and said second lip of said valve member engages said valve seating surface adjacent its projecting lip when closing so that two series gas flow seals are provided when said valve member is moved against said valve seating surface,
said flexible valve member has a rigid backing member and a space between the back side of the flat surface of said flexible valve member and said rigid backing member to allow for movement of the flat surface of said valve member when engaged by said first lip of said valve seating surface upon closure of said valve member to provide a seal between said first lip of said seating surface and said valve member all around the surface of said first lip,
said flexible valve member has inlet gas pressure on its back side to force said second lip against said flat portion of said valve seating surface and said flexible flat surface of said valve member against said first lip to provide said two series seals against gas flow through said passageway.

4,188,014
GATE VALVE WITH POSITION RESPONSIVE INTERLOCK
Patricio D. Alvarez, Rosenberg, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Oct. 11, 1978, Ser. No. 950,494
Int. Cl.² F16K *25/00*
U.S. Cl. 251—196 **10 Claims**



1. A gate valve comprising:
a housing having a valve chamber therein and inlet and outlet flow passageways communicating with the valve chamber, a seat about each flow passageway, an expansible ported gate assembly mounted in said chamber for linear movement between open and closed positions relative to the passageways;
said gate assembly comprising a gate member and a segment member, the gate member being connected to a control stem extending to one end of the housing while the segment member floats in depedence on the gate member, said two members having parallel outer sealing surfaces to engage the valve seats and complementary inner surfaces so that the two members interface one another, each of said inner surfaces being a bifurcated surface inclined with respect to the sealing surfaces and diverging away from a point at about its mid-length to form two pairs of wedging surfaces which operate to expand the assembly normally to said seats into sealing engagement therewith, said members having a pair of opposed side surfaces joining said outer and inner surfaces, and also having the aligned ports through one of the pairs of wedging surfaces,
said gate assembly also having a positioning device interconnecting said gate and segment members, said positioning device including
a guide rail secured to the interior of said valve chamber adjacent one of said seats and extending parallel the direction of travel of the gate assembly, said guide rail having an interruption therein, and
a rocker arm pivotally secured to one of the two gate assembly members through one of the side surfaces thereof adjacent said guide rail, the rocker arm having a slot engaging a pin protruding from the corresponding side surface of the other member,
said rocker arm also a pair of downwardly extending lobes at its opposed extremities, on opposed sides of its connection to the two members, said lobes contacting and riding on said guide rail except when one of them enters the interruption in the guide rail and permits the rocker arm to rotate,
whereby during movement of the gate assembly between the two sealing positions at the ends of its stroke, said rocker arm lobes are both in contact with the guide rail and maintain the two members in non-wedging and non-expansive relationship with one another, preventing drag between the moving assembly and the valve seats,
while at the ends of the stroke of the assembly, one of said lobes enters the interruption in the guide rail and permits the two members to be wedged into sealing relationship with the valve seats.

4,188,015
BALL VALVE HAVING IMPROVED SEALING CAPABILITY
Joseph C. Halpine, P.O. Box 2903, Tulsa, Okla. 74101
Filed Mar. 13, 1978, Ser. No. 885,801
Int. Cl.² F16K *5/06*
U.S. Cl. 251—315 **3 Claims**



1. A ball valve having improved sealing capability comprising:
(a) a housing having a flow opening therethrough, and having means to connect said flow opening into a pipe system;
(b) a ball having an axial opening therethrough, and axial means to support, and to rotate, said ball in said housing, said axial means at right angle to said flow opening, and means to seal said axial means in said housing, whereby said ball can be rotated from outside said housing so that said axial opening is coaxial with said flow opening;
(c) at least one metal seal ring, and means to seal said seal ring in said housing in a position where it is coaxial with said flow opening, said seal ring having a resilient seat ring inserted into one face thereof; and

(d) at least one circular ridge on the surface of said ball, in such a position that when said ball is turned so that said axial opening is perpendicular to said flow opening, said ridge will be coaxial with said resilient seat ring, and in contact therewith, with a selected force of contact, the circular ridge being in the form of a ring of wire of circular cross-section, the ring of wire being fully exterior of the spherical surface of said ball and welded to ball along both sides of the ring of wire;

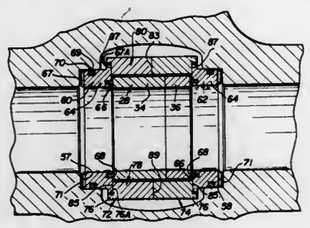
whereby said ring will penetrate a selected distance into, and depress the surface of said seat ring, to seal against a selected fluid pressure in said flow opening.

4,188,016

SPACER CARRIERS FOR FLOATING SEATS IN GATE VALVES

William L. Whaley, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,607
Int. Cl.² F16K *3/00*
U.S. Cl. 251—328 **4 Claims**



1. A gate valve structure comprising:

a valve body having a valve chamber therein and axially aligned upstream and downstream flow passages communicating with the valve chamber;

a bonnet detachably connected to an upper end of the valve body over the valve chamber and permitting access to the valve chamber when removed;

a pair of opposed spacer carriers fitting within the valve chamber, one of the carriers being positioned adjacent the upstream flow passage and the other carrier being positioned adjacent the downstream flow passage, each spacer carrier including an annular base ring in alignment with the associated flow passage and a pair of generally parallel spacers extending from the ring in a direction axially of the flow passages, the spacers on one of said opposed carriers being aligned with and in abutting relation to the spacers on the other of said opposed carriers;

a gate mounted between the spacers for movement between open and closed positions;

and an annular seat around each of the flow passages between the valve body and adjacent spacer carrier for sealing against the gate in the closed position thereof, the seats being spaced from each other by said spacer carriers a predetermined minimum distance.

4,188,017

TENSIONING DEVICE FOR FRAME PIECES

Gerhard Dingler, Ortsstrasse 1, 7274 Halterback, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,786
Int. Cl.² B25B *1/08*
U.S. Cl. 254—51 **3 Claims**

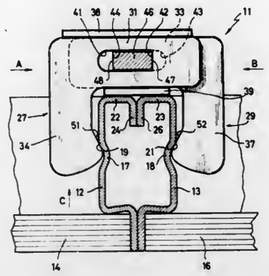
1. A tensioning device for frame pieces having outer surfaces and longitudinal beads, said tensioning device comprising:

two substantially congruent, approximately L-shaped claws formed of cross members and longitudinal members, which are resistant to bending, are parallel to each other, are rigidly connected together and are arranged at a short distance from each other,

two aligned elongate openings in the centre of the cross members which receive a tensioning wedge and which have on one of their cross sides a contact surface for one of the contact sides of the tensioning wedge,

a contact surface for the frame piece, on the cross members on the side that is directed towards the outer surface of the frame piece,

a third claw, which is substantially congruent with the first two claws, guided with its cross member so as to be movable in its longitudinal direction between the cross members of the first two claws but with little play in the two transverse directions and also having an opening which



receives the tensioning wedge and a contact surface for the other contact side of the tensioning wedge on the cross side that is opposite to the first-mentioned contact surfaces,

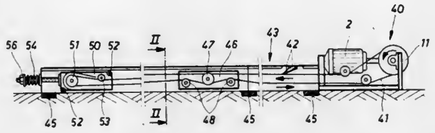
the longitudinal members of the substantially flat claws having, at their end areas, on the areas which are directed towards one another, oblique surfaces whose obliquity corresponds approximately to the angle of the outer flank of the frame piece longitudinal bead, so that when the frame piece outer surfaces rest against the contact surface and the wedge is driven, the inwardly projecting oblique surfaces rest under pressure against the outer flank of the longitudinal bead, and a tensioning wedge with spaced contact surfaces on opposite sides, vertical to the tensioning claws.

4,188,018

MEANS FOR ACCELERATING THE SPEED ON A SKI JUMP

Pertti Pasanen, Fredrikinkatu 61, 00100 Helsinki 10, Finland

Filed Feb. 17, 1978, Ser. No. 878,923
Int. Cl.² B61B *11/00, 12/10*
U.S. Cl. 254—175.3 **17 Claims**



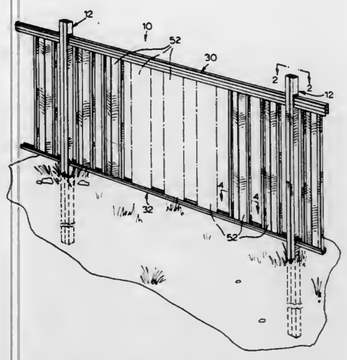
1. An apparatus for towing a skier on skis to a ski-jump takeoff at an accelerating speed comparable to that given by a starting tower comprising an endless wire or rope carrying gripping members for grasping by a skier between an end roller and a drive roller, an electric motor with a transmission means for driving said endless wire or rope through said drive roller, said endless wire or rope being guided by rollers enclosed in a housing adapted to be straddled by a skier, the upper face of said housing having a longitudinal slit whereby said gripping members are exposed the length of said longitudinal slit, said transmission means being adapted to provide a preselected constantly increasing acceleration to said endless wire or rope during the distance of said longitudinal slit through said drive roller.

4,188,019

FENCING CONSTRUCTION

Harold F. Meredith, Mississauga, Canada, assignor to Meredith Manufacturing Co. Limited, Toronto, Canada

Filed Aug. 22, 1978, Ser. No. 935,759
Claims priority, application Canada, Aug. 15, 1978, 309355
Int. Cl.² E04H *17/16*
U.S. Cl. 256—24 **8 Claims**



1. A fencing panel comprising:

an upper transverse member shaped to define a downwardly open channel,

a lower transverse member shaped to define an upwardly open channel, both channels having substantially the same width,

and a plurality of elongated upright members spanning between the transverse members, each upright member having its ends lodged in said open channels, each upright member being of resiliently deformable material and having an unstressed, generally V-shaped cross-section which defines an obtuse angle and which cannot be received in said channels when unstressed, the cross-section being shaped to be capable of resilient deformation to enlarge the obtuse angle, so that the cross-section is receivable within said channels, whereby the resiliency of the upright member urges parts of said cross-section against the channels, thereby binding said upright members within the channels.

4,188,020

KNOTTED WIRE FENCING

Klaus Herrig, and Heinz Wagner, both of St. Ingbert, Fed. Rep. of Germany, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg

Filed Nov. 3, 1977, Ser. No. 848,325
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650578
Int. Cl.² E04H *17/04*
U.S. Cl. 256—45 **1 Claim**

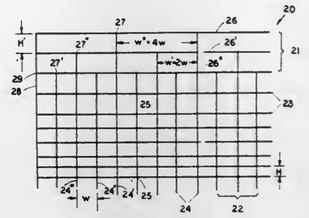
1. Knotted wire mesh, especially for fencing, comprising:

a first array of mutually parallel spaced-apart longitudinal wires with the spacing between two longitudinal wires being H at one edge of said first array, said wires of said first array having a spacing progressively increasing from H from said one edge of said first array to the opposite edge thereof at which the longitudinal wires have a spacing H' which is greater than H; and

a second array of single transverse wires reaching from said one edge towards said opposite edge of the mesh and in mutually spaced substantially parallel relation, the two arrays of wires having crossover points at which said transverse wires and said longitudinal wires are tied together by the looping of one of the wires at each crossover point in a single loop about the other wire at such point,

the lengths of successive transverse wires along the second array varying periodically by at least the spacing H' at said opposite edge of said mesh,

a first transverse wire of said second array extending the full width of said first array between said edges,



second, third and fourth transverse wires of said second array counting along the second array from said first wire terminating at longitudinal wires inwardly from said opposite edge of said mesh,

said second and fourth transverse wires terminating at a different one of the longitudinal wires than that at which said third wire terminates inwardly from said opposite edges, and

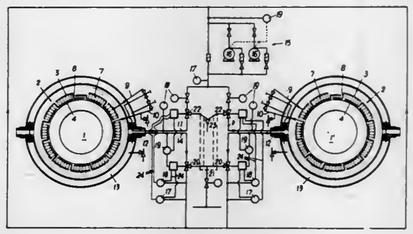
said first, second, third and fourth transverse wires repeating periodically along said second array.

4,188,021

METALLURGICAL VESSEL COOLING AND SAFETY SYSTEM

Alexander Patuzzi, and Manfred Eysn, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 14, 1978, Ser. No. 896,458
Int. Cl.² C21C *5/28*
U.S. Cl. 266—88 **11 Claims**



1. A metallurgical vessel cooling system, in particular a cooling system for a steel-making converter, including a coolant supply means, cooling elements provided on the wall of the vessel and coolant conduit means for connecting said supply means to said elements, said conduit means and elements being flown through by a coolant from said supply means, the improvement comprising:

a pressure gas line to which the coolant conduit means are adapted to be alternatively connected for emptying the coolant from the conduit means and the cooling elements,

coolant monitoring means contained in the coolant conduit means for checking at least one parameter of the coolant, and

control means actuated by the coolant monitoring means for separating the coolant conduit means from the coolant

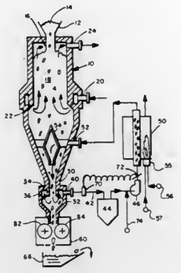
supply means and connecting the coolant conduit means to the pressure gas line whenever the at least one parameter checked deviates from a pre-determined value.

4,188,022

HOT DISCHARGE DIRECT REDUCTION FURNACE

Donald Beggs, and Robert M. Escott, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Sep. 8, 1978, Ser. No. 940,806
Int. Cl.[2] F27B *1/20*
U.S. Cl. 266—195 **7 Claims**



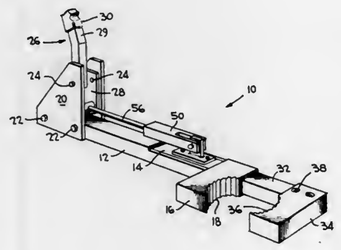
1. In an apparatus for the direct reduction of metal oxides to a hot metallized product in solid form comprising a generally vertical shaft furnace having product introducing means at the top thereof, particle removal means at the bottom thereof for creating gravitational flow of particulate burden therethrough, intermediate reducing gas introduction means, and upper spent top gas removal means, the improvement comprising:
   a. a seal gas disengaging chamber integrally connected to the discharge outlet of said furnace in direct line of product flow;
   b. a seal gas removal means engaging said seal gas disengaging chamber;
   c. a seal gas introducing means in the lower portion of said furnace, and
   d. means connected to said seal gas removal means and to said seal gas introducing means for cleaning said seal gas and for heating said seal gas to the desired introduction temperature.

4,188,023

CLAMPING DEVICE

Kent Whaley, R.R. 1, Box 6A, Wheaton, Minn. 56296, and Joseph Reinart, Browns Valley, Minn., assignors to Kent Whaley, Wheaton, Minn.

Filed Nov. 29, 1978, Ser. No. 964,649
Int. Cl.[2] B34Q *3/02*; B25B *13/16*
U.S. Cl. 269—228 **9 Claims**



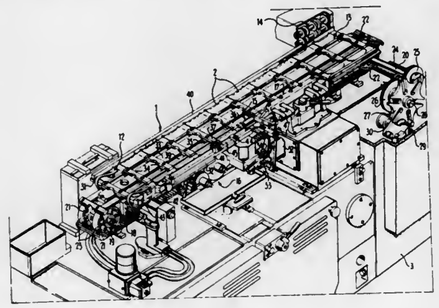
1. A clamping device comprising a base member having a bore and having an attached jaw, the base member including an opening in the wall of the member communicating with the bore, a sliding member partially located within the bore of the base member, a jaw attached to the portion of the sliding member outside the bore of the base member and adapted to cooperate with the jaw attached to the base member to clamp about an object, and a clamping mechanism including a lever pivotably attached to the base member at a point on the lever spaced from the end of the lever, and a connecting linkage pivotably attached near the end of the lever and to the slidable member through the opening in the base member, whereby upon rotation of the free end of the lever towards the base member, the jaw of the slidable member is caused to move towards the jaw of the base member and upon sufficient rotation of the lever toward the base member, the longitudinal axis of the connecting linkage passes through the axis of the pivot connecting the base member and the lever.

4,188,024

DEVICE FOR FOLDING SHEET MATERIAL INTO HINGED LID PACKETS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Apr. 27, 1977, Ser. No. 791,281
Claims priority, application Italy, May 6, 1976, 3423 A/76
Int. Cl.[2] B65H *45/18*
U.S. Cl. 270—67 **3 Claims**



1. A device for folding sheet material, particularly folding peripheral flaps of preshaped or punched pieces of cardboard or the like along a predetermined fold line, said device comprising a support with a slide surface for said preshaped pieces, intermittently operating feed means for feeding the preshaped pieces in a predetermined direction along said slide surface and cyclically stopping such preshaped pieces at predetermined positions, said feed means carrying the preshaped pieces with the fold line oriented approximately in the direction of travel, and folding means arranged to cooperate with each of a succession of said preshaped pieces to rapidly fold the peripheral flaps thereof, and said folding means further comprising an upstanding abutment at one transverse side of the slide surface and a fixed plate at the other transverse side of the slide surface and substantially coplanar therewith to underlie and support the preshaped pieces, the fixed plate being disposed at one of said predetermined positions and having an inner edge adjacent the slide surface and an outer edge remote from the slide surface and extending in the direction of feeding, said outer edge precisely underlying the fold line of each preshaped piece when another peripheral portion of the piece engages the upstanding abutment, said abutment being elongate and extending in the direction of feeding, said folding means also including a folding rod adjacent the outer edge of the fixed plate, the rod lying substantially horizontally and extending perpendicular to said feed direction, first operating means operable in coordinated relation to said feed means to move said rod in a substantially axial direction between a rest position spaced from said plate and edge and a working position in which an end portion of said rod is in lapped relation with the

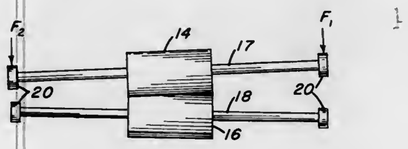
fixed plate and positioned below said plate, and mobile flexing means for fixing each preshaped piece in said predetermined position against said fixed plate and against the abutment during the folding of the flap, and the folding rod extends generally horizontally, said first and second operating means comprise an articulated parallelogram disposed in a plane substantially perpendicular to the direction of feeding, and comprising first and second rocker arms with means pivotally connecting to the folding rod, said arms being hinged to a substantially vertical connecting rod rigid with a fixed frame, a pair of coordinated rotary cams each producing the entire rocking movement of a respective rocker arm, said second rocker arm supporting said rod and moving the rod in the axial direction into and out of lapped relation with the fixed plate, and said first rocker arm moving the rod transversely of itself and above and below the fixed plate.

4,188,025

OFFSET SHEET STACKING APPARATUS

Gary B. Gusfafson, Hilton, and Martin L. Staub, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,416
Int. Cl.[2] B65H *29/22*
U.S. Cl. 271—314 **5 Claims**



1. Apparatus for offset stacking one sheet relative to a second sheet, comprising:
   means for seriatim feeding said sheets including a pair of rotatable rollers mounted to form a sheet propelling nip, said rollers being positionable relative to each other such that in a first position they define a first nonuniform nip contact area and in a second position a second nip contact area which respectively impart different velocity profiles to sheets in the nip; and
   means for selectively moving at least one of said rollers between said two positions to form said first and second nip contact areas, so that in the first position the nip imparts a nonuniform velocity profile to one sheet to move it to a first stacking position, and in the second position the nip imparts a different velocity profile to a second sheet to move it to a second stacking position which is offset from said first stacking position.

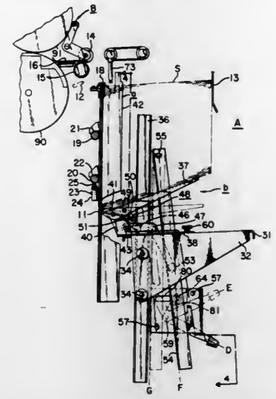
4,188,026

PAPER SHEET FEEDING DEVICE

Kazumasa Nagai, Hiroshima, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Jan. 25, 1978, Ser. No. 872,267
Claims priority, application Japan, Jan. 31, 1977, 52/10917[U]
Int. Cl.[2] B65H *7/08*
U.S. Cl. 271—148 **11 Claims**

1. A feeding attachment for a printing machine of the type having a vertically travelling support plate for supporting a pile of paper and for maintaining the top sheet in the pile of paper at a substantially constant level for feeding said top sheet into said printing machine, wherein the improvement comprises:
   (a) an auxiliary support plate removably pivotably connected to said vertically travelling support plate and moving in the vertical direction therewith for supporting said pile of paper;
   (b) pivot means for pivoting said auxiliary support plate with respect to said vertically travelling support plate;
   (c) actuating means for controlling the angle of said auxiliary support plate with respect to said vertically travelling support plate;
   (d) said actuating means having a guide rail;



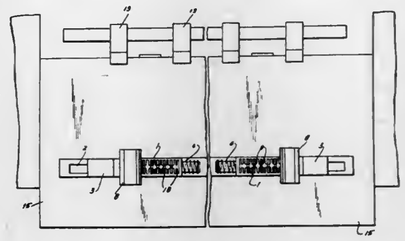
   (e) pivoting means for adjusting an angle between an axis of travel of said vertically travelling support plate and an axis of said guide rail;
   (f) lever means connected to said auxiliary support plate for controlling the pivoting thereof; and
   (g) engagement means on said lever means engaging said guide rail and being operative to pivot said auxiliary support plate in proportion to the vertical position of said vertically travelling support plate.

4,188,027

APPARATUS FOR LATERALLY POSITIONING SHEETS IN PRINTING MACHINES OR THE LIKE

Reinhard Naumann, Securiusstr. 32, 727 Delitzsch, German Democratic Rep.

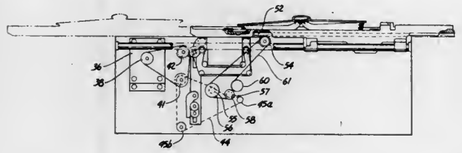
Filed Jun. 10, 1977, Ser. No. 805,391
Claims priority, application German Democratic Rep., Jun. 11, 1976, 193317; Feb. 21, 1977, 197486
Int. Cl.[2] B65H *9/12*
U.S. Cl. 271—241 **10 Claims**



1. In combination with a machine having a sheet support surface having a lateral stop, an apparatus for laterally positioning a sheet against said stop and comprising:
   a displacer member laterally displaceable under said support surface between an outer position extending beyond said lateral stop and an inner position generally underneath and close to said lateral stop;
   a suction drawbar limitedly laterally displaceable on said displacer member between a pair of end positions and

having at least one suction aperture exposed at said surface;
means for aspirating air downwardly through said aperture and thereby drawing a sheet overlying said suction drawbar on said surface against said drawbar;
means for laterally displacing said displacer member from said outer position into said inner position and thereby displacing a sheet drawn suctionally against said drawbar laterally against said lateral stop; and
biasing means including a spring for urging said drawbar on said displacer member into one of said end positions and for simultaneously permitting displacement of said drawbar on said displacer member toward the other of said end positions against a predetermined biasing force of such magnitude that on engagement of a sheet held suctionally by said drawbar with said stop said drawbar moves relative to said displacer member.

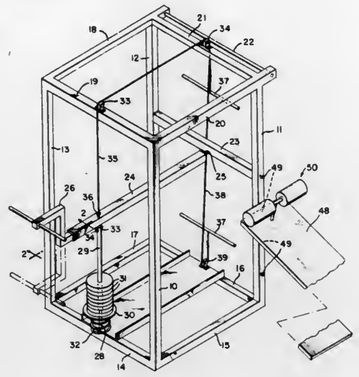
4,188,028
DOCUMENT HANDLING APPARATUS AND DRIVE CONTROL
Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney Bowes Inc.
Filed Oct. 11, 1977, Ser. No. 840,795
Int. Cl.[2] B65H *5/04, 5/06, 5/26*
U.S. Cl. 271—265 **16 Claims**



1. In a copying machine having a frame, means mounted on the frame defining an illuminating station, a carriage mounted on the frame for carrying a thick or thin original document along a path across the illuminating station, cooperating feed rollers normally positioned in the path of the carriage for feeding a thin original document across the illuminating station, means for moving the cooperating feed rollers in a direction transversely out of the path of said carriage, and a motor mounted on the frame for supplying a drive for the carriage and the cooperating feed rollers, the improvement comprising:
carriage transmission means for delivering the output of the motor to the carriage for reciprocally driving the carriage when the feed rollers are out of the path of the carriage and
feed roller transmission means for delivering the output of the motor to the feed rollers independently of both the carriage transmission means and the position of the feed rollers.

4,188,029
MULTIPLE USE WEIGHT LIFTING EXERCISING DEVICE
Harold E. Brower, and Jeffrey H. Brower, both of 30815 28th Ave. South, Federal Way, Wash. 98003
Filed Nov. 11, 1977, Ser. No. 850,595
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—62 **8 Claims**

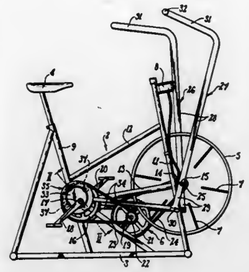
6. A multi-purpose body exercising machine comprising:
a cage-like frame including two pairs of spaced vertical frame members joined by two pair of horizontal support members at the upper and lower ends thereof,
a cross member extending between two of the vertical supports intermediate the upper and lower ends of the vertical supports,
an exercise beam pivotally connected at one end to the cross member for vertical movement about the pivot point, the exercise beam including an adjustable exercise bar on the opposite end capable of being gripped and urged by muscular effort in a vertical direction,
a vertical guide rod secured to one of the lower horizontal support members beneath and laterally spaced from the horizontal cross member to which the exercise beam is secured,
a hollow elongated sleeve member having means thereon for supporting a plurality of vertically stacked weights, the sleeve member and weights mounted for slidable, vertical displacement over the vertical guide rod, the sleeve member detachably secured at one end to the exercise beam,
first cable guide means fixedly mounted to an upper horizontal support member of the frame above the exercise beam and weights,



second cable guide means laterally spaced from the first cable guide means in the same plane thereof fixedly mounted to an upper horizontal support member of the frame,
third cable guide means fixedly mounted to a lower horizontal support member of the frame beneath the second cable guide means and the pivot point of the exercise beam,
a cable segment secured at one end to the weights through the exercise beam and extending through the first, second and third cable guide means, and
a second exercise bar detachably securable to the free end of the cable segment for applying a pulling force on the cable segment by muscular effort to displace the weights and exercise beam vertically.

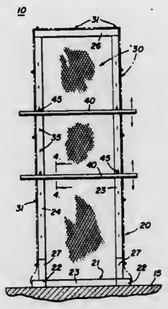
4,188,030
CYCLE EXERCISER
Lindsay A. Hooper, Belgrave, Australia, assignor to Repco Limited, Melbourne, Australia
Filed Aug. 29, 1977, Ser. No. 828,737
Claims priority, application Australia, Oct. 18, 1976, PC7758
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—73 **16 Claims**

1. A cycle exerciser including; a frame; a seat mounted on said frame; energy absorbing means rotatably mounted on said frame; a substantially horizontal drive shaft having two ends rotatably carried by said frame; first drive means connecting said drive shaft to said energy absorbing means to cause rotation thereof in response to rotation of said drive shaft; a drive crank arm secured to each of two opposite end portions of said drive shaft and extending laterally therefrom in opposite directions; two foot pedal crank arms; connecting means through which each said foot pedal crank arm is fixedly secured to the outer end of a respective said drive crank arm to permit rotation of said drive shaft by foot operation; two handlebar levers mounted on said frame for oscillatory movement; and second drive means connecting the outer end of each said drive crank arm to a respective one of said handlebar levers so that said drive shaft is caused to rotate in response to said oscillation of the handlebar levers; said second drive means being connected



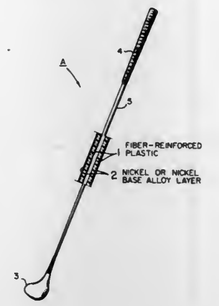
to said connecting means so as to be interposed between the outer end of each said drive crank arm and the adjacent end of the respective foot pedal crank arm.

4,188,031
MULTISPORT PRACTICE DEVICE
Robert Z. Fox, 5004 Valerie Drive, Crystal Lake, Ill. 60014
Filed Oct. 26, 1978, Ser. No. 954,873
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 A **9 Claims**



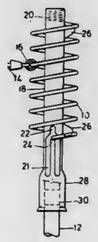
1. A multisport practice device for defining a target for arresting the flight of a ball or other projectile, said device comprising a base, a pair of elongated laterally spaced-apart support posts mounted on said base and extending vertically upwardly therefrom, a net mounted on said support posts and closing the space therebetween for intercepting and arresting the flight of an associated projectile, a plurality of hook members secured to and vertically spaced apart along each of said support posts so that each hook member on one of said support posts is substantially in horizontal alignment with a corresponding hook member on the other support post, and two crossbar members each having two eyelet members secured thereto respectively adjacent to the opposite ends thereof, said eyelet members on each crossbar member being adapted respectively to receive therein associated horizontally-aligned ones of said hook members for adjustably mounting said crossbar members at vertically spaced-apart locations on said support posts to define therebetween a variable target area.

4,188,032
NICKEL-PLATED GOLF CLUB SHAFT MADE OF FIBER-REINFORCED PLASTICS
Seiichi Yanagioka, No. 284-1, Shindo, Hiratsuka-shi, Kanagawa-ken, Japan
Filed Apr. 25, 1977, Ser. No. 790,343
Claims priority, application Japan, May 19, 1976, 51-62573[U]
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.[2] A63B *53/10*
U.S. Cl. 273—80 R **1 Claim**



1. A golf club shaft comprising and elongated body having one end adapted to be gripped and an opposite end adapted to be attached to a golf club head, said elongated body composed of fiber-reinforced plastic material having on substantially its entire outer surface a metallic plating selected from the group consisting of nickel and nickel based alloys.

4,188,033
TETHERED BALL GAME WITH HELIX SUPPORT
John L. Wells, Rotorua, New Zealand, assignor to Zimm-Zamm Aktiengesellschaft, Zug, Switzerland
Filed Aug. 19, 1977, Ser. No. 826,183
Claims priority, application United Kingdom, Aug. 26, 1976, 35636/76
Int. Cl.[2] A63B *67/10*
U.S. Cl. 273—413 **2 Claims**



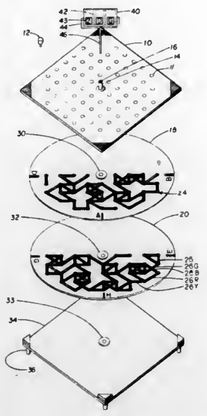
1. Apparatus for a game comprising a pole supporting a helix and a ball on a line, the other end of the line being coupled by a line attachment to the helix, there being the possibility of relative movement between the line attachment and the helix according to the direction in which the ball is hit, characterised by the provision of a slidable element inside the helix, the element being supportable in a cocked position, and triggering formations are provided at each of the end positions of the helix, the triggering formations being releasable for abrupt uncocking action by movement of the line attachment into either of its two end positions, to provide a perceptible signal.

4,188,034

SKILL BOARD GAME

Leonard H. Dempsey, and Linda S. Adrian, both of 13217 1st South, Seattle, Wash. 98134

Filed Dec. 1, 1977, Ser. No. 856,303
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—248 **5 Claims**



1. A skill board game having a transparent upper planar member provided with a partial first allowed direction-movement pattern, and at least one lower planar member underlying the upper planar member and having a partial second allowed direction-movement pattern which complements the direction-movement pattern of the upper planar member, said planar members being movable to change the alignment of the direction movement patterns between the two planar members for varying the combined allowed direction of movement,

a stationary transparent top board having piece receiving indicia, and revealing the patterns of said upper and lower planar members,

pieces movable along the top board for following the allowed direction-movement pattern, and

means for selecting the choice of alignment between the two planar members and the number of moves allowed for the pieces, the partial first and second allowed direction-movement patterns each including a series of independent segments arranged in random directions and in random multiples of allowed interconnected segments wherein a partially completed random path of more than one segment interconnected in more than one direction is provided by combining vertically and horizontally overlying and visually interconnected segments with each selection of alignment between the upper and lower planar members whereby a movement of a piece on the top transparent board following the pattern of partial first and second allowed direction-movement interconnected segments can be moved in varying directions and in varying numbers of segments dependent upon the means for selecting the number of moves allowed and selecting the planar member alignment.

4,188,035

CHESS WORD GAME

Robert A. Metzler, Jr., 400 W. 43rd St., Apt. 13-H, New York, N.Y. 10036

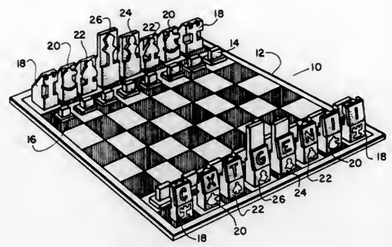
Filed May 8, 1978, Ser. No. 903,830
Int. Cl.[2] H63 *3/02*
U.S. Cl. 273—260 **6 Claims**

1. A chess word game comprising:

checkered board game;

a plurality of pawns;

a plurality of game pieces, each having on the front thereof a conventional chess symbol in three-dimensions and on the upper part of the back thereof a slot for removably receiving an insert bearing a letter indicia, each game piece having below the respective slot thereof a two-dimensional representation of the chess symbol disposed on the opposite side thereof; and



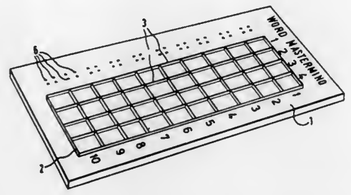
a plurality of inserts, each bearing a letter indicia whereby, when an insert is disposed in each game piece, the game pieces may be moved on said board according to standard chess moves such that the indicia-bearing inserts spell out a multiple letter word.

4,188,036

BOARD GAME WITH LETTER SHAPED PLAYING PIECES

Edward J. Jones-Fenleigh, Oadby, England, assignor to Invicta Plastics Limited, Oadby, England

Continuation-in-part of Ser. No. 752,534, Dec. 20, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 877,886
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—265 **2 Claims**



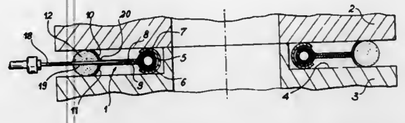
1. A board game for two players comprising a board, a holder, a set of playing pieces, a set of marking elements, a set of scoring elements and a word list; the board having a common horizontal playing surface divided into a plurality of similar rows of individual playing areas, each area having a slot to receive a playing piece, a score area and marking areas, each of the marking areas being associated with a row of playing areas, each marking area being adapted to receive a maximum number of marking elements equal to the number of playing areas in a row, the scoring area comprising lines of apertures, each aperture being adapted to receive a scoring element; the holder having a row of target playing areas, each target playing area having a hole to receive a playing piece, and a separate shield, the number of target playing areas in said holder row being equal to the number of playing areas in a row of the board, and the shield being removably locatable over said target playing areas by a first player to shield playing pieces mounted thereon from a second player, the playing pieces being a set of moulded pieces each in the configuration of a letter of an alphabet, each piece having a tongue at a base portion thereof, said tongue being receivable in a selected slot in one of the playing areas of the board or one of the target playing areas of the holder so that each piece stands independently with respect to its playing area; and the word list having thereon a list of words from which a code word may be chosen by the first player as a target for the second player.

4,188,037

COMPOSITE FLEXIBLE JOINT

Claude Abbes, Saint Etienne; Andre Gournier, Saint Priest en Jarez; Christian Rouaud, Bourg Saint Andeol, and Raymond de Villepoix, Donzere, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 21, 1978, Ser. No. 972,009
Claims priority, application France, Jan. 6, 1978, 78 00290; May 25, 1978, 78 15555
Int. Cl.[2] F16J *15/12*
U.S. Cl. 277—2 **8 Claims**



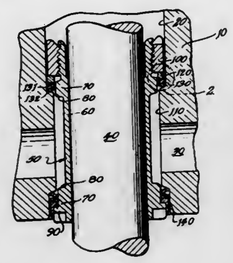
1. A metalloplastic flexible annular joint, wherein it comprises a first metal ring constituted by an inner metal spring with contiguous turns closed on itself and surrounding said spring, at least one metal envelope in which is embedded the spring, said envelope being extended by two parallel planar faces which extend in a transverse equatorial plane of symmetry of the joint, said faces having flared extensions moving away from said plane at a predetermined distance from the spring to partly surround a second solid elastomer plastic ring which is coaxial to the spring in such a way as to create between the two rings a sealed enclosure of limited volume which can be used for controlling the sealing of the joint.

4,188,038

SEAL ARRANGEMENT FOR INTERSECTING CONDUITS

Friedrich E. Goedicke, Trafford, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1968, Ser. No. 721,138
Int. Cl.[2] B65D *53/00*
U.S. Cl. 277—64 **2 Claims**



1. A seal assembly for sealing first and second intersecting conduits from each other, comprising:

a housing containing the conduits, the first conduit having an inwardly protruding wall section intersected by the second conduit, the ends of the protruding wall section defining first and second shoulders;

a stationary sleeve in the first conduit, said sleeve having a central portion narrower than the protruding wall section of the first conduit, and first and second end portions of larger external diameter than the central portion, each end portion being placed adjacent to one of the shoulders of said protruding wall section, the first end portion having attached to it a threaded extension and the second end portion having a flange at its outer extremity;

a first flexible sealing means surrounding the first end portion of the sleeve and abutting the first shoulder of said protruding wall section;

a second flexible sealing means surrounding the second end portion of the sleeve and lying between the second shoulder of said protruding wall section and the flange; and

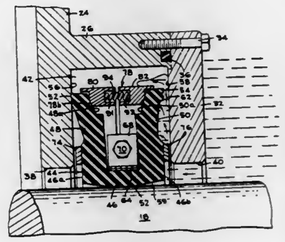
a single loading nut for simultaneously tightening the first and second flexible sealing means, the loading nut being attached to said threaded extension.

4,188,039

BULKHEAD SHAFT SEAL

Edward J. Krisak, and Stephen Strozak, both of Indiana, Pa., assignors to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 600,747, Jul. 30, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,833
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—95 **7 Claims**



3. Apparatus for blocking the flow of fluid from one compartment to an adjacent compartment and alternatively from said adjacent compartment to said one compartment through a partition having a rotatable shaft extending therethrough, the apparatus comprising a housing in said partition having a pair of spaced wall sections, said wall sections having aligned openings on an axis to receive with clearance said shaft as it extends from said one compartment to said adjacent compartment, said housing defining in said partition an internal totally enclosed chamber except for said openings and said housing defining with said partition a fluid tight barrier between said compartments except for said openings, a resilient seal having a hub portion and a pair of spaced flanges, a band around said hub portion and between said flanges to clamp the hub portion securely to the shaft, said flanges extending radially outwardly from said hub portion beyond the boundaries of said openings in closely spaced relation to said wall sections, one of said flanges pressed into sealing contact with the wall section adjacent thereto on the increase of fluid pressure within said chamber above the pressure in the compartment on the other side of the wall from said one flange to block the flow of fluid between said compartments and, alternatively, the other of said flanges pressed into sealing contact with the wall section adjacent thereto on the increase of fluid pressure within said chamber above the pressure in the compartment on the other side of the wall from said other of said flanges to block the flow of fluid between said compartments.

4,188,040

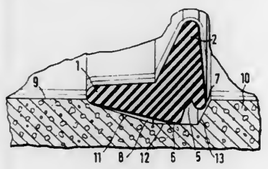
SEALING RING

Franz-Josef Wolf, and Hans J. Kunze, both of Bad Soden-Salmunster, Fed. Rep. of Germany, assignors to Firma WOCO Franz-Josef Wolf & Co., Bad Soden-Salmunster, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,204
Int. Cl.[2] F16L *21/02*
U.S. Cl. 277—207 R **15 Claims**

1. A sealing ring of elastic material for a plug-in type pipe

joint made up of two concentrically interfitting pipe elements of a mineral material in the case of which the sealing ring can be preassembled by insertion into the outer pipe element or socket before the insertion of the inner pipe element or spigot characterised in that (a) the sealing ring by and large has a substantially V-shaped axial section profile with the formation of two annular lips consisting of a support lip and a sealing lip in that (b) the support lip in the unstressed condition of the sealing ring, when the sealing ring is mounted in the socket, lies substantially axially in the opposite direction to the direction of the insertion of the spigot and has a clearance internal diameter, which is larger than the maximum external diameter, within the range of manufacturing tolerance, of the spigot, in that (c) the sealing lip in the unstressed condition of the sealing ring, when the sealing ring is mounted in the socket, extends substantially radially and has a clearance internal diameter, which is smaller than the smallest external diameter within the range of manufacturing tolerance, of the spigot, in that (d) the sealing ring has a sealing foot, which is opposite to the angle included by the support lip and the sealing lip, in that in the sealing foot of the sealing ring a sealing foot annular groove is



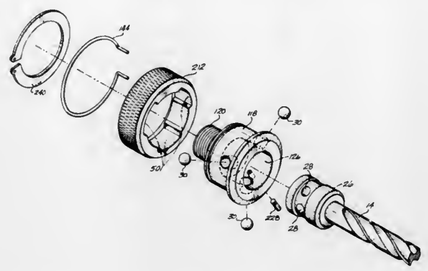
provided which forms the sealing foot into a front sealing foot lip which is axially to the front and provides a sealing action against external pressure and forms an axially rear sealing foot lip which provides a sealing action against internal pressure, and said sealing ring can be fixed by its sealing foot by dint of an annular groove constructed in an inner wall of the socket in order to prevent axial displacement of the sealing ring in the insertion direction of the spigot and in that (e) the sealing ring on insertion of the spigot into the socket can be inwardly axially tilted through the radial plane defined substantially by the sealing foot of the sealing ring in such a manner that the support lip and the sealing lip stand substantially symmetrically with respect to the radial plane, and when the spigot is inserted the radial clamping and distortion of the sealing ring in the case of the largest sealing gap permitted in the manufacturing tolerance range the support lip makes a sealing engagement with the external casing of the spigot with respect to external pressure, the sealing lip makes sealing engagement with the external casing of the spigot with respect to internal pressure and the sealing foot makes sealing engagement with the floor of the annular groove or on the inner wall of the socket with respect to internal and external pressure.

4,188,041
MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION

Mark S. Soderberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 799,407, May 23, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 932,093
Int. Cl.[2] B23B *3/04, 31/22*
U.S. Cl. 279—75 **2 Claims**

1. In combination:
a tool having a cylindrically shaped adapter portion;
a tool-holding chuck assembly having a generally cylindrically shaped body member including a first end portion adapted for coupling to a portable motor and a hollow second end portion for receiving said cylindrically shaped adapter portion in slip fit relationship therewith;
said cylindrically shaped tool adapter portion including an array of six spherically shaped dimples circumferentially disposed in the outer surface of said cylindrically shaped adapter portion;
said tool-holding chuck assembly including three spherically shaped ball elements, and a rotary spring-biased collar member rotatable in a counterclockwise direction when viewing said tool-holding chuck assembly from the open end thereof, thereby permitting disengagement of said three spherically shaped ball elements by allowing said three spherically shaped ball elements to move outward radially from said spherically shaped dimples, said rotatable spring-biased collar member further adapted to be

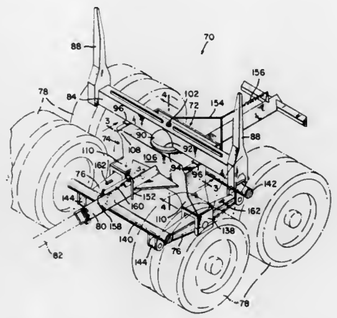


released from confining said three spherically shaped ball elements between a raised inner surface of said collar member and said spherically shaped dimples, said generally cylindrically shaped body member including a fixed stopping member for preventing rotation of said collar member beyond the position required for release from confinement of said three spherically shaped ball elements, said fixed stopping member pressed into said cylindrically shaped body member, and said rotary spring biased collar member including a biasing spring having a first end anchored to said fixed stopping member and a second end hooked over one of a plurality of spline like recesses in said cylindrically shaped collar member.

4,188,042
LOG TRAILER ASSEMBLY

Brian L. Pederson, 2411 Yew St., and Stephen F. Pederson, 2535 Michigan St., both of Bellingham, Wash. 98225

Filed Apr. 20, 1978, Ser. No. 898,109
Int. Cl.[2] B60P *3/40*
U.S. Cl. 280—404 **9 Claims**



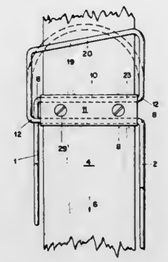
1. A trailer assembly adapted to carry a load, such as a load of logs comprising:
a. a chassis frame having a longitudinal axis, a lateral axis and a vertical axis, said chassis frame comprising:

1. a central body portion having a top, bottom and two sides,
2. two laterally spaced leg portions connected to the bottom of said body on opposite sides thereof,
3. two laterally spaced shoulder portions, located at the top of said body portion on opposite sides thereof,
b. a load carrying bunk member positioned above said frame and extending laterally over said frame,
c. support means to support said bunk member on said frame, said support means comprising:
1. a main rotary thrust bearing mounted to the top of said body portion at the center thereof and transmitting major thrust forces from said bunk member directly to said body portion in a manner to provide major support for said bunk member,
2. two auxiliary support members mounted to said shoulder portions on opposite sides of said thrust bearing to provide direct auxiliary support for said bunk member on side portions thereof,
d. a reach tube structure adapted to receive a reach and extending through said body portion at a location beneath said rotary thrust bearing,
e. plate support means centrally mounted in said body portion and rigidly connected to one another to form a support column which extends vertically from said rotary thrust bearing downwardly to transmit force loads from said rotary thrust bearing downwardly and outwardly to said leg portions,
f. a pair of walking beams mounted one to each of said leg portions, each walking beam having a center portion mounted for rotation to its related leg portion, and forward and rear ends adapted to be rotatably connected to forward and rear axles,
g. said walking beams being adapted to carry strain gauge means thereon to measure forces transmitted from said bunk, through said support means to said chassis frame and thence to said walking beams, as a means of determining the weight of the load carried on the bunk.

4,188,043
SKI BRAKE APPARATUS

Günter Schwarz, Au, Zürich, Switzerland, assignor to S.A. Etablissement Francois Salomon & Fils, Annecy, France

Division of Ser. No. 595,791, Jul. 11, 1975, Pat. No. 4,036,509. This application Apr. 25, 1977, Ser. No. 790,178
Claims priority, application Switzerland, Jul. 17, 1974, 9863/74; Jan. 14, 1975, 478/75
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **7 Claims**

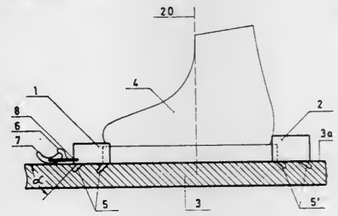


1. A brake apparatus for a ski having opposite lateral sides and upper and lower surfaces, said brake being securable to the upper surface of said ski and comprising:
two pivotable brake arms, each arm being respectively located adjacent one of the opposite sides of the ski;
a common spring bracket located above the upper surface of the ski and having bent ends defining respectively a first shaft connected with a first brake arm and a second shaft connected with the second brake arm, said shafts forming pivot axis for the corresponding brake arm and being arranged substantially parallel to the upper surface of the ski, transverse to the longitudinal axis thereof and in spaced relationship to one another in the lengthwise direction of the ski; and
means for pivotally mounting the brake arm shafts on the ski so as to enable pivoting of said brake arms from a preparatory position in which said brake arms lie above the lower surface of the ski into a braking position in which the brake arms extend at least partly beneath the lower surface of the ski.

4,188,044
CONNECTING ARRANGEMENT FOR THE DETACHABLE MOUNTING OF A BINDING ON SKIS

Norbert Kautzky, Schoffelgasse 26-28, A-1180, Vienna, Austria

Filed Feb. 17, 1978, Ser. No. 878,761
Claims priority, application Austria, Feb. 18, 1977, 1095/77
Int. Cl.[2] A63C *9/00*
U.S. Cl. 280—611 **21 Claims**



1. A connecting arrangement for detachably mounting a binding member consisting of a front binding device and a rear binding device on a ski member having an upper surface, which comprises
(a) connecting studs affixed to one of said members, the studs
(1) extending obliquely to the upper surface of the ski member and enclosing therewith an acute angle substantially less than 90° in planes extending perpendicularly to the upper ski member surface and parellel to a longitudinal center line of the ski member when the binding member is mounted thereon,
(2) the studs associated with the front binding device extending in one direction and the studs associated with the rear binding device extending in another direction, and
(3) the studs associated with the front binding device being arranged substantially symmetrically with respect ot the studs associated with the rear binding device in relation to a plane of symmetry extending perpendicularly and transversely to the upper ski member surface between the front and rear binding devices, and
(b) the other one of said members defining bores arranged to receive the connecting studs whereby the studs may be plugged into the bores.

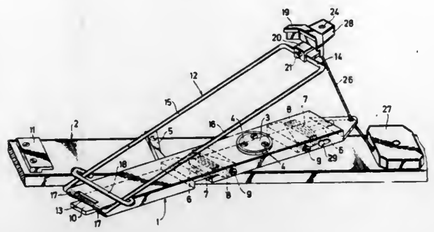
4,188,045
SAFETY SKI BINDING

Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,452
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731897
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—614 **7 Claims**

1. A safety ski binding comprising a baseplate, which is mountable on an upper surface of a ski adjacent to a heel of a skiing boot to extend normally in the longitudinal direction of the ski; means for mounting the baseplate on the upper surface so that the baseplate is rotatable on a vertical axis; a first adjustable resistance for opposing rotation of the baseplate; and a

boot carrier, which is hinged to the baseplate at the forward end of the latter and holds a skiing boot so that the latter is only arbitrarily detachable; a second adjustable resistance for opposing lifting of the rear end of said boot carrier from the baseplate, the boot carrier comprising a frame that extends



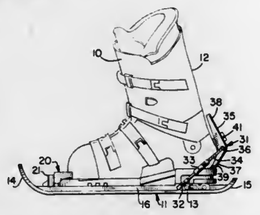
across the baseplate adjacent to the skiing boot, a forward end member of the frame constituting a horizontal hinge pin, which is rotatably mounted on the baseplate; and a spring-loaded cable and winder assembly for connecting rear ends of the baseplate and boot carrier.

4,188,046

SKI AND INTEGRAL BOOT PLATE WITH TOE PIECE AND RELEASABLE HEEL BINDING

John Fleckenstein, 20580 Enterprize Ave., Brookfield, Wis. 53005

Filed Apr. 19, 1978, Ser. No. 897,587
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—618 **1 Claim**



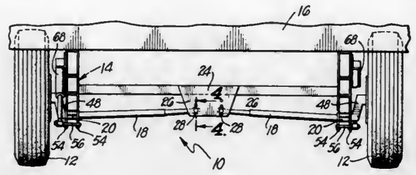
1. A ski for specialty skiing comprising a runner having a maximum length of about 20" and having a front tip curved upwardly on a radius, a boot plate formed integrally with said runner including a plurality of upstanding lengthwise ribs on the runner, an upstanding toe piece mounted on the boot plate, a heel anchor device pivotally secured in the rear portion of said boot plate, said anchor device including a flexible cable having a pivot mounting device in the boot plate, an anchor member pivotally mounted in the cable, said cable having turn buckles respectively connecting the opposite ends thereof with said pivot mounting device, said pivot mounting device being threaded into the boot plate, a plurality of longitudinally spaced threaded openings into the opposite sides of the boot plate to receive the pivot mounting device, said pivot mounting device including a pair of angle shaped members entering said boot plate from opposite sides thereof and each having threads for engagement by said turn buckles and threads for engagement in the boot plate disposed respectively on right angled portions of the angle shaped members, said toe piece being separate from said boot plate and adjustably mounted on said lengthwise ribs, said toe piece including a toe binding piece and a toe block piece having an upstanding portion containing a plurality of vertical openings, vertical fastening members extending through said openings threaded into said boot plate, and a plurality of longitudinally spaced threaded openings formed in enlargements of said ribs affording a plurality of longitudinally adjusted positions to receive said fastening members.

4,188,047

TRAILER SUSPENSION

John C. Crean, San Juan Capistrano, and Bill Stroppe, Long Beach, both of Calif., assignors to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed May 30, 1978, Ser. No. 910,464
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—678 **10 Claims**



1. In a trailer having a chassis, a plurality of wheels and suspension means for connecting said wheels to said chassis the improvement which comprises:

said suspension means comprising a separate suspension structure for each of said wheels,

each of said suspension structures including an elongated rod-like member serving as an axle, a spring, a torsional energy absorption means for use in absorbing torsional energy and a mounting means for use in securing said torsional energy absorption means to said chassis,

said member having a chassis mounting end and a wheel mounting end,

one of said wheels being rotatably mounted on said wheel mounting end,

said spring being connected to said wheel mounting end and to said chassis and serving to resiliently support said wheel mounting end on said chassis,

said mounting means being located on said chassis remote from said wheel and said wheel mounting end,

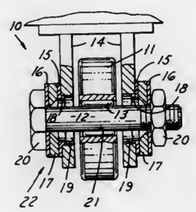
said torsional energy absorption means being connected to said chassis mounting end and to said mounting means so as to absorb torsional energy transmitted through said elongated member said energy absorption means being composed of a resilient, elastomeric body.

4,188,048

WHEEL SUSPENSION

Bernard Haung, Canton, Mich., and Evgeny I. Rivin, Windsor, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 2, 1978, Ser. No. 930,440
Int. Cl.[2] B60G *11/24*
U.S. Cl. 280—688 **11 Claims**



1. A wheel suspension for movable object including:

a pair of spaced side walls having opposed openings;

an elongated axle extending between said side walls and through said opposed openings so that said axle has end portions adjacent said side walls;

a wheel rotationally mounted on said axle between said side walls;

a pair of resilient means coupling the end portions of said axle to an adjacent one of said side plates, said resilient means each including a pair of spaced cover plates having an elastomer therebetween and attached to said cover plates, a first of said cover plates being attached to said axle and a second of said cover plates being attached to one of said side walls so that movement of said axle in a radial direction with respect to said side walls applies a shear force to said elastomer and a damping force to the wheel suspension;

said first of said cover plates is annular and has an inner diameter substantially equal to the diameter of said axle so that radial movement of said axle causes corresponding radial movement of said first cover plate thereby applying a shear force to said elastomer and thus resisting motion of said axle with respect to said side plate and;

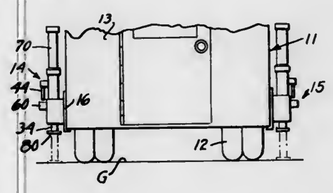
said second of said cover plates is annular and has an inner diameter sufficiently larger than the diameter of said axle to permit some radial movement of said axle which movement is limited by interference with the innermost boundary of said opening in said side plate and said inner diameter of said second cover plates.

4,188,049

ADJUSTABLE STABILIZER FOR MOTOR VEHICLES AND THE LIKE

Robert M. Kimbro, 7752 Garvey Ave., Rosemead, Calif. 91776

Filed May 24, 1978, Ser. No. 908,809
Int. Cl.[2] B60S *9/02*
U.S. Cl. 280—766 **9 Claims**



1. An adjustable support comprising

a support post,

a device movable along said post,

a first one-way clutch for preventing relative movement between said post and said device in one direction and permitting relative movement in the opposite direction,

a second one-way clutch for preventing relative movement between said post and said device in said opposite direction and permitting relative movement in said one direction,

selectively settable means for releasing one or the other of said clutches,

a slider movable lengthwise of said post,

a third one-way clutch for preventing relative movement between said post and said slider in said opposite direction and permitting relative movement in said one direction,

an adjusting lever,

first pivot means pivotally connecting said lever to said slider,

second pivot means pivotally connecting said lever to said device, and

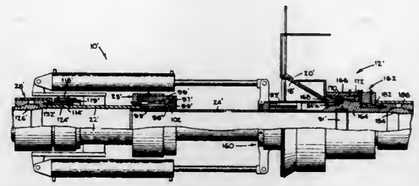
means for oscillating said lever whereby to advance said device along said post upon movement of said lever in one direction about said first pivot means and to advance said slider along said post upon movement of said lever in an opposite direction about said second pivot means.

4,188,050

REMOTE-CONTROLLED FLOWLINE CONNECTOR

Glen E. Lochte, Cypress, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 25, 1977, Ser. No. 844,564
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—24 **16 Claims**



1. A remotely controllable connector for interconnecting the ends of a pair of subsea flowline pipes using remote control, said connector comprising:

a pair of coupling members, at least one of said coupling members being extendable;

means for connecting a first end of each of said coupling members to the end of a corresponding one of said pair of flowling pipes;

a pair of orienting cones;

means for connecting each of said cones to a second end of a corresponding one of said coupling members, said cones providing means for urging said coupling members into axial alignment as said coupling members are moved toward each other;

power means for extending said extendable coupling member to move said second end of said extendable coupling member in a generally axial direction toward said second end of the other coupling member;

universal joint means connected between said first end of a first coupling member and said first end of a second coupling member to provide axial alignment of said second end of said first coupling member with said second coupling member as said cones urge said coupling members toward axial alignment;

means for clamping said second end of said first coupling member to said second end of said second coupling member; and

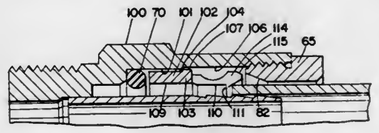
an annular seal interposed between said second ends of said coupling members for providing a fluid-tight seal therebetween.

4,188,051

TUBE COUPLING

Donald G. Burge, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 789,826, Apr. 22, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 884,872
Int. Cl.[2] F16L *17/02, 21/08, 33/16, 37/08*
U.S. Cl. 285—104 **6 Claims**



1. A preassembled coupling for tubes wherein a final fluid tight joint may be made solely by insertion of a tube therein, said coupling comprising a body having a first bore for receiving a tube, a chamber axially outwardly of and adjacent the first bore and in which a packing ring is received and sealingly

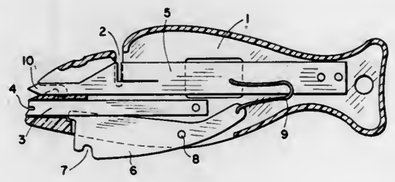
engages the tube and a radially outer cylindrical wall of said chamber, a second bore in the body axially outwardly of the chamber and in which a sleeve is received, and an internal thread axially outwardly of the second bore, a transverse shoulder at the bottom of the second bore, a nut threadably engaged with said internal thread, engaged abuttment surfaces on the body and nut fixing the axial position of the nut relative to the body, said sleeve having an inner end wall forming a movable outer wall of said chamber and when there is no fluid pressure in the body being unbiased in either axial direction and being freely moveable between an innermost position and an outer position, said packing ring being subject to pressure of fluid in the inner end of said chamber and moveable thereby into engagement with said sleeve for moving said sleeve to said outer position, said chamber being of an axial length greater than the axial length of the packing when said sleeve is in said innermost position whereby when there is no fluid pressure within the axially inner end of said chamber said packing may move to said inner end and be out of contact with the sleeve when the sleeve is in said innermost position, said nut having a bore therethrough that terminates in a frusto-conical cam surface at the inner end of the nut, said sleeve having a circumferentially continuous inner end surface and an inwardly facing second surface that engages said shoulder when the sleeve is in said innermost position, said sleeve having longitudinal slits at its outer end forming a plurality of circumferentially spaced fingers, said fingers having a radially inwardly projecting rib of smaller diameter then the tube prior to insertion of the tube within the coupling, said fingers having a flare mouth at their outer ends, said sleeve when in said innermost position being out of contact with said cam surface, said sleeve being in engagement with said cam surface when said sleeve is in said outer position whereby the outer ends of said fingers and said rib are contracted radially inwardly by said cam surface and the rib grips the tube for retaining the tube within the coupling.

4,188,052

LINE THREADING AND CUTTING DEVICE

Charles W. Browning, 4645 E. 57th St., Tulsa, Okla. 74135

Filed Aug. 10, 1978, Ser. No. 932,567
Int. Cl.[2] D04G *5/00*
U.S. Cl. 289—17 **7 Claims**



1. An improved Line Threading and Cutting Device comprising an enclosure case, the said enclosure case having a gauge slot and a groove in the outer structure; the said enclosure case having means therein suitable for mounting;

(a) a lure holder with means for threading a line through an eyelet of a lure,

(b) a double blade assembly,

(1) the first said blade being slotted and aligned with the said gauge slot in the said enclosure, the said blade assembly being mounted in a stationary position within the said enclosure case;

(2) the said second blade being attached to the said first blade and slidably mounted with means to move the said second blade over the said first blade, the end of the said second blade moving over the said slot in the first said blade to form a cutting edge;

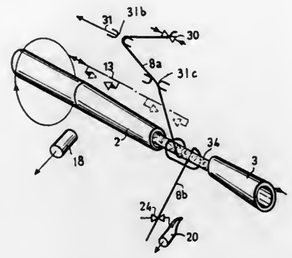
(c) a spring loaded lever pivotally mounted in the said enclosure case for releasing a line looped over the said enclosure case, the said line passing over the said groove in the said enclosure case and over a slot in the said spring loaded lever, the said line being released to form a knot so as to secure the said line to said lure.

4,188,053

MACHINE FOR AUTOMATICALLY TYING THE ENDS OF SAUSAGES AND THE LIKE

Yves A. Pujol, Albi, France, assignor to S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques, Albi, France

Continuation-in-part of Ser. No. 733,402, Oct. 18, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,707
Claims priority, application France, Dec. 10, 1976, 76 30852
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—18.1 **16 Claims**



1. A machine for automatically binding with a cord the end of a sausage or the like longitudinal article, comprising

means for unwinding a cord from a spool of binding cord;

a first tube axially movably and rotatably mounted in said machine and having a first projection, said cord being adapted to be looped around said first tube and first projection in a first step;

a second tube axially movably mounted in said machine relative to said first tube, said cord being adapted to be looped around said second tube in a second step;

and means operatively mounted in said machine and coacting with said cord and first and second tubes to form a clove-hitch knot around said longitudinal article when it has been positioned in axial alignment with said first and second tubes.

4,188,054

CLOSURE, PARTICULARLY FOR INDUSTRIAL FREEZER DOORS

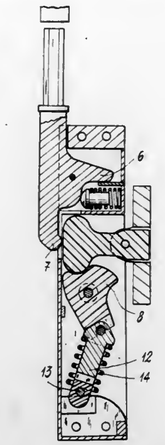
Giuseppe La Marca, Milan, Italy, assignor to Intertecnica S.p.A., Milan, Italy

Filed Sep. 11, 1978, Ser. No. 940,951
Claims priority, application Italy, Sep. 20, 1977, 22264/73[U]
Int. Cl.[2] E05C *19/02*
U.S. Cl. 292—226 **5 Claims**

1. A closure, particularly for industrial freezer doors, comprising:

a box-like body having a top portion provided with a horizontal top clearance surface, and a lower portion, there being provided in the lower portion a suitably shaped "nose" element pivoted to the side walls of said box-like body, said nose being articulated by means of a plate to a spring guide element incorporating a spring, said guide element resting as an articulation on suitable notches provided at the bottom of the said body; and

a second separable element comprising a substantially mushroom-shaped member, said second element being insertable into the said box-like body between said top closure surface and said nose element, so as to engage said nose element, and tip the nose element over center such that said articulation provides a snap action in tipping behind said mushroom-shaped member, said mushroom-shaped member being thereby retained within the body by means of said nose element so as to make up a secure closure.

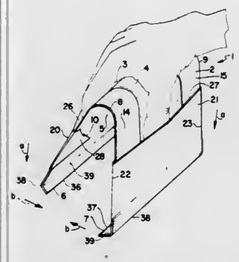


4,188,055

DISPOSABLE SHOVEL TONGS

Martin Green, 480 McDermott Rd., Rockville Center, N.Y. 11570

Filed Sep. 22, 1978, Ser. No. 944,949
Int. Cl.[2] A47L *13/52*
U.S. Cl. 294—1 R **11 Claims**



1. Disposable manual shielding shovel tongs comprising

a self interlocking unitary firm structural planar member of stiffly bendable disposable material including

a longitudinal main panel having top and bottom surfaces, opposed substantially transversely extending longitudinal ends, opposed substantially longitudinally extending lateral sides, and insert slots therethrough longitudinally inwardly of the longitudinal ends,

a pair of opposed substantially longitudinally extending lateral panels extending substantially to the longitudinal ends of the main panel and joined to the main panel along the lateral sides of the main panel and disposed in substantially coplanar disposition on the top surface of the main panel to provide longitudinal reinforcement for the underlying portions thereat of the main panel,

a pair of opposed longitudinally spaced apart substantially transversely extending end panels extending to the lateral sides of the main panel and dimensioned to be thereby substantially transversely coextensive with the main panel and having opposed laterally outwardly facing sides and joined to the main panel along the longitudinal ends of the main panel and disposed normally in substantially coplanar disposition on the top surface of the main panel and in overlying relation over the adjacent portions thereat of the lateral panels and longitudinally inwardly terminating in spaced relation to each other to provide longitudinally opposed substantially transversely extending, normally closed and manually distendable and openable, finger insertion shielding external pockets in conjunction with the underlying marginal portions thereat of the main panel adjacent the longitudinal ends of the main panel, and

reverse locking tabs joined to the laterally outwardly facing sides of the end panels and disposed in substantially coplanar disposition on the bottom surface of the main panel longitudinally inwardly of the longitudinal ends of the main panel and arranged in interlocking relation with the insert slots therein,

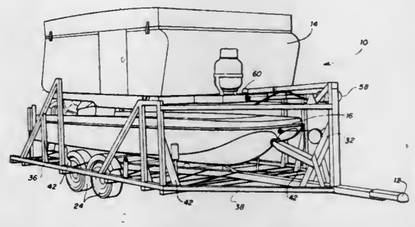
whereby upon bending the member upon itself with the pockets on the resultant exterior and the bottom surface of the main panel on the resultant interior, a pair of manual shielding shovel tongs is formed having jaws corresponding to the longitudinal ends of the main panel.

4,188,056

COMBINATION BOAT AND CAMPER TRAILER

Charles L. Watson, R.R. 7, Paris, Tex. 75460

Filed Mar. 17, 1978, Ser. No. 887,714
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—157 **9 Claims**



1. In a trailer for transporting and launching a boat, the improvement comprising:

structure defining a frame rigidly secured to the trailer for supporting a camper;

said frame including front and rear pairs of forwardly inclined guide members mounted on opposite sides of the trailer and supporting the camper for movement between an upper position over the boat and a lower position wherein the camper rests on the trailer in place of the boat;

said camper being positioned between said guide members and constrained for movement along said guide members;

means for selectively securing the camper to the frame in the upper position on said guide members; and

camper winch means connected between the camper and the frame for selectively effecting movement of the camper along the guide members between upper and lower positions.

4,188,057

RETRACTABLE PATIO ASSEMBLY FOR RECREATIONAL VEHICLE

Harry P. Pauli, P.O. Box 143, Burns, Wyo. 82053

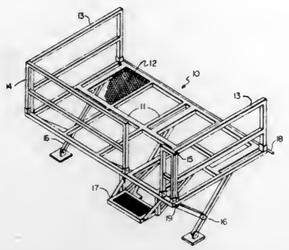
Filed Jun. 28, 1978, Ser. No. 928,969
Int. Cl.[2] B60P *3/30*
U.S. Cl. 296—162 **10 Claims**

1. A retractable patio assembly for use with a recreational-type vehicle and movable from a use position adjacent a door of said vehicle to a stowed position to the side of said door comprising:

mounting means attachable to a structural member of said vehicle;

platform means pivotally connected to said mounting means, said platform means being laterally movable from a substantially horizontal use position in front of and below the vehicle door to a substantially vertical retracted position alongside the vehicle door; and

a plurality of individually adjustable, ground engaging platform support means, each of said support means providing



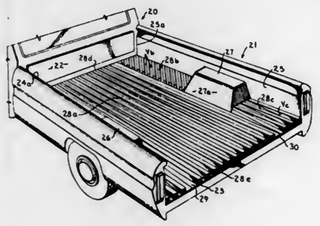
at least two points of support to said platform and comprising three arm members arranged to form a triangle, a first of said arm members pivotally connected at one end to the platform and pivotally connected at the other end to a second of said arm members at a point intermediate its ends, the third arm member being of adjustable length and disposed parallel to the platform means.

4,188,058

SELF DRAINING TRUCK BED FLOORINGS

Richard N. Resa, 3220 Susan Dr., Hannibal, Mo. 63401, and David M. Kuntzi, #1 Skyline Dr., Louisiana, Mo. 63353

Filed Apr. 10, 1978, Ser. No. 894,725
Int. Cl.² B60N *3/04*
U.S. Cl. 296—208 **8 Claims**



1. An insert flooring for a substantially rectangular truck bed whose area and boundaries are defined by a normally substantially horizontal rectangular bottom wall, a normally substantially vertical rectangular front wall and two normally substantially vertical rectangular side walls,

said side walls meeting at their front ends at substantial right angles with the side edges of the front wall and the side and front walls meeting the bottom wall at their lower edges,

there being at least one wheel well on each side of the truck bed intermediate the front and rear ends thereof, comprising

a substantially rectangular sheet of rigid, strong, water resistant material substantially overlying the entire bottom wall of the truck bed substantially abutting the front wall thereof with the front edge thereof and the side walls thereof with the side edges thereof with cut out portions therein for the said wheel wells

said sheet corrugated centrally between the wheel wells longitudinally substantially the entire length thereof from front to rear and wheel well to wheel well,

the crests of said corrugations paralleling one another and normally horizontal so as to normally parallel the truck bed bottom wall surface,

the valleys of said corrugations substantially paralleling one another and increasing substantially uniformly in depth from the front edge of said sheet to the rear edge of said sheet,

the areas behind the wheel wells of said sheet corrugated in the same manner as the area between the wheel wells and

the areas in front of the wheel wells of said sheet each corrugated in such manner as to pass liquid in the corrugation valleys centrally and rearwardly of said truck bed,

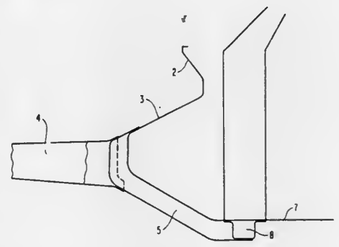
the areas of the truck bed immediately inboard of the wheel wells from front to back comprising corrugation valleys.

4,188,059

FORWARD LONGITUDINAL BEARER SUPPORTED AT THE VEHICLE END WALL OF A SELF-SUPPORTING MOTOR VEHICLE BODY

Wilhelm Bauer; Kurt Heinrich, both of Sindelfingen; Wolfgang Klie, Korntal; Wolfgang Rau, Renningen, and Werner Trost, Raidwangen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,929
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725085
Int. Cl.² B62D *21/00*
U.S. Cl. 296—188 **11 Claims**



1. A motor vehicle body including a longitudinal bearer and comprising end wall means defining a wall of a passenger compartment and locally bulged out in the direction of the respective vehicle end in a manner forming a rigid body, said longitudinal bearer having an end supported against said end wall and being forked so as to create a pair of arms partially surrounding said rigid body and extending to a subfloor forming means.

4,188,060

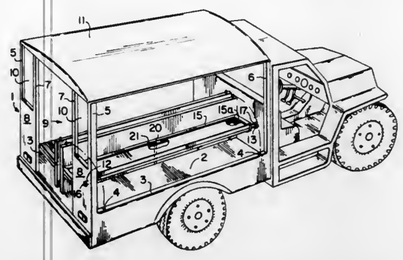
COMBAT AND TRANSPORT VEHICLE BODY

Eduardo V. Alcanzare, Angeles City, Philippines

Filed Sep. 15, 1978, Ser. No. 942,480
Claims priority, application Philippines, May 25, 1978, 21192
Int. Cl.² B60N *1/00*
U.S. Cl. 296—63 **3 Claims**

1. A vehicle body having a floor, vertical outer rear posts and front posts which are aligned along the longitudinal sides of said floor, rear inner rear posts spaced inwardly of said rear outer posts, a front transverse wall connected to said front

posts, a pair of longitudinal seat frames, each pivotally connected to a corresponding rear inner post and to said front



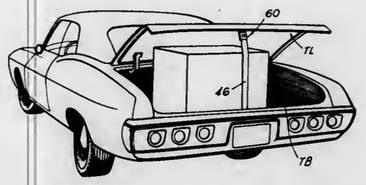
wall, and a corresponding longitudinal side wall hingedly connected to the longitudinal side of said seat frame.

4,188,061

AUTOMOBILE TRUNK LID HOLDER

Lyle E. Shehi, 19 Ontario Dr., Chattanooga, Tenn. 37415

Filed Mar. 7, 1978, Ser. No. 884,123
Int. Cl.² B62D *25/10*
U.S. Cl. 296—76 **5 Claims**



1. A holding device for an automobile trunk lid during transporting of oversized cargo in the automobile trunk, said device comprising a first buckle component, a hinge carrying the first buckle component and having one leaf thereof attached to the first buckle component and a second leaf adapted for attachment to the underside of an automobile trunk lid, a spring connected with the hinge and biasing the first leaf in a direction holding the first buckle component against the interior of the trunk lid during periods of non-use of the device, a trunk lid holding strap, a spring reel connected with the strap and tending to reel in the strap to a retracted position, means for attaching the spring reel to the bed of an automobile trunk in opposing relation to said first buckle component, and a second buckle component carried by the free end of said strap and engageable lockingly and releasably with the first buckle component when the strap is extended from the spring reel, and pawl and ratchet means connected with the spring reel and being normally active to allow free strap rewinding movement of the spring reel while positively locking the spring reel against strap unwinding movement and including release means allowing such strap unwinding movement.

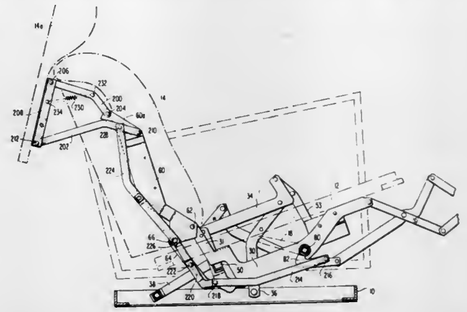
4,188,062

HANDLE-OPERATED WALL-AVOIDING RECLINER CHAIR WITH HEADREST

Walter C. Rogers, Jr., Denton, and David S. Hoffman, High Point, both of N.C., assignors to Royal Development Company, Inc., High Point, N.C.

Filed Jul. 10, 1978, Ser. No. 923,389
Int. Cl.² A47C *1/037, 7/36*
U.S. Cl. 297—61 **2 Claims**

1. In a wall-avoiding recliner chair including a primary support structure, a seat and backrest mounted relative to the primary support structure for movement between normal and reclining positions with the seat and backrest being movable forwardly relative to the primary support structure when moving to reclining position, a backrest linkage mounting the backrest for movement relative to the seat, a footrest movable between an extended position projected forwardly from the chair and a retracted position adjacent the front of the chair, and a handle-operated actuating means for driving the footrest between the extended and retracted positions thereof; a headrest (**14*a***), a headrest mounting linkage (**200, 202**) mounting the headrest to the backrest for movement between a normal position behind the backrest and an extended position projected above the backrest, and a headrest actuating linkage (**214, 220, 224**) connected to said handle-operated actuating means for moving the headrest to the extended position when the footrest is moved to the extended position, said headrest



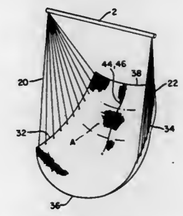
actuating linkage includes a first link (**214**) extending in the generally forward-rearward direction of the chair and having a forward end portion connected to said handle-operated actuating means to be driven generally longitudinally thereof, a second link (**220**) pivotally mounted intermediate its ends relative to said backrest linkage, said second link having one end portion pivotally connected to a rear end portion of said first link and having an opposite end portion, and a third link (**224**) extending in a generally vertical direction and having a lower end portion pivotally connected to said opposite end portion of said second link (**220**) and an upper end portion pivotally connected to said headrest mounting linkage for driving the same between said normal and extended positions in response to said handle-operated actuating means.

4,188,063

HAMMOCK CHAIR WITH BACK SUPPORTING MEANS

Etienne R. Dusart, 4C Continental Villa, Carolina, P.R.

Filed Nov. 9, 1978, Ser. No. 959,085
Int. Cl.² A47D *13/10*
U.S. Cl. 297—273 **6 Claims**



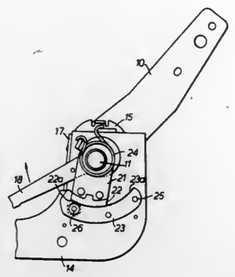
1. A suspendable hammock chair for supporting a seated person, comprising a seat part having a part adapted to engage the back of the user, and means forming in the back engaging part a ridge projecting inwardly and extending transversely of the chair at the area of the seat part engaged by the small of the back of the user.

4,188,064

VEHICLE SEAT HINGE MECHANISM

Ernest L. Cheshire, Hartwell, England, assignor to UOP Inc., Des Plaines, Ill.

Filed May 12, 1978, Ser. No. 905,482
Claims priority, application United Kingdom, May 20, 1977, 21425/77
Int. Cl.² A47C *1/025, 1/026*
U.S. Cl. 297—367 **4 Claims**



1. A hinge mechanism for supporting the back part of a vehicle seat for pivotal movement relative to a base part and for locking it at a desired inclination thereto, said mechanism comprising

two hinge arms,

a support plate mounted on and parallel spaced from a first one of said hinge arms,

a shaft rigidly secured to the second of said hinge arms,

a rotational supporting device journalled in apertures in the first hinge arm and in said support plate respectively,

the shaft extending through and journalled within eccentric apertures in said supporting device,

an operating member connected to said supporting device for rotating said device relative to both said hinge arms thereby to displace the axis of said shaft laterally,

a radial arm rigidly secured to said shaft,

a first set of teeth on the radially outer end of said radial arm,

a second set of teeth fixed relative to said first hinge arm adjacent the first set of teeth,

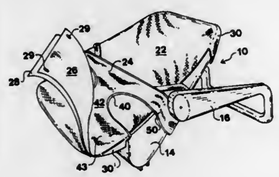
said first set of teeth being disposed along an arc centered on the axis of said rotational supporting device, said sets of teeth being capable of meshing engagement with each other over a predetermined arc of relative movement of the two hinge arms.

4,188,065

COMBINATION HARNESS AND COVERLET FOR INFANT SEATS

Marlene F. Meeker, 804 Meade Dr., Greensboro, N.C. 27410

Filed Jul. 31, 1978, Ser. No. 929,451
Int. Cl.² A47C *31/00, 27/00*
U.S. Cl. 297—485 **3 Claims**



1. An accessory for existing infant seats of the type having a back portion, a seat portion, and a skirt portion, said accessory comprising a single unit construction including:

(a) a pad having upper and lower ends and overall dimensions such that said upper end substantially overlies the back portion, and said lower end substantially overlies said skirt portion of the infant seat;

(b) a restraining harness overlying the lower end of said pad and including:

(i) a base portion and an upper portion said base portion being secured and its side and bottom edges to the corresponding peripheral portion of said lower end of said pad;

(ii) a pair of midriff straps extending from opposite sides of said upper portion around opposite sides of the seat;

(iii) means for fastening the opposite ends of said midriff straps; and

(iv) a pair of notched areas separating the base portion of said harness from said midriff straps through which an infant's legs extend and forming a straddle area between said notched areas and joining the upper portion and base portion;

(c) at least one coverlet attached to the lower end of said pad and harness assembly of subparagraphs (a) and (b); and

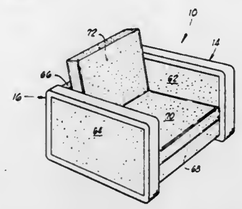
(d) means for removably attaching said pad to said infant seat.

4,188,066

FURNITURE CONSTRUCTION

Amerigo Terenzoni, 5721 N.W. 19th, Oklahoma City, Okla. 73127

Filed Sep. 14, 1978, Ser. No. 942,367
Int. Cl.² A47C *7/00*
U.S. Cl. 297—440 **21 Claims**



1. An improved furniture construction, comprising:

a frame, having a planar cavity therein, said cavity including an outer periphery substantially defined by said frame; and

an upholstery panel having a peripheral edge engaging said frame about the outer periphery of said planar cavity, and having a shape defined by said cavity and being dimensioned so that said panel may be press fit into said cavity and retained therein by the frictional force of said press fit.

4,188,067

KNOCK-DOWN CHAIR

Steven A. Elmer, 8506 Owensmouth Ave., Canoga Park, Calif. 91304

Filed Jul. 14, 1978, Ser. No. 924,781
Int. Cl.² A47C *4/00*
U.S. Cl. 297—442 **3 Claims**

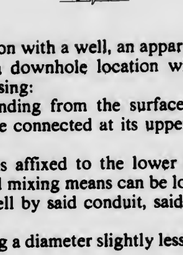
1. A chair of knock-down construction, comprising:

two legs, each including an upright corner portion;

a back in locked engagement with each of said legs, said back including two lower corner portions each formed with a slotted projection;

a seat in locked engagement with each of said legs and with said back, said seat including two rear corner portions;

said locked engagement being accomplished by wall structure defined by said corner portions comprising mutually engaging slots through the rear surface of each rear corner portion of said seat and the forward surface of each upright corner portion of said legs, a hole through each rear seat corner portion intersecting the slot thereat for receiving respective back lower corner projections, the slots through the bottom surface of each lower corner projection of said back and each upright corner portion of said legs being mutually engaging when said projections



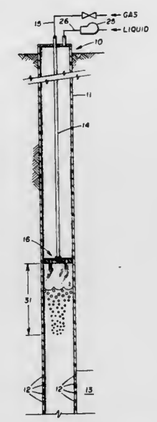
are received in said rear seat corner holes, each projection engaging the upright corner portions of each leg on opposite surfaces thereof.

4,188,068

APPARATUS FOR MIXING GAS AND LIQUID AT A DOWNHOLE LOCATION

Billy G. Holmes, Lancaster, and Jimmie Crofford, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,829
Int. Cl.² E21B *23/28*
U.S. Cl. 299—5 **5 Claims**



1. In combination with a well, an apparatus for mixing a gas and a liquid at a downhole location within said well, said apparatus comprising:

a conduit extending from the surface into said well and adapted to be connected at its upper end to a supply of said gas;

a mixing means affixed to the lower end of said conduit whereby said mixing means can be lowered into or raised from said well by said conduit, said mixing means comprising:

a plate having a diameter slightly less than the diameter of said well;

said plate having a central opening therethrough in which said lower end of said conduit is affixed, said conduit terminating at said plate;

said plate having a plurality of additional openings therethrough surrounding said central opening, said liquid flowing through said additional openings when said liquid is flowed down said well through the annulus formed between said conduit and the wall of said well; and

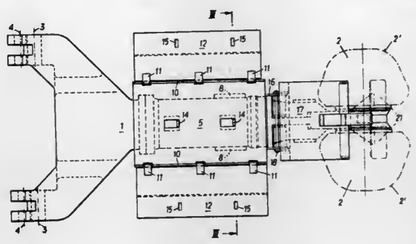
means on said plate for forming a seal between said plate and the wall of said well when said mixing means is in an operable position within said well.

4,188,069

MINING MACHINE HAVING WALK-ON PLATFORM ON CUTTER ARM

Arnulf Kissich, and Florian Süssenbacher, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 11, 1978, Ser. No. 895,503
Claims priority, application Austria, Apr. 28, 1977, 3028/77
Int. Cl.² E21C *35/00*
U.S. Cl. 299—73 **4 Claims**



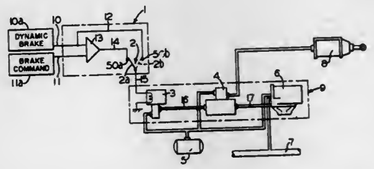
1. In a cutting machine having a cutter arm which is mounted at one end for universal pivotal movement and which carries at its free end a cutting tool: a walk-on platform covering at least part of the cutter arm, said platform being box-shaped in cross-section and having a width greater than the width of the cutter arm so as to protrude beyond the sides of the cutter arm and said platform having a generally planar top wall and a bottom wall which conforms to and rests on the exterior surface of the cutter arm; and at least one walk-on plate hinged to the platform at a side edge thereof for swinging movement about an axis which is approximately parallel to the axis of the cutter arm, said plate having a width less than the width of the top wall of the platform movable from a position in which it lies on the top wall of the platform to an extended position in which it is approximately co-planar with the top wall of the platform.

4,188,070

BRAKING COORDINATION DEVICE

Michel Grenier, Dampmart, France, assignor to WABCO Westinghouse, Freinville-Sevran, France

Filed Apr. 24, 1978, Ser. No. 899,446
Int. Cl.² B60T *13/74*
U.S. Cl. 303—3 **10 Claims**



1. In a rail car brake control system having a dynamic brake, a supplemental brake, an electric control circuit providing an error output signal according to the difference between a brake command signal and a dynamic brake signal representing the effectiveness of the dynamic brake, which is under control of the brake command signal, an electro-pneumatic valve device operatively responsive to the error output signal to provide a first control pressure, a main brake control pipe, a pneumatic

brake distributor valve operatively responsive to variations of pressure in the main brake control pipe to provide a second control pressure, a reservoir and a brake cylinder device, there is provided a brake blending relay valve device comprising:

(a) a pressure regulator for controlling the supply of fluid pressure from the reservoir to the brake cylinder and the exhaust of the brake pressure; and

(b) a piston assembly engageable with said pressure regulator for effecting operation thereof, said piston assembly comprising:

(i) a first piston subjected on one side to the brake cylinder pressure for urging said piston assembly in a first direction and subjected on the other side to the first control pressure for urging said piston assembly in a direction opposite said first direction,

wherein the improvement comprises:

(ii) a second piston subjected on one side to said first pressure for movement in said first direction independently of said first piston and subjected on the other side to said second pressure for urging movement of said first piston in said second direction.

4,188,071

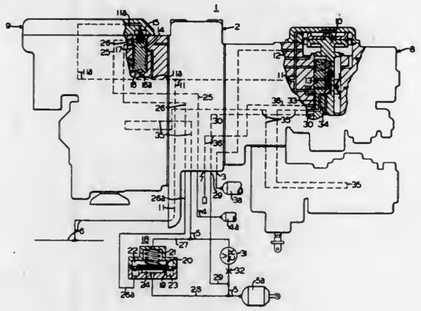
RAILWAY VEHICLE BRAKE APPARATUS ARRANGED TO ACCOMMODATE REDUCED EMERGENCY RESERVOIR VOLUME

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jun. 19, 1978, Ser. No. 916,999

Int. Cl.² B60T *15/22*

U.S. Cl. 303—33 **5 Claims**



1. A fluid pressure controlled railway vehicle brake apparatus comprising:

(a) a brake pipe in which the variation of fluid pressure is effective to initiate brake application and release control of the brakes on said vehicle;

(b) an auxiliary reservoir normally charged during brake release with fluid pressure at a value corresponding to the pressure carried in said brake pipe;

(c) an emergency reservoir normally charged with fluid pressure corresponding to the pressure carried in said brake pipe;

(d) fluid pressure operative brake means for effecting a brake application on said vehicle;

(e) a fluid pressure operative brake control valve device comprising:

(i) service brake control means for establishing fluid pressure communication between said auxiliary reservoir and said brake means in response to a reduction of fluid pressure in said brake pipe to provide a service brake application and for establishing fluid pressure communication between said brake means and atmosphere in response to an increase of fluid pressure in said brake pipe to provide said brake release; and

(ii) emergency brake control means for establishing fluid pressure communication between said emergency reservoir and said brake means when said reduction of said brake pipe fluid pressure occurs at a predetermined rate to provide an emergency brake application;

wherein the improvement comprises:

(f) first and second conduits connected in parallel with said brake means via which said auxiliary reservoir fluid pressure and said emergency reservoir fluid pressure is conducted, respectively, in accordance with operation of said service and emergency brake control means;

(g) cut-off valve means in said second conduit for interrupting fluid pressure communication between said emergency reservoir and said auxiliary reservoir during said emergency brake application until such time as said auxiliary reservoir fluid pressure is reduced to a predetermined value; and

(h) a one-way check valve device in said first conduit preventing the flow of said emergency reservoir fluid pressure from said second conduit to said auxiliary reservoir via said first conduit.

4,188,072

BRAKE ACCELERATOR DEVICE FOR AN AIR BRAKE SYSTEM OF A RAILWAY VEHICLE

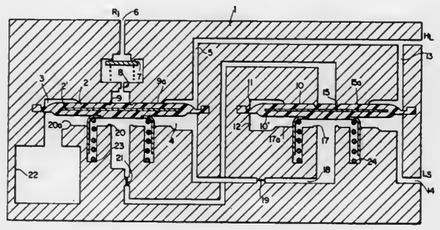
Josef Hintner, and Georg Staüble, both of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,754

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727762

Int. Cl.² B60T *15/32*

U.S. Cl. 303—69 **7 Claims**



1. A brake accelerator for an air brake system of a railway vehicle and comprising a first piston having one side subjected to air pressure in a brake line and a second side subjected to air pressure in an auxiliary reservoir, a first passage connected from an emergency reservoir and opening to said one side of said first piston, means defining an inlet valve in said first passage actuated by said first piston, a second piston having one side subjected to air pressure in a brake line and a second side subjected to air pressure in an auxiliary reservoir, means defining a first chamber on said second side of said first piston, means defining a second chamber at said second side of said second piston, a second passage including said second chamber connecting said first chamber to the auxiliary reservoir when the pressure in the brake line is less than or equal to the pressure in the auxiliary reservoir, and means for closing said second passage when the air pressure in said brake line reaches a predetermined value higher than the brake pressure in the auxiliary reservoir.

4,188,073

ANTI-VIBRATION APPARATUS FOR A VEHICLE BRAKE SYSTEM

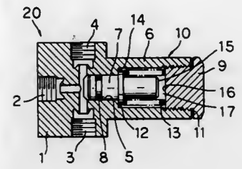
Masakazu Ishikawa; Juichi Shibatani, and Sadayoshi Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 5, 1978, Ser. No. 922,237

Claims priority, application Japan, Jan. 19, 1978, 53-4996

Int. Cl.² B60T *17/04*

U.S. Cl. 303—87 **3 Claims**



1. An anti-vibration means for an automotive hydraulic disc brake comprising:

a cylinder portion formed in communication with a hydraulic braking fluid circuit;

a plunger slidably and fluid-tightly fitted in said cylinder portion, one end of said plunger being under the pressure of said hydraulic braking fluid and the other end of said plunger facing an air chamber;

restricting means for restricting the axial sliding of said plunger within a limited range; and

spring means for constantly biasing said plunger in a direction to resist the braking fluid pressure,

wherein said cylinder portion is accommodated in a cup-shaped piston and integrally formed on the bottom wall of said piston, said piston being slidably fitted in a wheel cylinder of a disc brake, and the resilient force of said spring means is determined smaller than the force acting on said plunger through said braking fluid pressure in the high pressure range wherein no brake vibration occurs.

4,188,074

HYDRAULIC ANTI-SKID DEVICE

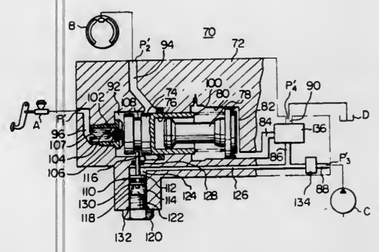
Toshio Yama, and Kazuaki Shimizu, both of Fujisawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 22, 1977, Ser. No. 826,671

Claims priority, application Japan, Aug. 23, 1976, 51-100372

Int. Cl.² B60T *17/18*

U.S. Cl. 303—92 **2 Claims**



1. A hydraulic anti-skid device for a hydraulic braking system, comprising

a pump for feeding a hydraulic fluid pressure into said anti-skid device,

first passage means for receiving a braking pressure,

second passage means communicable with said first passage means for allowing the braking pressure to be discharged from said anti-skid device,

an expansion valve operably disposed for controlling communication between said first and second passage means,

said expansion valve having a first position in which it provides said communication and a second position in which it obstructs said communication and reduces the braking pressure in said second passage means,

third means for causing said expansion valve to assume said first position when it is unnecessary to reduce the braking pressure in said second passage means and for causing said expansion valve to assume said second position when it is necessary to reduce the braking pressure in said second passage means, locking means which, when said anti-skid device is fed with said hydraulic fluid pressure from said pump, permits movement of said expansion valve from said first position into said second position and which, when said anti-skid device is not fed with said hydraulic fluid pressure from said pump, locks said expansion valve in said first position,

said expansion valve being formed with a groove,

said locking means comprising stop means engaged in said groove by biasing means when said anti-skid device is not fed with said hydraulic fluid pressure from said pump and disengaged from said groove by said hydraulic fluid pressure from said pump when said anti-skid device is fed with said hydraulic fluid pressure from said pump.

4,188,075

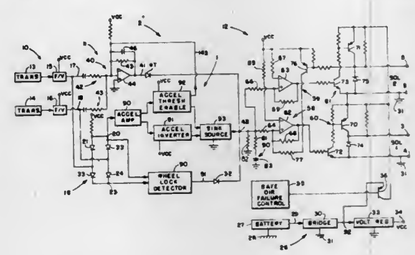
ADAPTIVE ACCELERATION SYSTEM FOR VEHICLE SKID CONTROL SYSTEMS

Yudh V. Rajput, Dayton, Ohio, and Gary J. Skodack, Novi, Mich., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 16, 1978, Ser. No. 916,311

Int. Cl.² B60T *8/02*

U.S. Cl. 303—106 **6 Claims**



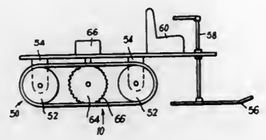
1. An anti-skid brake control system for automatically overriding manual control of a vehicle brake system in response to changes in vehicle wheel speed indicative of a skid condition or the like, comprising transducer means for producing an electrical signal representative of the speed of at least one vehicle wheel, detector means responsive to changes in such wheel speed as represented by such electrical signal for detecting deceleration of a magnitude indicative of an actual or incipient skid, control means for overriding such vehicle brake system in proportion to such detected deceleration, acceleration detector means for responding to acceleration of such vehicle wheel to produce an acceleration signal representative of such acceleration, and output means for controlling such control means to effect such overriding in inverse relation to the magnitude of such detected acceleration and further comprising enabling means for enabling said output means to effect such controlling when such vehicle wheel acceleration exceeds a predetermined threshold and until after such acceleration has begun decreasing, and wherein said output means includes means for disabling said detector means when enabling said output means.

4,188,076

ENDLESS BELT AND ROLL ASSEMBLY FOR VEHICLES OR CONVEYERS

Jorma Pohjola, Haravatie 6, 90530 Oulu 53, Finland

Filed Jun. 23, 1977, Ser. No. 809,453
Claims priority, application Finland, Jun. 24, 1976, 761865
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.² B65D *55/24*
U.S. Cl. 305—29 **9 Claims**



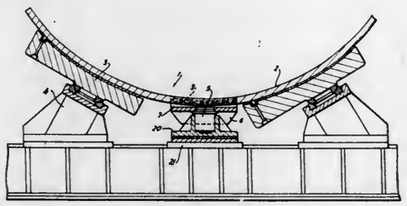
1. In a structure such as a vehicle or conveyer, a pair of roll means which are spaced from each other and which have central axes of rotation, respectively, situated in a given common plane and fixed with respect to each other, and endless belt means extending between and guided around said pair of roll means and having on opposite sides of said plane, respectively, a pair of runs which respectively travel in opposite directions between said roll means during rotation of the latter, said endless belt means having opposed endless side edge regions and midway between the latter an endless elongated central region which is flexible but substantially non-stretchable while between said central substantially non-stretchable region and each of said side edge regions said endless belt means has an endless lateral elastic portion capable of stretching and contracting longitudinally, each of said edge regions being in a stretched condition tending to contract upon itself when having a length approximately equal to that of said central region.

4,188,077

THRUST BEARING FOR TAKING UP AXIAL THRUST OF A ROTATING CYLINDER

Alain Chielens, Marcq en Baroeul; Bernard Deschamps, Villeneuve d'Ascq, and Gerard Marchal, Hellemmes, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 29, 1978, Ser. No. 891,296
Claims priority, application France, Apr. 1, 1977, 77 09879
Int. Cl.² F16C *25/02*
U.S. Cl. 308—135 **10 Claims**



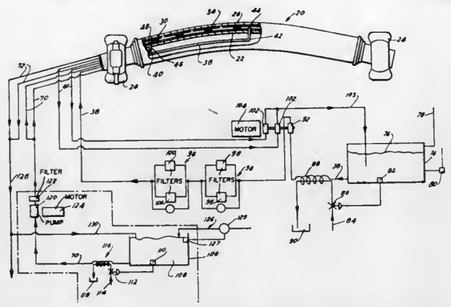
1. A thrust bearing device for taking up axial thrust of a cylindrical element of large radius rotating about an axis, the cylindrical element comprising a ring and bearings supporting the ring for rotation of the cylindrical element, which device comprises a support, a stationary stand, the support being mounted on the stand for pivoting about an axis extending radially with respect to the cylindrical element, the cylindrical element having at least one plane face, and bearing means mounted on the pivotal support in a gliding relationship along each plane face of the cylindrical element, the bearing means comprising a series of bearings arranged in an arc of a circle in gliding relationship with the plane face.

4,188,078

BEARING LUBRICATION SYSTEM FOR BOWED ROLLS

Joseph A. Bolton, Glens Falls, and William Hoover, Hudson Falls, both of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed May 25, 1978, Ser. No. 909,201
Int. Cl.² F16C *33/76*
U.S. Cl. 308—187 **9 Claims**



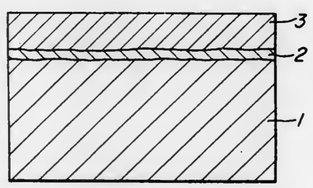
1. In a roll of the type having an elongated shaft, a plurality of spools dispersed about said shaft for rotation and a plurality of ball bearings disposed along said shaft, each of said bearings having an inner race in contact with said shaft, an outer race in contact with one of said spools and a through passageway between said races and cooperating with said races in defining a ball chamber, the improvement comprising; a recirculatory lubricant system for providing lubricant to the interior of said ball chambers including a lubricant reservoir, a lubricant line extending between said reservoir and the interior of the roll so that lubricant may be interjected to the interior of the roll at a predetermined location, and means for directing the lubricant interjected from the line into communication with the ball chambers in a desired pattern.

4,188,079

MULTIPLE-LAYER METAL BEARING FOR USE IN A LARGE-SIZE ENGINE

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Feb. 22, 1978, Ser. No. 879,973
Claims priority, application Japan, Aug. 22, 1977, 52/100277
Int. Cl.² F16C *33/06, 9/02*
U.S. Cl. 308—237 R **4 Claims**



1. A multi-layer metal bearing for use in a large-size engine having three layers consisting of a steel backing layer, a bonding layer of aluminum or aluminum alloy, and a bearing alloy layer, the improvement wherein said bearing alloy layer has the compositions of more than 50% up to 65% by weight tin, more than 0.5% up to 1.5% by weight copper, and the remainder essentially of aluminum, and said bearing alloy exhibits high temperature hardnesses at 100° C. or higher that varies continuously within the following range, i.e.;

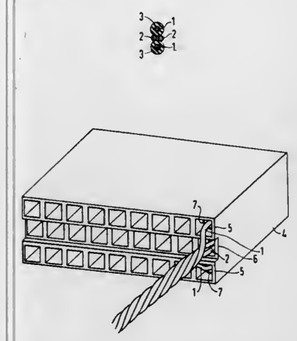
At 100° C.—18 to 29 Hv
At 150° C.—14 to 24 Hv
At 200° C.—9 to 19 Hv.

4,188,080

CABLE FOR TRANSMITTING LOW-LEVEL SIGNALS

Bernd Streble, Friedberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,855
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711531
Int. Cl.² H01B *11/04*
U.S. Cl. 339—14 R **7 Claims**



1. A signal transmitting system for transmitting two signals by cable with reduced cross-talk wherein the cable comprises: a cable formed of four conductors arranged together in a spiral quad, two of said conductors being positioned opposite to one another, said two of said conductors being signal conductors, the other two of said conductors being ground conductors, wherein the ground conductors are bare and the signal conductors are individually insulated and wherein the winding of the spiral quad is such that a line joining the center of the cores of the signal conductors is substantially perpendicular to the line joining the centers of the cores of the ground conductors, and wherein one of said signals is transmitted by one of said signal conductors and the other of said signals is transmitted by the other of said signal conductors.

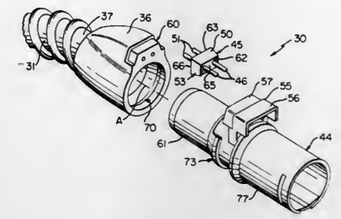
6. A cable and connector assembly for transmitting low-level signals with a low degree of close cross-talk comprising a cable consisting of four conductors combined together to form a spiral quad, two of the conductors being positioned opposite one another and being designated as signal conductors, another two of said conductors being designated as ground conductors and being, at least in part, positioned intermediate the signal conductors, the signal conductors being individually insulated and the ground conductors being bare, the conductors being connected to a connection element, the connection element comprising a three-row plug, a central row of the plug forming a ground row, the ground connectors being attached to the ground row, outer rows of the plug forming signal rows, and one of the signal conductors being each attached to one of the signal rows.

4,188,081

VACUUM CLEANER HOSE ASSEMBLY AND METHOD OF MAKING SAME

Homer N. Holden, Sylva, and Ivan Gaster, Hazelwood, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Jun. 5, 1978, Ser. No. 912,906
Int. Cl.² H01R *3/04*
U.S. Cl. 339—15 **28 Claims**



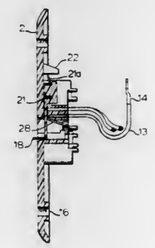
1. In a vacuum cleaner hose assembly comprising; an elongated vacuum hose having a hose end and a central longitudinal axis; a plurality of electrical conductors extending along said vacuum hose with each conductor having an end portion disposed immediately adjacent said hose end; a plurality of electrical connectors each fixed to an associated end portion of an associated conductor, and a flexible hose fitting fixed to said hose end and formed substantially as an integral part thereof with said fitting having a plurality of said electrical connectors embedded therein which are movable with flexing movements of said fitting; the improvement comprising; a rigid hose adapter operatively connected to said fitting, an electrical device carried by said adapter and connected to said embedded connectors, said device having precisely aligned integral electrical connector means, said device comprising a rigid support structure made of an electrical insulating material, and means positioning the electrical device relative to said adapter with said precisely aligned electrical connector means readily accessible for easy mating with cooperating electrical connector means, said positioning means comprising a positioning surface on said support structure and a cooperating surface on said adapter, said surfaces being self-aligning surfaces which self align upon connecting said adapter and electrical device to said fitting and embedded connectors.

4,188,082

TELEPHONE WALL JACK

Donald F. Dickey, Arlington, Tex., assignor to Superior Cable Corporation, Hickory, N.C.

Filed Feb. 15, 1979, Ser. No. 12,503
Int. Cl.² H01R *13/44*
U.S. Cl. 339—36 **9 Claims**



1. A telephone wall jack comprising:
(a) a base plate having at least one rectangular shaped hole therein;

(b) a jack housing circumscribing said hole on three sides composed of two directly opposing sidewalls integrally connected one to another by a third sidewall, all of said sidewalls extending perpendicular from and integrally connected to said base plate, said two directly opposing sidewalls forming a passageway in communication with said rectangular shaped hole and are connected by a top disposed parallel to and spaced apart from said base plate, said top having at least one free edge, said free edge containing a plurality of parallel slots adapted to receive spring contacts of a dielectric carrier;

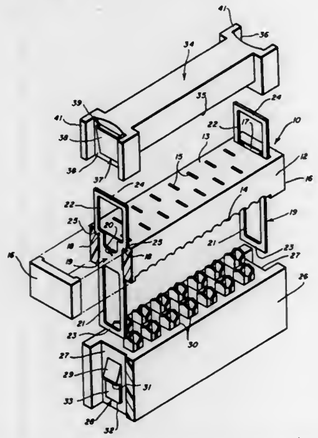
(c) a gate means disposed in said passageway slidably engaged between said directly opposed sidewalls from an open position, essentially exposing said rectangular shaped hole, to a closed position, essentially closing said rectangular shaped hole, and a spring means, said gate means being biased by said spring means to position the gate means in said closed position.

4,188,083

FLAT CABLE CONNECTOR WITH STRAIN RELIEF AND TWO-POSITION LATCH

Robert G. Knowles, Litchfield, Conn., assignor to Litton Systems, Inc., Oakville, Conn.

Filed Jun. 1, 1978, Ser. No. 911,213
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**



1. In a connector for terminating flat multi-conductor cables including a lower contact support in which is mounted a plurality of insulation displacement contacts, a pressure member having a pair of end walls on opposite ends thereof, and a strain relief, the combination comprising:

clip means for transmitting stress from said strain relief to said lower contact support,

slot means at either end of said pressure member for receiving said clip means,

means for holding said clip means in said slot means,

a first latch portion formed on one end of each of said clip means and a second latch portion formed on another end of each of said clip means,

first detents formed on opposite end surfaces of said lower contact support,

second detents formed on opposite end surfaces of said strain relief,

first catch means on each of said first detents for engaging said first latch portions,

second catch means on each of said first detents for engaging said first latch portions,

third catch means on each of said second detents for engaging said second latch portions, and

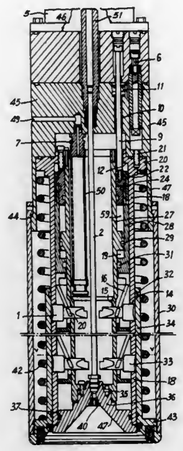
support surfaces between said first catch means and said second catch means for supporting said first latch portions.

4,188,084

UNDERWATER ELECTRICAL CONNECTORS

Georges Buresi, Versailles, and Rene G. Grappé, Paris, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Nov. 17, 1978, Ser. No. 961,829
Claims priority, application France, Nov. 21, 1977, 77 34855
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 R **19 Claims**



1. An electrical connector for underwater connection of groups of electrical contact elements comprising:

a movable plug carrying a group of electrical contact elements;

a base carrying a group of electrical contact elements to be connected to the elements of said plug;

an enclosure in each of said plug and base filled with insulating liquid in which the respective said electrical contact elements are immersed, one of said enclosures being annular and the other of said enclosures being cylindrical;

an inner protective body inwardly limiting said annular enclosure; and

an outer protective body outwardly limiting said cylindrical enclosure,

wherein said cylindrical enclosure is adapted to slide relatively over the surface of said annular enclosure so as to replace said inner protective body from said cylindrical enclosure and to place corresponding ones of said electrical contacts opposite one another.

4,188,085

HIGH DENSITY SOLDER TAIL CONNECTOR ASSEMBLY FOR LEADLESS INTEGRATED CIRCUIT PACKAGES

Lionel D. Aldridge, Seminole, Fla., and George J. Sprenkle, Phoenixville, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 27, 1978, Ser. No. 946,279
Int. Cl.[2] H05K *1/10*
U.S. Cl. 339—176 MP **17 Claims**

1. A connector assembly for leadless integrated circuit packages comprising:

(a) a plurality of complementary pairs of unitary metallic contacts, each of said contacts comprising:

(i) an elongated S-shaped spring-beam portion;

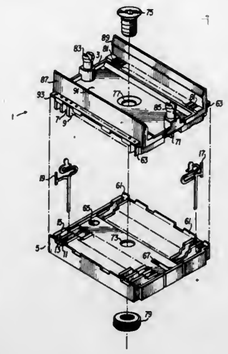
(ii) a contacting portion formed on an upper part of said spring-beam portion;

(iii) a preloading tab formed on said upper part of said spring-beam adjacent said contacting area;

(iv) a substantially flat base portion connected to a lower part of said spring-beam portion;

(v) a dog-leg portion formed on said base portion; and

(iv) a downwardly extending tail portion formed on said dog-leg portion, said complementary pairs of contacts



differing solely in the location of said dog-leg portion formed on said base portion; and

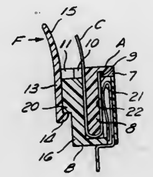
(b) upper and lower dielectric headers each having a plurality of contact receiving cavities formed therein, said cavities separated by a plurality of intermeshing walls, each said cavity of said lower header including channel means for receiving said contact, and each said cavity of said upper header including contact receiving means and preloading means to bias said contact in a preloaded position when said upper header is fitted over said lower header.

4,188,086

CONNECTOR FOR TERMINATING FLEXIBLE PARALLEL CONDUCTORS

Hiromasa Inouye, Musashino; Tomonari Ohtsuki, Itabashi, and Yoshiaki Igarashi, Ichikawa, all of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 12, 1978, Ser. No. 914,196
Claims priority, application Japan, Jun. 13, 1977, 52/075911[U]
Int. Cl.[2] H01R *13/54;* **H05K** *1/12*
U.S. Cl. 339—176 MF **4 Claims**



1. A connector for terminating flexible parallel conductors, comprising:

a male part having a length of distal surface about which an end of a flexible group of parallel conductors is bent, said male part including a base portion and an elongate projection projecting perpendicularly from said base, the end of said elongate projection defining said length of distal surface;

a female part having a closed slot therein and a plurality of contacts along at least one wall of said slot, for receiving at least said length of distal surface with said end of said group of parallel conductors bent thereabout, said contacts electrically contacting respective ones of said parallel conductors; and

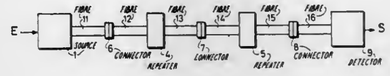
a plurality of recesses in said base portion of said male part spaced along said elongate projection for receiving and holding the ends of respective ones of said parallel conductors.

4,188,087

OPTICAL FIBRE POSITIONING FERRULE AND CONNECTOR COMPRISING SUCH A FERRULE

Luigi D'Auria; André Jacques, and Christian Malsot, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 10, 1978, Ser. No. 895,076
Claims priority, application France, Apr. 13, 1977, 77 11060
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **7 Claims**



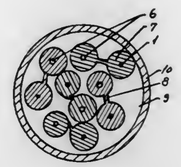
1. A positioning ferrule for an optical fibre propagating a radiation and comprising a core and a sheath, said ferrule comprising a rigid body inserting said fibre and being integral with said fibre, and photodetector means located within said body for receiving the fraction of energy travelling in said sheath.

4,188,088

OPTICAL ELEMENT FOR USE IN OPTICAL TRANSMISSION MEANS

Axel Andersen, Gentofte; Poul U. Knudsen, Hellerup, and Knud B. Jensen, Skodsborg, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Copenhagen, Denmark

Filed Nov. 4, 1977, Ser. No. 848,694
Claims priority, application Denmark, Nov. 9, 1976, 5053/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.23 **15 Claims**



13. Optical transmission means comprising at least one optical element located in a sheath, wherein said optical element comprises at least one optical fiber which is provided with an essentially tight-fitting coating and a strength member provided with an essentially tight-fitting coating of the same material, each of said coatings having an essentially circular cross-section, the coating or coatings on the optical fibers further being firmly connected with the coating on the strength member by a connection means of the same material as the coating, and whose thickness is substantially smaller than the diameter of the coatings and where further the fiber or fibers are given a curve shaped course.

4,188,089

OPTICAL FIBERS HAVING HIGH INFRARED TRANSMITTANCY

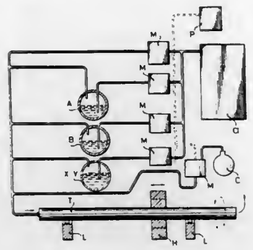
Georg Gliemeroth, Finthen, and Lothar Meckel, Ostrich, both of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,238

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648702

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.34 **12 Claims**



1. In an optical fiber having infrared transmittancy, and a refractive index gradient, and which is prepared by chemical vapor deposition, the improvement wherein in the vitreous, light-conducting region of the fiber, the anions are predominantly S, Se, Te or combinations thereof, and the cations are Ge, Si, P, B, Sb, Ti or combinations thereof.

4,188,090

RETRACTABLE HEAD-UP DISPLAYS

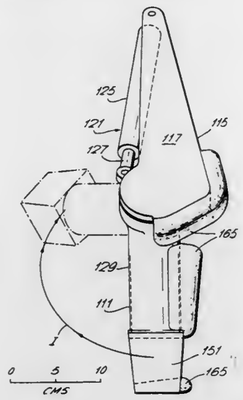
Stafford M. Ellis, East Preston, England, assignor to Elliott Brothers (London) Limited, Chelsmsford, England

Filed May 26, 1978, Ser. No. 909,831

Claims priority, application United Kingdom, Jun. 1, 1977, 23101/77; Jun. 21, 1977, 25809/77; Apr. 4, 1978, 13143/78

Int. Cl.[2] G02B *27/10*

U.S. Cl. 350—174 **3 Claims**



1. A display head for an aircraft head-up display system comprising an optical projector and an image combiner through which an observer can view a distant scene and from which collimated optical images developed by and projected from the optical projector are reflected to the observer wherein: the image combiner is supported from a light obstructive member which intrudes within the observer's field of view of the distant scene in use of the display head, but no intruding part of said member has a width greater than a prescribed interpupillary distance so that notwithstanding the intrusion of said member there is no obstruction by said member of the observer's view of the distant scene, the display head being rotatable about a single axis for displacement between an operational position in which the display head is at a position intercepting the observer's line-of-sight to the distant scene and a stowed position at which the display head is at a position at which it does not intrude into the observer's field of view of the distant scene, and said single axis being inclined with respect to the aircraft orthogonal axes at such an angle, and the display head is so shaped, that in moving the display head from the operational position to the stowed position the initial movement of the display head has a major component parallel to the observer's line-of-sight to the distant scene, and the terminal movement of the display head has a major component to the left or right of said line-of-sight, in a direction at right angles to said line-of-sight towards the stowed position.

4,188,091

CATA-DIOPTRIC OBJECTIVE LENS SYSTEM

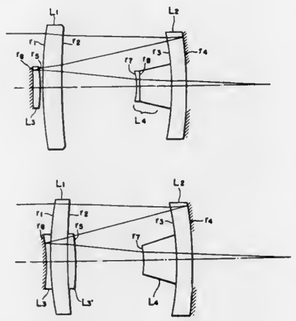
Toru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,806

Claims priority, application Japan, Apr. 22, 1977, 52-46463

Int. Cl.[2] G02B *17/08*

U.S. Cl. 350—201 **5 Claims**



1. A cata-dioptric objective lens system comprising a first, second, third and fourth lens components, said first lens component being a positive meniscus lens arranged convex toward the object side, said second lens component being arranged concave toward the object side and having a concave primary mirror formed on its surface on the image side by leaving a transparent central portion, said third lens component being arranged near said first lens component and having a secondary mirror formed on its surface on the object side, said fourth lens component being a negative lens component having a large thickness and being cemented to said second lens component, said cata-dioptric objective lens system being arranged so that the rays entered through said first lens component are reflected by said primary mirror and secondary mirror, go out through said transparent central portion of said second lens component and are imaged thereafter, said cata-dioptric objective lens system satisfying the following conditions:

(1) $1.0f \leqq f_1 \leqq 2.5f$

(2) $0.05f \leqq |r_7| \leqq 0.2f$

(3) $0.05f \leqq D_4 + D_2 \leqq 0.1f$

wherein reference symbol f_1 represents the focal length of the first lens component, reference symbol r_7 represents the radius of curvature of the surface on the object side of the fourth lens component, reference symbol D_2 represents the thickness of the second lens component, and reference symbol D_4 represents the thickness of the fourth lens component.

4,188,092

RETROFOCUS TYPE WIDE-ANGLE OBJECTIVE LENS

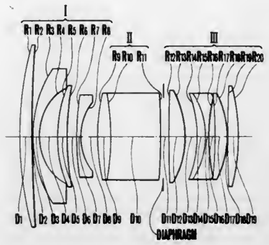
Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,422

Claims priority, application Japan, Apr. 5, 1977, 52/38690

Int. Cl.[2] G02B *9/64*

U.S. Cl. 350—214 **5 Claims**



1. A retrofocus type wide-angle objective lens comprising:

a divergent first lens group including in the indicated order a first positive meniscus lens having a convex face directed toward an object to be photographed, a second negative meniscus lens having a convex face directed toward the object, a third positive meniscus lens having a convex face directed toward the object and a fourth negative meniscus lens also having a convex face directed toward the object;

a convergent second lens group behind the first lens group and coaxial therewith and including a positive lens having a convex front lens face directed toward the object;

a convergent third lens group behind the second lens group and coaxial therewith and including in the indicated order a positive lens having a convex rear lens face directed toward an image of the object being photographed, a biconcave lens, a positive meniscus lens directing a convexed face to the image and a positive lens; and

a diaphragm disposed between the second and third lens groups.

4,188,093

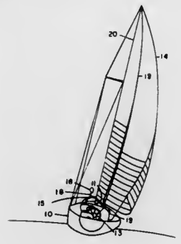
LARGE SAILBOAT VISIBILITY IMPROVEMENTS

Henry A. Netzer, 7441 Classic Dr., Glen Burnie, Md. 21061

Filed Mar. 30, 1978, Ser. No. 891,905

Int. Cl.[2] G02B *5/08*

U.S. Cl. 350—303 **1 Claim**



1. A pair of wide angle mirror assemblies adapted to be mounted on the bow or bowrail of a large sailboat comprising, a pair of mirror brackets for use in affixing the mirrors to the bow or bowrail of the sailboat, a pair of mirrors, means for mounting one of said mirrors so as to permit pivotal movement about a horizontal axis to each of said mounting brackets, and means attached to each said mirrors so that each mirror will always maintain the reflecting surface thereof in a vertical plane, said assemblies when attached to the bow of a large sailboat permitting the helmsman to see portions of the horizon, forward, around and behind the sails, which, in the absence of such device, would be obscured by opaque sail material.

4,188,094

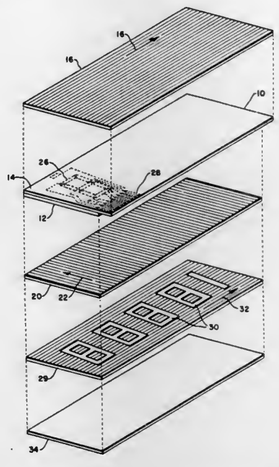
LIQUID CRYSTAL DISPLAY HAVING LIGHT INDICIA ON A DARK BACKGROUND

James L. Fergason, 5806 Horning Rd., Kent, Ohio 44240

Filed Feb. 15, 1978, Ser. No. 877,923

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—337 **3 Claims**



1. A liquid crystal display in which an image appears light on a dark background, comprising a layer of nematic liquid crystal material of positive dielectric anisotropy sandwiched between transparent parallel plates, films of transparent conductive material on selected areas of the plates and in contact with the liquid crystal material, the plates being treated to effect a twisted-nematic structure such that polarized light will be rotated through 90° in passing through the polarizer, first polarizer means on the front of said display, second polarizer means behind said display covering the entire area of the display except those selected areas defined by the transparent conductive material on one of the transparent plates, and third polarizer means adjacent said second polarizer means and crossed with respect thereto such that polarized light which passes through the transparent parallel plates in areas outside the selected areas will not pass through the second and third polarizer means.

4,188,095

LIQUID TYPE DISPLAY CELLS AND METHOD OF MANUFACTURING THE SAME

Katsuo Nishimura, and Takanori Nanya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 709,938, Jul. 29, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,053

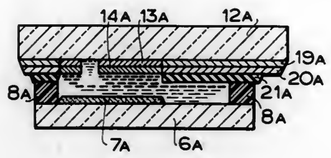
Claims priority, application Japan, Jul. 29, 1975, 50-92403; Jul. 29, 1975, 50-92406; Aug. 26, 1975, 50-102590

Int. Cl.[2] B01J *17/00*

U.S. Cl. 350—357 **6 Claims**

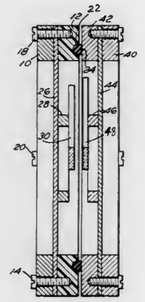
1. A method of manufacturing a liquid display cell of the type including electrode layers on a substrate and electrochromic layers on said electrode layers, said electrode layers and said electrochromic layers being arrange in a predetermined pattern, said method comprising the steps of forming an electrode layer on said substrate, forming an electrochromic layer

on said electrode layer, and photoetching in one step said electrode layer and said electrochromic layer thereby forming



a plurality of electrode layers and a plurality of electrochromic layers having the same pattern as said electrode layers.

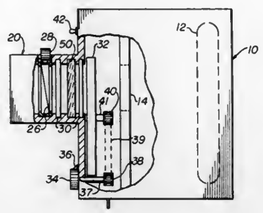
4,188,096
ACOUSTO-OPTICAL TRANSDUCER
Peter Shajenko, Storrs, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 2, 1976, Ser. No. 673,180
Int. Cl.[2] G02F *1/11*
U.S. Cl. 350—358 **5 Claims**



1. An acousto-optical transducer for detecting acoustic pressure wave which comprises:
a generally cylindrical housing having two generally parallel faces, said housing being air tight and water tight;
a pair of mirrors including a first mirror and a second mirror, said first mirror and said second mirror being arranged to be parallel to each other in said housing and being generally parallel to the faces of said housing;
means for free motion of said pair of mirrors under the influence of the acoustic pressure waves;
means for filling said housing with a transparent fluid;
means for allowing an incident light beam of a first frequency to fall on said first mirror in said housing and for allowing the reflected light of a second frequency after multiple reflections thereof to come out of said housing; and
means for comparing said reflected light beam of the second frequency with a light beam of a fixed frequency.

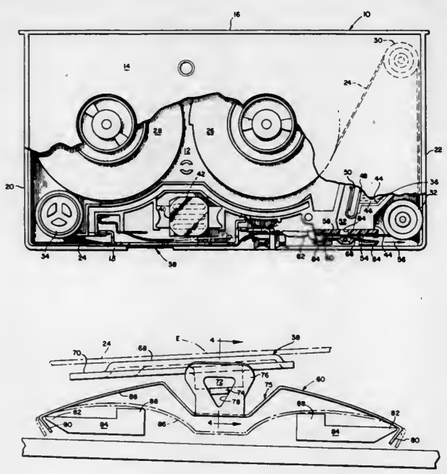
4,188,097
METHOD OF AND APPARATUS FOR TESTING VISUAL INTEGRITY
Jack T. Holladay, 8484 Ariel, Houston, Tex. 77074
Filed Jun. 2, 1977, Ser. No. 802,648
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—36 **18 Claims**

4. Apparatus used to test the visual integrity of an individual, comprising:
a target;
a light source for illuminating the target;
a binocular viewing mechanism or providing an orthophoric view of the target to the individual with a Cyclopean axis extending through the geometric center of the target, said binocular viewing mechanism having a right eyepice for viewing substantially one-half of the target formed when bisecting the target with a sagittal plane passing through the Cyclopean axis and a left eyepiece for viewing substantially the other half of the target;



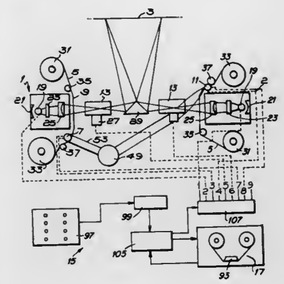
means for varying the intensity of light arriving at the right and left eyepiece in response to the light intensity perceived in each eye by the individual until the light intensity is perceived to be equal in both eyes; and
means connected to said varying means for providing a measurement of the difference between the light intensity provided at the right eyepiece and the light intensity provided at the left eyepiece as an indication of the visual integrity of the individual.

4,188,098
PHOTOGRAPHIC FILM CASSETTE HAVING BOWED SPRING WITH DEVICE PREVENTING OVERSTRESSING OF SPRING
Sheldon D. Powers, Stoneham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 4, 1979, Ser. No. 26,908
Int. Cl.[2] G03C *11/00*
U.S. Cl. 352—130 **9 Claims**



1. In a film cassette having a housing containing a strip of film, forming means for facilitating formation of a processing fluid layer on a given film surface during travel of the film therepast in a given direction, a pressure pad biased towards said forming means so as to support successive incremental portions of the film strip in a predetermined relationship to said forming means, the improvement comprising:
a deflectable, generally bowed shaped spring having end portions and an intermediate portion, said intermediate portion engaging and biasing said pressure pad toward said forming means with a predetermined minimum biasing force to support the strip in said predetermined relationship; and
spring support means for engaging and supporting said opposite end portions, said support means having spring bearing surfaces being in spaced relationship to said intermediate portion for limiting deflection of said spring such that said spring does not become deflected to the point of becoming overstressed, thereby precluding substantially altering said predetermined minimum biasing force.

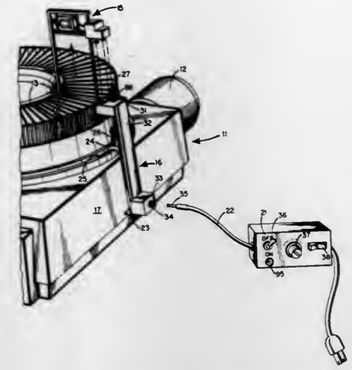
4,188,099
IMAGE PROJECTION APPARATUS WITH SUSTAINED IMAGE EXPOSURE
Phillip R. Hadden-Deering, 5 N. Dene, Birtley, Tyne and Wear, England
Filed Jan. 6, 1978, Ser. No. 867,411
Claims priority, application United Kingdom, Jan. 6, 1977, 280/77
Int. Cl.[2] G03B *21/32, 21/26*
U.S. Cl. 353—94 **2 Claims**



1. Apparatus for projecting plural images onto a screen area comprising in combination:
a pair of projectors, each of said projectors having an illuminating projection lamp, a zoom focusing lens and a film transport mechanism, said film transport mechanism comprising a drive connected to a film advancing sprocket by a selectively operable clutch and brake and a Geneva transmission for frame-by-frame advancing of a film for normal movie film-type drive, the Geneva transmission being selectively disconnectable from the sprocket in favor of an auxiliary drive for slowly advancing the film for scanning of a frame;
reflecting means arranged with said projectors so as to project the images produced by said projectors in coincidence onto a common screen area;
means for on/off switching of each of said projection lamps;
means for driving each of said transport mechanisms at a selected speed;
means for moving each of said zoom lenses; and
a control unit for controlling said switching means, said driving means and said zoom lens moving means, said control unit including a pre-programmed magnetic tape memory, a decoder and actuator means responsive to said decoder.

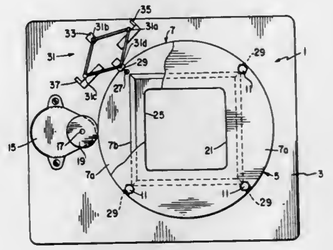
4,188,100
ROTARY SLIDE CARRIER SYSTEM
Harry W. Prichett, Newtonville, Mass., assignor to Media Arts Workshop Inc., Newton, Mass.
Filed May 24, 1976, Ser. No. 689,482
Int. Cl.[2] G03B *1/42, 21/00*
U.S. Cl. 353—95 **18 Claims**

1. A slide carrier system for use with a conventional projector of flat transparent slides, said projector being formed with a slot adapted to retain one of said transparent slides in a position common with the axis of the projector light bulb and lens assembly, said position being the slide projection position, said flat transparent slides being readily interchangeably placed in said slot, said slide carrier system comprising:
means for retaining a transparent slide;
a carrier frame, said means for retaining said transparent slide being mounted on said carrier frame for rotation with respect thereto, said carrier frame being adapted to be selectively placed into said slot in said projector so that



said transparent slide is in said slide projection position, said carrier frame and said transparent slides being interchangeable with each other to reside in said slot in said projector;
a motor mounted on said carrier frame;
means coupling said motor to said transparent slide retaining means for rotation thereof; and
means for coupling a source of power to said motor for selective rotation thereof.

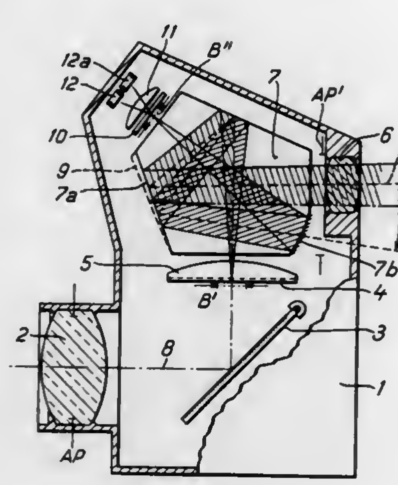
4,188,101
ROTATABLE SLIDE HOLDER
Hironori Masuda, 34-35 33rd St., Long Island City, N.Y. 11106
Filed Jun. 28, 1977, Ser. No. 810,866
Int. Cl.[2] G03B *1/48*
U.S. Cl. 353—95 **1 Claim**



1. A rotatable slide holder comprising:
support means;
slide gripping means including first and second spaced members adapted to maintain a slide between said members, one of said members being formed with four detents, each of said four detents being spaced 90° from the next adjacent one of said four detents, said member formed with said detents having a generally circular cross section and said detents geing indentations formed in the outer surface of said member;

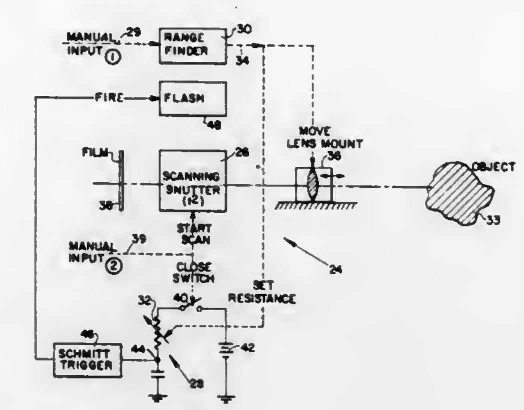
means for rotationally fixing said members relative to one another;
coupling means for rotationally coupling said slide gripping means to said support means whereby said gripping means is adapted to rotate about an axis perpendicular to a plane of a slide maintained between said first and second members;
drive means mounted on said support means and coupled to said gripping means for rotating said gripping means; and
switching means coupled to said drive means and sequentially interacting with each of said detents for controlling the operation of said drive means, said swiching means comprising a pantograph, one leg junction comprising said locking means and the two leg junctions adjacent said one junction comprising the contacts of said switching means, said switching means including locking means such that rotation of said gripping means is prevented and said drive means are deactivated when said locking means are moved into engagement with a detent.

4,188,102
MIRROR REFLEX CAMERA WITH ELECTRONIC RANGEFINDER
Klaus-Dieter Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Filed Jun. 20, 1978, Ser. No. 917,249
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731192
Int. Cl.[2] G03B *3/10, 13/06, 13/16*
U.S. Cl. 354—25 **2 Claims**



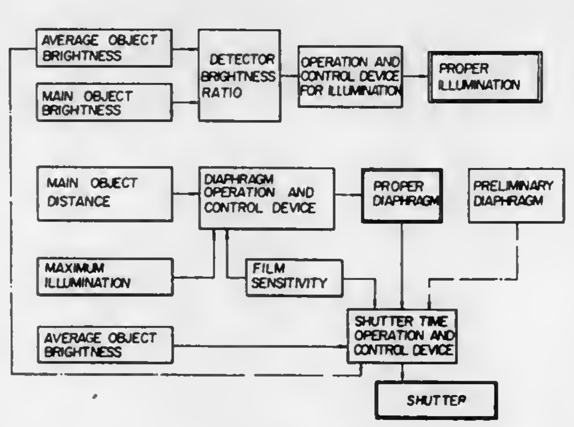
1. In a mirror reflex camera having a pentaprism having a beam exit surface and means for generating a viewer axis, a picture taking objective with a horizontal optical axis offset in parallel from its original path by multiple reflections in said pentaprism, a grating acting as a spatial frequency filter, an electronic range finder including a photoelectric detection system, an object image projected by said picture taking objective through said pentaprism by mirror means mounted at the beam exit surface of said pentaprism onto said grating, said grating located in the focal plane of said mirror means and preceding said photoelectric detection system, the improvement wherein said mirror means comprises a fully specular concave mirror (7*b*) provided at the lower edge of the exit surface of said pentaprism (7) and comprising means for deviating said viewer axis (8*a*) of a beam issuing from said object image by an angle up to 5° downward with respect to said horizontal optical axis (8) onto said fully specular concave mirror (7*b*) and deviating another beam issuing from said object image onto the transparent part of the rear surface of said pentaprism and an ocular (6) with an axis offset upward from said deviated viewer axis and slanted so that the ocular axis (6*a*) subtends an angle up to 5° with respect to said horizontal axis (8) of said deviated viewer axis.

4,188,103
RANGE SYNCHRONIZED FLASH PHOTOGRAPHIC APPARATUS AND METHOD FOR ACHIEVING OPTIMUM FLASH EXPOSURE
Conrad H. Biber, Needham; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 21, 1978, Ser. No. 898,546
Int. Cl.[2] G03B *7/10, 15/05*
U.S. Cl. 354—27 **24 Claims**



1. Apparatus for photographing a subject, comprising:
a scanning shutter which when actuated produces a predetermined, timewise variation in exposure aperture area;
ranging means for providing an output representative of the range of a subject;
a flash unit; and
means for actuating the shutter to start its scanning, the improvement comprising:
means for firing the flash unit to produce a flash of illumination after a time period, measured from the first light through the shutter, dependent on the output of the ranging means, the relationship between the time period and subject range establishing a parametric relationship between the brightness of the subject due to its flash illumination and the scanning time of the shutter, the inverse of this parametric relationship constituting the timewise variation in the exposure aperture area of the shutter.

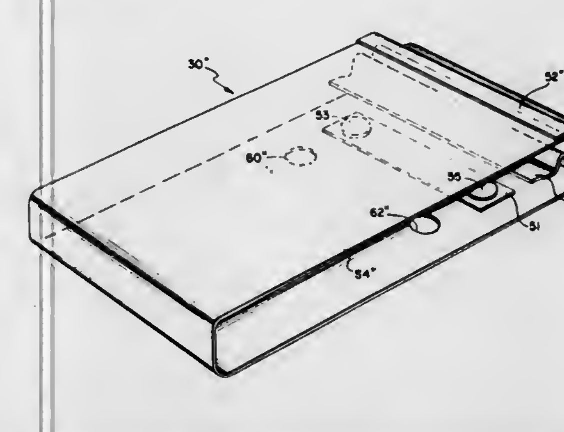
4,188,104
AUTOMATIC CONTROL DEVICE FOR ELECTRONIC FLASH
Takashi Uchiyama, Yokohama; Tetsuya Taguchi, Kawasaki, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 471,561, May 20, 1974, abandoned. This application Jan. 13, 1977, Ser. No. 759,063
Claims priority, application Japan, May 24, 1973, 48/58369
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—31 **12 Claims**



1. The combination of a camera and an electronic flash device, said electronic flash device comprising:

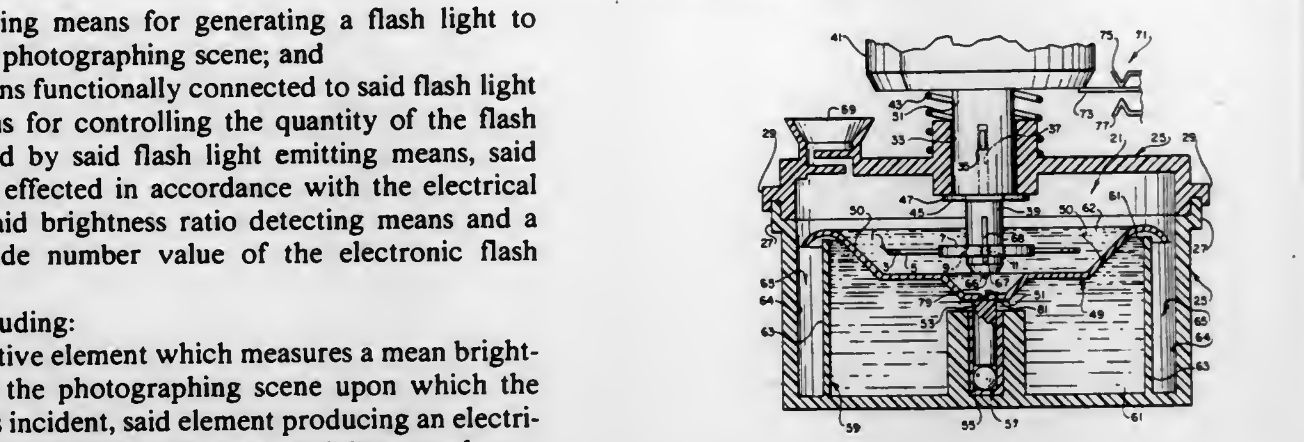
brightness ratio detecting means which measures a brightness value of a main portion of a photographing scene upon which natural light is incident and a brightness value of a sub-portion of the scene upon which the natural light is incident, said means producing an electrical signal corresponding to a ratio of one brightness value with respect to the other;
flash light emitting means for generating a flash light to illuminate the photographing scene; and
first control means functionally connected to said flash light emitting means for controlling the quantity of the flash light generated by said flash light emitting means, said control being effected in accordance with the electrical signal from said brightness ratio detecting means and a maximum guide number value of the electronic flash device;
said camera including:
a first light sensitive element which measures a mean brightness value of the photographing scene upon which the natural light is incident, said element producing an electrical signal corresponding to the mean brightness value;
second control means which controls the quantity of light incident upon said first light sensitive element and the aperture size of the camera according to said maximum guide number value and information relating to a distance to said main portion of the scene being photographed; and
third control means connected to said first light sensitive element for controlling an exposure time of the camera according to the electrical signal from said first light sensitive element.

4,188,105
BATTERY CONTAINING FILM CASSETTE WHEREIN REMOVAL OF LAST SHEET INSULATES CONTACTS
Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Nov. 6, 1978, Ser. No. 957,978
Int. Cl.[2] G03B *17/26, 19/10*
U.S. Cl. 354—202 **21 Claims**



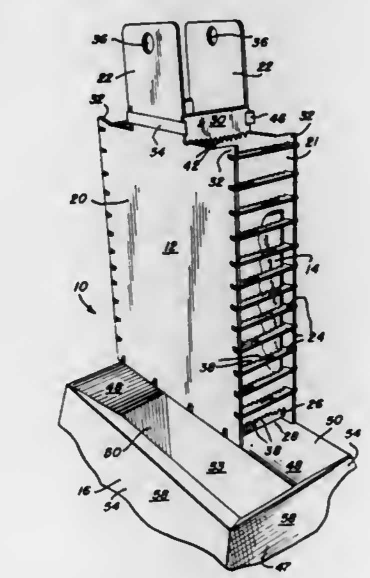
1. A photographic film assemblage comprising:
a film cassette having means for defining an exposure opening through which a film unit is adapted to be exposed, means defining an egress opening through which an exposed film unit is adapted to be advanced from the film cassette subsequent to exposure, and at least one aperture through which a pair of electrical contacts in a camera may extend so as to engage the terminals of a battery located within the film cassette;
a plurality of sheet-like members including several film units located within said film cassette;
a battery including a pair of terminals located within said film cassette with said terminals being located adjacent to and in alignment with said at least one aperture; and
means coupled to the last of said sheet-like members to be moved from said cassette via said egress opening when located within the camera for electrically insulating said terminals from the camera contacts in response to the movement of said last sheet-like member from said film cassette.

4,188,106
APPARATUS AND METHOD FOR PROCESSING FILM
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 6, 1978, Ser. No. 949,331
Int. Cl.[2] G03D *3/04*
U.S. Cl. 354—330 **9 Claims**



1. Apparatus for processing a film disc, said apparatus comprising:
a tray for receiving a film disc and a processing solution;
means for rotating a film disc with respect to said tray, the film disc being in contact with a processing solution in said tray;
means supporting said tray for rotation about the same axis as that of a rotated disc; and
means for selectively coupling said tray and said rotating means for simultaneously rotating said tray and a film disc to centrifugally dishcarge the processing solution from said tray and the film disc after the disc has been processed in the solution.

4,188,107
PHOTOGRAPHIC PRINT PROCESSING SYSTEM
Robert W. Mitchell, 707 Myrtle Ave., Saint Joseph, Mich. 49085
Filed Jan. 10, 1979, Ser. No. 2,437
Int. Cl.[2] G03D *13/04*
U.S. Cl. 354—328 **19 Claims**



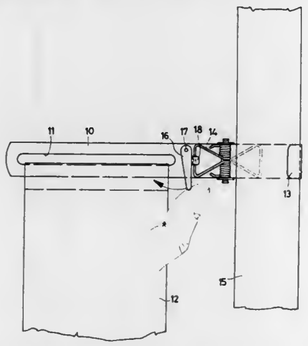
1. A photographic processing basket for use in processing flexible exposed photographic sheet material comprising:
substantially rectangular front and back members;
a handle extending upwardly from the top of said front and back members for holding the basket during use;
a plurality of spacers mounted along three sides and between said front and back members for holding said front and back members in spaced parallel relationship with each other creating a box-like structure;

each of said spacers having a means for receiving and separating said flexible photographic sheet material;
a plurality of base plates mounted in spaced relationship with each other across one side of said box-like structure and subtending at least some of said spacers for directing fluid and for creating solution turbulence when the basket is agitated within processing fluids;
a movable comb for engaging the top side of said front and back members and for holding and separating said flexible photographic sheet material;
means for guiding said comb along the top of said front and back members; and,
means for securely latching said comb to said front and back members thereby holding and separating the flexible photographic sheet material on all sides.

4,188,108
DEVICE FOR CLIPPING STRIPS OF PHOTOGRAPHIC PAPER TO DEVELOPERS COMPRISING A FLAT CONVEYOR BELT

Lodovico Falomo, Orcenigo Inferiore, Zoppola (Pordenone), Italy

Filed May 19, 1978, Ser. No. 907,616
Claims priority, application Italy, May 31, 1977, 24214A/77
Int. Cl.² G03D *13/10*
U.S. Cl. 354—345 **2 Claims**



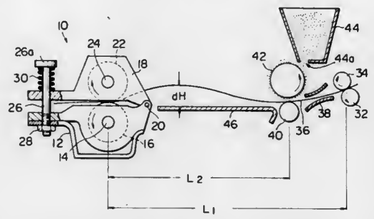
1. A device for clipping strips of photographic paper to a flat conveyor belt of a developer, comprising a bar to which the photographic paper is to be connected, a hook at one end of said bar for hooking to the flat belt of the developer, a resilient clip having a preloaded position and a released position fixed to the bar at a distance from the hook such that the clip in its released position is able to clamp the conveyor belt on to the bar when the bar is hooked to the belt by the hook, and a releasable retention means cooperating with the clip to maintain it in its preloaded position.

4,188,109
FIXING APPARATUS FOR ELECTROPHOTOGRAPHY

Hiroyuki Idenawa; Misao Tanzawa, and Yukihiro Ohno, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 21, 1976, Ser. No. 698,457
Claims priority, application Japan, Jun. 30, 1975, 50/81225
Int. Cl.² G03G *15/00;* **F27B** *9/28;* **H05B** *1/00*
U.S. Cl. 355—3 FU **4 Claims**

1. An electrophotographic copying apparatus comprising in combination:
feed means having first and second rotating feed rollers to feed a copy sheet;
developing means to form a toner image on said copy sheet, said developing means comprising a developing roller disposed above the path of travel of said copy sheet;
fixing means having first and second rotating fixing rollers to pressingly feed said copy sheet therebetween to fix the toner image to said copy sheet, said first and second fixing rollers having a bite at the point of contact therebetween;
an axis of said second fixing roller forming an acute angle with an axis of said first fixing roller such that a tangent line at the point of contact of the two fixing rollers at one longitudinal end of the fixing rollers extends downwardly in the direction of feed of the copy sheet and at the other longitudinal end extends upwardly in the direction of feed of the copy sheet;
said developing roller being located between said feed rollers and said fixing rollers and closer to said feed rollers than said fixing rollers;
the distance between said feed rollers and said fixing rollers being less than the length of said copy sheet;
said feed rollers feeding said copy sheet to said fixing rollers at a speed higher than the speed at which said fixing



rollers feeds said copy sheet therebetween such that said copy sheet between said fixing rollers and feed rollers bows generally upwardly to permit one side portion of the leading end of the copy sheet to be fed downwardly into said bite at the point of contact between said fixing rollers at said one longitudinal end of the fixing rollers and to permit the other side portion of the leading end of the copy sheet to be fed upwardly into the bite at the point of contact between said fixing rollers at said other longitudinal end of the fixing rollers, thereby precluding wrinkling of said copy sheet as the latter is fed to said fixing rollers while said generally upward bow does not exceed a height which would eliminate a gap between said bowed copy sheet and said overlying developing roller, said location of said developing roller closer to said feed rollers than said fixing rollers maximizing the distance of said upward bow from said developing means.

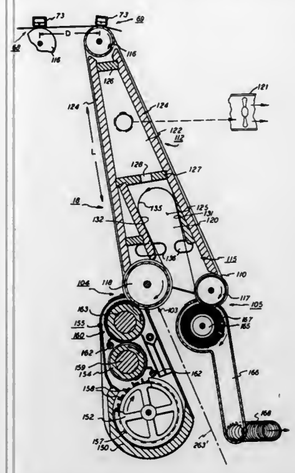
4,188,110
PHOTOCONDUCTIVE BELT SUPPORTING APPARATUS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,809
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 BE **6 Claims**

1. Photoreceptor support apparatus comprising in combination:
(a) at least two rotatable spaced apart belt supporting rolls, said rolls defining a belt run therebetween;
(b) an endless photoconductive belt disposed over said rolls, the length of said belt being greater than the length of the belt run defined by said rolls;
(c) means for drivingly rotating at least one of said rolls to produce uniform uninterrupted movement of said belt along the entire length of said belt;
(d) means forming a vacuum chamber interior of said belt run; and

(e) means for evacuating said chamber to draw the excess length of said belt into said chamber whereby to form a

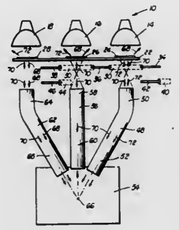


U-shaped belt loop while tensioning said belt to provide operative engagement with said rolls.

4,188,111
ADDITIVE TRI-COLOR LAMPHOUSE FOR A PHOTOGRAPHIC PRINTER

Roger L. Marvin, Wichita, Kans., assignor to Kreonite, Inc., Wichita, Kans.

Filed Sep. 15, 1978, Ser. No. 942,878
Int. Cl.² G03B *27/54, 27/76*
U.S. Cl. 355—37 **6 Claims**

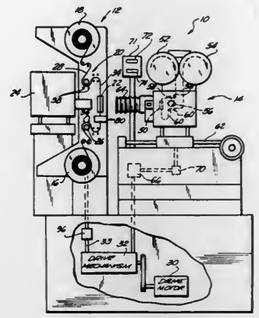


1. An additive tri-color lamp house for a photograph printer, the lamp house comprising:
a lamp house housing;
a first lamp, a second lamp, and a third lamp, said lamps mounted in said housing for passing light therethrough;
a fixed filter holder mounted in said housing, said holder disposed in front of said lamps, said holder including a first yellow filter positioned in front of said first lamp, a red filter positioned in front of said second lamp, and a first magenta filter positioned in front of said third lamp;
light guide means mounted in said housing and disposed in front of said yellow, red and magenta filters for receiving the filtered light therefrom; and
a mixing chamber disposed in said housing and communicating with said light guide means for receiving the filtered light therefrom and mixing the filtered light therein.

4,188,112
OUT-OF-FRAME DETECTOR FOR MOTION PICTURE FILM DUPLICATING EQUIPMENT

Michael D. Hamilton, 98 Chambers St., New York, N.Y. 10007

Filed Jun. 21, 1978, Ser. No. 917,562
Int. Cl.² G03B *27/48*
U.S. Cl. 355—50 **11 Claims**

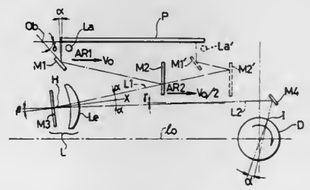


1. In a printer of the type comprising: a takeup reel, a supply reel, means for transporting film along a path between said supply reel and said takeup reel, means for continuously driving said transport means, and a gate wherein film is positioned for exposure during cycles of said gate the improvement comprising: first encoder means driven by said film positioned along the path of said film between the supply reel and gate, said first encoder being adapted to generate signals indicative of the length of film driving the encoder between cycles of said gate; second encoder means driven by said transport means, said second encoder being adapted to generate signals indicative of the length of film driven by said transport between cycles of said gate; and comparator means connected to said first and second encoder means and adapted to generate a signal in the event said first encoder signal and second encoder signal do not match.

4,188,113
COPYING DEVICE WITH FACSIMILE FUNCTION

Michio Hiraga, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1978, Ser. No. 950,871
Claims priority, application Japan, Oct. 14, 1977, 52/122316
Int. Cl.² G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **6 Claims**



1. In a copying machine having a plane stationary platen for holding a document, a photosensitive medium, a first scanning mirror driven in parallel with the platen surface at the same speed as a photosensitive medium, a second scanning mirror driven synchronously at half the speed of the first scanning mirror and in the same direction therewith, an in-mirror lens comprising a reflex mirror and a spherical lens system, and a fixed reflex mirror located on the same side as the first and second scanning mirrors with respect to the in-mirror lens and serving to reflect an image-forming beam from the in-mirror

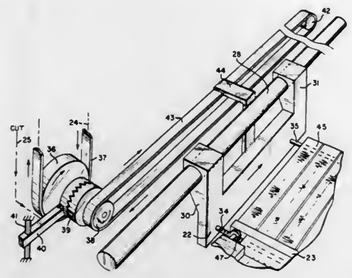
lens toward the photosensivie medium; the improvement comprising, facsimile functions means disposed in said machine having, a beam deflector comprising, a spherical lens system, a rotary polyhedral mirror, and rotary mirror driving means, said beam deflector disposed switchably at a position optically equivalent to the nodal point of the in-mirror lens; a laser source; an incident optical system for directing the laser beam from said laser source toward said beam deflector; and means for positioning said beam deflector and incident optical system so that the beam deflected by said beam deflector is selectively directed toward either the platen surface or the photosensitive medium surface.

4,188,114

MICROFICHE SCANNER MODULE

Karl H. Gensike, Northridge, and Ronald Sam, Los Angeles, both of Calif., assignors to Photomatrix Corporation, Santa Monica, Calif.

Filed Jun. 19, 1978, Ser. No. 916,946
Int. Cl.[2] G03B *27/44*
U.S. Cl. 355—54 **3 Claims**



1. A microfiche scanner module for insertion in a microfilm reader/printer projector including a light source, projection lens, print paper moving means, paper cut button and display screen, as a substitute for the normal microfilm cartridge mechanism for said projector, said module comprising:

(a) a supporting frame positionable in said reader/printer projector between said light source and projection lens in the opening normally occupied by said microfilm cartridge mechanism;

(b) a carriage mounted on said supporting frame for movement in a fore and aft direction;

(c) a film platen mounted on said carriage for movement in a left and right direction, said film platen being dimensioned to hold a microfiche having a plurality of side-by-side columns of images to be printed extending in said fore and aft directions;

(d) means connected to said print paper moving means to move said carriage in a forward direction at a rate proportional to the speed of movement of said print paper so that the image in a first column is projected onto said print paper for printing as said column is moved between said light source and projection lens;

(e) means responsive to said paper cut button for disconnecting said print paper moving means from said carriage so that said carriage can be retracted to its initial position; and,

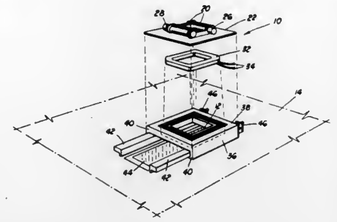
(f) means for moving said film platen to the right to position the initial portion of the next adjacent column between said light source and lens, whereby said carriage can again be moved in a forward direction by reconnecting it to said print paper moving means at a rate proportional to the speed of movement of said print paper so that said next column image is printed, the process being repeated to thereby provide a continuous series of paper print readouts of the information in the column images respectively the same as though the column images were provided successively on microfilm.

4,188,115

MAGNETIC FILM CARRIER

Roger L. Marvin, Wichita, Kans., assignor to Kreonite, Inc., Wichita, Kans.

Filed Jun. 28, 1978, Ser. No. 919,754
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **4 Claims**



1. A magnetic film carrier used in conjunction with a light source in a lamphouse of a photographic printer, the top of the lamphouse having a planar surface, the carrier comprising:

a flat metal plate having an aperture through the center thereof;

a film holder mounted on top of the plate and adapted for holding the film above the aperture in the plate; and

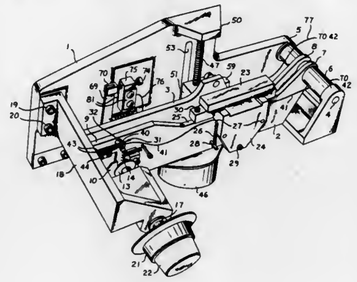
magnetic means adapted for receipt in the lamphouse and around the light source and magnetically attracting and holding the flat metal plate on top of the planar surface of the lamphouse, the flat metal plate movable in a plane parallel to the plane of the top of the lamphouse so that angular adjustments can be made thereon for misalignment of photographs and cropping of photographs.

4,188,116

ABBE REFRACTOMETER

Stephen A. Bartfay-Szabo, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 21, 1978, Ser. No. 879,315
Int. Cl.[2] G01N *21/46*
U.S. Cl. 356—137 **9 Claims**



1. In a refractometer having a frame, a primary prism for holding a specimen, a light source, and a movable mirror, the improvement comprising

mounting means carrying said mirror and connected to said frame for movement along a first path,

first drive means for moving said mounting means to a selected position,

follower means connected to said frame for movement along

a second path, a rest position for the follower being located at one end of said second path,

electric means for driving said follower along the second path, said electric means being responsive to a signal,

control means for generating said signal, means for activating said control means, said control means being responsive to said follower reaching a location along the second path corresponding to the selected position of said mounting means on the first path,

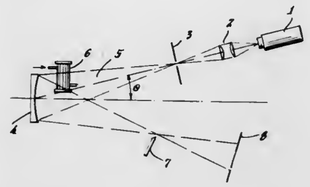
whereby upon activation of the control means, the electric means drives the follower from the rest position to an equivalent position corresponding to the selected position of said mounting means and then back to said rest position.

4,188,117

METHOD AND APPARATUS FOR DETECTING LEAKS IN HOLLOW FIBER MEMBRANE MODULES

Kazuhisa Yamauchi, Kyoto; Taku Tanaka, and Syuji Kawai, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 27, 1978, Ser. No. 900,582
Claims priority, application Japan, Apr. 28, 1977, 52-50416
Int. Cl.[2] G01N *21/16*
U.S. Cl. 356—237 **8 Claims**



1. A method for detecting leaks from a hollow fiber membrane module comprising a housing having at least one bundle of hollow fibers positioned therein with at least one end of each said bundle being sealed by a cemented layer, said method comprising the steps of:

directing gas under pressure over the external surfaces of the fibers within the housing, said gas having a refractive index different from the refractive index of the ambient atmosphere; and

optically monitoring an atmospheric volume adjacent the cemented end of the module to detect any refraction patterns caused by leaks of said gas through the cemented end.

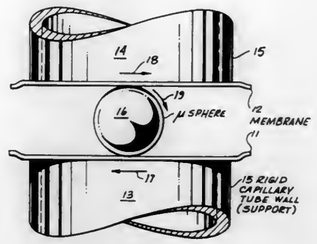
4,188,118

MANIPULATOR FOR ROTATING AND EXAMINING SMALL SPHERES

Berthold W. Weinstein, and David L. Willenborg, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1978, Ser. No. 906,815
Int. Cl.[2] G01N *21/16, 21/32*
U.S. Cl. 356—244 **6 Claims**

1. An apparatus for rotating a small spherical member about either of two axes without moving the center of the spherical member comprising: a pair of oppositely located members each having adjacent smooth, flat surfaces for retaining an associated spherical member therebetween by substantially frictional contact, and movable means connected to each of said members for moving said members in two directions parallel to said surfaces for rolling an associated spherical member retained



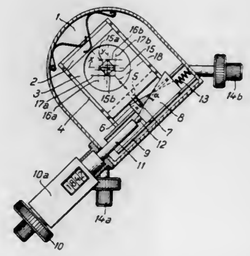
therebetween about either of two axes without moving the center thereof.

4,188,119

TWO-COORDINATE LENGTH MEASURING DEVICE FOR MICROSCOPIC INSTRUMENTS

Karl-Wilhelm Schenck, Hermannstein; Gunthard Nissel, Wetzlar, and Erich Schuster, Huttenberg, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,340
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707960
Int. Cl.[2] G02B *27/36*
U.S. Cl. 356—252 **6 Claims**



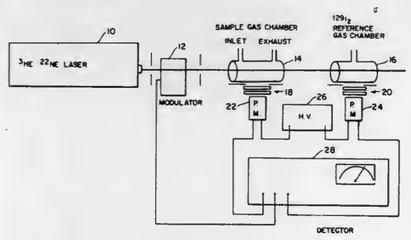
1. A two-coordinate measuring device for use in the measuring ocular of a microscopic measuring instrument for measuring the dimensions of an object, said object having object axes (x and y coordinates), comprising:

(a) two reference mark carriers, mounted movably with respect to each other in an intemediate image plane of said instrument, said reference mark carriers having the same path of movement and having a direction of movement which forms an angle of 45° with the object axes, said carriers each having a reference mark thereon, each reference mark comprising two perpendicular lines forming a 90° angle, with the two angles being oriented in opposite directions, such that the bisector of the angle of each of said reference marks coincides with the direction of movement of said carrier; and

(b) means mounted in said measuring ocular for separately adjusting the position of each of said mark carriers in order to align said reference marks with the dimensions of said object, said object, said adjustment means comprising a pair of independently operable drive screws, mounted in said ocular at an angle of 45° with respect to the object axes, which engage said carriers, and means for the rapid setting of said drive screws, said rapid setting means comprising:

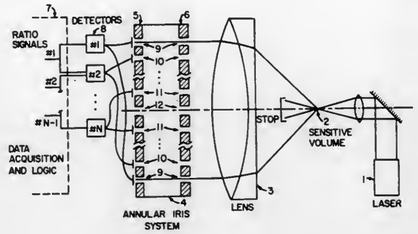
(i) a cylinder solidly mounted on said ocular having a pair of oppositely disposed longitudinal holes therein;
(ii) a circular nut which is slidable within said cylinder, and has a threaded central bore whose threads engage said drive screw, and at the end opposite said ocular, a pair of pins extending therefrom, said nut comprising an end section with a diameter corresponding to the internal diameter of said cylinder, an opposite end section of reduced diameter, and a ring section intermediate said end sections of smallest diameter;
(iii) a pair of semi-circular clamping segments having a diameter corresponding to the internal diameter of said cylinder, each of said clamping segments having an activating button mounted exteriorly thereon which extends through the longitudinal holes in said cylinder, a shoulder portion which engages said nut and rests in said nut ring section, a bead on the outer surface thereof, a semi-circular depression on the interior surface thereof for passage of said drive screw, and a pair of transverse bores; and
(iv) a pair of springs which are seated in the corresponding transverse bores of said clamping segments which bias said segments apart.

4,188,120
RADIOIODINE DETECTOR BASED ON LASER INDUCED FLUORESCENCE
Jimmie R. McDonald, Upper Marlboro, Md., and Andrew P. Baronavski, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 6, 1978, Ser. No. 867,412
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—318 **9 Claims**



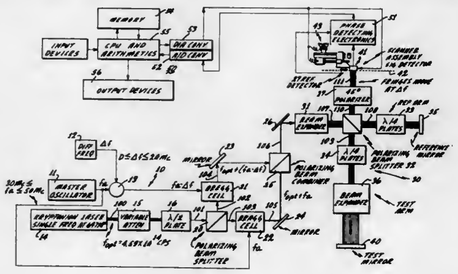
1. Apparatus for measuring the concentration of **I-129** in a gaseous mixture including other iodine isotopes comprising:
laser means for producing a laser beam of a wavelength of **6328 Å** capable of raising said **I-129** isotope to a metastable excited electronic state, said laser using $^3He^{22}Ne$ gas as the lasing medium;
means for modulating said laser beam with a low frequency;
sample gas-chamber means for receiving and containing a sample of said gas containing an **I-129** isotope, said sample gas-chamber means having said laser beam incident thereon for generating fluorescence emissions from said **I-129** isotope;
reference gas-chamber means containing a reference sample of said **I-129** isotope having a known concentration, said reference gas-chamber means having said laser beam incident thereon for generating fluorescence emissions from said **I-129** reference;
means for receiving and converting said fluorescence emission from said sample gas chamber to a sample electrical signal;
means for receiving and converting said fluorescence emissions from said reference gas chamber to a reference electrical signal; and
detector means receiving said sample and reference electrical signals for measuring the concentration of said **I-129** isotopes therefrom.

4,188,121
MULTIPLE RATIO SINGLE PARTICLE COUNTER
Edwin D. Hirleman, Jr., 432 E. Laquna, Tempe, Ariz. 85282, and Sigmar L. K. Wittig, Hooverstrasse 27, D75 Karlsruhe 41, Fed. Rep. of Germany
Filed Feb. 1, 1977, Ser. No. 764,657
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—336 **3 Claims**



1. A system for determining a parameter of a particle comprising:
means for directing incident electromagnetic radiation to a particle under examination,
means for detecting radiation scattered by said particle at more than two angles with respect to the direction of said incident electromagnetic radiation,
means for determining at least two ratios of said signals,
means responsive to said ratios for producing resultant signals representative of said parameter,
means for comparing said resultant signals to determine an unambiguous measure of said parameter.

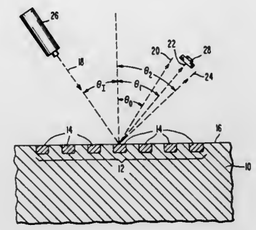
4,188,122
INTERFEROMETER
Norbert A. Massie, Thousand Oaks, and Sandor Holly, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 27, 1978, Ser. No. 890,096
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—349 **16 Claims**



13. In an interferometer having a beam splitter for splitting an incoming beam into two components being directed towards different reflecting surfaces and being recombined into a composite beam, the improvement for producing the incoming beam comprising:
means for providing a monochromatic beam;
means disposed to receive said beam for splitting the beam into two coherent monochromatic components;
first and second frequency shifting means;

means operatively connected to the first and second frequency shifting means to obtain two different frequency shifts;
said first and second means being disposed for frequency shifting at least one of the components, so that the two components differ in frequency by an amount equal to a difference in said two frequency shifts;
means for polarizing the two beam components differently; and
means for recombining the two beams components to produce a single beam having two differently polarized components of differing frequencies.

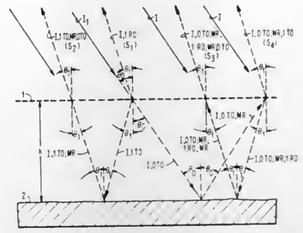
4,188,123
OPTICALLY MEASURING THE CARRIER CONCENTRATION IN A SEMICONDUCTOR
Hans P. Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.
Filed Aug. 30, 1978, Ser. No. 938,246
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—354 **8 Claims**



1. A method of optically measuring the concentration of carriers in a doped region adjacent a surface of a semiconductor wafer comprising the steps of:
selectively introducing conductivity modifiers into both said wafer and a test substrate simultaneously to form respectively said doped region in said wafer and a diffraction grating pattern in said substrate including periodically-spaced doped strips adjacent a surface of said substrate,
exposing said diffraction grating pattern to a beam of monochromatic light, whereby said diffraction grating pattern functions as a reflection phase grating, diffracting said beam of monochromatic light into diffracted beams of various orders, and
measuring the intensity of one of said diffracted beams, whereby the magnitude thereof is a measure of the carrier concentration in said doped region.

4,188,124
INTERFEROMETRIC MEASURING SYSTEM
Walter Jaerisch, Boeblingen, and Guenter Makosch, Sindelfingen-Maichingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 1, 1977, Ser. No. 820,985
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2636211
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—356 **3 Claims**

1. A method of generating an interference fringe pattern for measurement of irregularities in the evenness of surfaces comprising
interposing an optical grating intermediate a source of coherent light and a test surface;
directing said light to said test surface at angle of incidence to generate two interference fields forming a beat pattern in which the light reflected from the grating is combined with parallel rays of radiation diffracted on passage through the grating and reflected from said test surface including portions thereof diffracted on return passage through said grating, and
projecting said combined light beams onto an image plane,

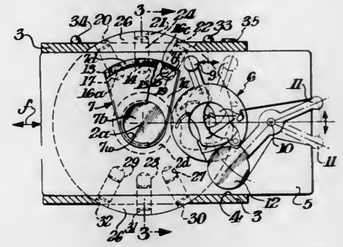


wherein the grating constant "g", the angle of incidence θ_0, angle of observation θ_1, wavelength λ of the beam source "I" and distance "h" between the grating and test surface conform to the relationship

$$h = \frac{\lambda}{4\,|(\cos\theta_1 - \cos\theta_o)|}$$

wherein the angle of incidence $\theta 0$ is a function of said grating constant "g" in accordance with the relationship $\sin\theta 0 = \sin\theta_1 \pm g\lambda$

4,188,125
APPARATUS FOR THE DETERMINATION OF THE COLOR COMPOSITION OF THE PRINTING LIGHT IN A PHOTOGRAPHIC ENLARGER
Siegfried Barbieri, and Wolfgang Kapfinger, both of Brixen, Italy, assignors to Durst AG Fabrik Fototechnischer Apparate, Bolzano-Bozen, Italy
Filed Sep. 2, 1977, Ser. No. 830,105
Claims priority, application Italy, Sep. 2, 1976, 4847 A/76
Int. Cl.[2] G01J *3/50*
U.S. Cl. 356—404 **12 Claims**



9. An apparatus for determining the color composition of printing light in a photographic enlarger having an objective lens with an intermediate diaphragm chamber by utilizing color-sensitive photoelectric transducer means comprising a construction and arrangement wherein the light in the intermediate diaphragm chamber is caused to impinge on the photoelectric transducer means whereby the color composition of the light in the intermediate diaphragm chamber is interpreted, the photoelectric transducer means is disposed outside of the intermediate diaphragm chamber, a light conducting means is disposed within the intermediate diaphragm chamber and extends therefrom to impinge light sampled from the intermediate diaphragm chamber upon the photoelectric transducer means, slide means is mounted on the objective lens for disposing different portions thereof optionally wherein the light-conducting means is mounted on a portion of the slide means for optional insertion inside of the intermediate diaphragm cham-

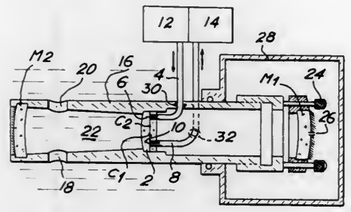
ber for sampling the light to determine its color composition and outside of the intermediate diaphragm chamber to permit an exposure to be performed.

4,188,126

PHOTOMETER WITH CONCAVE MIRRORS AND FIELD OPTICS

Gilbert Boisde, Bures sur Yvette, and Alain Boissier, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 12, 1978, Ser. No. 905,344
Claims priority, application France, May 13, 1977, 77 14753
Int. Cl.[2] G01N *21/24;* G01J *1/42*
U.S. Cl. 356—440 **10 Claims**



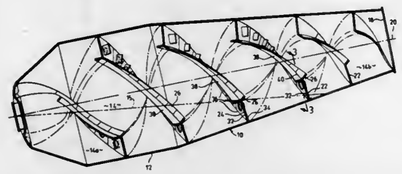
1. A photometer of the type comprising two facing mirrors, means for introducing a light beam between said mirrors, extraction means for said light beam after multiple reflections on the mirrors and means for introducing a fluid to be measured between these mirrors, wherein the two mirrors are concave mirrors, whose centres of curvature are slightly staggered relative to one another and wherein it comprises a field optics by transmission disposed in the vicinity of the centres and which optically conjugates the mirrors, the light beam introduction means comprising a first optical system having an exit pupil in the vicinity of the field optics, the extraction means of the light beam comprising a second optical system having an entrance pupil in the vicinity of the field optics, said entrance and exit pupils being optically conjugated by the action of the multiple reflections on the mirrors.

4,188,127

MIXING BLADES OF CONCRETE MIXING DRUMS

Jess W. Pawley, London, Canada, assignor to London Concrete Machinery Co., London, Canada

Filed Nov. 6, 1978, Ser. No. 957,868
Int. Cl.[2] B28C *5/20*
U.S. Cl. 366—44 **4 Claims**



1. In a rotary concrete mixing drum having an inner wall defining a mixing chamber which includes a mixing section and a charging throat section, said drum having a head end and an open charging end arranged at opposite ends thereof, said drum being mounted for rotation about a mixing axis extending between said head end and said discharge end, said charging throat section extending inwardly from said charging end to said mixing section, mixing blade means mounted on and extending spirally along said inner wall from adjacent said charging end to adjacent said head end, said mixing blades having a mixing face directed toward said head end and the discharge face directed toward said charging end, the portion of the mixing face extending within the charging throat section being a charging face, the improvement wherein said mixing blade comprises;

(a) a leg portion projecting inwardly from said inner wall,

(b) a discharge lip portion projecting laterally from an inner end of said leg portion in a direction toward said charging end, said leg portion and said discharge portion being connected to one another before said leg portion is secured to said inner wall of said chamber,

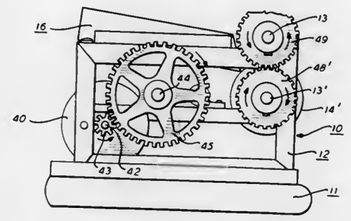
(c) a mixing lip projecting laterally from said charging face of said leg portion in a direction toward said head end, said mixing lip extending over at least a major portion of said mixing section inwardly from said charging throat section, said mixing lip being secured to said leg portion by welding thereto after said leg portion is secured to said inner wall of said chamber such that said mixing lip does not inhibit mounting of the leg portion within said chamber.

4,188,128

APPARATUS FOR AUTOMATICALLY KNEADING AND STRETCHING A MIXTURE

Jorge Betancourt, 111 73rd St., North Bergen, N.J. 07047, and Jose Hernandez, 408-5th St., Union City, N.J. 07087

Filed Jul. 14, 1977, Ser. No. 815,728
Int. Cl.[2] A21C *1/08, 1/08*
U.S. Cl. 366—72 **9 Claims**



1. An apparatus for automatically kneading and stretching a mixture of ingredients used in preparation of an article of food, comprising:

(a) a frame, which is portable;

(b) a plurality of rollers;

(c) means for supporting the rollers in the frame so as to form an open space therebetween for movement of the mixture of ingredients therethrough;

(d) means for driving the plurality of rollers, such that the mixture of ingredients may be pulled thereby through the open space therebetween; and

(e) means for supporting the mixture of ingredients in an inclined position so as to continuously feed such mixture into the space between the plurality of rollers.

4,188,129

DEVICE FOR OBTAINING LATERAL AND VIBRATIONAL MOVEMENT WITHIN ROTATABLE RECEPTACLES

Roy F. Thompson, 1909 W. 6th St., Aberdeen, Wash. 98520

Filed Mar. 27, 1978, Ser. No. 890,194
Int. Cl.[2] B24B *31/02;* B01F *9/00, 11/00*
U.S. Cl. 366—108 **3 Claims**

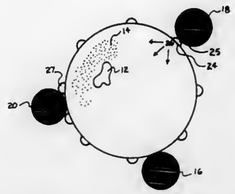
1. A vibrational rotatable receptacle comprising:

a cylindrical drum,

a series of rotation bars located about the circumference of the drum and being properly positioned to freely support the cylindrical drum and allow movement relative to the rotation bars;

a series of projections attached at either end of the cylinder

of the cylindrical drum wherein the projections are staggered such that when a rotation bar passes over a projection at one end of the cylinder, the rotation bar does not pass over a projection at the opposite end of the cylindrical drum.

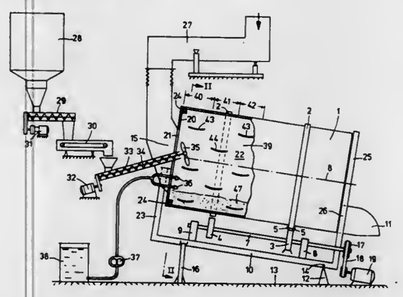


4,188,130

DEVICE FOR CONTINUOUSLY MIXING WOOD CHIPS WITH BINDER

Kaspar Engels, Mannheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,983
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744522
Int. Cl.[2] B01F *9/00*
U.S. Cl. 366—228 **3 Claims**



1. Apparatus for continuously mixing wood chips with a binder, comprising a cylindrical mixing drum having end walls and drivable about its central lengthwise axis, said drum having an inlet aperture for the wood chips in one end wall and an outlet aperture for the wood chips coated with binder in the other end wall, built in pockets provided on the inner wall of said drum, said pockets being open in the rotational direction of said drum, to scoop up wood chips from a chip bed located in the bottom of said drum, and means for distributing the binder in the interior of the mixing drum, wherein said means for distributing said binder terminate in the area of the interior of said drum which is associated with the descending part of said drum wall.

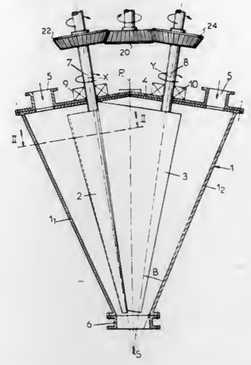
4,188,131

SELF-SCRAPING MIXERS

Jean-Claude Duguet, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jul. 6, 1978, Ser. No. 922,588
Claims priority, application France, Jul. 8, 1977, 77 21104
Int. Cl.[2] B01F *7/16*
U.S. Cl. 366—301 **7 Claims**

1. A self-cleaning mixer comprising a housing having a top and side wall members which together define an inner chamber, said inner chamber having an inner face, at least two blades rotatably mounted within the housing, said blades having a cross section defined by at least two arcs of a circle having the same length and the same radius R, and means for rotating these blades about their axes, said blades being arranged and dimensioned so that during their rotation their edges scrape the inner face of the inner chamber as well as the lateral faces of each blade, these blades remaining constantly



staggered in relation to each other by the same angle A when they are in mutual contact, the inner face of the inner chamber and the outer faces of the blades extending along truncated cones having the same apex with the axes of rotation of the blades passing through this apex wherein the radius R is given by the formula:

$$R = \frac{KD}{2} \cdot \left(m + \frac{1 - K^2}{m}\right) \quad (1)$$

in which the coefficient K is equal to cos A/2, D is the diameter of the envelope circle of the cross-section of a blade during its rotation and m is given by the formula:

$$m = \frac{1 - K + (1 - 2K^2 + K^3) \cdot tg^2 B}{1 + K \cdot (2 - K) \cdot tg^2 B} \quad (2)$$

where angle B is the semi-angle at the apex, at least equal to 5 degrees, of the envelope conical surface of a blade during its rotation.

4,188,132

SPIRAL STIRRER UNSUPPORTED AT ONE END

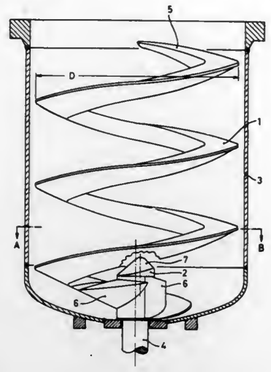
Wolfgang Lenart, Ludwigshafen; Wolfgang Rau, Heidelberg, and Hubertus Baron, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,086
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 227711[U]
Int. Cl.[2] B01F *7/24*
U.S. Cl. 366—314 **4 Claims**

1. In a spiral stirrer assembly comprising a stir vessel, a stirring spiral unsupported at its upper end and comprising a plurality of spiral turns of hollow profiles, the lower end of the spiral, facing the bottom of the stir vessel, being attached to a

hub in turn seated on a drive shaft which passes through the bottom of the stir vessel,

the improvement



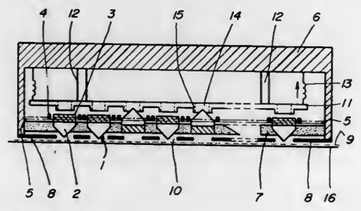
that a distributor spiral element is provided on said hub at a level where it forms a transition from said hub to the first turn of the spiral.

4,188,133

DOT MATRIX IMPACT PRINTER EMPLOYING MAGNETIC DOT ELEMENTS

Hirotoshi Matsui, Shiki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1978, Ser. No. 881,254
Claims priority, application Japan, Feb. 28, 1977, 52-22089
Int. Cl.[2] B41J *3/10*
U.S. Cl. 400—121 **12 Claims**



1. A dot matrix printer for printing a desired pattern on a record receiving member in accordance with print information in a dot matrix fashion comprising:

a magnetic dot element including an impact tip end;

support means for supporting said magnetic dot element, said support means acting in conjunction with said magnetic dot element to permit said magnetic dot element to rotate along an axis transverse to the longitudinal axis of said magnetic dot element and to shift in position along an axis substantially parallel to the longitudinal axis of said magnetic dot element;

magnetic field creating means for controlling the orientation of said magnetic dot element about the transverse axis relative to said support means; and

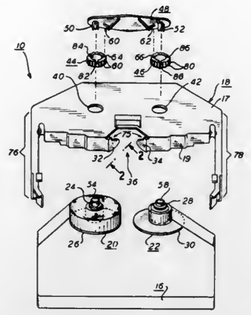
depression means for depressing said magnetic dot element toward said record receiving member.

4,188,134

RIBBON CARTRIDGE HAVING CAM MEANS FOR MOVING RIBBON SENSING AND REVERSING LEVER

John A. Garrido, Manalapan, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Nov. 3, 1977, Ser. No. 848,136
Int. Cl.[2] B41J *33/14*
U.S. Cl. 400—208 **14 Claims**



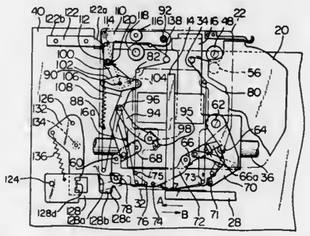
1. In a ribbon cartridge for insertion into a printing mechanism having a ribbon quantity sensing and reversing lever movable between at least one operative position in which the ribbon quantity sensing and reversing lever obstructs the insertion of the cartridge and at least one inoperative position in which the ribbon quantity sensing and reversing lever is rendered unobstructing, wherein the cartridge comprises a cassette having an inked ribbon therein, an improvement wherein the cassette comprises means rigid with the cassette and engageable with the ribbon quantity sensing and reversing lever for moving the ribbon quantity sensing and reversing lever into the inoperative position in the printing mechanism during insertion of the cartridge.

4,188,135

MULTIPLE INKED RIBBON COLOR CHANGEOVER MECHANISM FOR PRINTING MACHINE

Nagao Mizutani, Hachioji; Takashi Sawada; Yasuo Okawara, both of Sayama; Michio Koizumi, and Toshio Kurihara, both of Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1977, Ser. No. 827,054
Claims priority, application Japan, Aug. 31, 1976, 51-104151
Int. Cl.[2] B41J *35/22*
U.S. Cl. 400—214 **20 Claims**



1. In an inked ribbon changeover mechanism for a printing machine having a printing head for impacting a record medium to print a character thereon by means of a looped portion of a selected one of a plurality of inked ribbons, a frame, and a carrier supporting said printing head and guided by carrier guides secured to said frame, the improvement comprising:

a plurality of stationary guide members engaging with said plurality of inked ribbons, respectively, at fixed positions relative to said printing head;

a plurality of movable guide members engaging with said plurality of inked ribbons, respectively, to guide said plurality of inked ribbons in a direction of their lengths;

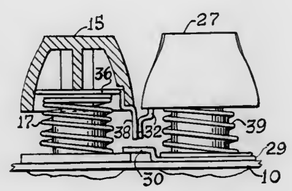
means for carrying said plurality of movable guide members, said carrying means being movable along a path parallel to the direction of said lengths to shift a selected one of said movable guide members to an operative position relative to a selected one of said stationary guide members whereby said selected one of said movable guide members maintains said looped portion of said selected one of said plurality of inked ribbons in a predetermined orientation between said printing head and said record medium.

4,188,136

KEYBOARD SWITCH ACTUATOR AND LOCKING ASSEMBLY

Michael F. Bedocs, Waukegan, Ill., assignor to Cherry Electrical Prod's. Corp., Waukegan, Ill.

Filed Jan. 19, 1978, Ser. No. 870,672
Int. Cl.[2] B41J *5/22;* **H01H** *9/26, 3/20*
U.S. Cl. 400—276 **3 Claims**



1. A key actuator and locking mechanism for use with a keyboard having a matrix of key-receiving openings for positioning a plurality of key housings thereon wherein the improvement comprises

(a) a first and second manually operated switch key, each including a key stem projecting out of an identical switch housing which are adapted to be selectively mounted within the key-receiving openings formed in the keyboard,

(b) a latch plate mounted on and movable with the stem of said first switch key and providing a latching cam extending transversely of and in spaced relation to said stem of said first key switch,

(c) a latch spring consisting of a single spring wire adapted to embrace the housing of said first switch key and providing a deflectable raised biased latch leg positioned in the path of movement of said latching cam when said first switch key is depressed and cooperating therewith to releaseably hold said first switch key in a depressed position, and

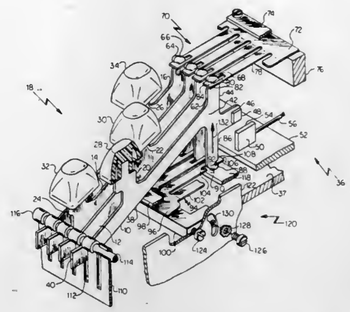
(d) a latch releasing cam carried by the stem of said second switch key and engageable with said deflectable latch leg when said second switch key is depressed so as to deflect said latch leg against its bias out of engagement with said latching cam to release said first switch key from its depressed position.

4,188,137

LOW SILHOUETTE KEYBOARD

Hugh St. L. Dannatt, Bethal, Conn., assignor to SCM Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,425
Int. Cl.[2] B41J *5/08*
U.S. Cl. 400—496 **10 Claims**



1. A keyboard for business machines having a frame, the keyboard comprising:

a plurality of T-shaped keylevers including a vertical extending cross arm forming a portion of said T-shape;

a first flexible keylever support member for each of said plurality of keylevers having one end fixedly supported on the frame and horizontally extending straight toward one of said keylevers in one direction;

a second flexible keylever support member for each of said plurality of keylevers having one end fixedly supported on the frame and horizontally extending straight toward said one keylever in an opposite direction from said first flexible keylever support member;

a first movable connection means coupling said first flexible keylever support member to said one keylever at one end of said cross arm;

a second movable connection means coupling said second flexible keylever support member to said one keylever at an opposite end of said cross arm vertically spaced from said one end of said cross arm; and

said first and second movable connection means cooperate in response to depression of said one keylever to nullify horizontal forces effecting the directional movement of said one keylever thereby resulting in controlled movement of said one keylever in a vertical direction.

4,188,138

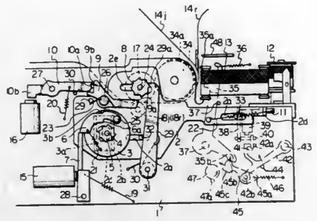
SWITCH MEANS FOR JOURNAL PAPER FEEDING AND RECEIPT PAPER FEEDING CONTROL CIRCUIT

Masao Yamazaki, Kawaguchi, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,376
Claims priority, application Japan, Aug. 10, 1977, 52-106245[U]
Int. Cl.[2] B41F *13/00;* **G06C** *25/00*
U.S. Cl. 400—586 **3 Claims**

1. Printer having at least a receipt paper feeding and printing mechanism and a journal paper feeding and printing mechanism each adapted to be operated in synchronism by a control circuit, wherein the improvement comprises mechanical switching means adapted to be operated for rendering either one of said receipt and journal paper feeding and printing mechanisms to be inoperative and a switch connecting said one of said receipt and journal paper feeding and printing mechanisms to said control circuit, said switch being operatively

coupled with said mechanical switching means so as to be opened when said switching means is operated to render said



one of said receipt and journal paper feeding and printing mechanisms to be inoperative.

4,188,139

METHOD AND APPARATUS FOR CORRECTABLY PRINTING CHARACTERS WITH SUBLIMABLE INK

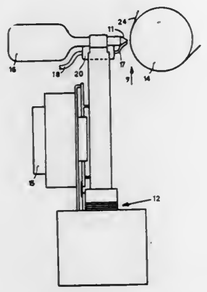
Arnaldo Pasini; Claudio Dalmasso; Riccardo Brescia, all of Ivera, and Roberto Bosio, Cascinette d'Ivera, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy

Filed May 6, 1977, Ser. No. 794,514

Claims priority, application Italy, May 10, 1976, 68142 A/76

Int. Cl.[2] B41J *29/16*

U.S. Cl. 400—696 **17 Claims**



1. A method for correctably printing alphanumeric characters visible under ordinary light, comprising the steps of printing the characters with an ink containing sublimable coloring agents selected from the group consisting of anthraquinone, azo, azomethines, stilbenes, nitrodiarylamines, acridines, xanthones and diazines, and producing local concentrated heating only of the improperly printed characters to be erased and not of the properly printed characters by applying a stream of hot air over said characters to be erased, so that the erasure of said improperly printed characters is effected leaving said properly printed characters intact.

4,188,140

WELDED JOINT

Kurt Clemens, Gummersbach, Fed. Rep. of Germany, and Hans Klein, deceased, late of Gummersbach, Fed. Rep. of Germany (by Maria Klein nee Frielingsdorf, heir), assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

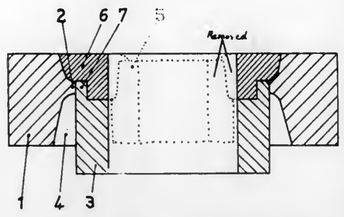
Filed Mar. 8, 1978, Ser. No. 884,593

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710201

Int. Cl.[2] B25G *3/00*

U.S. Cl. 403—13 **2 Claims**

1. A welded joint between the end of a tube and a wall, comprising: a wall having an opening with a radial, circumferential lip between the inner and outer surfaces of said wall to provide circumferential recesses between said lip and the opposite surfaces of said wall, the outer end of said tube fitting in said lip with its end terminating at the edge of said lip, said end of said tube having a circumferential, internal recess to provide a thin lip on the end of said tube fitting in said lip on said wall,



said lip on said tube being of greater length axially than the width of said lip on the wall, welding material filling the space in said opening formed by the recess in the end of said tube and the recess in said wall beyond said tube, said welding material having an interior surface forming a continuation of the interior surface of said tube, the tube being spaced from said wall on the other side of the lip on the wall.

4,188,141

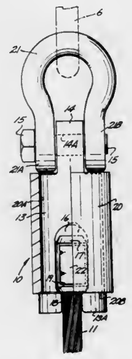
BUTT HOOK FOR A LOGGING CHOKER LINE

Robert C. Stoot, 3609 E. 17th Ave., Eugene, Oreg. 97403

Filed Aug. 8, 1978, Ser. No. 932,030

Int. Cl.[2] F16D *1/12*

U.S. Cl. 403—24 **4 Claims**



1. A butt hook for reception of a choker line ferrule, said butt hook serving to couple the log engaged choker line to a winch retrieved line, said butt hook comprising,

a main body defining a laterally opening cavity for reception of the choker line ferrule, said main body also defining a radially directed opening at one end for lateral passage of that portion of the choker line adjacent the ferrule,

a sleeve on said main body and adapted for limited axial movement therealong to open and close said cavity,

shackle means removably attached to the remaining end of said main body and adapted to receive the winch retrieved line, said shackle means having aligned ends proximate a sleeve end and normally preventing cavity opening movement of said sleeve in one direction,

said main body restricting sleeve movement in an opposite direction, and

said sleeve axially positionable upon removal of said shackle means from said body to provide ingress and egress of the ferrule.

4,188,142

LOCKABLE SWIVEL COUPLING

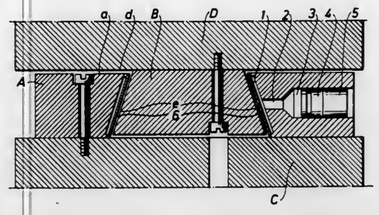
Hans O. Olsson, Krondikesvagen 42B, Ostersund, Sweden (831 00)

Filed Nov. 1, 1978, Ser. No. 956,729

Claims priority, application Sweden, Nov. 9, 1977, 77126480

Int. Cl.[2] F16D *3/80*

U.S. Cl. 403—31 **6 Claims**



1. In a lockable swivel coupling comprising two machine elements, a journal means on one of the elements, a hole means in the other of the elements, receiving the journal means, the journal means and the hole means having rotational-symmetric complementary gliding surfaces forming a guide for swivelling motion between the two elements about a swivelling axis which also constitutes a common axis for the hole means and the journal means, and locking means for rigidly locking the elements in different swivelling positions, the improvement comprising: that the complementary gliding surfaces are conical along at least part of their axial extensions; that the journal means has an end surface cooperating with a complementary bottom surface in the hole means, the journal means being axially form-locked in the hole means with small axial clearance; and the locking means comprises an integral leak-proof working chamber behind at least one of said conical surfaces, the end surface and the bottom surface, the chamber having a flexible wall defining said one surface, the working chamber communicating with a hydraulic pressure source, whereby a hydraulic pressurization of the chamber causes a rigid locking of the elements against swivelling relative to each other with retained angular attitude and a precise axial positioning of the elements relative to each other.

4,188,143

DEVICE FOR RETAINING SCAFFOLD MEMBER

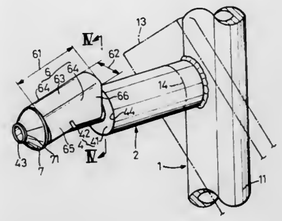
Norio Matsuura, 10-16 Minoo 6 chome, Minoo City, Osaka 562, Japan

Filed Aug. 11, 1978, Ser. No. 933,057

Claims priority, application Japan, Apr. 5, 1978, 53/40562

Int. Cl.[2] E04G *7/00*

U.S. Cl. 403—49 **4 Claims**



1. A device for retaining a scaffold member comprising:

a main body including a rod portion and a mounting pin extending from the forward end of the rod portion and having a circular section of a smaller diameter than the rod portion,

a retractable pivotable member rotatably fitting over and covering the mounting pin, the pivotable member including a semicircular curved portion having approximately the same length as the mounting pin, an annular portion integral with the forward end of the curved portion and loosely fitting around the mounting pin and a pair of parallel side plates extending from the opposite sides of the curved portion with the pin interposed between the side plates, and

an abutment provided at the forward end of the mounting pin for preventing the pivotable member from slipping off the pin.

4,188,144

MECHANISM FOR HOLDING AND GUIDING A PIVOTING MEMBER

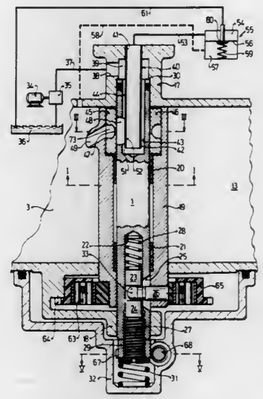
Klaus-Jürgen Peters, Affalterbach; Hermann Nusser, Asperg, and Manfred Knetsch, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,841

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637467

Int. Cl.[2] F16B *7/10*; F16D *1/12*

U.S. Cl. 403—104 **9 Claims**



1. A mechanism for holding and axially locating a pivoting member on a shaft, comprising:

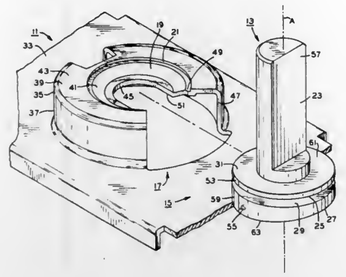
said shaft having a blind axial bore provided with partial internal threads and a radial channel communicating with said blind bore;

a hub surrounding said shaft coaxially and carrying said pivoting member, said hub having locating means extending through said radial channel into said blind bore in said shaft;

guide means, disposed on either side of said locating means in said blind bore in said shaft and capable of axial motion therein and disposed to engage and hold said locating means and said hub in a given axial position with respect to said shaft; and

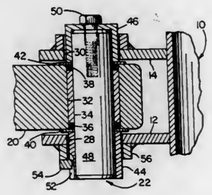
an externally threaded adjustment screw disposed to engage said internal threads of said blind bore in said shaft and to bear against one of said guide means to thereby limit the excursion thereof in one axial direction of said bore and a spring disposed in said blind bore to bear against to the other of said guide means to limit the axial excursion thereof in the opposite axial direction.

4,188,145
ASSEMBLY AND METHOD OF ASSEMBLING
Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.
Filed Jun. 5, 1978, Ser. No. 912,224
Int. Cl.[2] F16B *9/00*
U.S. Cl. 403—112 **21 Claims**



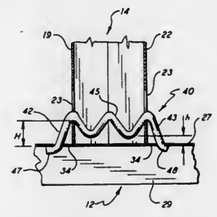
10. An assembly adapted for use in a condition responsive mechanism and comprising a housing part adapted for association with the condition responsive mechanism, aperture means in said housing part, a control device rotatably mounted at least in part in said aperture means and adapted for selecting a set temperature of the condition responsive mechanism, said control device including a body formed of a resin material and having a resilient yieldable characteristic, groove means in said body extending generally thereabout and having a pair of opposed sidewalls, a pair of opposite sections on said housing part arranged generally in off-set relation with each other about at least a part of said aperture means and disposed in releasable wedging abutment between said opposed sidewall pair of said groove means, respectively, at least one of said sidewalls of said groove means being yieldable with respect to said body in response to the releasable wedging abutment therewith of one of said sections of said housing part to establish a force acting to maintain said sidewall pair against displacement from their respective releasable wedging abutments with said section pair.

4,188,146
ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN A PRESELECTED COMPRESSED STATE
Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Mar. 15, 1979, Ser. No. 20,578
Int. Cl.[2] F16C *11/00*
U.S. Cl. 403—158 **3 Claims**



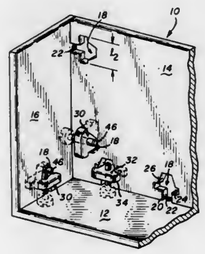
1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to the second member by a pivot pin assembly including aligned holes located in the pair of parallel portions and the second member, a bushing press fit into the hole in the second member and receiving a pin extending into the holes in the pair of parallel portions, and first and second paris of Belleville springs respectively located against opposite ends of the bushing, the improvement comprising: said pin having a head at one end thereof located in the hole of a first one of the pair of parallel portions; a cap received on a second end of the pin and located in the hole of a second one of the pair of parallel portions; a cap screw releasably securing the cap tight against said second end of the pin; and the distance between the head and the cap bearing such predetermined relationship to the combined length of the bushing and uncompressed Belleville springs that a predetermined compression of the springs is effected when the cap screw is tightened to draw the cap against the second end of the pin.

4,188,147
QUICK SET CLIP FOR PARTITION STUDS
Wesley T. Murphy, Auburn, N.Y., assignor to E.T.I. Corporation, Auburn, N.Y.
Filed Nov. 29, 1978, Ser. No. 964,741
Int. Cl.[2] F16B *7/04*
U.S. Cl. 403—230 **9 Claims**



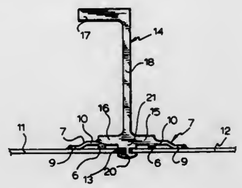
1. A clip for fastening metallic studding in place upon metallic runners, the clip including a single piece of high strength resilient material which lies within a single plane, the clip having two legs that are inclined within the plane and which slope towards each other from their respective distal ends toward their respective proximal ends, a sinusoidal shaped section cojoining the proximal ends of the legs, and extended locking keys depending outwardly from the distal end of said legs wherein the peaks and the valleys of said sinusoidal section are positioned a predetermined height above the top surface of said keys.

4,188,148
FASTENER ASSEMBLY
Helmut K. Waibel, Hayward, Calif., assignor to Durango Systems, Inc., San Jose, Calif.
Filed Sep. 20, 1978, Ser. No. 943,787
Int. Cl.[2] B25G *3/00;* **F16B** *5/00*
U.S. Cl. 403—258 **8 Claims**



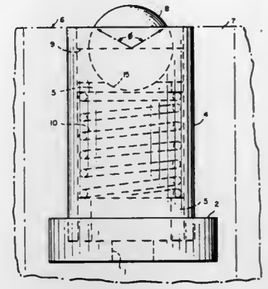
1. Faster assembly for mounting and securing two structural members in abutting relationship with each other, comprising:
a unitary planar anchor member having opposing parallel planar surfaces with the outer edges configured to form a main leg portion and a reverse C-shaped portion, the outer edge of said C-shaped portion further forming a top edge cross surface and a bottom edge cross surface intersecting the edge of the main leg portion to form a substantially P-shaped planar configuration, said top edge cross surface further forming a groove of a selected width;
a first planar structural member having a pair of opposing parallel planar surfaces with a composite notch therein, said notch being configured to include a pair of perpendicular intersecting slots forming a substantial T-shaped pattern with the cross member slot of said T-shaped notch extending parallel to the edge of the structural member and the leg slot of said T-shaped notch intersecting the edge of the structural member, the length of said cross member slot being less than the length of said main leg portion of the planar anchor member and at least equal to the distance between the points of intersection of said main leg portion and said reverse C-shaped portion of the planar anchor member and the depth of the structural member at the cross member slot being substantially equal to said selected width; the planar anchor member being press-fit into said cross member slot with the planes of the anchor being perpendicular to the plane of structural member about the notch and with a side edge surface of said main leg portion in abutment with the planar surface of the first structural member and said groove and said bottom edge surfaces of the reversed C-portion in abutment with the interior terminal edge surfaces of said cross member slot; and
a locking pin engaging a second structural member and said anchor member with means for locking the pin to the anchor member.

4,188,149
SKIN WELDED JOINT
Laurence W. Gray, Amherstview, Canada, assignor to Canadair Limited, Montreal, Canada
Filed Apr. 14, 1978, Ser. No. 896,388
Claims priority, application Canada, Jan. 13, 1978, 294944
Int. Cl.[2] F16B *5/08*
U.S. Cl. 403—271 **10 Claims**



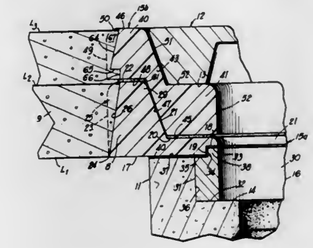
1. A skin welded joint comprising a thin metallic skin, a metallic frame member securable in contact with one face of said thin metallic skin and including a main body portion, at least one rib portion, and at least one flange portion, said rib portion projecting from one side of said main body portion and operatively abutting against said one face of the thin metallic skin, and said flange portion including an outer edge portion operatively contacting said one face of the thin metallic skin and being welded thereto, and an inner portion extending intermediate said outer edge portion and said rib portion, operatively spaced from said one face of the metallic skin, having a smaller thickness than said main body portion and being readily deformable under the heat of welding.

4,188,150
HIGHWAY LANE MARKER
Edward A. Sroka, 79 Lexington St., Waltham, Mass. 02154
Filed Jul. 13, 1978, Ser. No. 924,143
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—11 **8 Claims**



1. A marker to be embedded substantially below the grade of a roadway and having a portion projecting above the grade, said marker comprising:
a housing;
a substantially spherical member resiliently and rotatably supported in said housing;
cap means for retaining a major portion of said spherical member within said housing while permitting a portion of said spherical member to project from said housing;
support means for supporting said spherical member within said housing so that said spherical member can rotate within said housing when the portion of said spherical member that projects from said housing receives an impact parallel to the roadway; and
means for resiliently supporting said support means and said spherical member to allow axial movement of said support means and said spherical member within said housing.

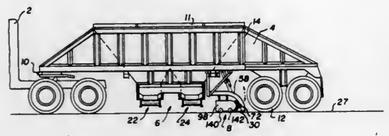
4,188,151
MANHOLE EXTENSION ASSEMBLY
John R. Hall, Atlanta, Ga., assignor to Margaret T. Hall, Atlanta, Ga. and James B. Turner, Jr., Raleigh, N.C.
Continuation-in-part of Ser. No. 844,649, Oct. 25, 1977. This application Mar. 30, 1978, Ser. No. 891,715
Int. Cl.[2] E02D *29/14*
U.S. Cl. 404—26 **14 Claims**



1. A manhole extension assembly comprising in combination with a manhole cover and a manhole having a top ring embedded in pavement of a plastic extender ring member having a bottom surface mounted in concentric relationship on the upper end portion of said top ring of said manhole below pavement level, said ring member having an upper surface which has an annular recessed seat therein for receiving and seating said manhole cover with its upper level at about the

level of said pavement, said ring member having circumferentially spaced peripheral outwardly opening recesses which receive the pavement therein to prevent appreciable rotation of said ring member and for overlapping of a portion of said ring member below the upper surface of said ring member to prevent appreciable upward movement of said ring member.

4,188,152
GRAVEL SPREADER
Edward A. Kitt, 1604 - 8th Ave. South, Cranbrook, British Columbia, Canada (V1C 2L4)
Filed May 30, 1978, Ser. No. 910,983
Int. Cl.[2] E01C *19/20*
U.S. Cl. 404—110 **12 Claims**



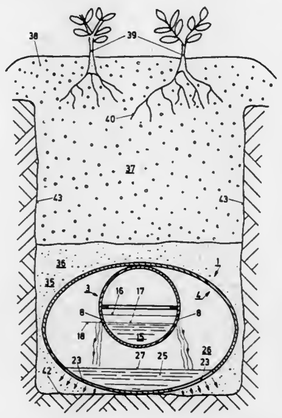
1. An apparatus for spreading loose material, such as gravel, onto a surface, comprising:
- a trailer with at least one hopper for the material, a set of wheels near a rear end thereof and means for pivotally connecting the trailer to a tractor near a front end thereof;
- an endless belt conveyor mounted below the hopper for distributing the material onto the surface to one side of the trailer;
- a frame connected to the trailer beneath the trailer and extending rearwardly from near the conveyor;
- an elongate spreader connected to the frame for positioning generally parallel to the surface a distance above at least a portion of the surface, the spreader being between the conveyor and the rear wheels of the trailer and having a bottom edge, a top, a front and a back and extending laterally from the trailer for spreading the material to the one side of the trailer;
- a first material retainer connected to the spreader at an end thereof distal the trailer and extending generally forwardly from the front of the spreader;
- a second material retainer connected to the frame, being spaced-apart from the first retainer and extending forwardly from near the front of the spreader; and
- means for positioning the first retainer and the second retainer a distance apart along the spreader so that, when the material is distributed from the hopper, the material is spread between the first retainer and the second retainer and between the bottom edge of the spreader and the surface as the trailer moves in a forward direction along the surface.

4,188,153
FORMATION OF BARRIERS
John E. Taylor, "Telford", Over, Gloucester, England
Filed Mar. 28, 1977, Ser. No. 782,052
Int. Cl.[2] E02B *3/12*
U.S. Cl. 405—34 **2 Claims**



1. A method of ground surface stabilization, comprising cutting holes through the tread portion of motor vehicle tyres, stacking the tyres to form a barrier, commencing with a base layer of tyres disposed edge to edge in rows transverse to the length of the barrier and superposing layers of tyres in rows in register with the rows of the base layer but offset to make a staggered formation in which each tyre laps two overlying tyres and two underlying tyres and securing together the tyres of superposed rows, and securing the tyres together and to the subjacent ground, the barrier thus formed being a stable cellular structure to be filled with earth, silt or driven sand.

4,188,154
APPARATUS FOR WATERING AND DRAINING SOIL
James P. Izatt, North Vancouver, Canada, assignor to Cellsystem AG, Oftringen, Switzerland
Filed Aug. 21, 1978, Ser. No. 935,484
Claims priority, application Switzerland, Aug. 23, 1977, 10298/77
Int. Cl.[2] E02B *11/00, 13/00*
U.S. Cl. 405—43 **9 Claims**



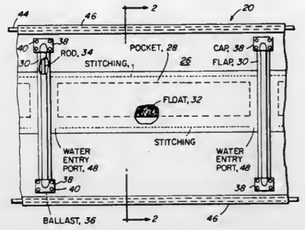
1. Apparatus by which an area of soil can be selectively and alternatively watered and drained, said apparatus being of the type comprising an outer duct and an inner duct that extends lengthwise withing the outer duct, said inner duct being connectable for watering with a water source and being communicable for drainage with a sink to which drainage water can be conducted, said apparatus being characterized by:

A. the inner duct being so secured to the outer duct, in the interior thereof, that when the ducts extend horizontally
  (1) the axis of the inner duct is parallel to the axis of the outer duct, and
  (2) an upper external surface portion of the inner duct is closely adjacent to an upper internal surface portion of the outer duct;

B. the inner duct
  (1) being substantially stiff so as to resist deformation in cross section, and
  (2) having ports through its wall, at intervals along its length, that are at a level between its top and its bottom, but being otherwise substantially imperforate; and

C. the outer duct
  (1) being substantially larger in cross section than the inner duct and sufficiently stiff to maintain a substantially large space in the outer duct that is below the level of said ports, and
  (2) the outer duct having ports through its wall that are spaced along its length and are at a level near its bottom but being otherwise substantially imperforate.

4,188,155
CONTAINMENT BOOM
P. Hillel Langermann, 86 Greenough St., Brookline, Mass. 02146
Filed Aug. 8, 1978, Ser. No. 931,965
Int. Cl.[2] E02B *15/04*
U.S. Cl. 405—63 **11 Claims**



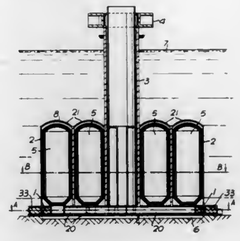
1. A boom for the containment of material floating on the surface of a liquid comprising:
- a curtain having a pocket attached thereto;
- means for floating said curtain on said surface;
- said pocket having a port permitting a quantity of said liquid to flow into said pocket in response to hydrostatic forces of said liquid in which said boom is to be floated, the size of said port being much smaller than the size of said pocket to provide an egress time of said quantity of said liquid which is much longer than the duration of an impact of a wave of said liquid upon said boom, said quantity of liquid being essentially entrapped in said pocket under the dynamic conditions of motion of said liquid thereby increasing the effective mass of said boom for resisting said liquid motion.

4,188,156
RISER
Edmund A. Fisher, and Emanuel Schnitzer, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.
Filed Jun. 1, 1978, Ser. No. 911,678
Int. Cl.[2] E21B *17/00*
U.S. Cl. 405—195 **6 Claims**



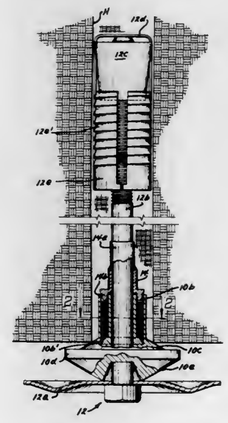
1. A riser adapted to extend from a subsea wellhead to a structure at the water surface comprising
- a lower section having means for connecting to the subsea wellhead, and
- an upper tubular section having means for connecting to the lower section and to the surface structure,
- said lower section having a smaller cross sectional area at its upper end whereby it has an increased flexibility at its upper end as compared with its lower end,
- the upper end of said lower section being of a less rigid material than the upper section whereby it has a greater flexibility than said upper section whereby a substantially longer life expectancy of the riser is achieved.

4,188,157
MARINE STRUCTURE
Kjell Vigander, Jar, Norway, assignor to A/S Høyer-Ellefsen, Oslo, Norway
Filed Mar. 13, 1978, Ser. No. 885,974
Claims priority, application United Kingdom, Mar. 15, 1977, 10897/77
Int. Cl.[2] E02B *17/00*; F17C *1/12*
U.S. Cl. 405—210 **8 Claims**



1. An offshore structure for handling of cryogenic fluids, such as liquefied natural gas, comprising a lower section of concrete and an upper section projecting up from the lower section above the sea level to support a deck superstructure, the lower section being formed of a plurality of cells, at least one of said cells housing an insulated tank for storage of low temperature fluids, the insulated tank housed by said at least one cell being completely submerged in operation and being rigidly supported by said at least one cell, said storage tank also comprising at least a primary and secondary barrier with insulation associated therewith, and said offshore structure further comprising an access tunnel system providing communication between the storage tank and the deck superstructure.

4,188,158
MINE ROOF BOLT HOLE SEAL
David C. Donan, Jr., and David M. Donan, both of Manitou, Ky., assignors to Waiamea Company, Inc., Manitou, Ky.
Filed May 15, 1978, Ser. No. 905,648
Int. Cl.[2] E21D *21/00*
U.S. Cl. 405—259 **6 Claims**



1. In combination with a roof bolt assembly including a roof

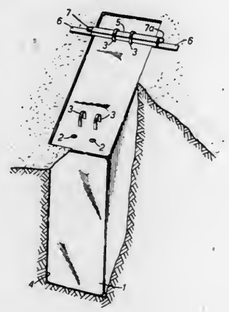
bolt having a shaft, a roof bolt base plate, and a roof bolt expansion shell in selective engagement with a roof bolt hole drilled in a mine roof, an integral seal surrounding said roof bolt shaft comprising a first portion extending within said roof bolt hole, a second portion extending around the opening to said roof bolt hole in a selective sealing relationship, and a third portion compressed between said roof bolt base plate and said mine roof in an installed position, said first portion having a desiccant receiving cavity therewithin surrounding said roof bolt shaft, and closure means mounted on said shaft of said roof bolt covering said cavity in said first portion and selectively separated from said first portion at said installed position.

4,188,159

MAINTAINING THE SHAPE OF HOLES

Stanley W. Clarke, and Angus J. Clarke, both of 2 High St., Weston Underwood, Olney, Buckinghamshire, England

Filed Apr. 7, 1978, Ser. No. 894,533
Claims priority, application United Kingdom, Apr. 13, 1977, 15345/77
Int. Cl.² E21D *11/00*
U.S. Cl. 405—282 **4 Claims**



1. A method for maintaining the shape of a hole dug in the ground, such as a grave, comprising the steps of

(a) introducing a normally-deflated inflatable support bag into the hole, said support bag having a configuration generally conforming to the configuration of the hole and including on its upper surface

(1) at least one pair of laterally spaced integral connecting loops, and

(2) at least one valve means;

(b) inflating said support bag through said valve means whereby said support bag initially assumes the configuration of the hole and subsequently presses in contiguous relation against the side walls of the hole to thereby become fixed therein;

(c) introducing at least one pair of connecting bar members through said pair of connecting loops, respectively, said connecting bar members extending completely across said support bag upper surface, the end portions of said connecting bars resting on the ground adjacent the hole;

(d) positioning a rigid protective cover member over said support bag upper surface and said connecting bar members, said cover member resting on the surface of the ground surrounding the hole;

(e) positioning a pair of locking bar members over said cover member adjacent said connecting bar members; and

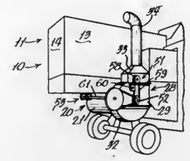
(f) connecting the end portions of said connecting bar and locking bar members, respectively, to anchor said cover member to said support bag.

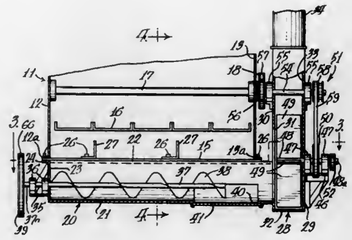
4,188,160

FEED RESIDUE SAVER FOR COMBINES

Wendell E. Corbett, Box 711, and Jay D. Sutton, 323 First Ave., S.W., both of Watertown, S. Dak. 57201

Continuation-in-part of Ser. No. 772,002, Feb. 25, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,562
Int. Cl.² B65G *53/04*
U.S. Cl. 406—58 **8 Claims**





1. A feed residue saver attachment for a combine which has a casing with sidewalls, and a chaffer screen in said casing, said attachment comprising:

a trough adapted to be detachably mounted in a transverse position beneath the rearward portion of a combine to receive residue from the chaffer screen which is usable for animal feed, and which the combine would otherwise discharge onto the ground, said trough having a rearward side and a forward side, an end plate on the trough adapted to extend downwardly from one sidewall of the casing, and the trough having an open end adapted to be adjacent the other sidewall;

conveyor means in the trough for moving residue toward said open end;

an impeller housing secured to said open end of the trough, there being an infeed opening in said housing to receive residue from the trough and a discharge opening in the housing which opens directly into a discharge duct;

an impeller journalled in the housing and rotatable to receive residue from the conveyor means and discharge it through said discharge opening and said discharge duct into a residue container adjacent the combine;

first power transmission means to drive the impeller from a driven shaft of the combine at a relatively high speed;

second power transmission means to drive the conveyor means from a driven shaft of said combine at a speed to deliver substantially 100% of the residue received by the trough into the impeller;

and a deflector plate at the rear of the trough extending upwardly into the combine casing behind the chaffer screen so as to direct residue carried off the rear of said screen downwardly into the trough.

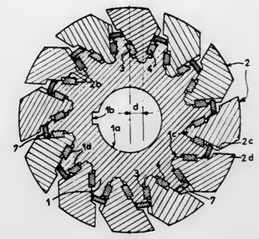
4,188,161

MILLING CUTTER WITH INSET CUTTING BLADES

Jean Cuilleron, 57 rue Francisque Voytier 42100, Saint-Etienne-Loire, France

Filed Feb. 21, 1978, Ser. No. 880,002
Claims priority, application France, Feb. 22, 1977, 77 06006
Int. Cl.² B26D *1/12*
U.S. Cl. 407—25 **11 Claims**

1. A milling cutter comprising a cylindrical body having a bore adapted for receiving a driving shaft in coupled relation, said body having a periphery with uniformly distributed trapezoidal cavities therein, cutting blades with teeth thereon and base sections of trapezoidal shape corresponding to said cavities and insertable therein in two different positions, one being an endless screw position in which the periphery of said teeth of blades are inscribed in a circle concentric with the axis of the body and the other being a spur position in which the tips of the teeth are inscribed in a circle concentric with the axis of the



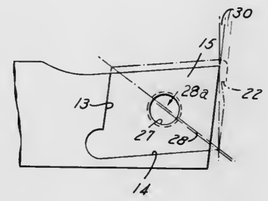
body, said base sections of trapezoidal shape of the blades having inclined, radial surfaces facing respective inclined side surfaces of the trapezoidally shaped cavities in said body, at least one of said pair of surfaces being provided with longitudinal groove means, an axial key engaged in said groove means to lock the respective blade in the cavity radially in either of said positions, and means on said body for engaging the blades at an intermediate location along the axial length thereof for securing the blades axially in both of said positions thereof.

4,188,162

INDEXABLE INSERT DRILL

Raymond T. Zweekly, Royal Oak, Mich., assignor to The Valeron Corporation, Oak Park, Mich.

Filed Dec. 27, 1977, Ser. No. 864,627
Int. Cl.² B23B *29/03*; B26D *1/00, 1/12*; B23B *51/00*
U.S. Cl. 408—199 **13 Claims**



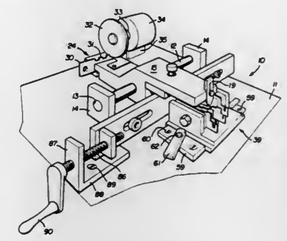
1. A replaceable insert drill comprising a shank having a center axis and a cutting insert end, a pocket at said insert end for locating a replaceable cutting insert, said pocket having a bottom insert face seating surface and side wall location for said insert, said seating surface extending to a radial extremity of said insert end on one side and substantially beyond the center axis of said drill on the other side, a parallelogram shaped cutting insert having a bottom seating face and a top face located in said pocket with an acute radially outermost axially leading cutting corner positioned to provide axial workpiece cutting clearance and negative axial lead, said insert having a slanting progressively deepening recess extending along the leading edge of its top face providing a cutting edge extending continuously in a notch interrupted straight line from said cutting corner at the outer face through or slightly under and substantially beyond the axis of said drill, and said notch comprising a chip interrupting notch in said cutting edge wherein said notch has a radially outermost non-cutting side which extends in a line substantially parallel to a designed axial direction of feed for said insert and a radially inwardly extending cutting side for leaving a substantial shoulder in the workpiece serving to stabilize the drill against vibration and drift upon axial drillentry into the workpiece.

4,188,163

KEY DUPLICATING MACHINE

John Juskevic, c/o Penne Products Corporation, 18454 Fitzpatrick, Detroit, Mich. 48228

Filed Jul. 21, 1978, Ser. No. 926,931
Int. Cl.² B23C *1/16*
U.S. Cl. 409—82 **4 Claims**



1. A key duplicating machine for cutting the shaped edge on a key blank, comprising:

a support base means upon which is mounted a horizontally arranged, fixed shaft;

a lever having a central opening through which said shaft is journalled, with the lever being pivotable about the shaft axis and slidable longitudinally of the shaft axis;

a stylus mounted upon one end of the lever;

and an upwardly opening key blank vise mounted upon the opposite end of the lever, with said vise including means for temporarily clamping a key blank with its edge arranged parallel to the shaft axis;

mounting means supporting a fixed location, horizontally axised, rotating cutting wheel arranged in a plane transverse to the shaft axis and at a short distance above the vise;

guide means mounted upon said support base means and located adjacent the stylus, and having a shaped stylus contacted guide surface corresponding to a pre-determined key edge configuration;

said guide means comprising a number of similar, flat, guide blades clamped together in face to face relationship, with each having an exposed guide edge formed with a number of steps, each step corresponding to a pre-determined depth of cut on the key blank shaped edge;

said blanks being arranged with each blank having one of its steps selected in side by side alignment with the selected steps of the other blades to form said guide surface, with said guide surface being aligned with the stylus and parallel to the shaft axis;

releasable clamping means for clamping the blades together so that the guide surface may be changed in configuration by unclamping the blades and relatively moving each of them to utilize different steps thereof to form said guide surface;

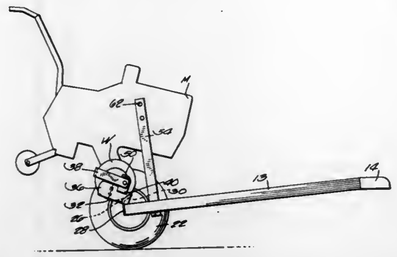
whereby said lever may be slid longitudinally of the shaft while the stylus contacts the guide surface to rock the lever about the shaft axis, to thereby move the key blank edge longitudinally beneath and towards and away from the wheel for thereby cutting the shaped edge on the key blank, and whereby different shapes may be cut upon key blank edges by pre-selecting the positions of each of the blades.

4,188,164

TOTE-TRAILER WITH WHEEL LOCKING DEVICE

Loren F. Hansen, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 24, 1978, Ser. No. 909,278
Int. Cl.² B60P *3/00*
U.S. Cl. 414—447 **8 Claims**



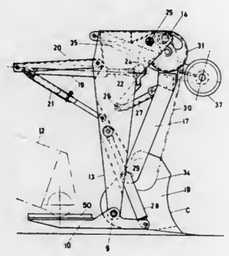
1. A trailer for carrying a machine having a frame supported by a wheel, said trailer comprising a trailer frame having a forward frame end and a rearward frame end, a ground engaging trailer wheel attached to said trailer frame adjacent said rearward frame end for supporting said trailer frame for movement on the ground and supporting said trailer frame for movement between a generally vertical position and a generally horizontal position, first means for supporting the machine on said frame in a position entirely off the ground when said trailer frame is in the generally horizontal position, second means for supporting the machine wheel connected to said trailer frame adjacent said trailer wheel, and a pivotable locking arm supported by said frame for releasably restraining the machine wheel on said wheel supporting means, said pivotable locking arm being movable between a first position wherein the machine wheel is restrained against said wheel supporting means and a second position spaced from the first position.

4,188,165

LOADERS FOR USE IN TUNNELS

Rolf C. Bôhme, Johannesburg, and Dieter G. Lück, Kyalami Ext. l, both of South Africa, assignors to General Mining and Finance Corporation Limited, South Africa

Filed Sep. 29, 1977, Ser. No. 838,111
Claims priority, application South Africa, Oct. 1, 1976, 76/5915
Int. Cl.² E02F *3/00*
U.S. Cl. 414—694 **9 Claims**



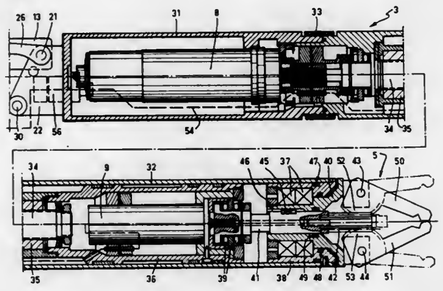
1. A loader comprising:
a base;
a yoke extending above the base and having uprights spaced apart at their top ends by a cross-member between the uprights;
a shaft between the uprights;
a dipper arm swinging from the shaft to move to either side of the yoke between the uprights and below the shaft;
means to cause the dipper arm to swing between a loading position at a first side of the yoke and an unloading position at the opposite second side of the yoke;
a bucket pivoted to the free end of the dipper arm about a first axis parallel to the shaft; and
means to rotate the bucket about its pivot axis from a digging attitude to a load retaining attitude whereby the bucket is below the horizontal plane containing the dipper shaft during the loading and unloading positions.

4,188,166

SMALL SIZE TELEMANIPULATOR

Claude Moreau, Nantes, and René Schréder, St. Herblain, both of France, assignors to Ateliers et Chantiers de Bretagne-A.C.B., Nantes, France

Filed May 19, 1977, Ser. No. 798,478
Claims priority, application France, May 24, 1976, 76 15701
Int. Cl.² B25J *3/00*
U.S. Cl. 414—735 **9 Claims**



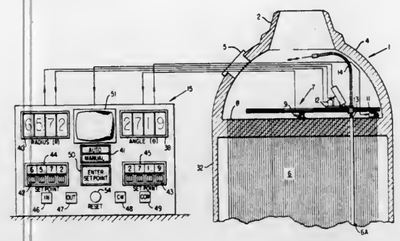
1. A telemanipulator arm element for mounting a gripping tool having gripping members, said element comprising an elongated body member; means to mount the tool adjacent to an end of the body member for rotation of the tool about the longitudinal axis of the body member; means to operate the gripping mechanism of the tool, including a first motor having a housing and a rotative drive shaft mounted within the body member, with said first motor housing secured against rotation with respect to the body member and said first motor drive shaft extending in substantial alignment with the longitudinal axis of the body member, and further including a slider and mechanical converting means for converting the rotation of the first motor drive shaft into linear movement of the slider in a direction generally parallel to the longitudinal axis of the body member and means for converting the slider movement into movement of said gripping members toward and away from one another; means to rotate the tool about the longitudinal axis of the body member, including a second motor having a housing and a rotative drive shaft mounted within the body member intermediate the first motor and the tool, with said second motor housing secured against rotation with respect to the body member and said second motor drive shaft extending in substantial alignment with the longitudinal axis of the body member; and nonrotative transmission line means for supplying driving power from an external source to said first and second motors.

4,188,167

APPARATUS FOR ALIGNING AN INSPECTION OR REPAIR DEVICE WITH A SELECTED TUBE IN A HEAT EXCHANGER

Gary E. Abell, Norton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 7, 1978, Ser. No. 884,305
Int. Cl.² F28G *15/02*
U.S. Cl. 414—744 **8 Claims**



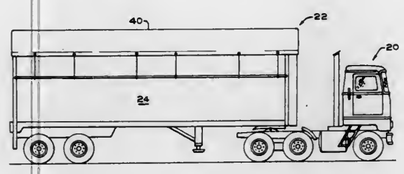
1. Apparatus for axially aligning an instrument guide with a selected one of a plurality of tubes in a heat exchanger having a flat circular tube sheet through which each of said plurality of tubes penetrates, comprising a beam, a fixed member supported on said tube sheet proximate the center thereof having an axis about which said beam is rotatable in a plane parallel to said tube sheet, a first servomotor operatively connected to said beam for angularly positioning said beam about said axis in clockwise and counterclockwise directions, a carriage having an instrument guide mounted on said beam, a second servomotor operatively connected to said carriage for radially moving said carriage toward and away from said axis, means operatively connected to said beam generating a first feedback signal proportional to the angular displacement of said instrument guide from a selected base radius and means operatively connected to said carriage generating a second feedback signal proportional to the radial displacement of said instrument guide from a predetermined radius.

4,188,168

BOW AND SPREADER BAR

William J. Brown, Lower Burrell, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 1, 1978, Ser. No. 911,598
Int. Cl.² B65G *67/24*
U.S. Cl. 414—786 **6 Claims**



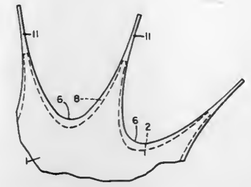
1. A method of loading a pack of sheets on frames mounted on bed of an open-top trailer, comprising the steps of:
mounting a pair of sheet slings in spaced relationship to one another on a rigid bar;
mounting the slings about ends of the pack;
lifting the bar containing the sheets to position the sheets on the frames;
removing the slings from the ends of the pack; and
mounting the bar to and between walls of the trailer to aid in maintaining the walls in spaced relationship to one another.

4,188,169

IMPELLER ELEMENT OR RADIAL INFLOW GAS TURBINE WHEEL

Jan Mowill, Daniel Barths vei 11, 3600 Kongsberg, Norway

Filed Aug. 9, 1977, Ser. No. 823,187
Claims priority, application Norway, Aug. 11, 1976, 762794
Int. Cl.² F01D *5/04*
U.S. Cl. 416—185 **4 Claims**



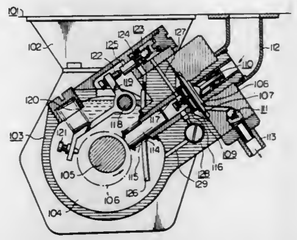
1. A radial inflow gas turbine wheel element adapted to be operatively associated with a turbine exducer portion, said wheel element having an axis and a plane of rotation, a hub portion, and a plurality of blades extending from said hub portion; each blade having an axial length, a radial length, and a thickness, said thickness of each blade taken in a plane normal to the plane of rotation and parallel to the axis of the element at any given radial station being generally uniform over substantially the entire axial length of said blade and said hub portion having an outer profile which is substantially parallel to the axis of rotation.

4,188,170

DIAPHRAGM PUMP

Jinichi Ito, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,151
Claims priority, application Japan, May 2, 1977, 52-50940; Jul. 28, 1977, 52-90560
Int. Cl.² F04B *9/10*
U.S. Cl. 417—387 **4 Claims**



2. A diaphragm pump comprising a diaphragm and having a pump chamber on one side of said diaphragm and a pressure fluid chamber on the other and a cylinder communicating with said pressure fluid chamber, a plunger reciprocally movable in said cylinder for raising and lowering the pressure of a pressure fluid in said pressure fluid chamber for deflecting said diaphragm in response to an increase or decrease in said pressure and causing said diaphragm to effect a pumping action on a pumped fluid in said pump chamber; driving means connected to said plunger for reciprocating said plunger; a pressure fluid reservoir; first means communicating the space within said cylinder and said pressure fluid chamber with said reservoir and having a pressure regulating valve for opening only when the pressure of the pressure fluid in said cylinder and said pressure fluid chamber exceeds a predetermined value during a pressurizing stroke of said plunger; further means communicating said space within said cylinder and said pressure fluid chamber with said reservoir and having a check valve means

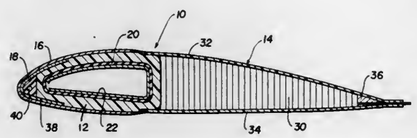
therein for opening or closing in response to the difference between the pressure of pressure fluid in said pressure fluid reservoir and the pressure of pressure fluid in said pressure fluid chamber and cylinder, said check valve means opening during a pressure reducing stroke of said plunger before the pressure of the pressure fluid in said cylinder and said pressure fluid chamber is lowered to a level at which the separation of air dissolved in said pressure fluid becomes vigorous, and closing during a pressurizing stroke of said plunger when the pressure of the pressure fluid in said pressure fluid chamber and cylinder is restored to a level at which the air begins dissolving into said pressure fluid again.

4,188,171

ROTOR BLADE INTERNAL DAMPER

Joseph M. Baskin, Bala Cynwyd, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 2, 1977, Ser. No. 821,070
Int. Cl.[2] B64C *27/46*
U.S. Cl. 416—226 **23 Claims**



1. An aerodynamic rotor blade comprising:

(a) an elongated structural spar member having an inner surface forming a hollow interior throughout its length and a contoured outer surface forming a leading edge portion and a spar heel portion which together define the chordwise limits of the spar member, and a tip end portion and a root end portion, which together define the spanwise limits of the spar member;

(b) an aft fairing structure attached to the spar member at the spar heel portion;

(c) at least one constraining member situated within the hollow interior of the spar member, each including a top, bottom and at least one side wall connected to the top and bottom walls; and

(d) as associated load absorbing elastic member for each constraining member, each having a stiffness less than that of the spar member and its associated constraining member, each being at least spanwise coextensive with its associated constraining member, and each being situated within the hollow interior of the spar member between the inner surface of the spar member and the outer surface of its associated constraining member, as defined by its top, bottom and at least one side wall, and being attached to said outer surface of its associated constraining member and to the inner surface of the spar member.

4,188,172

METHOD AND MEANS FOR INJECTING HOT LIQUID WHEN PUMPING COLD LIQUID

Sherwood G. Talbert; Thomas A. Klausing, both of Columbus, and Jan B. Yates, Reynoldsburg, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1978, Ser. No. 909,312
Int. Cl.[2] F04B *39/00, 39/06*
U.S. Cl. 417—53 **3 Claims**

1. A pumping system for removing viscous liquids at substantially increased flow rates from tanks in vessels or at other sites to other storage or transfer means comprising:

pumping means including a suction pump immersed in said liquids for removing lowered viscosity liquids therefrom, said pump disposed in a substantially vertical attitude in said liquids and having an inlet at the lower end thereof;

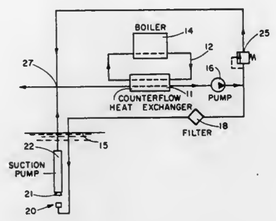
means remote from said liquids for heating and initiating flow of said liquids,

said remote means including a priming liquid, a boiler and a counterflow heat exchanger for transferring heat to said liquids,

said priming liquid substantially identical to said liquids to afford blending therewith;

means for injecting said heated liquids into said suction pump,

said injecting means including a nozzle positioned below said inlet and having at least a plurality of orifices so formed as to direct said liquids into said inlet,



said injecting means spaced from said pump to create an aspiration effect enhancing entry of said heated liquids into said inlet;

means coupling said pump to said boiler to return a portion of said liquids to said injecting means,

said means for initiating flow being a second pump and a filter connected in series between said counterflow heat exchanger and said nozzle; and

a relief valve connected in parallel across said second pump and said coupling means,

said pumping means further including a discharge line having a common connection with said suction pump, said relief valve and said heat exchanger.

4,188,173

VERTICAL PUMP WITH FREE FLOATING CHECK VALVE

Malcolm Lindsay, O'Hara Township, Allegheny County, Pa., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 6, 1976, Ser. No. 730,056
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—424 **3 Claims**

1. A vertical pump with bottom discharge having a free floating check valve comprising:

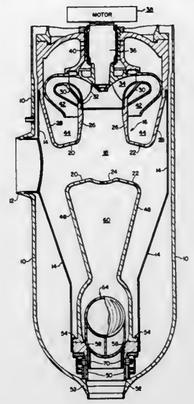
a substantially vertical discharge channel disposed adjacent to the outlet nozzle of said pump;

a first valve seat formed in the inlet to said discharge channel;

a second valve seat formed in the outlet of said discharge channel and disposed near said outlet nozzle;

a substantially spherical valve member disposed within said discharge channel for engaging said first valve seat under conditions of a reverse flow of coolant through said discharge channel thereby preventing reverse flow through said pump; and

a cage-like member with openings therein for the passage of said coolant attached to the underside of said spherical valve member for supporting said spherical valve member and holding said spherical valve member off said second valve seat to thereby allow said coolant to pass through said cage-like member and through said outlet nozzle, said spherical valve member together with said cage-like member acting to prevent reverse flow through said discharge channel that might damage said pump while allowing



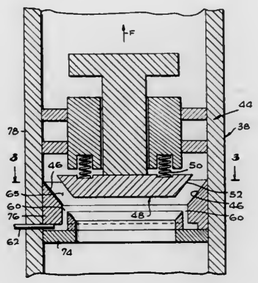
reverse and forward flows therethrough under conditions that will not damage said pump.

4,188,174

WEAR RESISTANT VALVE

Gerald S. Perkins, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 2, 1977, Ser. No. 830,133
Int. Cl.[2] F04B *21/00, 39/00*
U.S. Cl. 417—432 **4 Claims**



1. A fluid pump system comprising:

a main pump which includes a main cylinder with an outlet, and a main piston movable in the cylinder towards said outlet to pump material which lies in said cylinder out of said outlet;

a valve connected to said main cylinder outlet, including walls forming a valve seat, and a valve member with a seat-engaging portion movable against and away from said valve seat; and

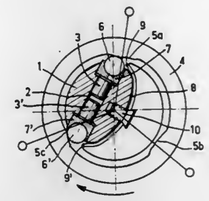
means for directing a washing fluid into the space between said valve member portion and said valve seat at a time immediately prior to closing of said valve member portion against said valve seat, including a washing fluid outlet positioned to direct a washing fluid into said space, a secondary pump which includes a secondary cylinder and a secondary piston movable in said secondary cylinder to pump washing fluid toward said washing fluid outlet, and means for coupling said main piston to said secondary piston only near the end of the stroke of said main piston as it approaches said outlet of said main cylinder, to then begin moving said secondary piston to pump said washing fluid.

4,188,175

FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

Jean-Claude Bonin, Blois, France, assignor to CAV RotoDiesel, Blois, France

Filed Oct. 7, 1977, Ser. No. 840,419
Claims priority, application France, Oct. 11, 1976, 76 30446
Int. Cl.[2] F04B *19/02, 29/00*
U.S. Cl. 417—462 **4 Claims**



1. An injection pump for supplying fuel to an internal combustion engine, comprising:

a housing,

a rotor mounted for rotation within the housing and arranged to be driven in timed relationship with the engine,

a transverse bore formed in the rotor,

a pair of plungers slidably mounted in said bore,

a cam ring surrounding said rotor and formed with cam lobes on its internal periphery,

a pair of rollers engaging the internal periphery of the cam ring, and

roller shoes for respectively supporting said rollers, said roller shoes being respectively in engagement with the outer ends of the plungers, whereby, as the rotor rotates about its axis of rotation, an inward movement is imparted to the rollers,

the axis of the bore in which the plungers are mounted and the rotor's axis of rotation not intersecting with each other, whereby, the rollers are angularly spaced from each other, with respect to the rotor's axis of rotation, by an angle less than 180°,

the distance between the axis of the bore and the rotor's axis of rotation being such that upon rotation of the rotor about its axis of rotation the two rollers are simultaneously engaged and disengaged by pairs of cam lobes.

4,188,176

VARIABLE DISPLACEMENT ROTARY FLUID ENERGY CONVERTER

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Filed Feb. 13, 1978, Ser. No. 877,326
Int. Cl.[2] F01C *1/02, 21/16;* **F03C** *3/00;* **F04C** *15/04*
U.S. Cl. 418—24 **3 Claims**

1. A variable displacement rotary fluid energy converter comprising:

a rotor,

said rotor being elongate and including a longitudinal slot,

a generally triangular chamber,

a crank,

said crank moving back and forth in said longitudinal slot as said rotor rotates end over end within said chamber,

a central plate,

said plate serving to close one end of said chamber and being free to move radially and not free to move axially,

said plate including an elongate hole shaped as the cross-section of said rotor and surrounding same,

said rotor being free to slide axially in said elongate hole,

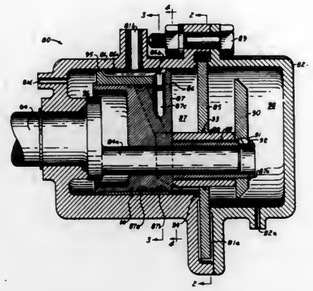
a ring,

the outer periphery of said ring being generally triangular as the cross-section of said chamber and located in same,

a disk,

said disk including a hole through which said crank passes,

said disk being free to rotate with said crank inside said ring, said disk including porting means to conduct fluid to and from said chamber and said longitudinal slot,



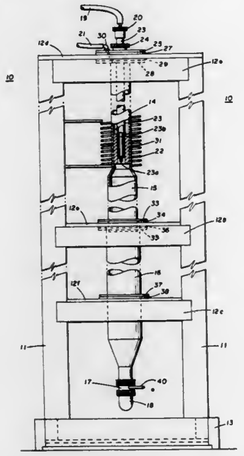
said disk and said ring serving to close the other end of said chamber and being free to slide axially with said rotor, so as to vary the displacement of said chamber per revolution of said rotor.

4,188,177

SYSTEM FOR FABRICATION OF SEMICONDUCTOR BODIES

Jack S. Kilby, Dallas; William R. McKee, Plano, and Wilbur A. Porter, College Station, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 7, 1977, Ser. No. 766,223
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—5 **9 Claims**



1. A system for fabricating small semiconductor bodies, which comprises:

(a) a capillary tube having heat transmissive properties for receiving a solid charge of semiconductor material and having a nozzle for discharging the semiconductor material;

(b) an outer tube enclosing said capillary tube;

(c) a heat susceptor internal to said outer tube and encircling said capillary tube;

(d) heating means for energizing said heat susceptor to render said charge molten; and

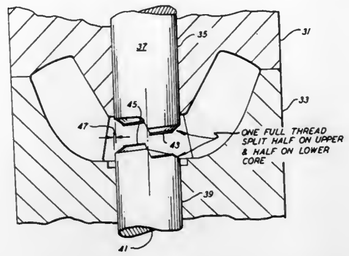
(e) means to pressurize said capillary to force said molten charge through said nozzle.

4,188,178

INTERNALLY THREADED PLASTIC NUT

Bernard Anscher, 21 Elm St., Woodbury, N.Y. 11797

Filed Feb. 28, 1978, Ser. No. 882,112
Int. Cl.[2] B29C *1/14*
U.S. Cl. 425—469 **2 Claims**



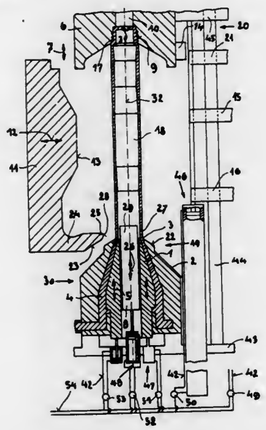
1. In a mold for molding a plastic nut which includes a mold cavity and at least one core member for molding internal threads in the nut, an improved core assembly comprising a first core member having on the end thereof only one-half thread and a second core member having on the end thereof only a second half-thread and shaped to mate with said first core member to form one single thread, said core members having their axes aligned and adapted to abut against each other during molding, whereby, a nut may be molded with a single thread therein using core members which can be simply, linearly inserted and removed from said mold cavity.

4,188,179

APPARATUS FOR MANUFACTURING A BLOWN SYNTHETIC HOLLOW BODY WITH A CLOSED BOTTOM PORTION

Gerhard Linss, and Karl Ossberger, both of Weissenburg, Fed. Rep. of Germany, assignors to Ossberger Turbinenfabrik, Fed. Rep. of Germany

Continuation of Ser. No. 752,126, Dec. 20, 1976, abandoned, which is a continuation of Ser. No. 582,939, Jun. 2, 1975, abandoned. This application Apr. 20, 1978, Ser. No. 898,171
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1974, 2426735
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—531 **2 Claims**



1. Apparatus for manufacturing a blown hollow body of a synthetic material, the hollow body having a head piece and a closed bottom portion, the apparatus having a longitudinal axis, said apparatus comprising:

a discharge receiver device movable along said axis from a lowered position to a raised position having a recess forming the head piece, said recess being aligned along said axis;

a blow needle having a nipple on one end thereof, said needle being concentrically housed in said discharge receiver device along said axis with said nipple extending into said recess;

a multi-sectional blow form concentrically aligned along said axis, said blow form comprising a plurality of sections movable from an open position to a closed position, said blow form abutting said discharge receiver device in said raised position in its closed position thus defining a closed mold volume, each section having a bottom piece with a bottom surface, each said bottom piece extending transversely to said axis and having a cutting edge;

a ring nozzle extrusion means concentrically aligned along said axis for extruding a synthetic material comprising a nozzle cone and a nozzle mouthpiece concentrically surrounding said nozzle cone forming a ring-slotted jet orifice from which the synthetic material can be extruded, said orifice terminating in a frontal area of said nozzle mouthpiece, the cross-sectional area of said jet orifice taken on a plane perpendicular to said axis reducing towards said frontal area of said nozzle mouthpiece;

means for abutting said discharge receiver device against said extrusion means in said lowered position and for moving said discharge receiver along said axis from said lowered position to said raised position with respect to said extrusion means so that a parison is formed therebetween;

means for moving said multi-sectional blow form from said open to said closed position so that a surface of said frontal area inclined with respect to said axis annularly abuts corresponding inclines on said bottom surfaces of said blow form sections whereby said blow form is wedged between said extrusion means and said discharge receiver device in said raised position and defining an ingot butt forming hollow space which bridges said jet orifice, said bottom pieces in said closed position meeting to form said closed mold volume; and

means for moving said nozzle cone with respect to said nozzle mouthpiece upon closing of said blow form sections such that said nozzle cone and nozzle mouthpiece come into contact with each other only at the frontal area of said nozzle mouthpiece, a frontal end portion of said nozzle cone extending into said hollow space;

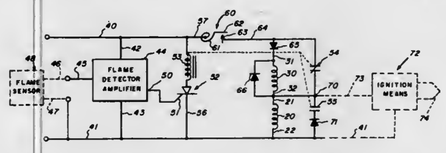
said hollow space being only large enough in a direction parallel to said axis such that said frontal end portion of said nozzle cone does not contact said bottom surfaces of said bottom pieces of said blow form sections.

4,188,180

FUEL BURNER SAFE STARTING SYSTEM

William B. Hamelink, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 2, 1977, Ser. No. 856,694
Int. Cl.[2] F23Q *9/08*
U.S. Cl. 431—46 **9 Claims**



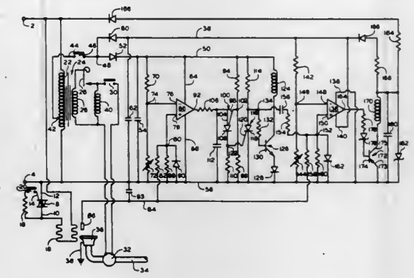
1. A fuel burner safe starting system, including: flame responsive switch means including a relay having a normally closed contact; said flame responsive switch means adapted to be energized from an alternating current source and to respond to a flame sensor to energize said relay upon said sensor detecting a flame; pilot valve means including coil means with said pilot valve means being capable of opening upon application of a full-wave alternating current voltage to said coil means, and remaining open upon the application of a one-half wave alternating current voltage to said coil means; main valve means including pressure responsive means and coil means with said main valve means being capable of opening upon the joint application of a fuel pressure to said pressure responsive means and a voltage to said main valve coil means; asymmetric current conducting means, said main valve coil means, and said pilot valve coil means forming a series circuit; and burner demand switch means connected to said series circuit and controllably connecting said series circuit across said alternating current source; said normally closed relay contacts connected in parallel with said asymmetric current conducting means and said main valve coil means to initially energize said pilot valve means upon said demand switch means closing thereby starting the operation of said system only upon said relay being initially deenergized.

4,188,181

GAS BURNER CONTROL SYSTEM

Dennis M. Rippelmeyer, Waterloo, Ill., and Robert L. Baysinger, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 24, 1978, Ser. No. 899,550
Int. Cl.[2] F23N *5/00*
U.S. Cl. 431—66 **9 Claims**



1. In a gas burner control system,

a burner;

an electrical resistance igniter for igniting said burner;

sensing means located in close proximity to said igniter and said burner; and

circuit means connected to said sensing means responsive to absence of current flow between said igniter and said sensing means when said igniter is below ignition temperature for effecting energizing of said igniter, and responsive to presence of current flow between said igniter and said sensing means when said igniter is above ignition temperature for effecting flow of gas to said burner, and responsive to presence of current flow between said sensing means and said burner when burner flame exists for maintaining gas flow to said burner.

4,188,182

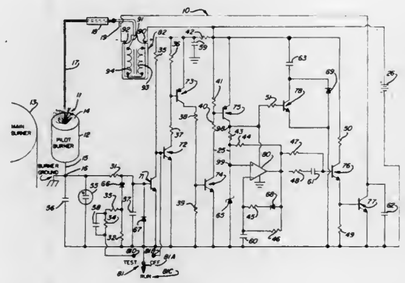
METHOD AND APPARATUS FOR IGNITING AND REIGNITING COMBUSTIBLE FUEL

Edward M. Junak, Grand Junction, Colo., assignor to Teletronics Co., Inc. of Clifton, Clifton, Colo.

Filed Aug. 26, 1977, Ser. No. 828,195
Int. Cl.[2] F23H *5/02*
U.S. Cl. 431—80 **17 Claims**

1. Apparatus for igniting and reigniting combustible fuel emitted from pilot burner structure or the like, comprising:

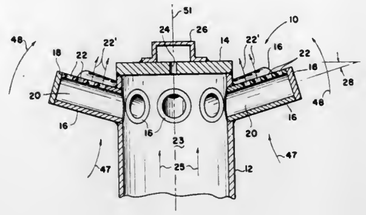
electrically-conductive means through which said fuel is emitted from said pilot burner structure;
electrically-conductive probe means for positioning adjacent said pilot burner structure in the region in which said fuel is emitted;
ignition coil means for generating ignition sparks, said coil means having a primary and secondary coil and three terminals, said secondary coil being connected between said first and second coil terminals, said primary coil being connected between said first and third coil terminals;
first means for connecting said probe means electrically with said second coil terminal;
power supply means for supplying a DC voltage, said power supply means having first and second voltage output terminals across which said DC supply voltage is generated;
second means for connecting said first voltage output terminal electrically with said first coil terminal;
third means for connecting said second voltage terminal electrically with said electrically-conductive means through which said fuel is emitted;



means for sensing the combustion of said emitted fuel, said sensing means being operable to generate a first signal when said emitted fuel is burning and a second signal when said emitted fuel is not burning; and,
switch means for electrically interconnecting said third coil terminal with said second voltage output terminal, said switch means having a closed circuit state in which said third coil terminal is connected with said second voltage output terminal and an open circuit state in which said third coil and voltage output terminals are disconnected from each other, said switch means being triggered by said first signal generated by said sensing means into said open circuit state whereby a substantially constant ion current flows through said primary coil and said burning emitted fuel, said switch means being responsive to said second signal generated by said sensing means to cycle at a predetermined rate between said closed and open circuit states whereby the electrical field in said primary coil periodically increases and collapses to generate ignition sparks between said probe means and electrically-conductive means through which said fuel is emitted thereby to ignite said emitted fuel.

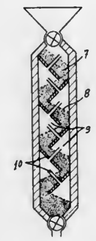
4,188,183
BETTER USE OF GAS DISCHARGE ENERGY FOR SMOKE SUPPRESSION
John S. Zink; Robert D. Reed, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.
Filed Mar. 21, 1977, Ser. No. 779,595
Int. Cl.[2] F23D *15/00*
U.S. Cl. 431—202 **16 Claims**

1. Apparatus for improved use of gas discharge energy for smoke suppression, comprising:
a plurality of horizontally spaced apart burner assemblies, each assembly comprising:
(a) a burner assembly having a vertical axis and a plurality of outwardly spaced tubular arms;
(b) a plurality of orifices in the top surfaces of said arms, the axes of said orifices directed upwardly in radial planes and inclined at a selected angle "A" to the axis of said burner;
(c) means to supply a combustible gas under selected pressure to each of said burner assemblies, and means to ignite said gas above said burner assemblies;
whereby, said gas will issue as high velocity jets from each of said orifices, and will entrain and aspirate air through the angular openings between said arms, and will turbulently mix said gas and air,



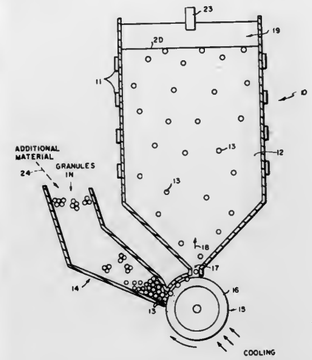
whereby said inclined jets of gas will intersect along the axis of said burner at a selected point above said burner, and will proceed as a single vertical jet of gas, air and flame; and
(d) each of said burner assemblies being spaced from each other, and from any confining structure,
whereby combustion air is free to flow upwardly along both sides of said arms to be freely aspirated into and turbulently mixed with the high velocity jets of gas issuing from said orifices.

4,188,184
CONTINUOUS PROCESSES AND EQUIPMENT FOR TREATMENT OF SOLID SUBSTANCES
Luigi Fornoni, Rua Dr. Mario Freire, 226, Sao Paulo, Brazil
Filed Nov. 21, 1977, Ser. No. 853,042
Claims priority, application Brazil, Apr. 13, 1977, 7702321[U]
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—13 **31 Claims**



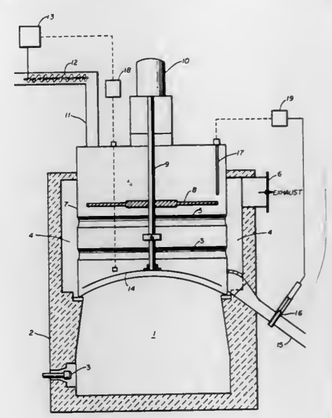
1. In an apparatus for continuous thermal treatment of solid substances of a general composition and damp or clayey composition, the apparatus including a closed vertical container made of refractory material and having at its upper end an inlet for solid substances, and at its lower end an outlet for discharge of treated substances, and a plurality of downwardly inclined deflectors angularly disposed within said container for supporting continuously slipping layers of the solid substances moving downwardly under the action of gravity, the improvement which comprises said deflectors being spaced apart from each other at a predetermined distance, so as to define a free space under each deflector for accumulation of gases therein, and passageway means disposed in said deflectors, for interconnecting one free space to another for passage of accumulated gases therebetween, and forming thereby an internal circuit for circulation of gases within said container.

4,188,185
METHOD AND APPARATUS FOR THE TREATMENT OF PARTICULATE MATERIALS
Nam P. Suh, Sudbury, and Salvatore C. Malguarnera, Medford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Aug. 12, 1977, Ser. No. 824,246
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—27 **8 Claims**



1. A system for treating solid polymer plastic particulate material comprising means for containing a heated fluid medium comprising mercury having a density which differs from the density of said particulate material;
means for heating said mercury to at least about 200° C.;
means for introducing said particulate material in the form of solid granules at a temperature of about 20° C. into said heated fluid medium at the lower end thereof so that the particles of said particulate material travel upwardly therethrough to the upper end thereof and become sufficiently heated to reach a flowable state, the density differential between said particles and said fluid thereby causing said particles to leave said fluid and to coalesce and form a flowable mass thereof external to said fluid.
2. A method for treating solid particulate material comprising the steps of
providing a fluid medium having a density which differs from that of said particulate material;
heating said fluid medium to a temperature higher than that of said particulate material;
introducing particles of said particulate material into said heated fluid medium whereby said particles travel through said medium and become heated to a flowable state,
said particles coming to and remaining at a general state of rest near a surface of said fluid medium, a thin film of said fluid medium being present between said particles and said surface,
each of said flowable particles being permitted to leave said fluid medim when said thin film ruptures at a region adjacent thereto, the density differential between said particles and said fluid medium causing said particles upon leaving to form a flowable mass of particulate material into which said particles are thereby coalesced.

4,188,186
AUTOMATIC CALCINING KETTLE
Richard D. Ladwig, Salina, Kans., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Jun. 22, 1978, Ser. No. 918,140
Int. Cl.[2] F27B *9/40*
U.S. Cl. 432—43 **5 Claims**



1. A control system for operating a gypsum calcining kettle in a continuous manner, including,
a furnace in which combustion supplies heat for calcining gypsum,
a kettle arranged in a heat exchange relationship with the products of combustion of the furnace combustion,
a supply of finely ground raw gypsum,
means connecting the supply to the kettle to control the gypsum supplied the kettle,
means for sensing the temperature of gypsum supplied and being calcined in the lower portion of the kettle,
a discharge conduit connected to the lower portion of the kettle,
a valve in the conduit,
and means of detecting the level of the calcining gypsum in the kettle and arranged to continuously operate the valve to adjust the position of the valve and regulate the flow of calcined gypsum from the lower portion of the kettle to maintain a level of the gypsum in the kettle within a predetermined range.

4,188,187

DYEING OF POLYAMIDE TEXTILES AND ANTHRAQUINONE DYESTUFFS THEREFOR

Roland Mislin, Saint-Louis, France, and Karl-Ulrich Steiner, Binningen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

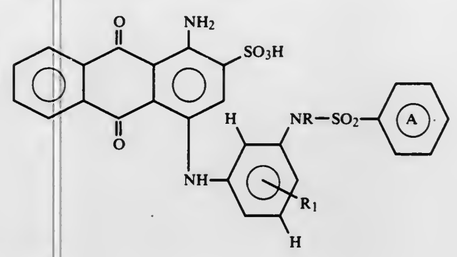
Filed Apr. 5, 1978, Ser. No. 893,730

Claims priority, application Switzerland, Apr. 6, 1977, 4357/77

Int. Cl.[2] C09B *1/00*

U.S. Cl. 8—39 B **11 Claims**

1. A process for dyeing or printing natural or synthetic polyamide textile substrates comprising employing, as dyestuff, a compound of formula I,



I

in which

R is hydrogen, methyl or ethyl,

R_1 is hydrogen, methyl or ethyl, and

the ring A is unsubstituted or monosubstituted by halogen, (C_{1-2})alkyl, (C_{1-2})alkoxy or alkyl(C_{1-2}) carbonylamino or disubstituted by methyl groups,

in free acid or salt form.

4,188,188

HIGH DENSITY LIPOPROTEIN CHOLESTEROL ASSAY

Howard Willner, San Anselmo, and Robert J. Kapteyn, Newport Beach, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Sep. 27, 1978, Ser. No. 945,982

Int. Cl.[2] G01N *31/02, 33/16, 31/14*

U.S. Cl. 23—230 B **11 Claims**

1. A composition for use in a HDL cholesterol separation comprising heparin, a divalent cation salt having the formula: CX_2, wherein C is selected from the group consisting of Group IIA metals and manganese and X is a halogen, and an inert filler comprising a polysaccharide, a terminal interlocking linear glucose polymer and a vinylpyrrolidone polymer.

4,188,189

QUANTITATIVE TESTING FOR VITAMIN B_{12}

Robert H. Allen, Englewood, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed Apr. 4, 1978, Ser. No. 893,524

Int. Cl.[2] G01N *33/16, 31/06*

U.S. Cl. 23—230.3 **6 Claims**

1. A radioisotope dilution assay for measuring the vitamin B_{12} level in a sample comprising:

contacting said sample with a known amount of a radioisotope of vitamin B_{12} and a composition containing a binding protein substantially specific to vitamin B_{12}, said composition being substantially free of substances which bind vitamin B_{12} analogues.

4,188,190

INPUT CONTROL METHOD AND MEANS FOR NITROGEN OXIDE REMOVAL MEANS

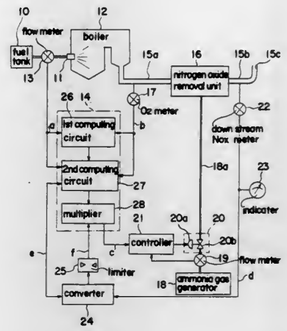
Ryoji Muraki, Nishinomiya; Shinichiro Takemura, Osaka; Yoshio Ohashi, Tokyo, and Athushi Ichioka, Machida, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki and Tokyo Shibaura Electric Co. Ltd., Kawasaki, both of, Japan

Filed Dec. 6, 1976, Ser. No. 747,687

Claims priority, application Japan, Mar. 23, 1976, 51/30887; Jun. 17, 1976, 51/70404

Int. Cl.[2] G05D *11/02*

U.S. Cl. 23—232 R **20 Claims**



1. A method of controlling input of a nitrogen oxide reducing agent into a system having means for removal of NO_x from flue-gas produced as a result of a combustion process effected in a heating installation and flowing through an exhaust line leading to the exterior of the heating installation and injection into said flue-gas of the nitrogen oxide reducing agent, said method comprising:

metering the value of at least one factor relating to the combustion process from among the factors of fuel flow rate, concentration of oxygen in the flue-gas, concentration of carbonic acid gas in the flow-gas, the flow rate of air employed in the combustion process and the amount of flue-gas, and using said metered value for calculating the NO_x concentration in the flue-gas;

directly measuring the value of the NO_x concentration in the flue-gas flowing in the exhaust line and relating said calculated NO_x value and said directly measured value for establishing a true NO_x value;

determining from said true NO_x value a basic calculation value indicating the requisite amount of nitrogen oxide reducing agent to be injected into said flue-gas; and

controlling the supply rate of said reducing agent injected into the flue-gas according to said basic calculation value.

4,188,191

PROCESS FOR REDUCING THE SULFUR CONTENT OF COAL AND COAL CHAR AND THE IGNITION TEMPERATURE OF COAL CHAR

James R. Longanbach, Claremont, and Leon Robinson, Upland, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 429,708, Jan. 2, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,875

Int. Cl.[2] C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 F **1 Claim**

1. A process for producing low sulfur char from coal comprising converting said coal to char at a temperature of about 1000° F. to about 1100° F.; and adding said char to a bath of molten caustic, said bath having a ratio of molten caustic to char of at least about three to one, for a residence time of about ten minutes, wherein said molten caustic is formed from a mixture of about equal parts of sodium hydroxide and potas-

sium hydroxide, said bath is maintained at a temperature of about 500° F. to about 750° F., said char is removed from said bath and washed sufficiently to cause said char to be substantially free of said caustic, and the sulfur content of said char is reduced to a value no greater than about 0.7 percent by weight on a dry basis.

4,188,192

FIRE IGNITING METHOD AND APPARATUS

Sol J. Levenson, and Michael K. Levenson, both of 2636 S. Belvoir Blvd., University Hts., Ohio 44118

Filed Apr. 8, 1976, Ser. No. 674,885
Int. Cl.² C10L *11/00*
U.S. Cl. 44—39 **6 Claims**

1. As fire igniting apparatus, a composite structure comprising

(a) a shaving stock member consisting of a body formed of a shavable magnesium base alloy, shavings of which burn with a dazzling white flame when ignited from a spark from a pyrophoric material, said alloy containing more than 50 wt.% magnesium, the balance of said alloy being formed substantially of one or more elements selected from the group consisting of Al, Mn, Zn, Th, Zr and the rare earths, and

(b) a pyrophoric element secured to said shaving stock member and defining an exposed or exposable surface thereof.

4,188,193

PROCESS FOR PRODUCING HYDROCARBON GAS FROM ORGANIC PLANT MATERIAL

George T. Felbeck, Jr., Wakefield, R.I., assignor to University of Rhode Island, Kingston, R.I.

Filed Mar. 21, 1979, Ser. No. 22,528
Int. Cl.² C10J *3/00*; C10B *2/04*
U.S. Cl. 48—197 R **7 Claims**

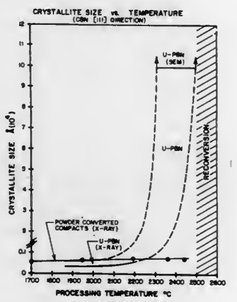
1. The process for converting an organic material selected from the group consisting of a plant-derived organic material, an alcohol, a sugar, and mixtures thereof to a high BTU gas which comprises heating said organic material with ammonia, in the presence of a vanadium catalyst wherein the vanadium is in the +3 or +4 state and a hydrogenation catalyst in an atmosphere substantially free of oxygen and recovering a gaseous product.

4,188,194

DIRECT CONVERSION PROCESS FOR MAKING CUBIC BORON NITRIDE FROM PYROLYTIC BORON NITRIDE

Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 736,988, Oct. 29, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,283
Int. Cl.² B24D *3/04*
U.S. Cl. 51—307 **7 Claims**



1. A high temperature and pressure process for making a sintered polycrystalline cubic boron nitride compact, said process comprising the steps of:

(a) placing preferentially oriented pyrolytic hexagonal boron nitride in a reaction cell, said boron nitride being substantially free of catalytically active materials, said cell having means for shielding said pyrolytic boron nitride from contamination during transformation;

(b) compressing said cell and the contents thereof at a pressure between about 50 kbars and 100 kbars;

(c) heating said cell and the contents thereof to a temperature of at least about 1800° C. within the cubic boron nitride stable region of the boron nitride phase diagram;

(d) maintaining said pressure and temperature conditions of steps (b) and (c) for a period of time sufficient to transform said pyrolytic boron nitride into a sintered polycrystalline cubic boron nitride compact;

(e) ceasing the heating of said cell; and

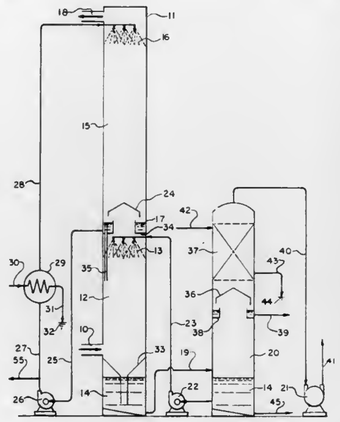
(f) removing the pressure applied to said cell.

4,188,195

TREATMENT OF WASTE LIQUOR

Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Continuation-in-part of Ser. No. 833,917, Sep. 16, 1977, which is a division of Ser. No. 640,331, Dec. 12, 1975, Pat. No. 4,061,531. This application Jan. 4, 1978, Ser. No. 866,820
The portion of the term of this patent subsequent to Aug. 24, 1997, has been disclaimed.
Int. Cl.² B01D *47/00*
U.S. Cl. 55—89 **12 Claims**



1. A process of separating a hot industrial process gas selected from the group consisting of coal and oil gas into its components without addition of external heat comprising:

(a) feeding said gas directly from collecting mains of said industrial process to the first stage of a primary cooler;

(b) directly contacting said gas in said first stage with an aqueous brine, derived from step (m) hereinbelow, to cool said gas, to transfer components from said gas to the brine, and to heat said brine;

(c) passing said cooled gas from said first stage to a second stage of said primary cooler;

(d) directly contacting said gas in said second stage with a condensed liquor derived from step (l) hereinbelow to further cool said gas, to transfer components from said gas to said condensed liquor, and to heat said condensed liquor;

(e) withdrawing said further cooled gas from said second stage as the overhead from said primary cooler;

(f) passing said heated brine from said first stage directly to an evaporator without addition of further heat to said heated brine;

(g) applying a vacuum to said brine in said evaporator to boil said brine and form a cooled concentrated brine and a vapor without addition of heat;

(h) condensing a portion of said vapor in an indirect condenser to form a condensate and separately withdrawing said condensate and said uncondensed vapors;

(i) withdrawing a portion of said cooled concentrated brine from said evaporator as concentrated product;

(j) passing at least a portion of said heated condensed liquor from said second stage to an indirect heat exchanger;

(k) removing heat from said heated condensed liquor in said heat exchanger to cool said liquor passed thereto;

(l) feeding said cooled liquor from step (k) to said second stage for use in step (d); and

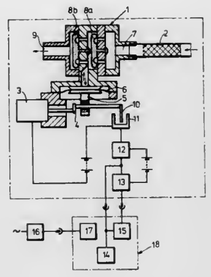
(m) feeding a portion of said cooled concentrated brine from step (g) to said first stage for use in step (b).

4,188,196

ABSORBER WITH SUCTION PUMP

Rudolf Casper; Roland Gröber, both of Leverkusen; Karl-Heinz Schabel, Burscheid, and Klaus Siemer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 862,088
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658739
Int. Cl.² B01D *53/04*
U.S. Cl. 55—270 **3 Claims**



1. A device for monitoring polutants, comprising an absorber, a suction pump connected downstream thereof, wherein the suction pump has inlet and outlet valves comprising O-ring disc valves and a pump drive and means for determining the quantity of air drawn through the pump in a given time period comprising a movable flag operatively connected to the pump drive and a light barrier through which the flag periodically moves during the pumping, wherein the determining means comprises counting means for counting the number of light pulses produced by the flag and light barrier and wherein the device further comprises a housing for the pump, flag, light barrier and counting means, said housing being sufficiently small to enable same to be worn on the body of a person for a complete working day without being cumbersome.

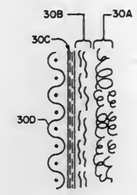
4,188,197

PARTICULATE FILTERING

Suresh D. Amberkar, Framingham, Mass.; Elwood F. Hansen, and David E. Hansen, both of Allendale, N.J., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 616,524, Sep. 25, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 839,048
Int. Cl.² B01D *46/02*
U.S. Cl. 55—382 **10 Claims**

1. A filter medium comprising three elements, the first of which comprises a plurality of successive layers of different densities, the second of which is formed by fibers having different deniers; and the third of which is made up of glass fibers; said first element having a porosity greater than that of said



third element, and said second element having a porosity range between a value above the lowest porosity of said third element and below the highest porosity of said first element.

4,188,198

JOINT DOPING OF POROUS GLASSES TO PRODUCE MATERIALS WITH HIGH MODIFIER CONCENTRATIONS

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Joseph H. Simmons, Bethesda, Md., and Mrinmay Samanta, Washington, D.C., assignors to Pedro Buarque de Macedo, Bethesdam and Theodore Aaron Litovits, Silver Spring, both of, Md.

Continuation-in-part of Ser. No. 755,590, Dec. 30, 1977. This application Nov. 23, 1977, Ser. No. 853,411
Int. Cl.² C03C *25/02, 15/00*
U.S. Cl. 65—3 A **5 Claims**

1. In a method of producing a glass article comprising adding a dopant to a porous glass matrix with interconnected pores by immersing the porous glass matrix in a solution of the dopant to impregnate the porous glass matrix with the solution, precipitating the dopant from the solution within the porous glass matrix, removing solvent and when necessary decomposition products from the porous glass matrix and collapsing the porous glass matrix to a solid form, the improvement which comprises immersing the porous glass matrix in a first dopant impregnating solution containing a mixture of dopants to impregnate the porous glass matrix with the first solution and form an impregnated porous glass matrix with the following composition:

(1) 7 to 25 weight % of the oxide equivalent of at least one member selected from the dopant group consisting of Pb and Bi, and

(2) 1.5 to 9 mole % of the oxide equivalent of at least one member selected from the dopant group consisting of Cs, Rb, and K,

and, prior to removing solvent and when necessary decomposition products from the porous glass matrix, immersing the impregnated porous glass matrix in a second dopant removing solution containing a separate solvent for each dopant group selected so that the solubilities of the dopants in the second solution are less than in the first solution and are approximately equal to within ±50% to decrease the concentration of each dopant substantially the same amount in the region of the article near the surface.

4,188,199

METAL COMPOUND COATING ON A FACE OF A CONTINUOUSLY LONGITUDINALLY MOVING GLASS RIBBON AND APPARATUS FOR USE IN FORMING SUCH COATING

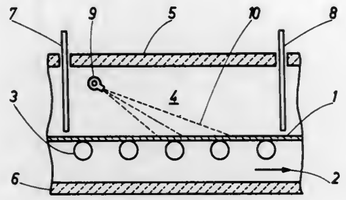
Robert Van Laethem, Loverval; Robert Leclercq, Auvelais; Philéas Capouillet, Gosselies, and Albert Van Cauter, Charleroi, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Mar. 28, 1977, Ser. No. 781,957

Claims priority, application United Kingdom, Apr. 13, 1976, 15063/76

Int. Cl.² C03C *17/06, 17/22*

U.S. Cl. 65—60 C **30 Claims**



1. A process for forming a uniform metal or metal compound coating on a face of a glass ribbon which comprises the steps of continuously longitudinally moving the glass ribbon in generally horizontal direction along a ribbon path, contacting the glass ribbon face while it is at elevated temperature, at a zone along the ribbon path, with a fluid medium containing a substance which undergoes chemical reaction or decomposition to form the metal or metal compound on said face, discharging continuously at least part of said fluid medium against said face in stream formation from stationary discharging means extending transversely across the ribbon path or from discharging means which are displaced to and fro transversely of the ribbon path, said stream formation having (1) a velocity component in the generally horizontal direction of movement of the glass ribbon and (2) an inclination to said face so that the acute or mean acute angle of incidence of the stream formation on said face, measured in a plane normal to said face and parallel with the direction of the glass ribbon movement, is not more than 60°.

9. A process as defined in claim 1, wherein said face is the top face of a continuous ribbon of float glass which is in the course of being formed.

4,188,200

METHOD AND APPARATUS FOR PRODUCTION OF PLATE GLASS

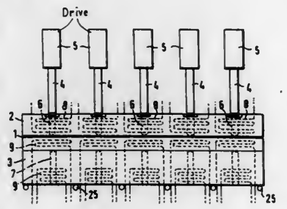
Hannes S. Horn, Im Defdahl 51, 4600 Dortmund 1, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,588

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747832; Oct. 26, 1977, 2747834

Int. Cl.² C03B *5/26*

U.S. Cl. 65—90 **20 Claims**



1. A method for production of wide bands of plate glass in which glass flows out of a nozzle orifice of a flat nozzle formed by two nozzle bars, comprising the steps of:

deforming in a controlled manner at least one of the nozzle bars so as to change its form in order to compensate for a distortion of at least one of the nozzle bars.

13. A nozzle system for the production of a band of plate glass, comprising:

two nozzle bar means in spaced apart relationship for forming a substantially flat band of plate glass;

one of the nozzle bar means being elastically deformable; and

adjusting means connected to control elastic deformation of said one nozzle bar means in accordance with a desired deformation.

4,188,201

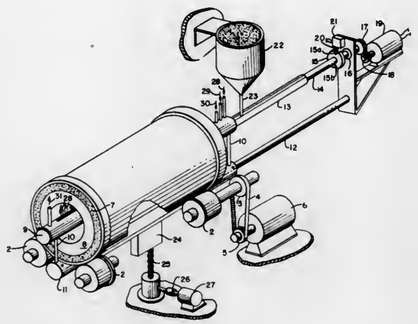
APPARATUS FOR FORMING AN INGOT IN A ROTATING HOUSING

Lothar Jung, 32 Lurline Dr., Millington, N.J. 07946

Filed Apr. 17, 1978, Ser. No. 897,117

Int. Cl.² C03B *19/04, 3/00, 23/20*

U.S. Cl. 65—302 **22 Claims**



1. An apparatus for manufacturing an ingot from a particulate ingot-forming material comprising:

(a) a housing mounted for rotation in a generally horizontal plane about a central axis, said housing defining an interior surface for receiving the particulate material and supporting the ingot formed from same;

(b) means for rotating the housing about its central axis at a speed sufficient to hold the particulate material against the interior surface by centrifugal force;

(c) means for depositing the particulate material by gravity onto the interior surface of said housing, said depositing means including an elongated hollow feeder tube having a slot or opening along its length for receiving and releasing the particulate material;

(d) means for introducing particulate material into the tube through the slot;

(e) means for selectively moving the tube into the housing interior with the slot in the uppermost position;

(f) means for rotating the tube until the slot reaches the lowermost position for discharge of the particulate material along the length of the housing interior; and

(g) heating means coextensive with the fully inserted feeder tube, said heating means arranged to melt the particulate material clinging to the interior surface of said housing as that clinging material is rotated to the uppermost position.

4,188,202

COMPOSITION

Christopher Gillings; Ian C. Jewry, both of Cambridge, and Harold G. Haynes, Royston, all of England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 737,987, Nov. 2, 1976, abandoned. This application May 19, 1978, Ser. No. 907,848

Claims priority, application United Kingdom, Nov. 12, 1975, 46659/75

Int. Cl.² A01N *9/00*

U.S. Cl. 71—88 **8 Claims**

1. An aqueous suspension concentrate which comprises from 100 to 700 g/l of 2-ethoxy-2,3,dihydro-3,3-dimethylbenzofuran-5-yl methane sulphonate at least 85% by weight of the particles thereof having a diameter of less than 5 microns as measured by Coulter Counter, from 0.5 to 10 g/l of a xanthomonas hydrophilic colloid, from 0.5 to 30% by weight, based upon the weight of said sulphonate present, of a surface active agent which comprises a block copolymer of ethylene oxide and propylene oxide and which has a reversible thickening temperature of 45° C. or above, and from 0.5 to 30% by weight, based upon the weight of said sulphonate present, of an anionic deflocculating agent.

4,188,203

HERBICIDAL AND PHYTOHORMONAL AMIDOXIMES

Daniel Farge, Thiais; Jean Leboul, Gip; Yves Le Goff, Bretigny, Orge, and Gilbert Poiget, Thiais, all of France, assignors to Philagro, France

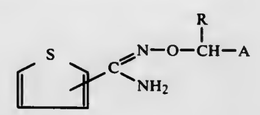
Continuation-in-part of Ser. No. 772,215, Sep. 10, 1976, Pat. No. 4,116,974. This application Jul. 27, 1978, Ser. No. 928,371

Claims priority, application France, Sep. 11, 1975, 75 27884; Jul. 8, 1976, 76 21717; Jul. 28, 1977, 77 24114

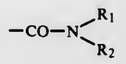
Int. Cl.² C07D *333/26;* **A01N** *9/12*

U.S. Cl. 71—90 **8 Claims**

1. A compound of the formula:



in which: R represents a hydrogen atom or an alkyl radical containing from 1 to 4 carbon atoms and A represents a cyano group or a radical of the general formula:



in which R_1 and R_2, which are identical or different, each represent a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms, an optionally substituted phenyl radical or an amino radical which is itself optionally substituted.

4,188,204

METALLURGICAL PROCESS USING LIQUID FUELS

James L. Norman, and Donald J. Mayhall, both of Houston, Tex., assignors to Falconbridge Nickel Mines Limited, Toronto, Canada

Filed Feb. 6, 1979, Ser. No. 9,880

Int. Cl.² C22D *7/06*

U.S. Cl. 75—11 **5 Claims**

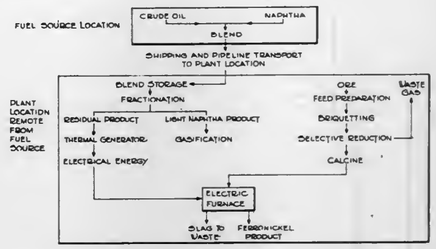
1. In a process for the recovery of ferronickel from lateritic nickel ores utilizing liquid hydrocarbons, at a location remote from a source of liquid hydrocarbons, the improvement comprising:

(i) blending heavy crude oil with naphtha to form a blend pumpable at ambient temperature;

(ii) transporting the blend between the source and the remote location by means which include pumping, at ambient temperature, through a pipeline;

(iii) fractionating the blend at the remote location to recover a light, low-sulphur naphtha product, and a heavy high-sulphur residual product;

(iv) partially combusting the naphtha product with air to form a hot reducing gas, and contacting the ore with the gas to obtain a hot, selectively reduced, calcine;



(v) using the heavy high-sulphur residual product for thermal generation of electrical energy;

(vi) using the electrical energy to melt the calcine to form a substantially barren slag underlain by a molten layer of ferronickel; and

(vii) separating the ferronickel from the slag.

4,188,205

FUEL INJECTION IN BLAST FURNACES

Donald E. Fless, Burlington, Canada, assignor to Alchem, Inc., Burlington, Canada

Filed Mar. 6, 1978, Ser. No. 883,772

Int. Cl.² C22B *5/00*

U.S. Cl. 75—42 **12 Claims**

1. An improved process for injecting a homogenized water-hydrocarbon liquid fuel composition into blast furnaces of the type wherein water and a liquid hydrocarbon fuel are homogenized and then atomized into a blast furnace under pressure to reduce coke consumption, the improvement which comprises introducing into the water-hydrocarbon liquid fuel composition prior to homogenization a metallic element in the form of a compound thereof, said metallic element being selected from the group consisting of zirconium, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper, zinc, aluminum, tin and lead in a quantity sufficient to provide 5–50 ppm as metal in the water-hydrocarbon liquid fuel composition whereby the efficiency of the blast furnace water-hydrocarbon liquid fuel injection is improved.

4,188,206

METALLURGICAL PROCESS

Mans K. O. Johnsson, and Lars A. Eriksson, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Uddeholms, Sweden

Division of Ser. No. 550,554, Feb. 18, 1975, Pat. No. 4,021,233, which is a division of Ser. No. 295,355, Oct. 5, 1972, Pat. No. 3,867,135. This application May 2, 1977, Ser. No. 792,790

Claims priority, application United Kingdom, Oct. 8, 1971, 46507/71; Feb. 28, 1972, 9162/72; Sweden, Jun. 9, 1972, 7583/72

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 **13 Claims**

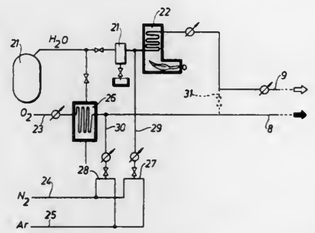
1. A method of reducing the carbon content of a carbon-containing alloy, said alloy containing at least 10by weight of chromium and, as the major component thereof, at least one metal selected from the group consisting of iron, cobalt and nickel, said method comprising:

(a) first melting the alloy and bringing the molten alloy substantially up to the decarburization temperature essen-

tially by oxidising substantially completely any silicon present in the alloy and optionally, any other oxidizable component present in the alloy,

(b) thereafter, decarburizing the alloy at a decarburization temperature of about 1550° to about 1800° C. by introducing into the molten alloy at a depth of at least about 20 cm below the surface thereof:

1. oxygen; and
2. at least one hydrogen containing compound selected from the group consisting of steam and ammonia; and
3. nitrogen; said oxygen oxidising carbon in the alloy to carbon monoxide, the volume ratio of the introduced oxygen to the hydrogen containing compound during at least part of the main decarburization period being below 3:1, said hydrogen containing compound liberating elementary hydrogen in the molten alloy, said nitrogen and elementary hydrogen working as diluting gas for said oxygen in the molten alloy, the amount of



diluting gas and carbon monoxide in the molten alloy being such that the partial pressure of carbon monoxide in the molten alloy is below 0.5 atmospheres and lower than that partial pressure which corresponds to the equilibrium pressure for the carbon/chromium oxidation,

(c) maintaining the molten alloy at a decarburization temperature of at least about 1500° C. essentially by oxidizing chromium in the alloy, wherein the decarburization temperature is at least partly controlled by varying the volume ratio of introduced oxygen to hydrogen-containing compound, said ratio being decreased during the course of the decarburization to below 1:1, using amounts and concentrations such that the decarburization temperature is essentially maintained at no greater than about 1800° C., and,

(d) thereafter removing at least part of the hydrogen remaining in the molten alloy.

4,188,207

ALUMINUM PRODUCTION

Clyde M. Adams, Jr., 3509 Biddle St., Cincinnati, Ohio 45220

Filed Oct. 23, 1978, Ser. No. 953,561

Int. Cl.[2] C22B *21/00*

U.S. Cl. 75—68 B **10 Claims**

1. A process for separating and refining aluminum comprising:

bringing together in a closed process environment a mixture of:

(a) an aluminum-bearing raw material,

(b) at least one alkaline earth chloride selected from the group consisting of calcium, barium, strontium and magnesium chlorides, and

(c) at least one reducing agent selected from the group consisting of silicon, ferrosilicon, calcium silicide, calcium carbide, silicon carbide, aluminum and carbon;

heating said mixture above 1600° C.,

during said heating, venting a mixture of gases emitted from the hot mixture into a cooling zone; and

collecting condensed chlorides and aluminum from said vented gases.

4,188,208

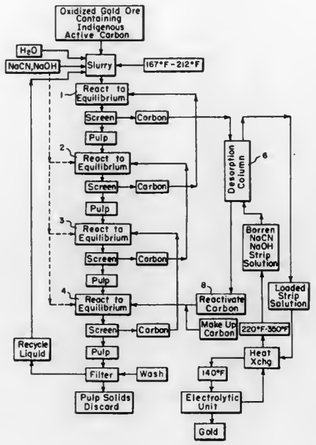
RECOVERY OF GOLD FROM CARBONACEOUS GOLD-BEARING ORES

Wilbur J. Guay, Newtown, Conn., assignor to Newmont Exploration Limited, Danbury, Conn.

Continuation-in-part of Ser. No. 908,166, May 22, 1978, abandoned. This application Dec. 22, 1978, Ser. No. 972,278

Int. Cl.[2] C22B *11/08*

U.S. Cl. 75—105 **8 Claims**



1. In the process for the recovery of gold from sedimentary gold-bearing ores containing indigenous organic carbonaceous material a component of which is capable of adsorbing aurocyanide complexes from an aqueous solution, wherein an aqueous slurry of the ore is advantageously subjected to a preliminary oxidation treatment to oxidize as much of the organic carbonaceous material contained therein as possible, the improvement which comprises:

subjecting the oxidized ore to a combined cyanidation and adsorption treatment by (a) forming an aqueous pulp by the oxidized ore, (b) heating the aqueous pulp to a temperature of between about 167° and 212° F., (c) adding an alkali metal cyanide and alkali metal hydroxide to the aqueous pulp to react with it and convert the gold content of the oxidized ore to a water soluble aurocyanide complex, the amount of alkali metal cyanide and alkali metal hydroxide added to the aqueous pulp being such that the pulp contains from about 0.1 to 1.0% by weight of alkali metal cyanide and from about 0.1 to 10% by weight of alkali metal hydroxide, (d) adding particles of granular activated carbon to the aqueous pulp to adsorb a major portion of the aurocyanide complex on the surface of said particles, and (e) agitating the aqueous pulp to promote the cyanidation reaction and the concurrent adsorption of the aurocyanide complex produced thereby for a period of time sufficient to allow these processes to approach chemical and physical equilibrium;

separating the particles of granular activated carbon on the surface of which said aurocyanide complex has been adsorbed from the aqueous pulp containing the oxidized ore from which said gold compounds have been extracted;

subjecting said particles of activated carbon to an aurocyanide complex desorption treatment to strip the aurocyanide complex from the surface of the activated carbon; and

recovering said aurocyanide complex and converting the gold content thereof to metallic gold.

4,188,209

NICKEL-BASE ALLOY

Gerhard Kruske, Oberursel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,718

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639325

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—122 **8 Claims**



1. A nickel-base alloy which is resistant to corrosion, abrasion, erosion, cavitation and to temperature cycles and possesses a high high-temperature strenght, consisting essentially of the following composition in % by weight:

Carbon: 0.5 to 5
Tungsten: 7 to 15
Chromium: 25 to 55
Boron: 0.5 to 3.5
Silicon: 1 to 5
Iron: 1 to 5
Nickel: balance

and

(a) % by weight C=% by weight C_1+% by weight C_2+0.2;

(b) % by weight W=36×% by weight C_1; and

(c) % by weight Cr≧17+9×% by weight C_2−4×% by weight C, % by weight C_1 being the carbon content required to form carbide refractory materials and % by weight C_2 being carbon content required to form chromium carbide.

4,188,210

IRON AND/OR STEEL TREATMENT WITH MAGNESIUM AND REFRACTORY COATED COMPOSITE SHOT

James F. Bregi, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 6, 1978, Ser. No. 875,273

Int. Cl.[2] C22C *33/08*

U.S. Cl. 75—130 R **6 Claims**

1. A process for the production of cast iron castings comprising:

(a) introducing into a ladle a predetermined charge of molten iron having sulfur in the range of 0.04–0.12% by weight of such composition that it would be a grey cast iron with the graphite in flake form if case, the charge is of such quantity to provide a ferrostatic head of at least two feet;

(b) either prior to or simultaneous with step (a), pouring a charge of coated iron-based shot onto the bottom of said ladle, each particle of said shot having a diameter substantially in the range of 0.4–0.20 inches, each particle of shot having an inner coating of substantially pure magnesium and an outer coating of a refractory material resistant to melting at molten iron temperatures, said magnesium coating forming a thin shell about each of said particles with a uniform thickness of 0.018–0.22 inches, said outer coating consisting of a wash in the thickness range of 0.004–0.010 inches, said iron based shot being added in a quantity predetermined to carry sufficient magnesium for at least desulfurizing said molten iron and acting as a chill core to promote liquidification of said magnesium coating by the heat of said molten iron.

4,188,211

THERMALLY STABLE AMORPHOUS MAGNETIC ALLOY

Norishige Yamaguchi; Kazuo Ohya; Osamu Kohmoto, and Hiroki Fujishima, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Feb. 9, 1978, Ser. No. 876,528

Claims priority, application Japan, Feb. 18, 1977, 52-16816; Feb. 24, 1977, 52-19460

Int. Cl.[2] C22C *19/00, 19/05*

U.S. Cl. 75—170 **42 Claims**

1. An essentially amorphous, magnetic alloy having stable magnetic properties after heating to a temperature in the range of 100° to 200° C. said alloy having the general formula:

$$(Fe_aCo_bNi_c)_x(Si_eB_f)_y,$$

wherein, a, b and c are the molar fractions of iron, cobalt and nickel, respectively, wherein a+b+c=1.00; e and f are the molar fractions of silicon and boron, respectively, wherein e+f=1.00; x is the atomic percent of iron, cobalt and nickel; and y is an atomic percent of silicon and boron, based on the alloy, respectively, and, wherein a, c, e, f and y are defined by the following relationships:

$$0.03 \leqq a \leqq 0.12$$

$$0 \leqq c \leqq 0.60$$

$$27.5 - 8c \leqq y \leqq 35 - 19c$$

$$0 \leqq ey \leqq 25, \text{ and}$$

$$0 \leqq fy \leqq 30.$$

5. An essentially amorphous magnetic alloy having stable magnetic properties after heating to a temperature in the range of 100° to 200° C. and which has a reduced irreversible dependence of the initial permeability over a temperature range of −40° C. to 120° C., said alloy having the general formula:

$$(Fe_aCo_bNi_c)_x\,(Si_eB_f)_y,$$

wherein, a, b and c are the molar fractions of iron, cobalt and nickel, respectively, wherein a+b+c=1.00; e and f are the molar fractions of silicon and boron, respectively, wherein e+f=1.00; x is the atomic % of iron cobalt and nickel and y is the atomic % of silicon and boron, respectively, based on the composition expressed by said general formula, and, further, said values a, b, e, f and y are defined by the following relationships:

$$0.03 \leqq a \leqq 0.12;$$

$$0.40 \leqq b \leqq 0.85;$$

$$20 \leqq y \leqq 35;$$

$$0 \leqq ye \leqq 25, \text{ and;}$$

$$0 < fy \leqq 30;$$

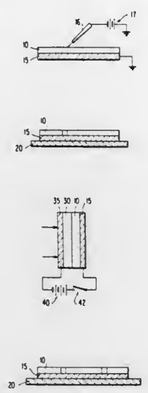
and, wherein at least one element selected from the group consisting of Ti, Zr, V, Nb, Ta, Cr, Mo, W, Zn, Al, Ga, In, Ge, Sn, Pb, As, Sb and Bi in an amount from 0.5 to 6.0 atomic % based on the total components of the amorphous alloy is present in said alloy expressed by said general formula.

4,188,212

ELECTRIC CURRENT CONDUCTIVE COMPOSITION, IMAGE RECORDING ELEMENT CONTAINING THE SAME AND PROCESS FOR RECORDING IMAGES USING THE SAME

Masato Fujiwara; Mitsuharu Nirasawa, and Keiji Takeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 16, 1977, Ser. No. 825,114
Claims priority, application Japan, Aug. 18, 1976, 51-98533
Int. Cl.² G03G *5/04, 13/22*
U.S. Cl. 430—69 **55 Claims**



10. An image recording element comprising (i) a first electrically conductive layer, (ii) a layer of an electric current conductive composition consisting essentially of benzotriazole, nitrobenzotriazole, an alkylbenzotriazole in which the alkyl moiety thereof has up to about 20 carbon atoms, a halobenzotriazole and an amidobenzotriazole in which the amido moiety thereof has up to about 20 carbon atoms, (b) a substantially electrically insulating binder, (c) a reducible metal compound and (d) a reducing agent for said reducible metal compound, (iii) a photoconductive material layer and (iv) a second electrically conductive layer, in this order, with at least one of said electrically conductive layers ((i) and/or (iv)) being transparent to actinic irradiation, wherein said component (a) is present in an amount efffective to render said layer containing said substantially electrically insulating binder electric current conductive by reducing the specific resistance of said binder, whereby a latent image can be formed in said layer of electric current conductive composition upon production of an imagewise distribution of an electric current therein.

4,188,213

COLOR CORRECTED PRINTING SYSTEM

Richard F. Lehman, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 421,387, Dec. 3, 1973, Pat. No. 3,902,801.
This application Mar. 28, 1975, Ser. No. 563,021
Int. Cl.² G03G *13/01*
U.S. Cl. 430—43 **3 Claims**

1. A method of producing a color copy, including the steps of:

recording successive single color electrostatic latent images on an image bearing member;

developing each successive single color electrostatic latent image with particles containing a predetermined dominant colorant therein corresponding to each recorded single color electrostatic latent image, said step of developing comprising the steps of depositing particles containing a dominant cyan colorant with a minor magenta colorant impurity on an electrostatic latent image formed from a red filtered light image, depositing particles containing a dominant magenta colorant with a minor yellow impurity on an electrostatic latent image formed from a green filtered light image, and depositing particles containing a dominant yellow colorant on an electrostatic latent image formed from a blue filtered light image;

transferring successive layers of particles to a sheet of support material such that the layer of particles having the dominant magenta colorant with the minor yellow colorant is superimposed over the layer of particles having the dominant cyan colorant with the minor magenta colorant impurity and the layer of particles having the dominant yellow colorant is superimposed over both of the previously transferred layers of particles; and

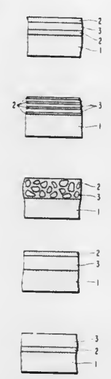
regulating electrically said transfer step so that successively thinner layers of particles are transferred from the image bearing member, to the sheet of support material resulting in a substantially color corrected copy.

4,188,214

RECORDING MATERIAL

Keishiro Kido; Satoshi Yoshida, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 695,212, Jun. 11, 1976, abandoned.
This application Feb. 3, 1978, Ser. No. 875,066
Claims priority, application Japan, Aug. 11, 1975, 50-97251
Int. Cl.² G03C *5/04, 1/76*
U.S. Cl. 430—494 **4 Claims**



1. A material for recording a laser beam scanned imagewise by evaporating or deforming scanned portions of a recording layer thereof by the heat energy of the laser beam, which comprises a support and at least one recording layer vapour deposited thereon having a thickness of about 300 Å to about 1500 Å and said layer comprising at least one metal selected from the group consisting of Sn, Bi, In, Zn, Al and Cu, wherein the improvement comprises said layer also containing one or more compounds selected from the group consisting of CrS, Cr_2S, Cr_2S_3, MoS_2, MnS, FeS, FeS_2, CoS, Co_2S_3, NiS, Ni_2S, PdS, Cu_2S. Ag_2S, ZnS, In_2S_3, In_2S_2, GeS_x, wherein x is a positive integer of 2 to 9, SnS, SnS_2, PbS, As_2S_3, Sb_2S_3, Bi_2S_3, MgF_2, CaF_2, RhF_3, MoO, InO, In_2O, In_2O_3, GeO and PbO, and wherein the volume ratio of said one or more compounds to said one or more metals is about 1/5 to about 1/30 in said at least one layer.

4,188,215

PHOTOSENSITIVE PRINTING PLATE, METHOD OF PREPARING SAME, AND METHOD OF PROCESSING SAME

Masamichi Sato; Sadaharu Ikeda, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 742,494, Nov. 17, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,680
Claims priority, application Japan, Nov. 17, 1975, 50-138424
Int. Cl.² G03C *1/76, 3/00;* **G03F** *7/02*
U.S. Cl. 430—156 **12 Claims**

1. A photosensitve printing plate comprising a support with a hydrophilic surface having formed in succession thereon (1) a layer of an oleophilic photosensitive resin composition which is sensitive to ultraviolet rays and wherein when the composition is exposed to ultraviolet rays a change occurs at exposed areas, whereby the exposed portions of the layer either become insoluble or soluble in a solvent, and (2) directly on said layer (1), a layer of photosensitive silver halide which is developable using an aqueous developer solution for the silver halide and comprising a dispersion of particles of photosensitive silver halide grains coated with a water soluble polymer in an oleophilic binder resin capable of being dissolved in a developer for said photosensitive resin composition, wherein the ratio of the silver halide to the water-soluble polymer, by weight, is 8:1 to 1:6 and the oleophilic binder is used in an amount of from 0.001 to 0.5 parts by weight per part by weight of the silver halide grains.

4,188,216

METHOD OF PRINT DYEING TEXTILE MATERIALS

Jon M. Blumenaus, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Division of Ser. No. 829,250, Aug. 30, 1977, Pat. No. 4,159,892.
This application Apr. 21, 1978, Ser. No. 898,880
Int. Cl.² G03C *5/04, 13/14;* **G03F** *1/00;* **G03C** *5/00*
U.S. Cl. 430—22 **7 Claims**

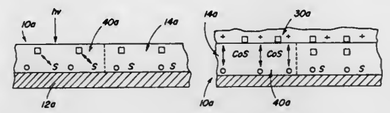
1. A method for preparation of the final film used for engraving a screen for use in continuous print dyeing of textile fabrics with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the printed fabric which comprises setting off a select area of the photograph to form a pattern with a predetermined outline to establish the basic repeat for the pattern without obvious discontinuities, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and a half-tone positive of each color separation, selectively combining the posterized and half-tone positives to provide a negative for use in engraving one or more screens with the combined negative.

4,188,217

CATALYTIC ACTIVATION OF COBALT COMPLEX IMAGING BY COBALT SULFIDE

Glenn R. Wilkes, Webster, and Albert T. Brault, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 595,932, Jul. 14, 1975, Pat. No. 4,061,497.
This application Sep. 15, 1977, Ser. No. 833,787
Int. Cl.² G03C *5/24*
U.S. Cl. 430—353 **4 Claims**



1. A process for forming an image in an element having a support bearing a layer containing a cobalt sulfide precursor composition comprising a photoreducible inert cobalt(III) complex capable of forming cobalt sulfide in the presence of a source of sulfide ions, and a source of sulfide ions capable of combining with cobalt(II) to form cobalt sulfide;

the process comprising

(a) imagewise exposing said layer;

(b) heating said layer, whereby the complex and the sulfide ion source combine to form a cobalt sulfide image, and

(c) reacting a reducible cobalt(III) complex and a primary aromatic amine developing agent in the presence of the imagewise distributed cobalt sulfide and a color coupler, whereby the developing agent is oxidized and the oxidized developer reacts with the coupler to form a dye image.

4,188,218

IMAGES FORMED BY DECOMPOSITION OF TE (II) COORDINATION COMPLEXES

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 703,405, Jul. 8, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,199
Int. Cl.² G03C *1/00, 1/48*
U.S. Cl. 430—495 **9 Claims**

1. A photosensitive element comprising a support having thereon

(1) a layer comprising a binder and a compound capable of forming an image of nuclei of one or more metals selected from the group consisting of Te, Pd, Ag and Cu; and

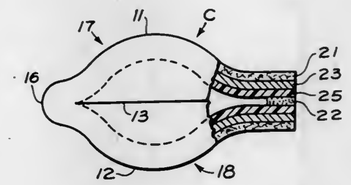
(2) a layer comprising a binder and a coordination complex of tellurium (II) and two univalent bidentate sulfur containing ligands, wherein said tellurium (II) is coordinated to said ligands through said sulfur, said layers being in reactive association.

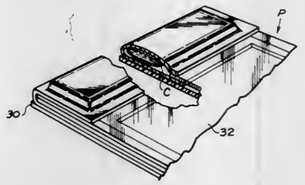
4,188,219

RUPTURABLE FLUID CONTAINER AND ELEMENTS CONTAINING SAME

John D. Cawley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1978, Ser. No. 959,827
Int. Cl.² G03C *1/48, 5/54;* **B43M** *3/00;* **B65D** *35/14*
U.S. Cl. 430—208 **22 Claims**





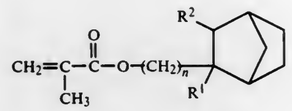
1. In a container useful for holding a fluid, said container comprising:

a pair of opposed walls marginally sealed together over a

substantial area to provide an internal cavity adapted to retain said fluid, at least one of said walls being flexible and deformable, said opposed walls being marginally sealed together over a first part of said area, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than over said first part of said area, whereby said seal of less strength preferentially bursts along said second part of said area upon the application of pressure to said container, the improvement wherein:

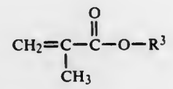
said sealing composition comprises a copolymer of

(a) at least about 50 percent, by weight, of a polymerizable monomer having the formula (I):



wherein n is an integer of from 0 to 3; R^1 is hydrogen or alkyl; and R^2 is hydrogen, alkyl or phenyl; with

(b) a copolymerizable monomer having the formula (II):



wherein R^3 is alkyl,

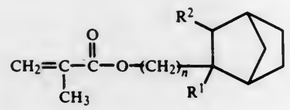
said copolymer having a glass transition temperature of at least about 80° C.

13. In a photographic film unit comprising a support and a container useful for holding fluid photographic processing material, said container comprising:

a pair of opposed walls marginally sealed together over a substantial area to provide an internal cavity adapted to retain said processing material, at least one of said walls being flexible and deformable, said opposed walls being marginally sealed together over a first part of said area, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than over said first part of said area, whereby said seal of less strength preferentially bursts along said second part of said area upon the application of pressure to said container, the improvement wherein:

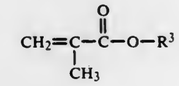
said sealing composition comprises a copolymer of

(a) at least about 50 percent, by weight, of a polymerizable monomer having the formula (I):



wherein n is an integer of from 0 to 3; R^1 is hydrogen or alkyl; and R^2 is hydrogen, alkyl or phenyl; with

(b) a copolymerizable monomer having the formula (II):



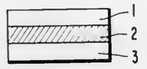
wherein R^3 is alkyl,

said copolymer having a glass transition temperature of at least about 80° C.

4,188,220
SUPPORTS FOR PHOTOGRAPHIC PAPER AND PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsuneo Kasugai, and Keishi Kitagawa, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 31, 1976, Ser. No. 672,357
Claims priority, application Japan, Mar. 31, 1975, 50-39526
Int. Cl.² G03C *1/85*
U.S. Cl. 430—536 **7 Claims**



1. A base support coated with a resin composition which comprises about 5 to about 25 parts by weight of a low molecular weight polyolefin having a number average molecular weight of from about 1,500 to about 10,000 in combination with 100 parts by weight of a polyolefin resin having a number average molecular weight of 20,000 to 200,000.

4,188,221
PHOTOSENSITIVE POLYAMIDE RESIN COMPOSITION USEFUL FOR MAKING RELIEF PRINTING PLATE

Masaru Nanpei; Toshiaki Fujimura; Hajime Kouda; Yoshihiro Kasho, and Kuniomi Etoh, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed May 8, 1978, Ser. No. 904,168
Claims priority, application Japan, May 14, 1977, 52-55744
Int. Cl.² G03C *1/68*
U.S. Cl. 430—288 **16 Claims**

1. A photosensitive polyamide resin composition useful for making a relief printing plate, which comprises 30 to 90% by weight of a water-soluble polyamide having ammonium type nitrogen atoms and 5 to 70% by weight of a photopolymerizable unsaturated compound prepared by reacting (meth)acrylic acid (I) and a polyglycidyl ether of an aliphatic polyvalent alcohol (II) in an equivalent ratio of $0.5 \leqq (I)/(II) \leqq 2.0$.

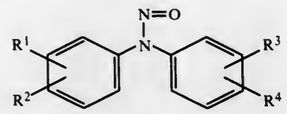
15. A photosensitive article useful in forming a relief printing plate comprising a layer of the composition of claim **1** on a support layer.

4,188,222
PHOTOCURABLE COMPOSITION CONTAINING AN N-NITROSODIARYLAMINE

Tuguo Nezu, and Nobuyoshi Miyata, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Sep. 15, 1975, Ser. No. 613,625
Claims priority, application Japan, Sep. 17, 1974, 49-106013
Int. Cl.² G03C *1/68*
U.S. Cl. 430—284 **10 Claims**

1. A photocurable composition comprising a major part of a photopolymerizable compound having at least two ethylenically unsaturated bonds in one molecule thereof, a minor part of a photosensitizer and 0.001–1.0% of an N-nitrosodiarylamine expressed by the formula



(wherein R^1 and R^2 are independently hydrogen, an alkyl group having 1–3 carbon atoms, a phenyl group, a halogen atom, a methoxy group, an ethoxy group, a dimethylamino group or a diethylamino group, and R^3 and R^4 are independently hydrogen, an alkyl group having 1–9 carbon atoms, a cyclohexyl group, a phenyl group, a halogen atom, a methoxy group, an ethoxy group, a dimethylamino group or a diethylamino group).

4,188,223
AMINO-FUNCTIONAL PHOTOPOLYMER COMPOSITIONS AND PHOTO-OXIDATION IMAGING PROCESSES EMPLOYING SAME

James C. Woodbrey, Chesterfield, Mo., and Marlowe V. Moncur, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1977, Ser. No. 866,133
Int. Cl.² G03C *1/68, 5/00*
U.S. Cl. 430—270 **13 Claims**

1. A photopolymer composition comprising an amino-functional photopolymer having two or more amino-functional groups per polymeric unit, said amino-functional groups comprising one selected from the group consisting of tertiary aliphatic amines, hindered secondary aliphatic amines, dialkyl aryl amines and combinations thereof, and

a photosensitizer capable of generating singlet molecular oxygen upon being subjected to electromagnetic radiation in the presence of ordinary molecular oxygen,

said photopolymer being capable of undergoing a photo-oxidation reaction when exposed to electromagnetic radiation in the presence of said photosensitizer and ordinary molecular oxygen.

4,188,224
PHOTOPOLYMERIZABLE COMPOSITION CONTAINING ANTHRONES

Louis Felder, Basel, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 768,243, Feb. 14, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 892,568
Claims priority, application Switzerland, Feb. 23, 1976, 2173/76
Int. Cl.² G03C *1/68*
U.S. Cl. 204—159.15 **6 Claims**

1. A photopolymerizable composition consisting essentially of one or more esters of acrylic acid or methacrylic acid and 0.5 to 5% by weight of a compound selected from the group consisting of 10,10-dimethoxyanthrone, 10,10-diethoxyanthrone and 10,10-ethylenedioxyanthrone.

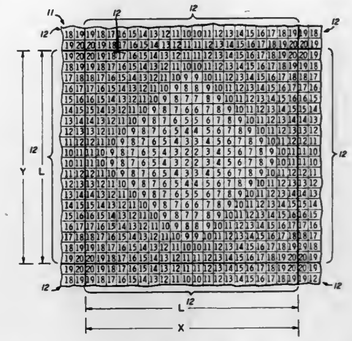
4,188,225
HALFTONE SCREEN WITH CELL MATRIX

Hua-Kuang Liu, Tuscaloosa, Ala., assignor to Lumin, Inc., Tuscaloosa, Ala.

Filed Apr. 10, 1978, Ser. No. 894,902
Int. Cl.² G03F *5/00*
U.S. Cl. 430—7 **12 Claims**

1. In a screen for use in the reproduction of continuous-tone graphic images:

screen means for use in the reproduction of continuous-tone graphic images, said screen means comprising a two dimensional matrix of cells, said cells having a common pattern of optical transmittance levels, said common pattern of optical transmittance levels for each cell being characterized by sets of unit areas, each set having a uniform optical transmittance level, with each set of unit areas having a discrete optical transmittance level differing from each other array of unit areas within the cell by a well-defined combination of unit step functions of transmittance, and said well-defined combination of unit step functions being functions of two variables, one variable being the distance to the point where the optical transmittance level is evaluated from the boundary of a first side of said cell, and the other variable being the distance of said



point from the boundary of the side adjacent said first side of said cell.

4,188,226
DRY IMAGE FORMING MATERIAL CONTAINING DIARYLHALOMETHANE

Kageyasu Akashi; Yoshio Hayashi; Tatsumi Arakawa; Takeo Kimura, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1978, Ser. No. 922,463
Claims priority, application Japan, Jul. 18, 1977, 52/85109
Int. Cl.² G03C *1/02*
U.S. Cl. 430—620 **7 Claims**

1. A dry image forming material comprising:

(a) a non-photosensitive organic silver oxidizing agent;

(b) a reducing agent for silver ion; and

(c) a compound of the formula,



wherein R^1 and R^2 independently represent an aryl group or a substituted aryl group; and X represents a chlorine atom, a bromine atom or an iodine atom.

4,188,227
METHOD OF PREPARING MULTI-COMPONENT CHEMICAL COMPOSITIONS

Randy L. Bauer, 4606 Sixth Ave., Vienna, W. Va. 26105, and Gerald A. Krulik, Rte. 1, Box 212, Washington, W. Va. 26181

Filed May 27, 1977, Ser. No. 801,185
Int. Cl.² C09D *5/20;* **C09K** *3/00, 3/18*
U.S. Cl. 106—1.27 **10 Claims**

1. A process for preparing a multicomponent chemical composition including an unreacted hydrated salt and a complexing agent comprising the steps of: (1) melting a hydrated salt which has a melting point below about 100° C.; (2) adding a complexing agent to the molten salt, said complexing agent being incapable of a direct combination reaction with said hydrated salt; (3) mixing said complexing agent into said molten salt to form a homogeneous mass; and (4) cooling said mass to solidify the resulting product.

4,188,228

FIBER GLASS MAKING PELLETS CONTAINING FIBER GLASS CULLET

Stanley F. Brzozowski, Coraopolis, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 902,598, May 4, 1978, abandoned, which is a division of Ser. No. 862,075, Dec. 19, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,758

Int. Cl.[2] C03B *5/16*

U.S. Cl. 106—50 **12 Claims**

1. In a fiber glass making composition comprising a pellet of batch ingredients consisting essentially of 52 to 56 percent SiO_2, 12 to 16 percent Al_2O_3, 16 to 25 percent CaO and 6 to 13 percent B_2O_3 the improvement comprising the presence in the pellet from about 5 to about 35 percent by weight of the pellet of a fiber glass cullet having the composition recited above, said fiber glass cullet being free of organic contaminants.

4,188,229

HIGH TEMPERATURE REFRACTORY CAULKING COMPOSITION

Frederick V. Reven, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 24, 1978, Ser. No. 963,665

Int. Cl.[2] C04B *35/14*

U.S. Cl. 106—68 **6 Claims**

3. A high temperature refractory caulking composition useful for sealing coke oven ascension pipes, Sinter furnaces, and the like, comprising:

Ingredients	% by Weight
Fluorspar	5 - 15
75% H_3PO_4	10 - 30
Alpha cristobalite	10 - 30
Alpha-quartz	10 - 50
Glassy polyphosphate having a deformation temperature of at least 500° C.	10 - 50
Bentonite clay	1 - 10
Water	An amount sufficient to form the above ingredients into a workable plastic mass.

4,188,230

SULPHUR CONCRETES, MORTARS AND THE LIKE

Jack E. Gillott; Ian J. Jordaan; Robert E. Loov, and Nigel G. Shrive, all of Calgary, Canada, assignors to Sulphur Development Institute of Canada, Calgary, Canada

Filed Sep. 12, 1978, Ser. No. 941,732

Int. Cl.[2] C04B *19/06*

U.S. Cl. 106—70 **48 Claims**

1. A hot-mouldable, water-resistant, composition comprising a mixture of mineral aggregate contaminated with swelling clay, sulphur in an amount effective to bind said aggregate and a petroleum or polyol additive effective to prevent disintegration of the composition in the presence of water.

4,188,231

METHODS OF PREPARING IRON OXIDE MORTARS OR CEMENTS WITH ADMIXTURES AND THE RESULTING PRODUCTS

Rudolph C. Valore, 618 Wyndemere Ave., Ridgewood, N.J. 07450

Filed Jun. 17, 1977, Ser. No. 807,598

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **57 Claims**

1. A mortar or cement composition adapted for being mixed with water and set, said composition comprising cement, iron oxide, a functional water reducer admixture, and a thickener admixture, said functional water reducer admixture being adapted to increase the density of the mortar or cement without substantially retarding the setting thereof and without entraining substantial amounts of air, said thickener admixture being adapted to inhibit bleeding of water from the mortar or cement.

4,188,232

MINI-AGGREGATE IRON ORE IN CEMENT MATRIX

William C. Hall, Albany Turnpike, Central Valley, N.Y. 10917, and John M. Peterson, Toleman Rd., Rock Tavern, N.Y. 12575

Continuation-in-part of Ser. No. 506,274, Sep. 16, 1974. This application Jun. 24, 1977, Ser. No. 809,783

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—97 **7 Claims**

1. A method comprising the step of preparing cement such that said cement has a strength substantially independent of the slump thereof by adding iron ore concentrate mini-aggregate to said cement, the mini-aggregate being characterized by high bulk density, a blackish shining appearance, and sharp crystalline corners and flat cleavage planes, said mini-aggregate being formed of particles in major proportion of sizes no larger than would pass through an eight mesh sieve and not small enough to pass through a 150 mesh sieve and being uniformly dispersed throughout matrix, said particles being in major proportion larger than would pass through a 150 mesh sieve.

4,188,233

PROCESS FOR PREPARING HYDRAULIC BINDING MATERIALS OF HIGH BONDING CAPACITY FROM GLASSY PYROGENIC ROCKS

Zoltán Juhász, and Gyula Varju, both of Budapest, Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Apr. 13, 1978, Ser. No. 896,338

Claims priority, application Hungary, Apr. 15, 1977, BU 848

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—97 **8 Claims**

1. A process for preparing hydraulic binding materials having a high bonding capacity, comprising grinding a natural pyrogenic glass containing more than 1% of combined water, for 0.5 to 36 hours, under a higher mechanical stress than is usual during conventional fine grinding, and thereafter admixing the glass with a member selected from the group consisting of lime and portand cement.

4,188,234

CHELATION

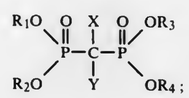
Edward G. Budnick, Scotch Plains, N.J., assignor to Plains Chemical Development Co., Scotch Plains, N.J.

Division of Ser. No. 688,388, May 20, 1976, Pat. No. 4,116,990, which is a division of Ser. No. 813,385, Feb. 28, 1969, and Ser. No. 505,471, Oct. 28, 1965, and a continuation-in-part of Ser. No. 485,624, Sep. 7, 1965, and Ser. No. 482,257, Aug. 23, 1965, said Ser. No. 688,388, is a division of Ser. No. 33,513, Apr. 20, 1970. This application Dec. 19, 1977, Ser. No. 862,194

Int. Cl.[2] C08L *27/06, 91/00*

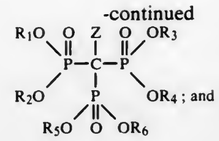
U.S. Cl. 106—267 **23 Claims**

6. A process for the production of a protective coating composition comprising: preparing a metal complex by contacting a solution of non-alkali metal ions with a phosphorus compound having a formula selected from the group consisting of:

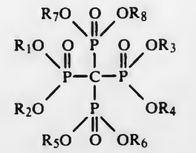


(a)

-continued



(b)



(c)

where R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are selected from the group consisting of hydrogen, alkali metal and ammonium, X is selected from the group consisting of hydrogen, alkyl, alkenyl, aryl, chloroalkyl, chloroaryl, and halogen of atomic weight 35 to 80, Y is selected from the group consisting of hydroxyl, phenyl and halogen of atomic weight 35 to 80 and Z is selected from the group consisting of hydrogen, phenyl and halogen of atomic weight 35 to 80, and mixing said metal complex with a protective coating vehicle and a film-forming material to produce said protective coating composition.

8. A process according to claim 6 wherein said protective coating vehicle is turpentine and said film-forming material is selected from the group consisting of linseed oil, tung oil, soybean oil and dehydrated castor oil.

4,188,235

ELECTRODE BINDER COMPOSITION

Wilton F. Espenscheid, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 703,720, Jul. 9, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,558

Int. Cl.[2] C08L *95/00*

U.S. Cl. 106—278 **3 Claims**

1. A binder composition suitable for carbon electrodes which consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4,188,236

PROCESS FOR THE PRODUCTION OF A PIGMENT COMPOSITION

George H. Robertson, Cincinnati, Ohio; Alistair B. Boyd, Paisley, and Robert L. Rooney, Beith, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,267

Claims priority, application United Kingdom, Nov. 18, 1977, 48061/77

Int. Cl.[2] C08J *3/12*

U.S. Cl. 106—308 Q **9 Claims**

1. A process for the production of a pigment composition in a non-dusting form which comprises contacting an aqueous dispersion of an organic pigment with

(a) a solution or dispersion of an alkaline soluble rosin acid derivative having an approximate acid value in the range 100–250 at a pH of from 8 to 11

(b) a sorbitan ester, and

(c) a water-insoluble organic carrier having a melting point below 100° C. at a temperature above the melting point of both the sorbitan ester and the organic carrier, reducing th pH to below 8, stirring the composition until the pigment, rosin derivative, sorbitan ester and organic carrier are associated in generally spherical granules, and recovering the resulting granules, the amounts of ingredients being 40–75% pigment, 5–25% rosin acid, 5–40% sorbitan ester and 5–50% carrier, all percentages being based on the weight of the total composition.

4,188,237

METHOD FOR CLEANING METAL PARTS WITH ELEMENTAL FLUORINE

Jack W. Chasteen, Kettering, Ohio, assignor to University of Dayton, Dayton, Ohio

Filed Feb. 2, 1978, Ser. No. 874,915

Int. Cl.[2] B08B *5/00*

U.S. Cl. 134—2 **4 Claims**

1. A method for cleaning damaged gamma prime hardened alloy parts in order to render them repair brazable comprising: (a) placing the part in a hermetically sealed passage having inlet and outlet gas ports, (b) locating a fluorocarbon resin in said passage upstream of said part, (c) heating said fluorocarbon resin to above its decomposition temperature to release elemental fluorine, (d) introducing hydrogen gas through said inlet port and flowing it past said fluorocarbon resin and, then, past said part to carry the elemental fluorine through said passage and toward said outlet port and (e) collecting the gas exiting from said outlet port.

4,188,238

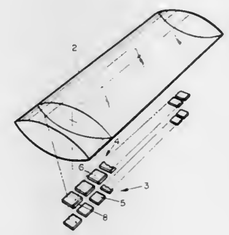
GENERATION OF ELECTRICAL ENERGY FROM SUNLIGHT, AND APPARATUS

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 3, 1978, Ser. No. 921,419

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 FC **7 Claims**



1. A process which comprises

(1) concentrating solar radiation optically with lens or reflector means to provide optically concentrated radiation and

(2) spectrally dividing said optically concentrated radiation by

(i) absorbing a portion of said concentrated radiation in a first luminescent solar collector and concentrating said absorbed radiation in the form of longer wavelength emitted luminescent radiation by the process of total internal reflection in said first luminescent solar collector,

(ii) passing the residual portion of said optically concentrated radiation through said first luminescent solar collector and, optionally, repeating steps (i) and (ii)

using one or more subsequent luminescent solar collectors in series acting on the residual optically concentrated radiation passing through the preceding luminescent solar collector,

(3) passing the concentrated emitted luminescent radiation in said first collector to a first photovoltaic cell optically coupled to a relatively small surface area of said first luminescent solar collector and passing the concentrated emitted luminescent radiation in each said subsequent luminescent solar collector, if any, to a different photovoltaic cell having a different bandgap than said first cell, which different cell is optically coupled to a relatively small surface area of the subsequent luminescent solar collector, and

(4) impinging the residual optically concentrated radiation directly on a still different photovoltaic cell responsive to at least a portion of said residual radiation.

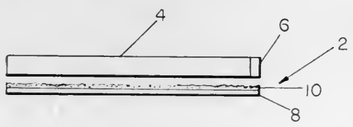
6. An arrangement of apparatus for converting solar energy to electrical energy which comprises a lens or mirror to receive and collect sunlight, arranged to impinge the optically concentrated sunlight on a face surface of a first luminescent solar collector optically coupled to a photocell means for generating electrical energy, and in series with the aforesaid luminescent solar collector a different photocell means having a different bandgap than the first mentioned photocell means, arranged to receive residual optically concentrated sunlight, and optionally interposed between said first solar collector and said different photocell means one or more luminescent solar collectors, each optically coupled to a different photocell means.

4,188,239

LUMINESCENT SOLAR COLLECTOR STRUCTURE

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 30, 1978, Ser. No. 965,446
Int. Cl.² H01L 31/04
U.S. Cl. 136—89 FC **3 Claims**



1. A luminescent solar collector in the form of a flat plate, optically coupled to at least one photovoltaic cell on a relatively small or minor portion of the surface area thereof; and essentially parallel to, facing, and spaced apart from said collector a layer of particulate phosphorescent material of a rough, diffusing physical structure, deposited on and backed by a mirror which is reflective of luminescent radiation produced by said phosphorescent material on activation, said phosphorescent material being responsive to solar radiation wavelengths which pass through said collector when said collector is exposed to solar radiation or radiation of solar wavelengths, wherein said luminescent solar collector contains at least one luminescent species which can be activated by luminescent emission from said phosphorescent material.

4,188,240

METHOD FOR PRODUCING A METAL LAYER BY PLATING

Akira Yoshio, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 939,194
Claims priority, application Japan, Sep. 5, 1977, 52-106445
Int. Cl.² C23F 7/02; B29D 17/00
U.S. Cl. 148—6.14 R **6 Claims**

1. A method for producing a metal layer by plating comprising the steps of:

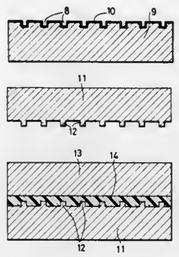
providing a substrate with a metallic surface to be plated;

oxidizing said metallic surface of said substrate with hypohalogenite for sufficient time to form an oxide parting layer thereon; and

plating a metallic layer on a surface of said oxide parting layer.

5. A method for producing a plastic disc containing recorded information comprising:

producing a master disc with a metallic surface and having said information defined by irregularities of said surface;



oxidizing said metallic surface with hypohalogenite for sufficient time to form an oxide parting layer thereon;

plating a metal layer on said oxide parting layer;

separating said metal layer from said master disc at said parting layer; and

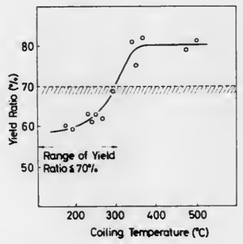
pressing a surface of said metal layer against a plastic disc material whereby a plastic disc is formed with a surface of said plastic disc having irregularities which are a replica of said information.

4,188,241

METHOD FOR PRODUCING HIGH TENSILE STRENGTH, HIGH DUCTILITY, LOW YIELD RATIO HOT ROLLED STEEL SHEET

Kunio Watanabe, and Yoshio Hashimoto, both of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 964,889
Claims priority, application Japan, Dec. 6, 1977, 52/145705
Int. Cl.² C21D 9/46, 9/48
U.S. Cl. 148—12 F **6 Claims**



1. A method for producing a plain low carbon hot rolled steel strip or sheet having a low yield ratio, not higher than 70%, high ductility and high tensile strength comprising: hot rolling a steel slab with its finishing temperature not lower than the Ar_3 transformation temperature, cooling the hot rolled sheet strip from a starting temperature not lower than Ar_3 transformation temperature, and coiling the hot rolled strip at a temperature not higher than 300° C.

4,188,242

COMBINATION CARBURIZING AND BORONIZING METHODS

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 803,906, Jun. 6, 1977, abandoned, which is a continuation of Ser. No. 622,929, Oct. 16, 1975, abandoned, which is a division of Ser. No. 387,566, Aug. 10, 1973, Pat. No. 3,922,038. This application Jun. 13, 1978, Ser. No. 915,094
Int. Cl.² C21D 9/22; E21B 13/00
U.S. Cl. 148—15.5 **5 Claims**

1. The method of manufacturing steel articles requiring a strong and tough wear resistant surface, said method comprising the steps of:

first, carburizing said surface, after said article has been formed, in a carbon rich environment in a furnace at a time and temperature to produce a carburized case of selected depth;

second pack boronizing said carburized case in a boron compound in a furnace at a time and temperature to produce a boronized case;

third, hardening said carburized case by quenching after heating to a temperature and cooling at a rate to produce martensite; and

fourth, tempering said carburized case by heating to a temperature to produce tempered martensite;

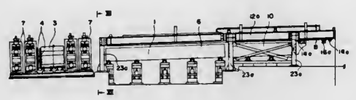
whereby the wear resistant boronized surface has a tough and strong supporting base to sustain large loads and avoid brittle fracture.

4,188,243

METHOD AND APPARATUS FOR HEAT-TREATING METALLIC MATERIAL

Nobuhiro Takahashi, Fukuyama, and Kenichi Hirata, Okayama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1978, Ser. No. 874,665
Claims priority, application Japan, Feb. 8, 1977, 52/12064
Int. Cl.² C21D 1/00
U.S. Cl. 148—155 **2 Claims**



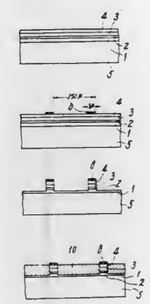
1. A method of heat treating a metallic material by conveying said material through a heat treating zone, wherein two cars are provided respectively at the entry and delivery sides of said heat treating zone, each of said cars having a dummy attached thereto, comprising the steps of gripping said metallic material at the forward and rear ends thereof by means of said dummies, simultaneously driving the car at the entry side at the rear end of said metallic material in the direction of movement of the metallic material through the heat treating zone and applying braking to the car at the delivery side at the front end of said metallic material, whereby the car at the front end is pushed forward with the metallic material at a steady speed through the heat treating zone by the car at the rear end, thereby subjecting said metallic material to uniform heat treatment.

4,188,244

METHOD OF MAKING A SEMICONDUCTOR LIGHT-EMITTING DEVICE UTILIZING LOW-TEMPERATURE VAPOR-PHASE DEPOSITION

Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 674,723, Apr. 6, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,419
Claims priority, application Japan, Apr. 10, 1975, 50-43967
Int. Cl.² H01L 21/203, 21/94
U.S. Cl. 148—174 **6 Claims**



1. A method of making a semiconductor light-emitting device comprising the following steps:

epitaxially forming at least a light-emitting active region and an electrode-contacting region on a semiconductor substrate,

etching said epitaxially formed regions in a manner that selected parts of said regions are etched away forming one or more recesses, the bottoms of which reach at least a depth of the lower junction of said light-emitting active region,

depositing a high resistivity polycrystalline semiconductor at a relatively low temperature in said one or more recesses to form a polycrystalline semiconductor region, wherein said deposition is done by one method selected from the group consisting of vapor phase reaction, vacuum deposition, sputtering and molecular beam growth, and

forming a metal electrode layer onto the surface of said electrode contacting region, extending onto the surface of said high resistivity polycrystalline semiconductor region.

4,188,245

SELECTIVE OPEN TUBE ALUMINUM DIFFUSION

Mike F. Chang, Liverpool; Alfred Roesch, Auburn, and Richard W. Kennedy, Skaneateles, all of N.Y., assignors to General Electric Company, Auburn, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,451
Int. Cl.² H01L 21/22
U.S. Cl. 148—188 **6 Claims**



1. A method for simultaneously forming a relatively shallow blanket diffusion and a relatively deeper selective isolation diffusion in a semiconductor comprising:

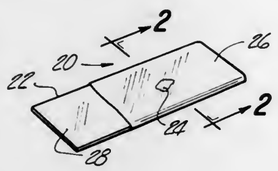
providing a semiconductor wafer;

selectively applying an aluminum pattern to a first surface of said wafer only to those areas under which said relatively deep isolation diffusion is desired;

inserting said wafer into an open diffusion tube;
introducing a flow of inert gas into a first end of said diffusion tube and exhausting said gas from a second end of said tube;
heating said tube to a temperature sufficient to cause aluminum to diffuse from said pattern directly into the bulk of said wafer underlying said pattern to form said deep isolation diffusions, and further to vaporize said aluminum and to diffuse said aluminum into the surface of said wafer not covered by said pattern to form said blanket diffusion; and
introducing a preselected percent of oxidizing gas into said gas after said blanket diffusion has been initiated to stop the further vaporization of said aluminum while said diffusion from said pattern continues whereby a deep selective isolation diffusion and a shallow blanket diffusion are simultaneously formed.

4,188,246
MICROSCOPE SLIDE AND METHOD FOR MAKING SAME

Julius Lipshaw, 23040 Valley Crest La., Southfield, Mich. 48034
Division of Ser. No. 809,368, Jun. 23, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,579
Int. Cl.² A01N *1/00, 3/00*
U.S. Cl. 156—57 **9 Claims**

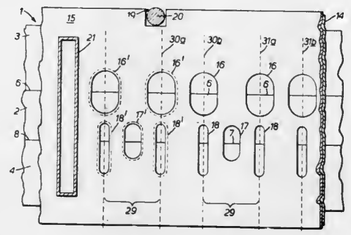


1. A process of preparing a microscope slide without any separate cover plate consisting essentially of applying a specimen to a slide plate of a transparent solid material which is of substantially uniform thickness, applying over the specimen and to the slide plate a liquid coating of a transparent plastic material of a type which will adhere itself to the slide plate with the liquid coating encircling and overlying at least the entire specimen on the plate and an area on the plate immediately adjacent the specimen, and subsequently converting the liquid coating to a solid coating which has a substantially flat exterior surface and is continuous over at least the specimen on the plate, permanently adheres to the plate, and hermetically seals the specimen on the plate so as to provide a microscope slide which does not have a separate cover plate of a clear transparent material overlying the specimen and fixed to the slide plate.

4,188,247
MANUFACTURE OF MAGNETIC TRANSDUCING HEADS

Peter C. Ridgway, Staines, and Derek F. Case, Sunbury on Thames, both of England, assignors to Data Recording Instrument Company Limited, Staines, England
Filed Mar. 6, 1978, Ser. No. 883,911
Claims priority, application United Kingdom, Mar. 15, 1977, 10797/77
Int. Cl.² B32B *31/00;* B24B *1/00;* G11B *5/42*
U.S. Cl. 156—154 **10 Claims**

1. A process for the manufacture of a pole structure for a magnetic transducing head, the process comprising:
providing a structure comprising first and second magnetic members, each member including a planar gap defining face and said members being located relative to one another with the gap defining faces in opposed relationship and separated by a non-magnetic gap filled with non-magnetic material, and said structure including an initial surface extending over both of said magnetic members and across the non-magnetic material in the gap between said members;
applying masking means to said initial surface to mask a first region of said initial surface leaving exposed a second region of said initial surface, said second region extending over a part of said first magnetic member and including an intersection with a part of the gap defining face of said first magnetic member:
directing a stream of abrasive particles toward said initial surface to produce at the exposed second region a recess including a side wall so inclined that an edge along an intersection between the side wall and the gap defining face of said first member intersects the initial surface at an initial location in said surface and at an angle to a direction perpendicular to said surface;
removing the masking means from said first region;

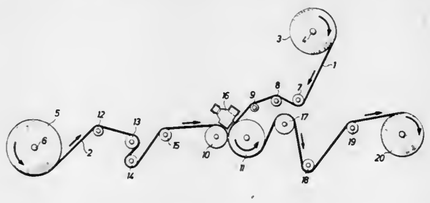


thereafter removing material substantially uniformly from said initial surface to produce a new surface so that due to said inclination of said edge the new surface has an intersection with said edge at a new location displaced from said initial location in a direction aligned with the surface; and
continuing to remove material until the new location is located at a desired position in the new surface of the structure.

8. A process as claimed in claim 1 in which the members are of ferrite bonded together at the non-magnetic gap by a first glass having a first softening temperature; and in which the recess is filled with a second glass having a second softening temperature lower than said first temperature prior to removing the material from the previously masked first region of the structure.

4,188,248
PRODUCING A CONTINUOUS FLEXIBLE SHEET COVERING MATERIAL FOR WRAPPING HEAT, COLD AND SOUND INSULATION

Ulf J. Millgardh, Stora Mellosa; Ulf W. Lindberg, Orebro; Weimar A. Anneflod, Orebro; Nils H. Werner, Orebro, and Björn Wimelius, Orebro, all of Sweden, assignors to Orebro Pappersbruks AB, Orebro, Sweden
Filed Mar. 7, 1978, Ser. No. 884,299
Claims priority, application Sweden, Mar. 14, 1977, 7702865
Int. Cl.² B32B *31/08*
U.S. Cl. 156—164 **4 Claims**

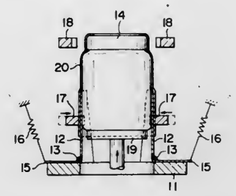


1. A method of producing a continuous, sheet-like, flexible

covering material intended for wrapping round heat, cold or sound insulation on piping and the like, said multilayer laminate being composed of at least two layer groups, bonded together by a binder, which also forms the outer part of the finished material as it is rolled up, said at least two layer groups including a first layer group containing a supporting layer of kraft paper and a second layer group of highly extensible kraft paper, said method comprising the steps of:
keeping said first layer group containing the supporting layer of kraft paper under minimum tensional stress in the order of magnitude of 1.5 N/cm sheet width,
providing said first layer group with a polyethylene layer on its outwardly facing surface while simultaneously providing said first layer group on its inside surface with a bonding material layer,
exposing said layer of highly extensible kraft paper of said second layer group which is exposed to a high tensional stress during lamination with said first layer group by utilizing at least a quarter of the stretching ability of the highly extensible kraft paper,
said process further comprising applying a polyethylene layer to both sides of the highly extensible kraft paper and passing together with the first layer group said second layer group into a roll nip such that both layer groups are pressed together with the extensible paper in a stretched condition within its elastic limits to produce a laminate having a tendency to curl up as a result of the contracting tendency caused by the extensible paper striving to regain its original shape.

4,188,249
PACKAGE INCLUDING AN ELASTIC CONTAINER PROTECTOR AND A METHOD AND MACHINE FOR FITTING THE PROTECTOR

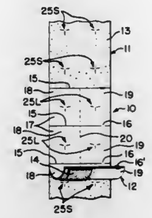
Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Japan
Filed Apr. 3, 1978, Ser. No. 892,854
Claims priority, application Japan, Apr. 5, 1977, 52/38104
Int. Cl.² B32B *31/00;* B29C *19/00;* B29D *3/00*
U.S. Cl. 156—165 **6 Claims**



1. A method for putting a container protector comprising an elastic film tube over a part of a container, the circumference of which is larger than that of the elastic film in its unstressed state comprising:
putting the film tube over a plurality of guide plates which are arranged around an axis and are movable inwards and outwards,
stretching the film tube by moving said guide plates outwardly,
inserting the part of the container inside the stretched film tube,
releasing the film tube so that it grips part of the container, and
gripping the film tube onto the container with gripping members while removing said guide plates.

4,188,250
METHOD OF MAKING A COMPOSITE WEB

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,971
Int. Cl.² B32B *31/18*
U.S. Cl. 156—253 **4 Claims**



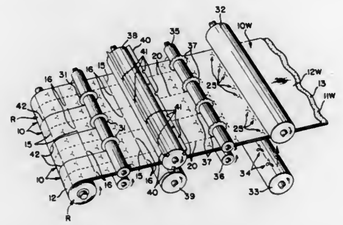
1. Method of making a composite web of pressure sensitive labels adapted to be used in a hand-held label applying apparatus, comprising the steps of: providing a composite web including a longitudinally extending web of supporting material having a release coating thereon and printable label material having pressure sensitive adhesive thereon, the adhesive being releasably adhered to the release coating on the supporting material web, severing the label material at longitudinally spaced laterally extending lines to provide a series of labels carried on the supporting material web, partially severing the web of label material along a longitudinally extending line between the side edges of the label material to provide each label with first and second label parts with only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the label securely to merchandise and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, the improvement wherein each line of lateral severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of the label without knife cutting, the first and second label parts being held together relatively securely at the longitudinal line of partial severing to prevent the second label part from being accidentally detached from the related first label part until ready to be detached and removed by the user, the force required to pull apart the second label parts of adjacent labels being substantially less than the force required to pull apart the first and second parts of each label.

4,188,251
METHOD OF DISPENSING LABELS

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., 05, Dayton, Ohio
Division of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,972
Int. Cl.² B32B *31/18*
U.S. Cl. 156—248 **16 Claims**

16. Method of using labels carried on a composite web including a longitudinally extending web of supporting material having a release coating thereon and printable label material having pressure sensitive adhesive thereon, the adhesive being releasably adhered to the release coating on the supporting material web, the label material being severed at longitudinally spaced laterally extending lines to provide a series of labels carried on the supporting material web, the label material being partially severed along a longitudinally extending line

between side edges of the label material to provide each label with first and second label parts with only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the label securely to merchandise and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, wherein each line of lateral severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of a label



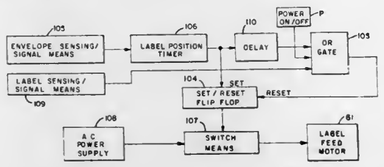
without knife cutting, comprising the steps of: printing a first price on the first label part and a second and lower price on the second label part, drawing the supporting material web around a relatively sharp bend until the just printed label is advanced to a position at which only a trailing marginal end portion is adhered to the supporting material web and the label is in label applying relationship with respect to a label applicator, applying the label to merchandise using the label applicator while pulling the trailing marginal end portion of the label away from the supporting material web and simultaneously pulling and thereby tearing the frangible portion which connects the second label part of the label which is being applied to the second label part of the next adjacent label, and thereafter tearing the second label part apart from the first label part.

4,188,252

LABEL POSITIONING AND APPLYING APPARATUS

Frank H. Brown, Norwich, N.Y., assignor to Automecha Ltd., Oxford, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,516
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—361 **9 Claims**



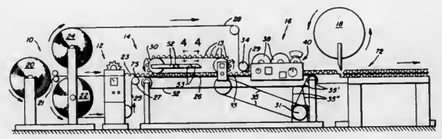
1. A machine for applying labels to envelopes and the like, comprising: a frame having upstanding, generally parallel side walls and defining a bottom, a top, a front and a back; a label affixing station at the bottom of the machine near the front; envelope feed means at the bottom for feeding an envelope or the like through the machine and past the label affixing station; label storage means at the top of the machine for storing a plurality of labels on a carrier web; label feed chute means at the front of the machine; label feed means for moving the web and thus the labels down the chute means and past the label affixing station; label stripping means at the label affixing station for separating labels from the web; and electronic control means for controlling feed of envelopes and labels past the label affixing station whereby accurate registry between the labels and envelopes is obtained, said control means including switch means connecting said label feed means to a power supply, switch control means controlling said switch means, reset means connected to said switch control means to cause said switch control means to actuate/deactuate said label feed means; envelope sensing means for sensing the approach of an envelope or the like to the label affixing station and operative to initiate feeding of labels, label sensing means for sensing movement of the labels toward the label affixing station, said label sensing means being connected to said switch reset means to operate said switch control means to terminate feeding of labels after a label has been advanced for application to an envelope or the like, a label position timer connected to said envelope sensing means, delay means associated with said label position timer for delaying a signal produced by said label sensing means, and redundant delay means connecting said label position timer to said switch control reset means for further delaying a signal produced by said label position timer a predetermined time, said further delayed signal being supplied to said reset means to reset said switch means after said predetermined time whether or not a label has been sensed by said label sensing means, said reset means being controlled via both said label sensing signal means and said redundant delay means to terminate the feeding of labels after a predetermined time even if advancement of a label is not actually sensed by said label sensing means.

4,188,253

MACHINE FOR THE FABRICATION OF PLASTICBOARD

Henry D. Swartz, Chestnut Hill, Mass., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 754,504, Dec. 27, 1976, Pat. No. 4,132,581.
This application Jul. 3, 1978, Ser. No. 921,501
Int. Cl.[2] B29C *17/00;* **B31F** *1/20*
U.S. Cl. 156—361 **7 Claims**



1. A machine for the fabrication of corrugated plasticboard comprising:

(a) a first means for (i) heating selectively apexes on a first side of said corrugated web from within corrugations of said corrugated web to a heat fusion temperature, (ii) conveying said corrugated web while said apexes on said first side of said corrugated web are in pressure contact with a first web heat fusible thereto and (iii) forming a bond between said corrugated web and said first web;

(b) a second means for (i) heating a second web to a heat fusion temperature, (ii) conveying said second web in pressure contact with apexes heat fusible thereto on a second side of said corrugated web and (iii) forming a bond between said second web and said apexes; and

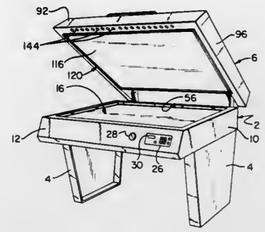
(c) means for synchronizing the speeds both of conveying by said first means and of conveying by said second means.

4,188,254

VACUUM PRESS

Lyle D. Hemperly, Jr., Naugatuck, Conn., assignor to Seal Incorporated, Naugatuck, Conn.

Filed Jul. 24, 1978, Ser. No. 927,331
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—382 **18 Claims**



1. A vacuum press comprising:

a work support assembly including a substantially rigid surface for supporting a workpiece;

a cover assembly disposed above and hingedly connected to said work support assembly so as to be movable into and out of engagement with said work support assembly, said cover assembly comprising a frame defining an opening, a pliable, air-impermeable sheet extending across said opening and secured at its edges to said frame, and electrical heater means for heating said workpiece disposed within said opening above said pliable sheet;

means carried by said cover assembly for sealing together said work support assembly and said cover assembly when mutually engaged so as to provide an airtight chamber between said surface and said pliable sheet;

means for evacuating said chamber so that the atmospheric pressure exterior of said chamber will force said pliable sheet towards said surface and thereby compress a workpiece supported on said surface;

cooling means including a blower for circulating a flow of cool air through said cover assembly over said pliable sheet;

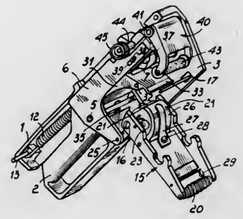
control means for operating said electrical heater means, said evacuating means and said blower so that a workpiece captivated in said chamber may alternately be heated under compression and cooled under compression.

4,188,255

PRICE LABELLING APPARATUS

Guido Gottardo, Marghera, Italy, assignor to Tovel S.p.A., Mestre, Italy

Filed Feb. 23, 1978, Ser. No. 880,608
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—384 **6 Claims**



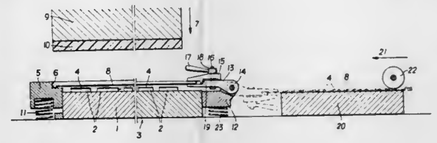
1. A price labelling apparatus comprising: a movable unit and a fixed unit respectively rigid with a movable control arm and a fixed control arm, said units being in engagement with a label carrying web entrainment device, with a printing head, bearing print characters with an inking device, with supports for said printing head, means adapted to select the print characters, means for positioning the stamp on the labels; said apparatus being characterized in that it comprises a lever brake, centrally and pivotally mounted to a pivot pin rigid with said fixed unit, and having a first end adapted to exert pressure on the label web, and a second opposite located end at a position opposing an adjustable projection element extending from said movable unit, said element biassing said second end of said lever brake such as to cause said first end to be maintained biased against said label carrying web.

4,188,256

APPARATUS FOR MANUFACTURING IDENTIFICATION PLATES HAVING INDENTED RETROREFLECTIVE CHARACTERS

Kurt Schwab, Innsbruck, Austria, assignor to D. Swarovski & Co, Glasschleiferei, Wattens, Austria

Filed Aug. 16, 1977, Ser. No. 825,025
Claims priority, application Austria, Aug. 27, 1976, 6380/76
Int. Cl.[2] B32B *31/20*
U.S. Cl. 156—386 **4 Claims**

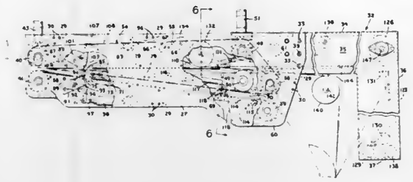


1. Apparatus for manufacturing identification plates having imprinted thereon recessed characters covered with retroreflective material comprising a male compression die member having thereon upstanding male die elements shaped in the form of characters to be imprinted on said identification plates, alignment means for enabling a plate blank from which said identification plate is to be made to be positioned relative to said male compression die member in accurate alignment over said male compression die elements, said alignment means operating to permit a plate blank to be accurately realigned with said male compression die member after said plate blank has been pressed thereover to receive thereon retroreflective material formed in the shape of characters to be imprinted on said identification plate, said retroreflective material having an adhesive layer on one side thereof and having been first placed over said male compression die elements with said adhesive side up to permit said material to be adhered to said plate blank, and after said plate has been subsequently subjected to a pressing operation to enhance adherence of said retroreflective material thereto and to remove air bubbles therefrom, compression means operating in cooperation with said male compression die member for stamping in said plate blank indentations shaped in the form of said male die elements after said plate blank has been replaced over said male die member in accurate alignment therewith by operation of said alignment means, and clamping means designed to clamp in fixed engagement therein said plate blank and mounted for pivotal motion about an axis extending generally parallel to one side of said plate blank for moving said plate blank between said aligned position over said male die member and a position at which said pressing operation is performed, said clamping means being pivotally mounted to a frame which is fixed relative to said male compressive die member in directions extending transversely to the direction of movement of said compression means but which is spring mounted in directions extending parallel thereto.

4,188,257
WEB HANDLING APPARATUS

Alan D. Kirkpatrick, Martinsville, N.J., assignor to Corrugated Development, Inc., Fairfield, N.J.

Filed Jan. 23, 1978, Ser. No. 871,557
Int. Cl.[2] B65H *19/08, 19/16*
U.S. Cl. 156—504 **27 Claims**



1. Web handling apparatus for accelerating a first web of material to the speed of a moving second web of material, said apparatus comprising:

first roller means for accommodating the passage therebetween of said first web of material;

second roller means for accommodating the passage therebetween of said second web of material;

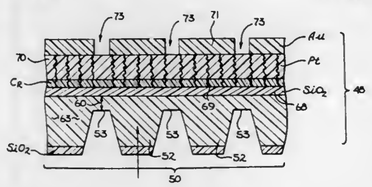
third roller means for receiving said first web of material from said first roller means and for receiving said second web of material from said second roller means, said third roller means for accommodating the passage therebetween of either of said first web of material individually, said second web of material individually or said first and second webs of material together; and

means responsive to the operation of said third roller means for driving said first roller means to accelerate said first web of material to said speed of said second web of material.

4,188,258
PROCESS FOR FABRICATING STRAIN GAGE TRANSDUCER

Carlyle A. Mounteer, Irvine, and Ronald L. Poteet, San Juan Capistrano, both of Calif., assignors to Gulton Industries, Inc., Princeton, N.J.

Filed May 18, 1978, Ser. No. 906,955
Int. Cl.[2] H01L *21/306;* **C23F** *1/02*
U.S. Cl. 156—628 **13 Claims**



1. A process for fabricating a strain gage transducer on a substrate comprising the steps of:

forming a layer of a platinum alloy strain gage material on said substrate;

forming an overlying gold layer on said platinum alloy strain gage material;

defining a strain gage pattern in said gold layer;

diffusing gold from said gold layer into said platinum alloy strain gage material so as to make said platinum alloy strain gage material receiving said gold more etchable;

forming a mask on said gold layer which defines leads for connecting with said strain gage pattern;

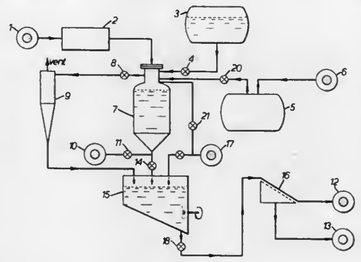
etching said gold layer and said layer of platinum alloy strain gage material to form strain gages and leads;

whereby platinum alloy strain gages with gold leads are formed on said substrate by etching.

4,188,259
RECOVERY OF FIBRE FROM LAMINATED CARTON BOARDS

Heikki Mamers, Seaford, and John E. Rowney, St. Albans, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Nov. 11, 1977, Ser. No. 850,519
Claims priority, application Australia, Nov. 11, 1976, 8104/69
Int. Cl.[2] D21B *1/32, 1/36*
U.S. Cl. 162—4 **30 Claims**



1. A method for recovering cellulosic fibres from a laminate having a cellulosic fibre layer and a layer of thermoplastic material, which method comprises the steps of:

(i) placing the laminate in contact with a pulping liquor, to provide a liquor-laminate system,

(ii) pressurizing and heating the liquor-laminate system to a temperature greater than or equal to the softening point of the thermoplastic material and maintaining this temperature for a time to sufficiently weaken the laminate structure,

(iii) cooling the liquor-laminate system to a temperature below the softening point of the thermoplastic material,

(iv) subjecting the cooled liquor-laminate system to defibration forces to provide a mixture of thermoplastic fragments and cellulosic fibres, and

(v) separating the thermoplastic fragments from the cellulosic fibres to thereby recover the cellulosic fibres.

4,188,260
LOW EFFLUENT PULP MILL, BLEACH PLANT OPERATION

Gordon Rowlandson, Birmingham, Ala.; Douglas W. Reeve, Orton, and W. Howard Rapson, Scarborough, both of Canada, assignors to Erco Envirotech Ltd., Islington, Canada

Division of Ser. No. 794,240, May 5, 1977, Pat. No. 4,104,114. This application Mar. 1, 1978, Ser. No. 882,362
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.[2] D21C *11/12*
U.S. Cl. 162—16 **5 Claims**

1. A bleached kraft pulp mill process, including the steps of:

(a) digesting cellulosic fibrous material in a pulping liquor containing sodium hydroxide and sodium sulphide as the active pulping chemicals to form brown stock and dilute black liquor, washing the resulting brown stock with a first wash water, passing the washed pulp through screens and cleaners and thence to a bleach plant;

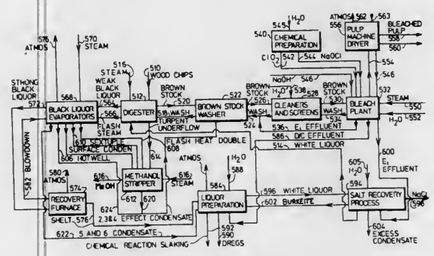
(b) subjecting the pulp to bleaching, caustic extraction and washing operations in said bleach plant to result in bleached pulp of the required brightness and purity;

(c) removing two effluents from the bleach plant consisting of an alkaline effluent and an acid effluent and utilizing part of said alkaline effluent as part of said first wash water;

(d) passing said dilute black liquor from the digestion step to sextuple effect black liquor evaporators to which heating steam is fed and recovering condensates from said evaporators;

(e) passing concentrated black liquor from the evaporators to a recovery furnace wherein organic materials present in the concentrated black liquor are burned and a smelt containing sodium carbonate, sodium sulphide, sodium chloride and sodium sulphate is formed;

(f) forming white liquor containing regenerated pulping chemicals from the smelt, separating substantially pure solid sodium chloride from the white liquor by an evaporation procedure, recovering condensed water from the evaporation, diluting the concentrated white liquor resulting from the evaporation procedure to the required pulping liquor concentration using the remainder of said alkaline filtrate, recycling said latter pulping liquor to said digestion step for use as at least part of the pulping liquor therein and discharging said condensed water;



(g) subjecting hotwell condensate, flash heat double evaporator condensate and sextuple surface condenser condensate from said sextuple effect evaporators along with turpentine underflow from said digestion step to steam stripping to remove therefrom BOD-causing volatile organic material, recovering the stripped volatile organic material and utilizing the stripped condensate as a source of water for the process; and

(h) passing fifth and sixth evaporator condensate for use in the formation of white liquor from the smelt; and

(i) passing said acid filtrate for use in the formation of white liquor from the smelt.

4,188,261
METHOD OF IMPROVING THE HOMOGENEITY OF LIGNOCELLULOSE CONTAINING MATERIAL

Sture O. E. Backlund, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sweden

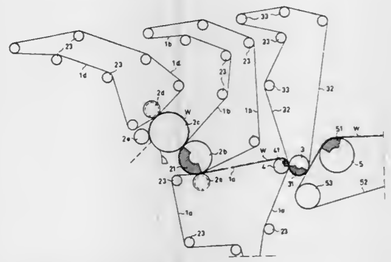
Continuation-in-part of Ser. No. 673,691, Apr. 5, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,568
Claims priority, application Sweden, Apr. 18, 1975, 7504526
Int. Cl.[2] D21C *3/22, 7/12*
U.S. Cl. 162—42 **6 Claims**

1. A method for improving the homogeneity of ligno-cellulose containing materials during digestion thereof in a digester, which comprises charging said ligno-cellulose materials and a cooking liquor into said digester, drawing off a portion of said cooking liquor from said digester, heating said drawn off cooking liquor, dividing said heated cooking liquor into a first portion and a second portion, returning said first portion of said heated cooking liquor to the top of said digester, returning said second portion of said heated cooking liquor to the bottom of said digester, and causing boiling to occur in said digester for a period of from about 2 to 20 minutes solely by terminating the return of said first portion of said heated cooking liquor to the top of said digester, whereby an increased amount of said heated cooking liquor greater than the amount of said second portion of said heated cooking liquor is returned to the bottom of said digester, said increased amount of said heated cooking liquor being from about 1 to 15 m^3/min and comprising the total amount of said cooking liquor drawn off from said digester.

4,188,262
METHOD FOR DEWATERING PAPER IN A PAPER MACHINE PRESS SECTION

Matti Kankaanpää, Tapiola, Finland, assignor to Valmet, Finland

Continuation-in-part of Ser. No. 544,952, Jan. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 310,805, Nov. 30, 1972, abandoned. This application Feb. 23, 1977, Ser. No. 771,149
Int. Cl.[2] D21F *2/00, 3/04*
U.S. Cl. 162—205 **5 Claims**



1. A method in a paper machine press section for dewatering a paper or paperboard web and for feeding said web from a forming wire of said paper machine through the press section, the web being substantially all the time supported by the surface of a felt or a roll comprising the steps of:

urging a pick-up felt by means of a pick-up suction roll against said web lying on said forming wire;

detaching the web from said forming wire and adhering the web by suction to the surface of said pick-up felt on which the web during its travel onwards is kept on an area defined by a suction sector of said pick-up roll;

detaching the web from said pick-up felt and transferring the web onto a transfer felt of a transfer felt loop while wrapping a transfer roll, said transfer roll operating inside the transfer felt loop contiguous to said pick-up roll;

passing the web lying on the surface of the transfer felt to a first dewatering press nip of the press section, which nip is formed by an upper suction press roll and cavernous surface lower press roll, wherein the cavernous roll operates inside said transfer felt loop and the suction press roll operates inside its own felt loop formed by a suction roll felt, said suction roll felt only lapping said suction press roll and not contacting said web prior to said web reaching said first dewatering press nip; pressing the web in said first press nip to dewater the web in two directions partly towards the suction roll whereby the water is removed through the suction roll felt and partly towards the cavernous surface roll so that the water is also removed from the web through the transfer felt;

adhering the web to the suction roll felt surface due to the effect of the suction prevailing inside said suction press roll;

transferring the web adherent to the suction roll felt surface to the second dewatering press nip of the press section, said second nip being formed by the suction roll of said first nip and by a smooth surface press roll;

pressing the web in said second nip so as to dewater the web only towards said suction roll whereby the water removed from the web is transferred into the suction roll felt;

detaching the web from said suction roll felt utilizing the adhesion force of the surface of said smooth surface press roll and adhering the web on said surface; and

transferring the web being adherent to the surface of said smooth surface roll to a following web treatment phase.

4,188,263

CARRIER-BOUND ACYLASES

Hans-Leo Hulsmann, Wetter, Fed. Rep. of Germany, and Gustav Renckhoff, deceased, late of Witten, Fed. Rep. of Germany (by Brunhilde Renckhoff nee Grave, heir and legal representative), assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,277

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703703

Int. Cl.[2] C07G *7/02;* **C12D** *13/06*

U.S. Cl. 439—179 **2 Claims**

1. Process of preparing carrier-bound acylase which comprises reacting a soluble acylase with a chemically bound reactive group of a cellulose derivative prepared by reaction of a hydroxyl group of cellulose with a reagent containing at least two reactive functional groups to provide said reactive group, the reaction of a hydroxyl group of cellulose and said reagent being performed by contacting the reagent with cellulose dissolved in dimethylsulfoxide containing polyhydroxymethylene for reaction of the cellulose and reagent to form said derivative.

4,188,264

PROCESS FOR DETERMINING BACTERIAL ENDOTOXIN AND REAGENTS USED THEREFOR

Sadaaki Iwanaga, Suita; Takashi Morita, Takatsuki; Shin Nakamura; Kenji Takahashi, both of Inuyama, and Makoto Niwa, Sakai, all of Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,582

Claims priority, application Japan, Jun. 14, 1977, 52/70335

Int. Cl.[2] G01N *31/14*

U.S. Cl. 23—230 B **6 Claims**

1. A process for determining a bacterial endotoxin, which comprises contacting an assay sample with (A) a material selected from the group consisting of an amoebocyte lysate of horseshoe crab and a pro-clotting enzyme separated from the lysate, and (B) a peptide-type substrate of the formula

$$R_1—Gly—Arg—R_2$$

wherein R_1 represents a member selected from the group consisting of an L-amino acid moiety whose N-terminal is protected by a protective group, a peptide moiety consisting of an L-amino acid and protected by a protective group at its N-terminal, a D-amino acid substituted L-amino acid moiety, and a D-amino acid substituted peptide moiety consisting of an L-amino acid, and is bonded to the amino group of the glycine moiety expressed by Gly through a peptide bond; and R_2 represents a chromogenic moiety which is bonded to the C-terminal of an L-arginine moiety expressed by Arg through an acid amide bond and/or ester bond and can be enzymatically hydrolyzed in the presence of the material (A) and the endotoxin to liberate R_2H, and/or its mineral acid salt, and detecting the resulting R_2H in which R_2 is as defined above.

4,188,265

PORTABLE INCUBATOR

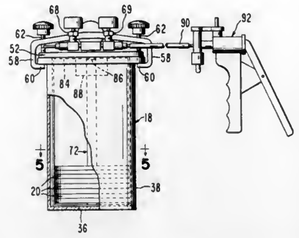
Harold D. Larro, Tigard, Oreg., assignor to Almore International, Inc., Beaverton, Oreg.

Filed Feb. 15, 1978, Ser. No. 877,921

Int. Cl.[2] C12K *1/10*

U.S. Cl. 435—313 **16 Claims**

16. In a portable incubator unit having an open top jar provided with a circular flange surrounding the open top thereof, a lid for covering the jar, the lid having a generally flat lower surface, there being a conduit above the upper surface of the lid and the lid having a hole therethrough; means on the lid for placing the hole and thereby the interior of the jar in fluid communication with the conduit at a location thereon intermediate its ends; means coupled with the top for securing the



same to the flange of the jar; and means for sealing the junction between said flat lower surface of the lid and the flange when the lid covers the jar.

4,188,266

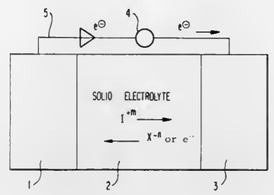
METHOD AND APPARATUS FOR CHANGING THE CONCENTRATION OF MOLECULES OR ATOMS

Richard A. Forman, 5007 Butternut Dr., Rockville, Md. 20853

Filed Apr. 11, 1978, Ser. No. 895,404

Int. Cl.[2] C25C *5/04, 1/22*

U.S. Cl. 204—1 R **12 Claims**



1. A method for changing the concentration of a preselected atom or molecule in a mixture containing said atom or molecule and at least one other atom or molecule having mass different from said preselected atom or molecule which comprises:

(A) providing a first electrode containing said mixture;

(B) providing a solid electrolyte which preferentially conducts the preselected atom or molecule in ionic form at a rate different from that of the other molecules in ionic form in said mixture;

(C) providing a second electrode of material having an electronegativity different from that of said preselected atom or molecule;

(D) placing said first and second electrodes on opposite sides of said solid electrolyte in electrically conducting relationship therewith;

(E) connecting said first and second electrodes with an electrical path to provide for the assembly of electrodes and solid electrolyte to pass current whereby said preselected atom or molecule moves in ionic form through said solid electrolyte in ionic form and concentrate at said second electrode;

(F) terminating said current when the concentration of said preselected atom or molecule at said first or second electrode has reached a predetermined level different from its concentration in said mixture; and

(G) removing from the region of said first or second electrode or said electrolyte, material having said preselected level of concentrate of said preselected molecule or atom.

12. Apparatus for changing the concentration of a preselected atom or molecule in a mixture containing said atom or molecule and atom(s) or molecule(s) having mass d different from said preselected atom or molecule comprising:

(A) a first electrode of material containing said mixture in an amount greater than that used in a solid electrolyte battery and sufficient to permit changing the concentration of said preselected atom or molecule;

(B) a second electrode of a material having an electronegativity different from that of the preselected atom or molecule;

(C) a solid electrolyte which preferentially conducts the preselected atom or molecule in ionic form at a rate different from that of the other atoms or molecules in ionic form in said mixture and sufficiently large to provide for the preselected level of concentration of said preselected atom or molecule;

(D) said solid electrolyte being in electrical contact with and between said first and second electrodes; and

(E) an electrical path interconnecting said first and second electrodes.

4,188,267

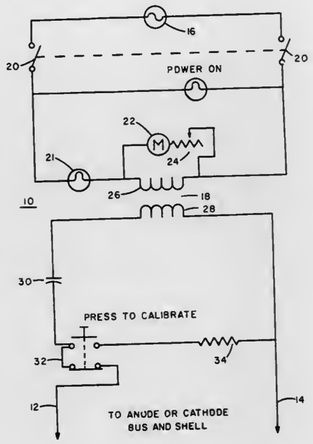
METHOD AND APPARATUS FOR MEASURING THE INTEGRITY OF AN ELECTROLYTIC CELL LINING

Edward J. Seger, Apollo, and Warren E. Haupin, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 797,748, May 17, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,604

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for continuously electrically monitoring the integrity of a lining in an electrolytic cell having an outer metal shell and a lining within said shell containing a corrosive environment, said cell being supplied with DC current by lead members extending through said shell from buses located externally of the cell, the method comprising the steps of connecting the primary winding of a filament type transformer to a source of house voltage, connecting the secondary of the transformer between at least one of said buses and the shell, such that an AC voltage of a house frequency is applied between the bus and shell, and continuously monitoring the existence of any AC leakage current flowing between the bus and shell through the use of an AC voltmeter connected across the primary winding of the transformer and having a scale providing readings in electrical resistance, said leakage current being indicative of the electrical resistance condition existing between the one bus and the shell.

4,188,268

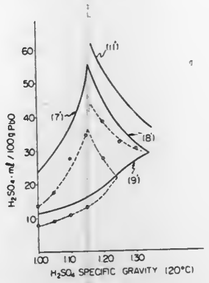
PROCESS FOR AN ELECTRODE FOR A LEAD BATTERY

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka; Akira Takahashi, Tsuruoka; Masanori Ito, Amarume, and Hisashi Tuchida, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1978, Ser. No. 919,047

Int. Cl.[2] H01M *10/44*

U.S. Cl. 204—2.1 **10 Claims**



1. A process for the preparation of an electrode for lead batteries comprising packing a paste of lead monoxide and sulfuric acid into a grid and subjecting the paste to the formation treatment to convert the paste to an active material and form a plate, said lead monoxide being a lead monoxide having a true density of 8.3 to 9.2 g/cc, an average particle size not larger than 0.2μ, an infrared absorption peak at a wave number of 1400 to 1410 cm^{-1} and a chromic anhydride reactivity of at least 94% or a heat treatment product thereof.

4,188,269

METHOD OF MAKING ELECTRODES FOR ELECTROLYTIC PURPOSES

Heinz P. Fritz, Munich, Fed. Rep. of Germany, assignor to Rheinisch-Westfälisches Elektrizitätswerk AG, Essen, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,583

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722840

Int. Cl.[2] C25D *5/42, 9/06*

U.S. Cl. 204—32 R **5 Claims**

1. A process for making an electrode containing lead dioxide as an active material, comprising the steps of:

(a) pickling a titanium support body;

(b) adsorptively coating the pickled titanium support body with a titanium (IV) layer by treating said body in a solution of a titanium (IV) compound selected from the group which consists of salts of inorganic oxyacids, organic salts and salts with complex formers or mixtures thereof;

(c) controlling the formation of the titanium (IV) layer on the surface of said body to preclude hydrolysis thereof by one of the steps of:

(C_1) maintaining the surface of said body in contact with a titanium (IV) perchlorate acid bath and then carrying out step (d) without rinsing of the surface,

(C_2) maintaining the surface of said body in contact with a titanium (IV) acetate acid bath and then carrying out step (d) after rinsing of the surface, and

(C_3) maintaining the surface of said body in contact with a bath of a titanium (IV) salt of cyclohexanediamine-(1,2)-tetracetic acid and then carrying out step (d) after rinsing the surface; and

(d) anodically coating the latter surface with lead dioxide.

4,188,270

PROCESS FOR ELECTROLYTICALLY FORMING GLOSSY FILM ON ARTICLES OF ALUMINUM OR ALLOY THEREOF

Akiyoshi Kataoka, Kabushiki Kaisha Shokosha nai, 8-16, Higashi 1-chome, Hanaten, Tsurumi-ku, Osaka, Japan

Filed Sep. 8, 1978, Ser. No. 940,730
Int. Cl.[2] C25D *11/08, 11/10, 11/20*
U.S. Cl. 204—42 **9 Claims**

1. A process for electrolytically treating an article of aluminum or alloy thereof to form a glassy film thereon, the process comprising the step of anodizing in an aqueous alkaline bath containing sodium phosphate and at least one compound selected from the group consisting of organic acids, inorganic acids and salts thereof under the conditions of a bath temperature of 20° to 90° C. and a current density of 0.5 to 80 A/dm^2.

4,188,271

ALKALINE ZINC ELECTROPLATING BATHS AND ADDITIVE COMPOSITIONS THEREFOR

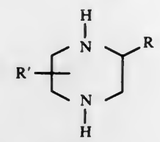
William E. Eckles, Cleveland Heights; Wilfred J. Ferguson, Cleveland, and William J. Willis, Stow, all of Ohio, assignors to Rohco, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 640,457, Dec. 15, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,978
Int. Cl.[2] C25D *3/22, 3/24;* **C08G** *12/26*
U.S. Cl. 204—55 R **15 Claims**

1. A composition comprising the reaction product obtained by the process of

(a) preparing an intermediate product by reacting formaldahyde with a mixture of

i. one or more piperazines having the formula



wherein R and R′ are each independently hydrogen or lower alkyl groups, and

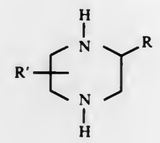
ii. at least one additional nitrogen-containing compound from the group consisting of ammonia or aliphatic, acyclic compounds containing at least one primary amine group, and

(b) reacting said intermediate product with an epihalohydrin or glycerol halohydrin or mixtures thereof at a temperature within the range of from room temperature to the reflux temperature of the mixture, the molar ratio of the piperazine(s), additional nitrogen-containing compound, formaldehyde and epihalohydrin or glycerol halohydrin being with the range of from about 1:1:2:1 to about 1:1:4.5:1.

9. An aqueous alkaline electroplating bath suitable for producing bright metallic zinc deposits comprising a source of zinc ions and an effective amount, sufficient to yield a bright zinc deposit, of a bath-soluble reaction product obtained by the process of

(a) preparing an intermediate product by reacting formaldehyde with a mixture of

i. one or more piperazines having the formula



wherein R and R′ are each independently hydrogen or lower alkyl groups and

ii. at least one additional nitrogen-containing compound from the group consisting of ammonia or aliphatic, compounds containing at least one primary amine group, and

(b) reacting said intermediate product with an epihalohydrin or glycerol halohydrin or mixtures thereof at a temperature within the range of from room temperature to the reflux temperature of the mixture, the molar ratio of the piperazine(s), additional nitrogen-containing compound, formaldehyde and epihalohydrin or glycerol halohydrin being with the range of from about 1:1:2:1 to about 1:1:4.5:1.

4,188,272

ELECTRICAL CHEMICAL PROCESS FOR THE REMOVAL OF HEXAVALENT CHROMIUM FROM AQUEOUS MEDIUM

James M. Moring, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 7, 1979, Ser. No. 36,939
Int. Cl.[2] C02C *5/12;* **C25C** *1/10*
U.S. Cl. 204—149 **4 Claims**

1. In a method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, which comprises passing an electric current through the ionizing medium containing the ion to be removed between an anode which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contaminant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminant ion is produced, and removing said insoluble iron compound or complex with the contaminant ion from the ionizing medium, the improvement wherein the pH of the feed stream is controlled at a level of from about 4.5 to about 5.8.

4,188,273

PROCESS FOR PREPARING NOVEL THIN FILMS

Takezo Sano, Takatsuki, and Masao Sasaki, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 526,253, Nov. 22, 1974, Pat. No. 4,056,456. This application Apr. 8, 1977, Ser. No. 785,950
Claims priority, application Japan, Nov. 22, 1973, 48-131989
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 HE **9 Claims**

1. A process for preparing a novel thin film which comprises crosslinking the surface of a layer of a surfactant selected from the group consisting of fatty acid salts, sulfuric acid esters of higher alcohols, alkylbenzenesulfonates, alkylnaphthalenesulfonates, naphthalenesulfonic acid-formalin condensates, dialkyl sulfosuccinates, alkyl phosphates, polyoxyethylene sulfates, alkylamine salts, quaternary ammonium salts, polyoxyethylene alkylamines, polyoxyethylene alkyl ethers, polyoxyethylene alkylphenol ethers, sorbitan fatty acid esters, polyoxyethylene fatty acid esters, hydroxyethylene sorbitan fatty acid esters, hydroxyethylenehydroxypropylene block polymers, fatty acid monoglycerides, and alkyl betaines, by irradiation with radiation selected from the group consisting of electron beams, X-rays, γ-rays, α-rays, neutron beams and ion beams, and then washing away the uncrosslinked portion of said surfactant with water or the like solvent to obtain an extremely thin film.

4,188,274

PROCESS FOR TRIFLUOROMETHYLATION OF AROMATIC AND HETEROCYCLIC COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 553,093, Feb. 26, 1975. This application May 19, 1978, Ser. No. 907,822
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 HA **5 Claims**

1. A decarboxylation process for introducing a trifluoromethyl group into aromatic compounds which comprises reacting the silver salt of trifluoroacetic acid and a ring compound containing a group selected from the class consisting of aromatic groups, heterocyclic groups, and mixtures thereof under decarboxylation conditions at −25° to 300° C.

4,188,275

PROCESS FOR PREPARING BETA-PHOSPHOSULFOXY ALCOHOLS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 836,398, Sep. 26, 1977, Pat. No. 4,155,958. This application Dec. 4, 1978, Ser. No. 965,795
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **4 Claims**

1. A process for preparing beta-phosphosulfoxy alcohols by reacting an olefinically unsaturated compound containing 2 to 30 carbon atoms and a poly-thiophosphoric acid containing 2 to 48 carbon atoms with oxygen using actinic radiation as an energy source at a temperature within the range from about −10° to +70° C.

4,188,276

VOLTAGE STABLE POSITIVE TEMPERATURE COEFFICIENT OF RESISTANCE CROSSLINKED COMPOSITIONS

Bernard J. Lyons, Atherton, and Young J. Kim, East Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 4, 1975, Ser. No. 601,550
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 **33 Claims**

1. A method for improving the voltage stability of an electrically conductive composition exhibiting a positive temperature coefficient of resistance, said composition comprising a crosslinked mixture of conductive carbon black and a polymer selected from homopolymers and copolymers comprising the repeat unit $-CH_2-CF_2-$, said method comprising:

(1) mixing said polymer with an amount of conductive carbon black sufficient to impart a positive temperature coefficient of resistance to the composition and render it electrically conductive, and at least one polymerizable polyfunctional unsaturated monomer in an amount sufficient to increase the voltage stability of said composition when said composition is crosslinked and

(2) crosslinking said composition.

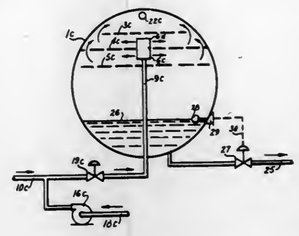
4,188,277

PROCESS FOR DESALTING PETROLEUM OILS

Robert B. Martin, Spring, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 867,417, Jan. 6, 1978, which is a continuation-in-part of Ser. No. 784,392, Apr. 4, 1977, Pat. No. 4,149,958. This application Nov. 14, 1978, Ser. No. 960,801
Int. Cl.[2] B01D *17/06;* **C10G** *33/02*
U.S. Cl. 204—190 **10 Claims**

1. A process for desalting a petroleum oil comprising emulsifying said oil with water to form a first stage emulsion, passing said emulsion between horizontally disposed electrodes contained in a treating vessel, whereby said emulsion is subjected to an electric field and the emulsion is broken, allowing de-emulsified water to fall towards the bottom of the vessel, collecting the so-treated first stage product, maintaining a pool of water in the lower portion of said vessel, emulsifying the first stage product with fresh water to form a second stage emulsion, passing said second stage emulsion between horizontally disposed electrodes in a path substantially parallel to but above that followed by the first stage emulsion and hydraulically substantially isolated therefrom but with no impermeable



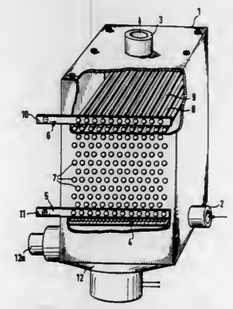
barriers between the stages, whereby the second stage emulsion is broken, allowing de-emulsified water to fall towards the bottom of the vessel into said pool of water, allowing the treated second stage product to rise between the edges of the upper electrode and the wall of the vessel, and withdrawing desalted product from the upper portion of said vessel and water from the lower portion of said vessel.

4,188,278

APPARATUS FOR DEGERMINATING FLUIDS

A. Reis, Munich; N. Kirmaier, Aschheim, and M. Schöberl, Prien, all of Fed. Rep. of Germany, assignors to Institut für Biomedizinische Technik, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,604
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742508
Int. Cl.[2] C02B *1/82;* **C02C** *5/12*
U.S. Cl. 204—268 **9 Claims**



1. An apparatus for treating fluids by anodic oxidation comprising

an electrolytic cell, having an inlet and an outlet through which said fluid flows,

a pair of main electrodes opposed to each other in the electrolytic cell,

a voltage source connected to the main electrodes,

a plurality of auxiliary electrodes disposed between the main electrodes,

each main electrode comprising a plurality of electrically connected bars which are arranged in a plane and parallel to each other,

each auxiliary electrode comprising electrically insulated bars which are arranged in a plane and parallel to each

other but whose bars are transversely shifted with respect to the bars of the adjacent electrode,

the main electrodes providing a region of varying potential between them through which the fluid flows,

the main electrodes located at the inlet and the outlet of the cell are substantially transverse to and cover the entire cross-section of fluid flow and are provided with openings between their bars to allow the passage of the fluid.

4,188,279

SHAPED CARBON ARTICLES

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 735,302, Oct. 26, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,557

Int. Cl.[2] C08L *95/00;* **C25B** *11/12*

U.S. Cl. 204—294 **13 Claims**

1. A pre-bake electrode composition consisting essentially of a homogeneous blend of pulverized carbon filler, between about 15 and 35 percent by weight of electrode binder pitch, and between about 0.1 and 10 percent by weight of an additive selected from phosphorus and boron oxides and acids; wherein said electrode binder pitch consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4. A carbon electrode consisting essentially of a baked homogeneous blend of a particulate coke matrix, between about 15 and 35 percent by weight of electrode binder pitch, and between about 0.1 and 10 percent by weight of an additive selected from phosphorus and boron oxides and acids; wherein said electrode binder pitch consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4,188,280

METHOD FOR REMOVING ARSENIC FROM SHALE OIL

Harbo P. Jensen, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1978, Ser. No. 945,750

Int. Cl.[2] C10G *23/00, 37/06*

U.S. Cl. 208—53 **8 Claims**

1. A method for producing a hydroprocessed shale oil product from a shale oil feedstock contaminated with more than 4 ppmw arsenic in the form of at least one soluble arsenic compound, which comprises:

(a) forming an aged shale oil having an arsenic content lower than that of said feedstock by contacting said feedstock with a porous solid contact material at a temperature from 149° to 510° C. (300° to 950° F.), at a liquid hourly space velocity from 0.1 to 60 volumes of liquid per hour per volume of contact material, and a pressure sufficient to maintain said feedstock in substantially liquid phase, whereby a portion of said arsenic is deposited upon said contact material;

(b) forming a coker distillate having an arsenic content lower than that of said aged shale oil and an arsenic-containing coke by coking at least a portion of said aged shale oil; and

(c) forming said shale oil product having less than 1 ppmw soluble arsenic and a higher hydrogen-to-carbon ratio than said feedstock by catalytically reacting at least a portion of said distillate from step (b) at an elevated temperature with hydrogen in the presence of a hydroprocessing catalyst.

4,188,281

TWO-STAGE PRODUCTION OF OLEFINS UTILIZING A FAUJASITE STRUCTURE ZEOLITE IN HYDROGENATION STAGE

Hans J. Wernicke, Wolfratshausen; Allan Watson, Ottobrunn; Walter Kreuter, Penzberg; Manfred Mansmann, and Horst Weber, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,486

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721503; Apr. 12, 1978, 2815859

Int. Cl.[2] C10G *23/02, 9/46*

U.S. Cl. 208—57 **22 Claims**

1. In a process for the production of olefins in two stages wherein, in the first stage, a heavy petroleum fraction is hydrogenated essentially in the liquid phase in the presence of hydrogen and a hydrogenation catalyst and, in the second stage, the thus-hydrogenated fraction is subjected to thermal cracking in the vapor phase in the presence of steam, the improvement which comprises employing as the hydrogenation catalyst a zeolite of the faujasite structure combined with elements from Groups VIB, VIIB and VIII of the periodic table of the elements, wherein the alkali component of the zeolite is exchanged at least partially for ammonium, hydronium, alkaline earth and/or rare earth ions, and the elements are present in a metallic, ionic, oxidic and/or sulfidic form.

4,188,282

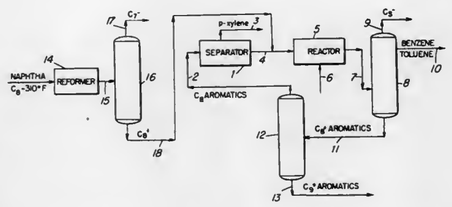
MANUFACTURE OF BENZENE, TOLUENE AND XYLENE

Samuel A. Tabak, Wenonah, and Roger A. Morrison, West Deptford, both of N.J., assignors to Mobile Oil Corporation, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,645

Int. Cl.[2] C10G *35/04;* **C07C** *5/24*

U.S. Cl. 208—134 **34 Claims**



1. A new use of known apparatus for simultaneously isomerizing xylenes and converting ethylbenzene to products readily separable by distillation from the mixture of C_8 aromatics by contacting a mixture of C_8 aromatics and hydrogen with a catalyst at conversion conditions of elevated temperature and pressure in a loop comprising an isomerization reactor for the

contact aforesaid, distillation means for separating C_8 aromatics from lower boiling and higher boiling hydrocarbons, means to transfer hydrocarbon effluent of said isomerization reactor to said distillation means, mixing means for mixing fresh feed C_8 aromatics containing xylenes and ethylbenzene with C_8 aromatics separated by distillation means, a xylene separator for recovery of para xylene, means for transfer of mixed C_8 aromatics from said mixing means to said xylene separator, and means to transfer C_8 aromatics lean in para xylene from said xylene separator to said isomerization reactor, which new use comprises contacting, in the isomerization reactor of said known apparatus, a vapor phase mixture of hydrogen, said C_8 aromatics lean in para xylene and fresh charge material containing alkyl benzenes of more than eight carbon atoms with a zeolite catalyst at a temperature of about 800°–1000° F., a pressure of 150 to 300 pounds per square inch and a weight hourly space velocity between 1 and about 200; said zeolite catalyst having a constraint index of 1 to 12, a silica to alumina ratio greater than 12 and a reduced activity such that less than 2 weight percent of xylene is converted to other compounds when contacted with said catalyst at 900° F., 200 psig and LHSV of 5.

4,188,283

STARTUP METHOD FOR A MOVING-BED HYDROGENATION ZONE

George J. Czajkowski, Chicago, and Frank Stolfa, Park Ridge, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 761,504, Jan. 21, 1977, Pat. No. 4,119,530, which is a continuation-in-part of Ser. No. 610,479, Sep. 4, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,710

Int. Cl.[2] C10G *23/08*

U.S. Cl. 208—143 **2 Claims**

1. A startup method for a hydrogenation process in which a feed stream comprising hydrogen and olefinic materials is contacted with a bed of solid catalyst located in a substantially cylindrical catalyst retention volume which comprises the steps of:

(a) passing the feed stream downward through a moving-bed reactor while less than 99 vol.% of the catalyst retention volume of the moving-bed reactor is filled by the bed of solid catalyst and effecting the hydrogenation of olefinic materials in the feed stream at on-stream non-cracking hydrogenation conditions including a pressure of from about 100 psig. to about 1200 psig. and a temperature of from about 250° F. to about 500° F. and a hydrogen feed rate of about 500 scf/bbl to 2000 scf/bbl;

(b) intermittently charging a quantity of catalyst greater than 0.1 vol.% of the catalyst retention volume and less than 5.0 vol.% of the catalyst retention volume per intermittent charge of catalyst to the reactor at a first rate of catalyst transfer and distributing each quantity of catalyst on top of the bed of solid catalyst;

(c) intermittently removing a quantity of used catalyst from the bottom of the reactor at a second rate of catalyst transfer less than the first rate of catalyst transfer; and,

(d) equalizing the first and the second rates of catalyst transfer when the catalyst retention volume of the moving-bed reactor becomes filled.

4,188,284

PROCESS FOR THE HYDROTREATING OF HEAVY HYDROCARBON STREAMS

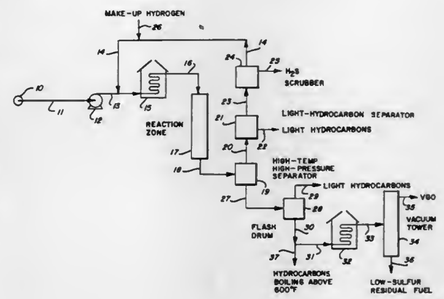
Leonard M. Quick, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 862,848, Dec. 21, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,432

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—216 PP **27 Claims**

1. A process for hydrotreating a heavy hydrocarbon stream containing metals, asphaltenes, nitrogen compounds, and sulfur compounds to reduce the contents of metals, asphaltenes, nitrogen compounds, and sulfur compounds in said stream, which process comprises contacting said stream under suitable conditions and in the presence of hydrogen with a catalyst comprising a hydrogenating component consisting essentially of (1) molybdenum and chromium, (2) their oxides, (3) their sulfides, or (4) mixtures thereof on a large-pore, catalytically active alumina, said molybdenum being present within the range of about 5 wt.% to about 15 wt.%, calculated as MoO_3



and based upon the total catalyst weight, said chromium being present in an amount within the range of about 5 wt.% to about 20 wt.%, calculated as Cr_2O_3 and based upon the total catalyst weight, and said catalyst having a pore volume within the range of about 0.4 cc/gm to about 0.8 cc/gm, a surface area within the range of about 150 m^2/gm to about 300 m^2/gm, and an average pore diameter within the range of abbout 100 A to about 200 A.

4,188,285

SELECTIVE PROCESS FOR REMOVAL OF THIOPHENES FROM GASOLINE USING A SILVER-EXCHANGED FAUJASITE-TYPE ZEOLITE

Manfred J. Michlmayr, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 20, 1978, Ser. No. 971,576

Int. Cl.[2] C10G *25/04*

U.S. Cl. 208—246 **7 Claims**

1. A process for upgrading a hydrofined gasoline feed containing residual thiophene-type contaminants comprising contacting said feed with a silver-exchanged faujasite-type crystalline aluminosilicate zeolite, said contacting being at (1) a temperature in the range of from about 20° to 370° C., and (2) an LHSV, V/V/Hr, in the range of from about 0.1 to 20; and recovering the resulting gasoline having, relative to said feed, a substantially reduced content of said contaminants.

4,188,286

SCREENING APPARATUS FOR FIBER SUSPENSIONS

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,123

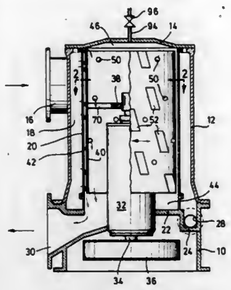
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712715

Int. Cl.[2] B07B *1/20*

U.S. Cl. 209—273 **9 Claims**

1. A screening apparatus for fiber suspensions comprising a housing and a stationary cylindrical screen cage having one side in flow communication with an inlet for said fiber suspensions and further having screen openings through which fiber suspension from the inlet flows as accepted stock; a rotor having a hollow cylindrical, substantially closed circumferential wall concentrically mounted relative to the screen cage over substantially the length thereof with one side adjacent the side of the screen cage not in direct flow communication with the inlet to form an annular space between the screen cage and the circumferential wall of the rotor for accepted stock, the

circumferential wall of the rotor further having elevations extending into the annular space immediately radially adjacent the screen openings for producing positive and negative pressure thrusts in the accepted stock within the annular space, and



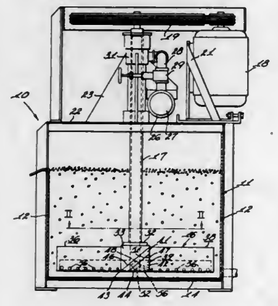
openings through which some accepted stock passes, the openings in the rotor wall being larger than the screen openings; and an outlet for the accepted stock connected to both the annular space and the opposite side of the rotor.

4,188,287

SLOW SPEED WEDGE BAR FLOTATION MIXING DEVICE

Bobby P. Faulkner, and Donald C. Moore, both of New Berlin, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 849,674, Nov. 8, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,223
Int. Cl.[2] B03D *1/20*
U.S. Cl. 209—168 **3 Claims**



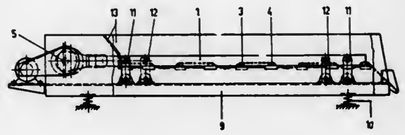
1. A distributor for a flotation apparatus comprising:
a vertical hollow drive shaft adapted to receive air under pressure;
a manifold secured to the depending end of said hollow drive shaft for rotation with said drive shaft, said manifold being connected to receive air under pressure from said shaft;
a plurality of distribution ports formed in said manifold to provide communicating passageways from the interior of said manifold to the exterior thereof;
a plurality of horizontally extending blades secured to said manifold;
a longitudinal passageway in each of said blades, the end of the passageways adjacent to said manifold being in communication with an associated manifold distribution port; and,
a plurality of individual means along the trailing edge of each of said blades and communicating with the associated longitudinal passage to provide for the discharge of the air under pressure in the passageway to cause a discrete bubble size to be emitted therefrom with low power input, said means being operable to regulate the discharge of air under pressure to provide for the discharge of air under pressure to cause a discrete bubble size to be emitted therefrom so that the bubbles emitted along the entire length of each blade are substantially the same size.

4,188,288

SCREEN WITH TUBULAR FRAME SYSTEMS COUPLED FOR RECTILINEAR MOTION

Albert Wehner, deceased, late of Wieladingen, Fed. Rep. of Germany (by Elfriede Wehner, legal representative), assignor to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 650,113, Jan. 19, 1976, which is a continuation of Ser. No. 501,652, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 310,806, Nov. 30, 1972, abandoned. This application Feb. 27, 1978, Ser. No. 881,265
Int. Cl.[2] B07B *1/42*
U.S. Cl. 209—310 **3 Claims**



1. A screening mechanism of the type having a base frame, two frame systems, each of which include two spaced-apart, longitudinally-extending, beams and a plurality of transversely-extending, spaced-apart rods, the ends of which are coupled to said beams, said frame systems being disposed relative to one another such that each of the rods of one frame system are disposed between the rods of the other frame system, said frame systems including an elastic sieve bottom secured alternately to the rods of the one frame system and the rods of the other frame system and bridging the spaces between said rods, means for movably mounting one of said frame systems on said base frame and means for movably mounting said other frame system on said base frame and drive means for moving said frame systems in a longitudinal direction thereof relative to one another, the improvement comprising:
said frame systems each forming a ladder-shaped frame system which comprises two tubular beams and a plurality of tubular rods, the ends of the latter of which are fixably secured to said beams, and said frame systems being mounted at an angle of inclination on said base frame;
spaced supports for each said beam and connecting means coupling said drive means to each of said frame systems;
said means for movably mounting said frame systems effecting exclusively rectilinear movement of said frame systems so that said drive means moves said frame systems in countermoving rectilinear oscillations; and
a pair of vertically disposed, longitudinally-extending sheet metal guide sheets carried by one of said frame systems, said guide sheets being disposed on opposite lateral sides of said one frame system.

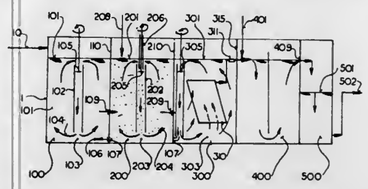
4,188,289

PROCESS FOR PURIFICATION OF SANITARY WATERS

Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)

Filed Jul. 18, 1978, Ser. No. 918,051
Int. Cl.[2] C02C *1/08, 1/40*
U.S. Cl. 210—7 **4 Claims**

1. A process for the purification of waste waters containing carbonaceous materials, nitrogenous materials, phosphorus and suspended solids in a single reaction tank which comprises:
(a) separating the reaction tank by vertical partitions into first reaction zone, second reaction zone and third reaction zone, the first reaction zone being in communication with the second reaction zone by a restricted opening in the common partition separating the first reaction zone from the second reaction zone, the second reaction zone being in communication with third reaction zone by restricted opening in the common partition separating the second reaction zone from the third reaction zone, the third reaction zone being in communication with the first reaction zone by a channel and restricted opening in the common partition separating the third reaction zone from the first reaction zone, said third reaction zone being in communication with an exit effluent line via submerged multichannel suspended solids separator located in third reaction zone, said submerged multichannel suspended solids separator equipped with means equalizing the flow of the purified waste water through the submerged suspended solids separator, said purified waste water flowing out of said third reaction zone being further treated or disposed off,
(b) establishing in first reaction zone, second reaction zone and third reaction zone fluidized beds, said fluidized bed in said first reaction zone, second reaction zone and third reaction zone being formed by addition of fine wood particles prefereably saw dust into the reaction zones before or during start up of the purification process and by accumulating the nonbiodegradable suspended solids present in the waste water, and by accumulating the precipitates formed in precipitating the phosphates from the processed waste water, and by accumulating the excess biological solids formed during biological oxidation of the organic matter present in the processed waste water, said



fluidized bed in each reaction zone being maintained by flow path of the suspension downwardly from the upper level of the fluidized bed in a recirculation pipe to the lower level of the fluidized bed, then upwardly through the fluidized bed, said recirculation of the suspension in first reaction zone and third reaction zone being maintained by a submerged propeller located in the recirculation pipe without adding atmospheric air into the recirculated suspension and maintaining the concentration of the disolved oxygen in said first and third reaction zones at close to zero mg/lit, said recirculation of the suspension in the second reaction zone being maintained by a submerged propeller located in the recirculation pipe and equipped with an air intake pipe simultaneously injecting into the recirculated suspension atmospheric air to provide partial saturation of the recirculating suspension with oxygen and maintaining the concentration of the disolved oxygen in the second reaction zone between 1.0 and 3.0 mg/lit.,
(c) adding into the fluidized bed established in the second reaction zone continuously soluble mineral to precipitate the various phosphates present in the incoming waste water, to coagulate and flocculate the colloidal matter present in the incoming waste water and to flocculate the fine suspended solids retained in said fluidized bed established in said first, second and third reaction zones,
(d) circulating a portion of the fluidized bed suspended solids from the first reaction zone into the second reaction zone, from said second reaction zone into third reaction zone and from said third reaction zone into said first reaction zone,
(e) flowing the incoming waste water into the fluidized bed established in said first reaction zone and mixing said waste water in said fluidized bed with the fluidized fine wood particles, nonbiodegradable suspended solids, mixed microbial population and recycled purified waste water,
(f) controlling the retention time of said mixture of waste water and fluidized bed suspended solids in said first reaction zone to carry out during said retention time in said fluidized bed in said first reaction zone simultaneously the processes of:
i. adsorbtion of the dissolved carbonaceous material on surfaces of the fluidized bed suspended solids
ii. absorption of a portion of the dissolved carbonaceous material ammonia and phosphorus into microbial cells,
iii. adsorption of a portion of soluble phosphates on to surfaces of said fluidized bed solids,
iv. biological respiratory denitrification of nitrite and nitrate nitrogenous material to nitrogen gas,
v. biological oxidation of a portion of dissolved carbonaceous material and a portion of the non-nitrite and/or non-nitrate nitrogenous material using up the oxygen present in the incoming waste water and the chemically bound oxygen in said nitrite and/or nitrate nitrogenous material, and
vi. hydrolysis of the fluidized bed suspended solids,
(g) allowing the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said first reaction zone cocurrently to said suspension flow and separating the gases from said suspension at the upper level of the fluidized bed and releasing said gases to atmosphere,
(h) flowing the mixture of partially purified waste water and the fluidized bed solids by gravity from said first reaction zone into said second reaction zone, mixing said mixture in said fluidized bed established in said second reaction zone with fluidized bed solids and with the diffused air injected into the recirculated suspension by said submerged propeller and carrying out in the second reaction zone simultaneously the processes of:
i. biooxidation of the remaining disolved carbonaceous material present in the partially purified waste water,
ii. transformation of remaining non-nitrite and/or non-nitrate nitrogenous material to nitrite and/or nitrate nitrogenous material,
iii. partial respiratory degradation of the nitrite and/or nitrate nitrogenous material to nitrogenous gas,
iv. chemical precipitation of phosphates and free metal ions from the partially purified waste water by the added dissolved mineral,
v. adsorption of a portion of soluble phosphates on the surfaces of the fluidized bed solids,
vi. partial biooxidation of the carbonaceous material adsorbed on the fluidized bed solids,
vii. hydrolysis of a portion of fluidized bed solids,
viii. coagulation and flocculation of the colloidal matter present in the partially purified waste water,
(i) allowing the excess diffused air and the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said second reaction zone cocurrently to flow of said suspension and separating the gases from the suspension at the upper level of the fluidized bed and releasing the gases to atmosphere,
(j) flowing the mixture of partially purified waste water and the fluidized bed solids by gravity from said second reaction zone into said third reaction zone, mixing said mixture in said fluidized bed established in said third reaction zone with the purified waste water and with the fluidized bed solids in absence of disolved oxygen and carrying out in said third reaction zone simultaneously the processes of:
i. biooxidation of the carbonaceous material adsorbed on the surfaces of the fluidized bed solids and biooxidation of the carbonaceous material absorbed by the microbial cells,
ii. respiratory degradation of the nitrite and/or nitrate nitrogenous material to nitrogenous gas,

iii. biooxidation of the disolved material released into the purified waste water through hydrolysis of said fluidized bed solids,

iv. coagulation and flocculation of the colloidal matter present in the fluidized bed,

v. separation of the suspended solids from the purified waste water,

(k) allowing the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said third reaction zone cocurrently to said suspension flow and separating the gases from the suspension at the upper level of the fluidized bed and releasing the gases to atmosphere,

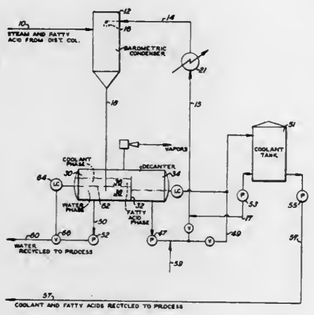
(l) flowing the suspended solids separated from the purified waste water in said reaction zone together with portion of the purified waste water back into said first reaction zone completing the process cycle and flowing the purified waste water out of said third reaction zone for further treatment or disposal.

4,188,290

POLLUTION CONTROL FOR FATTY ACID CONDENSATION

James J. Graham, Wayland, Mass., and Roger J. Vernon, Maidenhead, England, assignors to The Badger Company, Cambridge, Mass.

Filed Jun. 29, 1977, Ser. No. 811,329
Int. Cl.² B01D *5/00, 21/00*
U.S. Cl. 210—21 **6 Claims**



1. The process of separating fatty acids from steam containing fatty acids entrained therein, comprising contacting the steam and fatty acids therein with a cooling medium comprising a fatty acid having between six and eighteen carbon atoms which is miscible with the fatty acids entrained in the steam passed directly to a barometric condenser to form a condensate of acid vapors, said cooling medium having a temperature above about 80° F., separating the resulting organic and water phases of the condensate by decantation, recycling a portion of the organic phase for use as the cooling medium, and processing the other separated liquid components for recovery of water and fatty acids.

4,188,291

TREATMENT OF INDUSTRIAL WASTE WATER

Donald R. Anderson, 3062 Blume Dr., Los Alamitos, Calif. 90720

Filed Apr. 6, 1978, Ser. No. 894,174
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.² C02B *1/20;* **B01D** *13/02, 21/01*
U.S. Cl. 210—23 H **10 Claims**

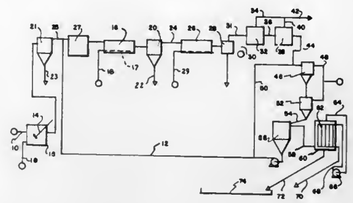
10. The method of processing waste water from an electrical power generation plant which comprises:

(a) adding calcium hydroxide to the waste water in an amount sufficient to coprecipitate magnesium hydroxide and silica in the water;

(b) adding magnesium hydroxide and gaseous carbon dioxide to the waste water in an amount sufficient to precipitate calcium carbonate in the water;

(c) settling the precipitates in said water and recovering a treated water having substantially reduced silica and calcium contents and a higher magnesium salt content than said waste water;

(d) processing the treated water by reverse osmosis, distillation, electrodialysis or freezing to obtain a purified water



and a residual brine enriched in calcium and magnesium contents;

(e) adding calcium hydroxide to at least a portion of said brine in an amount sufficient to precipitate magnesium hydroxide therefrom;

(f) separating said magnesium hydroxide from said brine;

(g) returning said magnesium hydroxide for addition to said waste water in the aforesaid precipitation of calcium carbonate; and

(h) processing said brine from step (f) by vapor compression evaporation to concentrate said brine to a slurry of salt solids.

4,188,292

INEXPENSIVE PURIFICATION OF UREA WASTE STREAMS

William O. Fitzgibbons, Hudson, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 463,476, Apr. 24, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 847,201
Int. Cl.² C02B *1/16, 1/44*
U.S. Cl. 210—29 **16 Claims**

1. A process for destroying urea dissolved in an aqueous stream further containing anions and cations comprising:

(a) contacting the aqueous stream with a hydrogen form cation exchange resin in such a manner that at least some of the cations in the aqueous stream are exchanged with the cations of the resin, and

(b) contacting the resulting stream from step (a) with nitric oxide, nitrous acid or a nitrite salt, thereby substantially reducing the urea content of said aqueous stream, said resulting stream having a pH of 1–3 when contacted with said nitric oxide, nitrous acid or a nitrate salt.

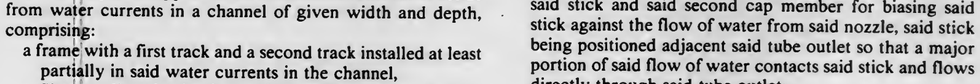
4,188,293

METHOD OF EFFECTING FLOCCULATION

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

Division of Ser. No. 902,894, May 4, 1978, which is a continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application Jan. 4, 1979, Ser. No. 980
Int. Cl.² B01D *21/01;* **C02B** *1/20*
U.S. Cl. 210—47 **1 Claim**

1. A method of effecting flocculation in aqueous systems containing solid particles in suspension which comprises applying to said aqueous systems an effective amount sufficient to form flocs from said solid particles of a compound or mixture of compounds having the formula:



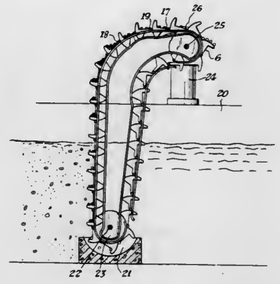
wherein Z is selected from the group consisting of X and $-N(CH_3)_2$, wherein X is a halogen having an atomic weight greater than 34, wherein X^- is the anionic form of X, there being one such anionic halogen for each cationic nitrogen, and wherein n is an integer of from 2 to 20, said compound or mixture of compounds being formed by the reaction of substantially equimolar proportions of 1, 3-bis-dimethylamino-2-propanol and 1, 3-dichloro-2-propanol, the reaction being effected at a temperature of about 40° to about 90° C. for about 2 to 12 hours.

4,188,294

ROTARY FILTER APPARATUS

Tadashi Hagihara, 655 Karakashiwa, Isawa-cho, Higashi-Yatsushiro, Yamanashi, Japan

Filed May 18, 1978, Ser. No. 906,967
Int. Cl.² B01D *33/02*
U.S. Cl. 210—160 **7 Claims**



1. A rotary filter apparatus for continuous removal of solids from water currents in a channel of given width and depth, comprising:

a frame with a first track and a second track installed at least partially in said water currents in the channel,

a filter medium in the form of an endless belt, said filter medium including endless connecting means for forming the endless belt, a number of transverse linking rods each with at least one track means on one end thereof, said linking rods linked to said endless connecting means and positioned parallel with each other, said track means for following said first track positioned in working relationship to said first track, said filter medium including screen means for filtering purposes incorporated longitudinally with respect to said endless connecting means, said screen means includes a plurality of parallel members positioned longitudinally with respect to said endless connecting means,

a filter plate positioned between each said parallel members and fitted rockably on one of said linking rods, said filter plate including a forward portion and a rear portion,

transverse interlocking rods including at least one interlocking rod tracking means on at least one end of each transverse interlocking rod, said interlocking rod tracking means for following said second track and positioned in working relationship to said second track and positioned to pass through said rear portion of each said filter plate, and

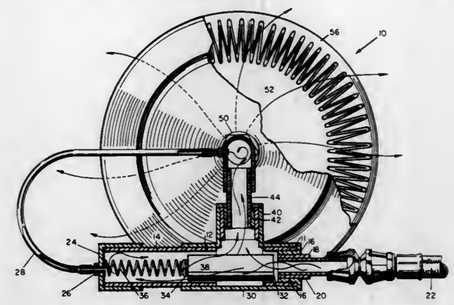
drive means for imparting rotation to said filter medium which travels with said linking rods regulated by said first track of said frame and said interlocking rods regulated by said second track of said frame.

4,188,295

APPARATUS FOR CHLORINATING AND FILTERING WATER FOR SWIMMING POOLS DURING FILLING OPERATION

Willis R. Burnett, Orlando, Fla., assignor to Mid-Florida Pools and Repair, Inc., Orlando, Fla.

Filed Aug. 15, 1977, Ser. No. 824,360
Int. Cl.² C02B *1/36;* **E04H** *3/20*
U.S. Cl. 210—206 **6 Claims**



1. Apparatus for chlorinating swimming pools during a filling operation comprising:

a hollow, cylindrical tube;

a first cap member over one end of said tube and having an opening therein;

a nozzle cooperating with said cap member and extending through said opening for directing a stream of water axially through said tube;

a second cap member over the other end of said tube having an opening therein;

a tube outlet extending substantially transverse to the axis of said tube for feeding chlorinated water to said swimming pool;

a generally cylindrical stick of chlorine positioned in said tube, said stick being supported by biasing means between said stick and said second cap member for biasing said stick against the flow of water from said nozzle, said stick being positioned adjacent said tube outlet so that a major portion of said flow of water contacts said stick and flows directly through said tube outlet;

a bypass tube having a smaller cross-section than said outlet and communicating between said opening in said second cap member and said tube outlet at a point distal from said inlet, said bypass tube receiving water passing along said stick and having a higher chlorine content than water passing into said outlet;

means for developing a high pressure in said bypass tube with respect to said stream from said inlet; and

wherein said stick has an outer diameter slightly smaller than the inner diameter of said tube, such that a substantial surface area of said stick is present for erosion at a relatively high water pressure with respect to the pressure at said nozzle.

4,188,296

FUEL COMBUSTION AND MAGNETIZING APPARATUS USED THEREFOR

Etuo Fujita, No. 2-15-17, Jiyugaoka, Meguro-ku, Tokyo, Japan (152)

Filed Jan. 10, 1978, Ser. No. 868,291
Claims priority, application Japan, Jan. 10, 1977, 52/774
Int. Cl.² B01D *35/06;* **F23D** *0/0*
U.S. Cl. 210—222 **3 Claims**

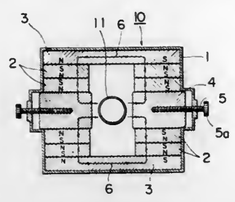
1. In combination with pipes for feeding fluid fuel and air-

containing gas to combustion devices, a magnetizing apparatus comprising

a casing having means for securing the casing on the pipe so that the pipe penetrates the casing substantially at the center thereof,

a pair of connecting yokes fixedly disposed in the casing at opposite sides thereof,

a plurality of permanent magnets placed in two parallel rows between said connecting yokes said magnets being oriented such that the poles of all of the magnets in each row



are aligned along a single axis and the axes of the two rows are parallel to one another,

a pair of movable yokes sandwiched between said magnets in each row, said movable yokes facing the pipe and being movable in a direction perpendicular to the direction of the rows of said permanent magnets and

adjusting means for moving said movable yokes towards and away from the pipe in the direction perpendicular to the direction of the rows of said permanent magnets,

wherein said magnets and yokes produce a variable flux density of at least 10 gauss traversing the pipe.

4,188,297

LUBRICANT ADDITIVE

Gerald J. J. Jayne, Wokingham, England, and David R. Woods, Kilcolgan, Ireland, assignors to Edwin Cooper and Company Limited, Bracknell, England

Filed Jul. 12, 1978, Ser. No. 923,816

Claims priority, application United Kingdom, Jul. 22, 1977, 30977/77

Int. Cl.[2] C10M *1/38;* C07G *17/00*

U.S. Cl. 252—45 **58 Claims**

1. A lubricating oil additive made by the process comprising reacting about 0.5–1.5 moles of at least one reactive olefinically unsaturated hydrocarbon containing about 6–30 carbon atoms and 1–3 olefinic double bonds with about 0.5–5 moles of elemental sulfur and about 0.1–2 moles of a mercaptan compound selected from the group consisting of

(1) alkyl mercaptan selected from methyl mercaptan, ethyl mercaptan, n-propyl mercaptan, isopropyl mercaptan, isobutyl mercaptan, n-butyl mercaptan and tert-butyl mercaptan;

(2) cycloalkyl mercaptan containing 5–8 carbon atoms;

(3) aryl mercaptan containing 6–20 carbon atoms;

(4) alkaryl mercaptan containing 7–20 carbon atoms;

(5) aralkyl mercaptan containing 7–20 carbon atoms;

(6) polymercapto aromatic selected from 1,4-dimercaptobenzene, 1,2-dimercaptobenzene, and 1,4-dimercapto-2-methylbenzene; and

(7) dimercaptoalkane containing 2–10 carbon atoms at a temperature of about 50°–200° C.

4,188,298

SYNTHETIC AIRCRAFT TURBINE OIL

Russell R. Reinhard, Hopewell Junction, and Roberta Yaffe, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 30, 1978, Ser. No. 910,718

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—46.6 **10 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(b) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(c) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(d) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.01 to about 1.0 percent by weight of a dialkyl sulfide compound having the following formula:

$$R—S—R^1$$

wherein R and R^1 each can be a C_1–C_{14} straight chain or branched chain alkyl group or mixtures thereof.

3. A lubricating composition as claimed in claim 1 wherein said dialkyl sulfide compound is di-dodecyl sulfide.

4. A lubricating composition as claimed in claim 1 wherein said dialkyl sulfide compound is di-(2-ethylhexyl) sulfide.

4,188,299

OIL SOLUBLE DITHIOPHOSPHORIC ACID DERIVATIVES OF MERCAPTOTHIADIAZOLES

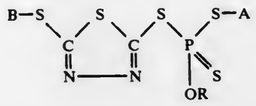
Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 17, 1978, Ser. No. 906,849

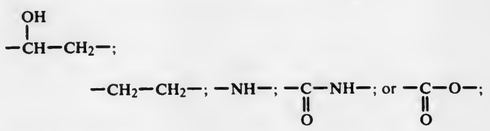
Int. Cl.[2] C10M *1/46, 1/54;* C07D *285/12*

U.S. Cl. 252—46.4 **18 Claims**

1. A compound having the structure:



wherein B is hydrogen or A and A is R—X—; X is



and R is a hydrocarbyl having about 1 to 100 carbon atoms.

2. A lubricating oil composition containing a major portion of a lubricating oil and about 0.1 to 10.0 weight percent of the compound of claim 1 based on the oil.

4,188,300

COSULFURIZED OLEFIN AND LARD OIL

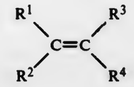
Henry E. Sanson, III, Medford Lakes, and Wallace R. Hartman, Jr., Willingboro, both of N.J., assignors to Mayco Oil and Chemical Company, Inc., Bristol, Pa.

Filed Apr. 5, 1973, Ser. No. 348,458

Int. Cl.[2] C10M *1/38, 3/32;* C07G *17/00;* C08H *3/00*

U.S. Cl. 252—48.6 **7 Claims**

1. A composition comprising a cosulfurized blend of from 50 to 90 parts by volume of lard oil containing free fatty acid but below 0.5 weight percent calculated as oleic acid and having a pour point of 35° to 40° F., and from 50 to 10 parts by volume of a hydrocarbon containing from 2 to about 24 carbon atoms and having the structure



wherein R^1, R^2 and R^3 are either hydrogen or alkyl and R^4 is either hydrogen, alkyl, aryl, cycloalkyl or alkaryl, which cosulfurized blend contains chemically combined therewith from 5 to 25 weight percent as based on said blend of sulfur.

4,188,301

MAGNETIC RECORDING COMPOSITION

Tunehide Naruse; Yasushi Sasaki, and Yukio Matsumoto, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 19, 1979, Ser. No. 22,048

Claims priority, application Japan, Mar. 20, 1978, 53/31017

Int. Cl.[2] H01F *1/00;* G11B *5/70, 5/78*

U.S. Cl. 252—62.54 **4 Claims**

1. A magnetic recording composition comprising 65 to 90 wt % of a magnetic powder, corresponding by 35 to 10 wt % of a resinous binder, and triolein as a lubricant contained in an amount of 0.5 to 10 wt % of the binder.

4,188,302

MANUFACTURE OF ACICULAR COBALT-MODIFIED MAGNETIC IRON OXIDE

Hans-Juergen Becker, Goennheim; Christof Jaeckh, Heidelberg; Eberhard Koester, Frankenthal; Werner Loeser, Ludwigshafen; Manfred Ohlinger, Frankenthal, and Werner Steck, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,262

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705967

Int. Cl.[2] C01G *49/06*

U.S. Cl. 252—62.56 **2 Claims**

1. A method of preparing acicular magnetic iron oxide particles, said particles being modified with 0.5 to 10 percent by weight of cobalt and up to 24 percent by weight of divalent iron, each based on the amount of iron oxide, which comprises the steps of

(a) suspending acicular gamma-iron(III) oxide in water and bringing the pH of the suspension to neutral,

(b) passing nitrogen into the suspension while heating it at a temperature of from 50 to 100° C.,

(c) adding to the suspension an aqueous solution of a cobalt-(II) salt and a base in an amount required to achieve an hydroxyl ion concentration of at least 3.16×10^{-6} moles/-liter,

(d) introducing into the suspension an aqueous solution of an iron(II) salt,

(e) heating said suspension for at least 15 minutes at a temperature of from 50 to 100° C., said suspension having a hydroxyl ion concentration greater than 3.16×10^{-6} moles/liter,

(f) filtering off and washing the resulting precipitate until neutral,

(g) drying the precipitate at below 100° C., and

(h) heating the dried precipitate at from 100 to 200° C. until a TA value less than 3.5 is obtained.

4,188,303

POLYMERIC ELECTRICAL INSULATORS HAVING INCREASED RESISTANCE TO PARTIAL DISCHARGES CONTAINING METAL CHELATES

Jean Barge, Paris la Defense; Raymond Catte, Lacq; Gilbert Chapelet, Symphorien d'Ozon; Ai Bui, Toulouse; Pierre Dejean, Sens; Claude Huraux, and Christian Mayoux, both of Toulouse, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

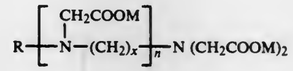
Continuation of Ser. No. 588,207, Jun. 19, 1975, abandoned. This application May 1, 1978, Ser. No. 902,007

Claims priority, application France, Jun. 21, 1975, 75 21779

Int. Cl.[2] H01B *3/18*

U.S. Cl. 252—63.7 **20 Claims**

1. An electrical insulator consisting essentially of a void-containing polymeric macromolecular insulating material suitable for use under voltage capable of causing partial discharges in said voids containing an agent for promoting an increase of the voltage thresholds liable to cause said partial discharges, said agent being present in an amount of 0.001 to 5 percent of said polymeric macromolecular insulating material, said agent being formed by at least one metal chelate which is a derivative of an organic compound of the formula



wherein

x is an integer of from 1 to 4,

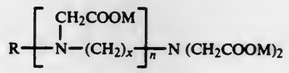
n is an integer of from 0 to 4,

R is —CH_2COOM and, when n is not 0, R may be —OH,

M is Na or H

the metal of the chelate being one selected from the group consisting of iron, copper, zinc, aluminum, cadmium and the metal chelate being present in the material in an amount sufficient to promote the extinction of said partial discharges.

15. In an electrical apparatus operative under high electrical field and voltage comprising a conductor and a void-containing macromolecular polymer insulator, said voids being liable to give rise to partial discharges, under such high electrical fields, the improvement, for promoting an increase of the voltage thresholds liable of causing said partial discharges in the voids of said insulator, wherein said insulator comprises from 0.001 to 5 percent by weight of at least one metal chelate which is a derivative of an organic compound of the formula



wherein

x is an integer of from 1 to 4,

n is an integer of from 0 to 4,

R is —CH_2COOM and, when n is not 0, R may be —OH,

M is Na or H

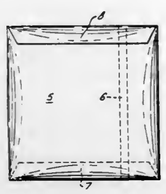
the metal of the chelate being one selected from the group consisting of iron, copper, zinc, aluminum and cadmium.

4,188,304

DETERGENT COMPOSITION IN A WATER-INSOLUBLE BAG HAVING A WATER-SENSITIVE SEAL

David E. Clarke; James F. Davies, both of Wirral, and John B. Tune, Higher Bebington, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,680
Claims priority, application United Kingdom, May 18, 1977, 20934/77
Int. Cl.² C11D *17/04*
U.S. Cl. 252—93 9 Claims



1. A detergent product comprising a particulate detergent composition contained within a closed water-insoluble bag which has a water-sensitive seal, whereby the contents of the bag are discharged on contact of the bag with water.

4,188,305

SURFACTANT FOR AN AUTOMATIC DISHWASHER

Linda A. Halas, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1977, Ser. No. 863,379
Int. Cl.² C11D *7/54, 7/60*
U.S. Cl. 252—95 6 Claims

1. An automatic dishwashing detergent composition consisting essentially of:
(1) from about 10% to about 90% of the detergency builder;
(2) available chlorine at a level of from 0% to about 3%; and
(3) from about 2.5% to about 30% of a low foaming nonionic surfactant which is the condensate of an alcohol containing from 17 to 19 carbon atoms with from about 6 to about 15 moles of ethylene oxide per mole of fatty alcohol, at least 50% of the ethylene oxide homologs containing within ±2 ethylene oxide moieties of the average.

4,188,306

PUMPABLE SOAP

Alan Dillarstone, Bramhall; Norman Lowe, Flixton, and Edwin Cropper, Shaw, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,802
Claims priority, application United Kingdom, Aug. 23, 1976, 34960/76
Int. Cl.² C11D *9/32, 17/04*
U.S. Cl. 252—121 5 Claims

1. An aqueous soap composition which is pumpable and substantially single phase at a temperature in the range of about room temperature to about 70° C. and consists essentially of, by weight, about 15% to 30% of a sodium soap obtained by neutralizing a mixture of tallow fatty acids and nut oil C_8–C_{18} fatty acids with an aqueous sodium hydroxide, the weight ratio of tallow fatty acids to nut oil fatty acids being in the range of 100:1 to 1:1; a water-soluble sodium, potassium or ammonium salt of a C_1–C_4 alkylbenzene sulfonate, the weight ratio of said soap to said sulfonate being about 50:1 to 10:1 and being sufficient to maintain the viscosity of said composition in a pumpable range; and 50% to 80% of water.

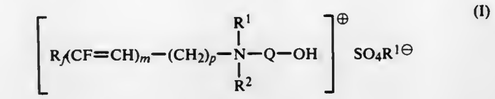
4,188,307

MIXTURE WITH LOW SURFACE TENSION WHICH CONSISTS OF FLUORINATED ALKYLAMMONIUM MONOALKYL SULFATES AND FLUOROALKYL-SULFATOBETAINES

Heinrich Bathelt, Altotting, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

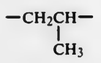
Filed Nov. 1, 1978, Ser. No. 956,750
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749330
Int. Cl.² B01F *17/04*
U.S. Cl. 252—355 5 Claims

1. Mixture with low surface tension, containing 10 to 80% by weight, based on the mixture, of at least one compound of the formula

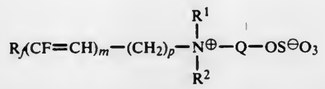


(I)

in which R_f denotes a perfluoroalkyl radical with 3 to 16 C atoms, R^1 denotes an alkyl radical with 1 to 4 C atoms, R^2 denotes an alkyl radical with 1 to 4 C atoms, a cyclohexyl radical or a 2-hydroxyalkyl radical with 2 to 4 C atoms, Q denotes a $-CH_2CH_2-$ or



radical, m denotes the number 0 or 1 and, if m is 0, p is an integer from 1 to 4 and if m is 1, p is the number 1, and 90 to 20% by weight, based on the mixture, of at least one compound of the formula



(II)

in which R_f, R^1, R^2, Q, m and p are as defined above.

4,188,308

CONVERSION OF PENDANT SULFONATE GROUPS TO SULFONIC ACID GROUPS ON PERFLUORVINYLETHER-TETRAFLUOROETHYLENE COPOLYMER CATALYSTS

Ronald J. Vaughan, Orinda, Calif., assignor to Varen Technology, Marshallton, Del.

Continuation-in-part of Ser. No. 660,634, Feb. 23, 1976. This application May 10, 1978, Ser. No. 904,503
Int. Cl.² B01J *31/40*
U.S. Cl. 252—413 2 Claims

1. A method for reactivating a deactivated acid catalyst comprising a copolymer of perfluorovinyl ether and tetrafluoroethylene, said copolymer catalyst containing pendant sulfonic acid groups, said catalyst having become deactivated by use in a hydrocarbon conversion process, which reactivating method comprises contacting said deactivated catalyst with strong nitric acid to remove contaminants and to convert sulfonate groups into sulfonic acid groups, removing excess nitric acid and salt formed from such conversion by water washing said sulfonic acid group containing copolymer until the wash water has a pH above 4 and drying the washed acid copolymer catalyst at 50° to 200° C.

4,188,309

SHAPED CATALYST AND PROCESS FOR ITS PRODUCTION

Herbert Völker, Hanau; Edgar Koberstein, Alzenau; Alfred Bozon, Erlensee, and Jörg Hensel, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,461
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745188
Int. Cl.² B01J *21/04, 23/78, 23/84, 21/12*
U.S. Cl. 252—466 J 51 Claims

1. A shaped catalyst consisting essentially of a structural reinforcing agent of ferrous metal, a layer of a heat-resistant carrier material on the structural reinforcing agent, a catalytically active component on the carrier material; the body of the structural reinforcing agent consisting essentially of iron or steel and having its surface provided with a non-scaling, adhesive and anchoring-favoring aluminum/iron diffusion layer, said diffusion layer having been obtained by tempering an aluminum-coated iron or steel at a temperature between 600 and 1200° C. for at least 1 minute.

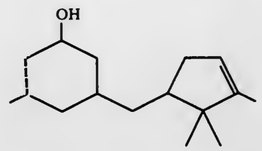
4,188,310

SUBSTITUTED CYCLIC ALCOHOLS, METHODS OF PREPARING AND COMPOSITIONS CONTAINING SAME

Brian J. Willis, Bergenfield, and John M. Yurecko, Jr., Bayonne, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Nov. 2, 1978, Ser. No. 957,047
Claims priority, application Japan, Sep. 30, 1977, 52-118070
Int. Cl.² A61K *7/46;* C11B *9/00;* C07C *35/21, 49/36*
U.S. Cl. 252—522 R 14 Claims

1. A compound having the structure



wherein the dashed line may be either a carbon-carbon single bond or a carbon-carbon double bond.

4,188,311

DETERGENT COMPOSITIONS CONTAINING ETHER SULFATES

Johan G. Aalbers, and Nicolaas I. Van Paassen, both of Bodegraven, Netherlands, assignors to Chem-Y, Fabriek Van Chemische Produkten B.V., Bodegraven, Netherlands

Filed Jul. 20, 1976, Ser. No. 707,092
Claims priority, application United Kingdom, Jul. 24, 1975, 31012/75
Int. Cl.² C11D *11/04*
U.S. Cl. 252—551 6 Claims

1. In a detergent composition consisting essentially of a detergent effective amount of detergent product and a detergent adjuvant, the improvement wherein said detergent product is of the formula $RO-(C_2H_4O)_nSO_3M$, wherein R is a mixture of alkyl groups having from about 10 to about 15 carbon atoms and containing at least about 30% of alkyl groups with branched carbon chains, n is a number having an average value of about 1 to about 5 and M is a cation, said detergent product having been prepared by ethoxylating the corresponding compound ROX with ethylene oxide using an acidic catalyst, followed by sulfation and conversion to the desired salt, and further wherein said detergent product and said detergent adjuvant are in aqueous solution and the composition further includes a thickening amount of sodium chloride.

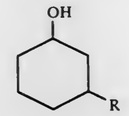
4,188,312

SURFACE-COATING BINDERS AND THEIR USE FOR CATHODIC ELECTROCOATING

Fritz E. Kempter, Mannheim; Eberhard Schupp, Schwetzingen, and Rainer Blum, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 969,551
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755908
Int. Cl.² C25D *13/06;* C08L *63/00, 91/00*
U.S. Cl. 260—19 EP 16 Claims

1. A surface-coating binder which is substantially free from epoxide groups and is based on a reaction product of (A) from 25 to 90 percent by weight of a Mannich base obtained from
(a_1) one or more polyhydric phenols which are free from ether groups and contain two or more aromatic rings, and/or
(a_2) one or more monohydric or polyhydric phenols which contain one or more ether groups and contain two or more aromatic rings, and
(b_1) one or more secondary amines which contain one or two hydroxyalkyl groups, or a mixture of (b_1) with
(b_2) a secondary dialkylamine or dialkoxyalkylamine, and
(c) formaldehyde or a formaldehyde donor,
and (B) from 75 to 10 percent by weight of one or more epoxy resins, wherein the reaction product of (A) and (B) additionally contains, built into its chemical structure, an olefinically unsaturated alkylphenol of the general formula (I)



where R is a radical of 11 to 19 carbon atoms which contains from one to three carbon-carbon double bonds.

4,188,313

COMPOSITIONS INTENDED FOR THE FLAMEPROOFING OF PLASTICS

Jacqueline Cerny, and Gilbert Vivant, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 28, 1976, Ser. No. 690,843
Claims priority, application France, Jun. 10, 1975, 75 18038
Int. Cl.² C08L *63/00*
U.S. Cl. 260—37 EP 8 Claims

1. Compositions for flameproofing plastics, which compositions are in particulate form and do not evolve toxic products when use is made of the plastics characterised in that the flameproofing composition consists of a mixture comprising
(a) 50 to 95% by weight of red phosphorus in the form of a powder having a mean particle size of less than 200μ and
(b) 5 to 50% by weight of epoxy resins, and in which the particles of red phosphorus are coated with the epoxy resin.

6. A plastic composition for the production of flameproofed shaped articles comprising a plastic, with or without filler, in which the plastic is flameproofed by admixture with 0.2 to 20% by weight of previously formed particles of 50 to 95% by weight red phosphorus and 5 to 50% by weight epoxy resin, in which in the preformed particles the phosphorus is coated with the epoxy resin compound.

4,188,314

SHAPED ARTICLE OBTAINED FROM A CARBONATE-POLYESTER COMPOSITION

Daniel W. Fox, Pittsfield, and John A. Rock, Dalton, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 750,511, Dec. 14, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,256

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—37 PC **11 Claims**

1. A shaped article in the form of a substantially transparent sheet having enhanced chemical resistance which consists of:
(a) from 25 to 98 parts by weight of an aromatic carbonate polymer; and
(b) from 2 to 75 parts by weight of a polyester polymer derived from cyclohexanedimethanol and a mixture of iso- and terephthalic acids wherein said mixtures contain from about 5% to about 90% isophthalic acid and from about 95% to about 10% terephthalic acid.

4,188,315

PROCESS AND COMPOSITION FOR POLYMERIZING AND CURING METHYL METHACRYLATE MONOMER-POLYMER SYRUPS IN THE PRESENCE OF METAL SALTS OF HEMI-PERESTERS OF MALEIC ACID

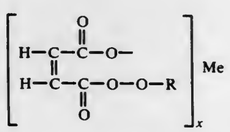
Ronald S. Dudinyak, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,801, Apr. 14, 1076, abandoned, which is a continuation-in-part of Ser. No. 615,722, Sep. 22, 1975, abandoned. This application May 25, 1978, Ser. No. 909,556

Int. Cl.[2] C08K *3/10*

U.S. Cl. 260—40 R **5 Claims**

1. An improved process for preparing a cured polymeric article which includes curing a mixture consisting essentially of
(a) a syrup containing 10–40% by weight of a methyl methacrylate polymer, having an inherent viscosity of 0.25–1.0, in monomeric methyl methacrylate, said polymer being selected from the group consisting of methyl methacrylate homopolymer and copolymers of methyl methacrylate with α,β-ethylenically unsaturated compounds;
(b) at least some inert additive, in an amount up to 85% by weight, based on the weight of (a) plus (b); and
(c) a small amount of a metal salt of a hemiperester of maleic acid having the formula



wherein
Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;
X is an integer having a value of from 1 to the valence of the metal; and
R is a saturated tertiary alkyl radical
wherein the improvement comprises the presence of a salt of an oxo acid of sulfur activator selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts.

4,188,316

PROCESS FOR PRODUCING SHAPED ARTICLES WITH PATTERNS

Shuichi Sawada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 27, 1977, Ser. No. 801,414

Claims priority, application Japan, Jun. 3, 1976, 51-64848

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—40 R **13 Claims**

1. A process for producing a molding compound with a controlled color pattern which comprises the steps of:
(a) preparing a plurality of unsaturated polyester resin compositions of different color tones and having fluidity, said compositions containing at least one thickening agent selected from the group consisting of metal oxide, metal hydroxide and crystalline unsaturated polyester;
(b) thickening at least one of a pair of said compositions sufficiently so that it loses its fluidity by allowing said composition to stand for a period of time at a temperature effective to cause said thickening;
(c) uniting the plurality of resin compositions after at least one of each pair of adjacent compositions to be united has been thickened sufficiently to lose its fluidity and determine physical boundary while retaining its uniting ability; and
(d) further thickening the whole of the united resin compositions to form a solid or semi-solid molding compound.

4,188,317

DENTAL RESTORATIVE COMPOSITIONS CONTAINING TITANIUM SILICATE

Samuel C. Temin, Needham, Mass., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 929,069

Int. Cl.[2] C08K *3/24, 3/34*

U.S. Cl. 260—42.53 **10 Claims**

1. In a dental restorative composite composition, which is a mixture of a finely divided, inert inorganic filler and a liquid polymerizable resin binder system, the improvement comprising, as at least the major portion of said finely divided inert inorganic filler, titanium silicate.

4,188,318

SIMPLIFIED METHOD FOR PREPARATION OF HIGH YIELD, HIGH PURITY FACTOR VIII CONCENTRATE

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92700

Continuation of Ser. No. 586,948, Jun. 16, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 899,235

Int. Cl.[2] A61K *37/02*

U.S. Cl. 260—112 B **1 Claim**

1. The method of concentrating and purifying Factor VIII consisting essentially of the steps of:
collecting cryoprecipitate from about 100 or more liters of frozen plasma;
extracting the cryoprecipitate thus collected in from about 2 to about 3 volumes of pyrogen-free water at about 25° C. to 30° C. and about pH 7 for from about 30 to about 60 minutes;
removing lipids, denatured proteins and prothrombin complex from the extract solution by adsorption:
precipating fibrinogen its denatured and degraded products, without removal of significant amounts of Factor VIII from the resulting low ionic strength liquid extract by cooling the liquid to from about 1° C. to about 2° C. for from about one-half hour to about 2 hours;
separating, stabilizing, clarifying and sterilizing the supernatant liquid containing about eighty percent or more of the Factor VIII in the starting material;
lyophilizing the stabilized supernatant liquid to produce a Factor VIII concentrate which can be stored for long periods of time and which can be easily reconstituted by dissolution in distilled water or physiologic saline.

4,188,319

4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

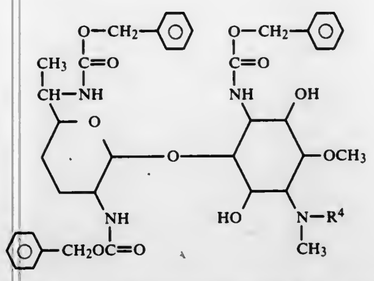
John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 888,085, Mar. 20, 1978, Pat. No. 4,155,902, which is a division of Ser. No. 725,829, Sep. 23, 1976, Pat. No. 4,091,032. This application Jan. 12, 1979, Ser. No. 3,053

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **20 Claims**

1. A compound of the formula



wherein R^4 is acyl, N,N-diloweralkylaminoacyl, or an acyl group derived from an N-benzyloxycarbonyl protected amino acid or a short peptide.

4,188,320

ESTER OF HIGHER FATTY ACID AND REAGENT FOR DETERMINATION OF ACTIVITY OF LIPASE

Shinichi Kamachi, Mitaka, and Yosuke Ohkura, Fukuoka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

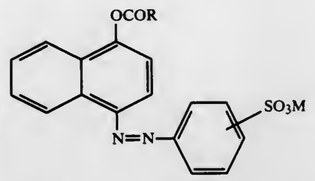
Filed Sep. 20, 1978, Ser. No. 943,981

Claims priority, application Japan, Sep. 22, 1977, 52-113206

Int. Cl.[2] C07C *107/04*

U.S. Cl. 260—202 **11 Claims**

1. An ester of higher fatty acid of the formula:



(wherein R is an alkyl group of 9 to 17 carbon atoms; M is an alkali metal).

4,188,321

25-DESACETYL RIFAMYCINS

Nicola Maggi, and Piero Sensi, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Oct. 30, 1967, Ser. No. 679,195

Claims priority, application United Kingdom, Nov. 3, 1966, 49389/66

The portion of the term of this patent subsequent to Mar. 24, 1989, has been disclaimed.

Int. Cl.[2] C07D *491/08*

U.S. Cl. 260—239.3 P **4 Claims**

1. 25-desacetyl-3-(4-methyl-piperizinyl-iminomethyl)-rifamycin SV.

4,188,322

PROCESS FOR THE PREPARATION OF 6-HALO-PREGNANES

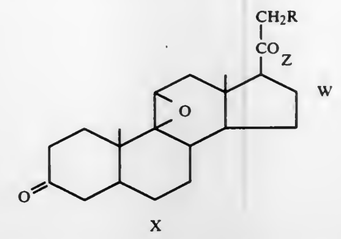
Pier P. Castelli, Monza, and Bruno Romano', Besana Brianza, both of Italy, assignors to Blasinachim S.p.A., Milan, Italy

Filed Apr. 28, 1978, Ser. No. 900,886

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 R **9 Claims**

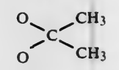
1. A process for the preparation of a 6α-halo-3-keto-$\Delta^{1,4}$-pregnadiene-derivative of the structure:



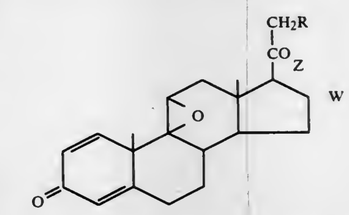
III

X

wherein R and Z are hydrogen, or hydroxy or acyloxy derived from carboxylic acids containing up to 9 carbon atoms; or when Z is hydroxy and W is hydroxy α-oriented can represent together the group

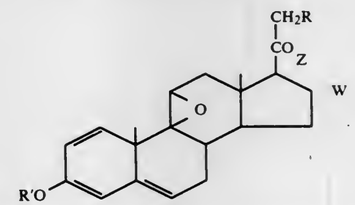


W is hydrogen or hydroxy or methyl; X is halogen, preferably fluorine and chlorine, which comprises reacting a 3-keto-$\Delta^{1,4}$-pregnadiene-derivative of the structure I:



I

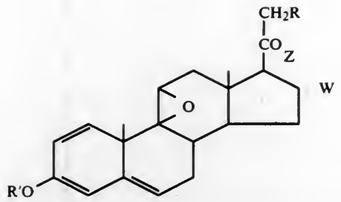
in which R,Z and W have the above meaning, with a suitable acylating or etherifying agent, such as acyl anhydrides, isopropenyl acetate, trialkyl orthoformates in the presence of acid catalysts, such as p-toluenesulfonic acid, to give the corresponding 3-enol-derivatives of the structure II:



II

wherein R,Z and W have the above meaning and R' is a lower acyl or alkyl, which is then reacted with a suitable halogenating agent such as a N-halo-amide, perchloryl fluoride to produce the desired compound III.

2. A compound of the structure:



II

wherein R, Z and W have the above meaning and R′ is a lower acyl or alkyl.

4,188,323

DERIVATIVES OF 2-OXAZOLYDONE AND METHODS FOR PREPARING THE SAME

Vittorio Pestellini; Mario Ghelardoni; Claudio Bianchini; Piero Del Soldato; Giovanna Volterra, and Alberto Meli, all of Florence, Italy, assignors to A. Menarini S.A.S., Italy

Filed May 11, 1978, Ser. No. 905,047
Claims priority, application Italy, Sep. 22, 1977, 9578 A/77
Int. Cl.[2] C07D *263/24;* A61K *31/42*
U.S. Cl. 548—229 **6 Claims**

1. A member selected from the group consisting of 3-isopropyl-5-(1-naphthyloxymethyl)-2-oxazolydone; 3-isopropyl-5-(4-acetaminophenoxymethyl)-2-oxazolydone; 3-isobutyl-5-{2[(tetrahydrofurfuryl)oxy]phenoxy}methyl-2-oxazolydone; 3-n-octyl-4-methyl-5-(4-isopropylthiophenyl)-2-oxazolydone; 3-isopropyl-5-(4-nitrophenyl)-2-oxazolydone.

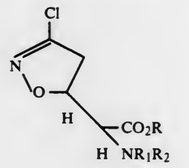
4,188,324

PURIFICATION OF AT-125

David G. Martin, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 918,569, Jun. 23, 1978, which is a continuation-in-part of Ser. No. 906,028, May 15, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,217
Int. Cl.[2] C07D *261/04*
U.S. Cl. 548—240 **5 Claims**

1. A compound having the formula

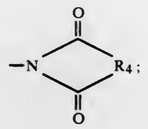


I

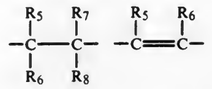
wherein R is selected from the group consisting of hydrogen and alkyl of from 1 to 8 carbon atoms; R_1 and R_2 are different and are selected from the group consisting of hydrogen,



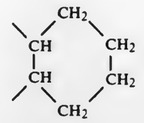
or when taken together with the nitrogen atom form the group



wherein R_3 is alkyl of from 1 to 8 carbon atoms, inclusive; and R_4 is selected from the group consisting of (a)



where R_5, R_6, R_7 and $R_8$are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylenes with the proviso that other than when R_1 and R_2 forms a ring with the nitrogen atom one of R_1 and R_2 must always be hydrogen.

4,188,325

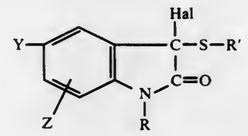
ISATIN PROCESS AND PRODUCTS

Paul G. Gassman, St. Paul, Minn., and Berkeley W. Cue, Jr., Groton, Conn., assignors to Regents of University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 787,992, Apr. 15, 1977. This application Aug. 21, 1978, Ser. No. 935,687
Int. Cl.[2] C07D *209/34*
U.S. Cl. 260—325 R **25 Claims**

1. A process for making isatins which comprises the steps of
(1) subjecting a 3-hydrocarbonthiooxindole, having a hydrogen atom present as a further substituent on the 3-carbon atom thereof, to oxidative halogenation by reaction with an oxidating-halogenating agent under oxidative-halogenation reaction conditions to produce a 3-halo-3-hydrocarbon thiooxindole;
(2) subjecting the formed 3-halo-3-hydrocarbonthiooxindole to hydrolysis with a hydrolyzing agent under hydrolysis conditions to produce an isatin; and,
(3) isolating the thus-formed isatin.

10. The compound of the formula



wherein
X and Z are hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy, lower acyloxy, carbonyloxyl-lower alkyl, or carboxyloxy-phenyl;
R is hydrogen or a lower hydrogenated radical free of aliphatic unsaturation;
R′ is a lower hydrocarbon radical; and
Hal is chlorine or bromine.

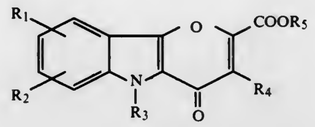
4,188,326

INDOLOPYRONES HAVING ANTI-ALLERGIC ACTIVITY

Richard E. Brown, Hanover, N.J., and Paul C. Unangst, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 764,150, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 611,453, Sep. 8, 1975, Pat. No. 4,028,383. This application Mar. 20, 1978, Ser. No. 890,544
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—326.29 **11 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are hydrogen, halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl of 1 to 6 carbons, or may be taken together to form a methylenedioxy group; wherein R_3 is hydrogen, lower alkyl of 1 to 6 carbons, phenyl, or phenylmethyl; wherein R_4 is hydrogen; and wherein R_5 is hydrogen or lower alkyl of 1 to 6 carbons.

4,188,327

SULFOLENE HYDROGENATION

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1978, Ser. No. 940,674
Int. Cl.[2] C07D *333/48*
U.S. Cl. 549—87 **14 Claims**

1. A process for converting sulfolene to sulfolane which comprises contacting
(a) a feed of at least one sulfolene compound containing sulfur dioxide and other sulfur-containing catalyst poisons with
(b) hydrogen in the presence of
(c) a metal hydrogenation catalyst, and
(d) an effective amount of sulfur dioxide neutralizers or scavengers comprising at least one of alkali metal and alkaline earth metal hypohalite salts under hydrogenation conditions including a temperature at which the reaction mixture is liquid and which is below that at which the materials decompose and sufficient to effectively convert said sulfolene compound to a sulfolane compound.

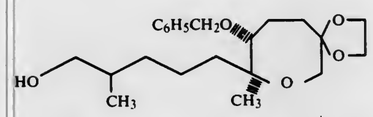
4,188,328

CHEMICAL INTERMEDIATES IN THE PREPARATION OF OXEPANE COMPOUNDS

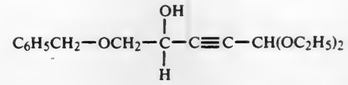
Michael P. Wachter, Bloomsbury, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 18, 1978, Ser. No. 970,726
Int. Cl.[2] C07D *317/00*
U.S. Cl. 260—340.9 R **7 Claims**

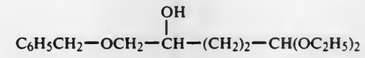
1. The process for the preparation of a compound of the formula:



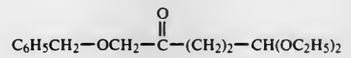
which comprises reacting a compound of the formula



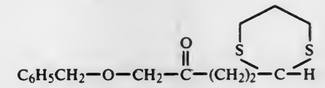
with hydrogen in the presence of a catalyst to produce a hydrogenated compound of the formula



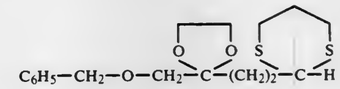
oxidizing the product with an oxidizing agent to form a ketone derivative of the formula



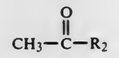
reacting said product with an alkyl thiol to form a 1,3-dithiane of the formula



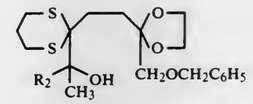
reacting said product with ethylene glycol to form a ketal of the formula



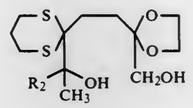
condensing the lithio salt of said product with a methyl ketone of the formula



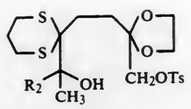
to form an acyclic tertiary alcohol of the formula



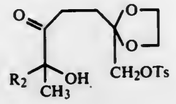
reacting the product formed with an alkali metal in liquid ammonia to form a compound of the formula



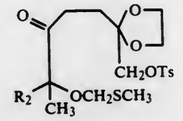
reacting said product with tosyl chloride to form a tosylate of the formula



removing the dithiane protecting group to form a ketone of the formula

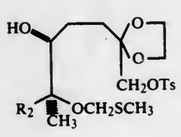


reacting said product with dimethyl sulfoxide in an alkyl anhydride to form a compound of the formula

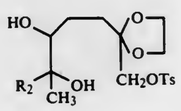


reacting the product formed with sodium borohydride to form an epimeric mixture of alcohols of the formula

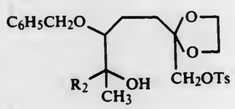
and



chromatographing the mixture over an adsorbent material to separate the isomers, reacting the erythro isomer with a mixture of mercuric chloride and calcium carbonate to form an erythro diol of the formula



reacting said product with a benzyl halide to form an erythro benzyl ether of the formula



and reacting said product with a base in dimethyl sulfoxide, wherein R_2 is $-CH_2)_3CH(CH_3(CH_2OSi(C_6H_5)_2t\text{-}C_4H_9$; and wherein R_2 is $(CH_2)_3CH(CH_3)CH_2OCH_2OCH_2CH_2OCH_3$ reacting said product with a base in dimethyl sulfoxide followed by reaction with zinc chloride; and wherein R_2 is $-(CH_2)_3C(CH_3)=CH_2$ reacting the product with a base in dimethyl sulfoxide followed by reaction with borane methylsulfide.

4,188,329

INTERMEDIATES FOR THE PREPARATION OF PROSTAGLANDINS AND PROSTAGLANDIN ANALOGS FROM A MOLD METABOLITE

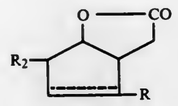
Lester A. Mitscher; George W. Clark, III, both of Lawrence, Kans., and Gordon H. Bokelman, Vancouver, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 707,726, Jul. 22, 1976, Pat. No. 4,103,091, which is a continuation-in-part of Ser. No. 611,468, Sep. 8, 1975, abandoned. This application May 11, 1978, Ser. No. 904,831

Int. Cl.[2] C07D *307/93*

U.S. Cl. 260—343.3 P **10 Claims**

1. A compound of the formula



wherein R is $-CH=CHCHO$, $-CHOH-CHOH-CH_3$, $-CH=CHCH_3$ or $-CH=CH-CR_5(CH_2)_4CH_3$ with R_5 being $=O$ or



the broken line in the cyclopentene ring indicates an optional double bond; and R_2 is an O-protective acyl group that can be removed chemically without adverse effect on the other substituents of said cyclopentene, said substituent being in the β-position.

4,188,330

SUBSTITUTED PHTHALIDE DERIVATIVES

Thomas J. Giacobbe, Concord, and Halbert C. White, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

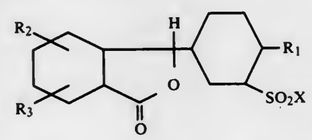
Filed Oct. 10, 1978, Ser. No. 949,479

Int. Cl.[2] C07D *307/88*

U.S. Cl. 260—343.3 R **3 Claims**

1. A compound of the formula

(II)



wherein R_1 represents chloro, bromo, $NR'R''$, lower alkyl or lower alkoxy radicals, R_2 and R_3 each independently represent hydrogen, chloro, bromo, nitro or lower alkyl radicals, and X represents chloro or bromo, R' and R'' each independently representing hydrogen, lower alkyl, lower alkenyl or lower hydroxyalkyl radicals.

4,188,331

PROSTAGLANDIN DERIVATIVES

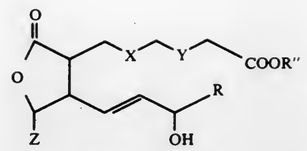
Andre G. Pernet, Kirkland, Canada; Hiromasa Nakamoto, Awara, and Naoyasu Ishizuka, Ou, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 746,022, Nov. 30, 1976, abandoned, which is a division of Ser. No. 647,822, Jan. 9, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,905

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **5 Claims**

1. A compound of the formula



wherein R is a linear, branched or cyclic alkyl group of 3 to 7 carbon atoms; Z is OH or CH_2OH, X is $-CH=CH-$ or $-C\equiv C-$; Y is O or CH_2 and R'' is H or loweralkyl.

4,188,332

TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-PGF,1,11- OR 1,15-LACTONES

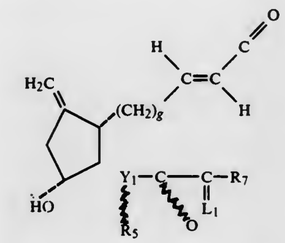
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978. This application Aug. 11, 1978, Ser. No. 932,995

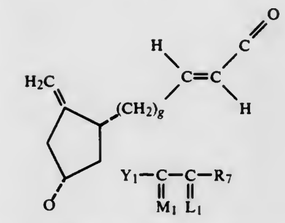
Int. Cl.[2] C07D *313/00*

U.S. Cl. 260—343.41 **22 Claims**

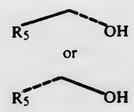
1. A prostaglandin of the formula



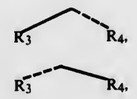
or



wherein Y_1 is trans—CH=CH—, $-C\equiv C-$, $-CH_2CH_2-$, or cis—CH=CH—;
wherein M_1 is



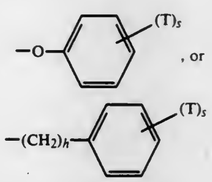
wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 4, 5, or 6;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,

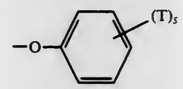


(2)

, or

(3)

wherein h is zero, one, two, or three,
wherein m is one to 5, inclusive, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero.
one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,188,333

PROCESS FOR SELECTIVELY HYDROGENATING POLYENIC COMPOUNDS IN OILS

Raymond M. Cahen, 21, avenue Commandant Lothaire, 1040 Brussels, Belgium

Filed Oct. 25, 1977, Ser. No. 845,061

Claims priority, application Luxembourg, Jan. 18, 1977, 76591

Int. Cl.[2] C11C *3/12;* **B01J** *23/40*

U.S. Cl. 260—409 **13 Claims**

1. A process for selectively hydrogenating oils containing polyenic compounds into oils wherein the content of polyenic compounds is reduced with a minimum formation of solid products, which comprises the step of hydrogenating said oil in the presence of a catalyst comprising nickel on a titanium oxide carrier, wherein the per weight ratio of nickel:carrier is between about 1.5 and about 4.5.

4,188,334

ORGANOTIN COMPOUNDS

Wolfgang Wehner, Zwingenberg, and Hermann O. Wirth, Bensheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

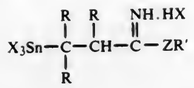
Filed Sep. 6, 1978, Ser. No. 939,944

Claims priority, application Switzerland, Sep. 9, 1977, 11065/77

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **6 Claims**

1. An organotin compound of the general formula



wherein
X is a chlorine, bromine or iodine atom,
R is selected from the group consisting of a hydrogen atom and alkyl,
Z is an oxygen or sulphur atom, and
R′ is a hydrocarbon group of aliphatic, cycloaliphatic or aromatic character, or said group substituted by a hydroxyl, thiol, alkoxy, alkylthio, carboxyl or carboalkoxy group.

4,188,335

NOVEL SOLVENTS FOR THE CATALYTIC PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS

Leonard Kaplan, Charleston, W. Va., and Frank A. Cotton, Bryan, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,969
Int. Cl.² C07C *27/06*
U.S. Cl. 260—449 L **13 Claims**

1. The process for producing polyhydric alcohol(s) which comprises reacting hydrogen and oxides of carbon in a solvent comprising a 2,2-di(alkyl)-gamma-butyrolactone wherein the alkyl groups have from 1 to 12 carbon atoms, in the presence of a rhodium carbonyl complex at a temperature of between about 100° C. and 375° C. and a pressure of between about 1000 psia. and 50,000 psia. to produce said polyhydric alcohol(s).

4,188,336

CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 825,622, Aug. 18, 1977. This application May 5, 1978, Ser. No. 903,270
Int. Cl.² C07C *1/04*
U.S. Cl. 260—449 R **5 Claims**

1. In a process for forming hydrocarbons containing improved yields of aromatics by converting syngas comprising hydrogen and carbon oxides with a catalyst composition comprising a methanol synthesis catalyst component in admixture with a crystalline zeolite component comprising a silica-to-alumina ratio greater than 12, a pore dimension greater than about 5 Angstroms and a constraint index in the range of 1 to 12, the improvement which comprises
admixing each of the components of the methanol catalyst comprising zinc, chromia and alumina and the crystalline zeolite component in a fine state of sub-division finer than 80 mesh and thereafter pelletizing the mixed finely ground material to form particles of the catalyst composition of a particle size in the range of 10 to 30 mesh.

4,188,337

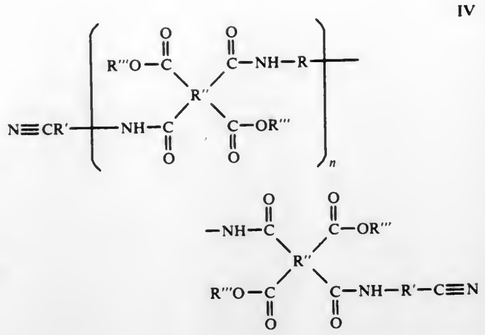
NITRILE SUBSTITUTED POLYIMIDE PRECURSORS

Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 702,818, Jul. 6, 1976, Pat. No. 4,129,570. This application Jul. 28, 1978, Ser. No. 929,046
Int. Cl.² C07C *121/78*
U.S. Cl. 260—465 D **5 Claims**

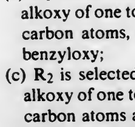
1. A compound of the following structure

IV



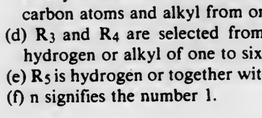
wherein R is arylene ether or arylene thioether, R′ is arylene or arylene ether, n is an average from 1 to about 4, R″ is

II



or

III



X″ is C=O, CH_2, O, S, or a bond and R‴ is a lower alkyl.

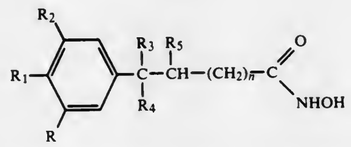
4,188,338

HYDROXAMIC ACIDS AND PROCESS FOR MAKING SAME

Antonius H. N. M. Bruins, and Gerlof Vollema, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 9, 1977, Ser. No. 859,142
Claims priority, application Netherlands, Dec. 18, 1976, 7614113
Int. Cl.² C07C *83/10*; A61K *31/185*
U.S. Cl. 260—500.5 H **16 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein:
(a) R is alkoxy of from one to six carbon atoms or alkenyloxy of two to six carbon atoms;
(b) R_1 is selected from the group consisting of hydrogen, alkoxy of one to six carbon atoms, alkenyloxy of two to six carbon atoms, alkyl from one to six carbon atoms, and benzyloxy;
(c) R_2 is selected from the group consisting of hydrogen, alkoxy of one to six carbon atoms, alkenyloxy of two to six carbon atoms and alkyl from one to six carbon atoms;
(d) R_3 and R_4 are selected from the group consisting of hydrogen or alkyl of one to six carbon atoms;
(e) R_5 is hydrogen or together with R_3 or R_4 methylene, and
(f) n signifies the number 1.

4,188,339

PROCESS FOR PREPARING ACRYLAMIDE AQUEOUS SOLUTION

Yasumasa Yamaguchi, and Kazuo Kohno, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,472
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N **11 Claims**

1. A process for preparing an aqueous solution of acrylamide, which comprises
catalytically hydrating acrylonitrile in the presence of a metal-containing catalyst to form a mixed aqueous solution containing about 15 to about 35% by weight of acrylamide and about 0.5 to about 20% by weight of acrylonitrile, then flash distilling the mixed aqueous solution obtained by hydration, and then
concentrating the mixed aqueous solution obtained by flash distilling to a high concentration aqueous solution of acrylamide having an acrylonitrile concentration of about 0.1% by weight or less using a centrifugal film evaporator in which a stream of mixed aqueous solution and a stream of evaporated vapor flow countercurrently to each other and without using a distillation tower.

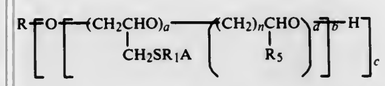
4,188,340

POLYETHERS HAVING AMINOTHIOETHER SIDE CHAINS

Richard A. Hickner, Lake Jackson, Tex., and Hugh A. Farber, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 427,605, Dec. 26, 1973, abandoned, which is a division of Ser. No. 846,946, Aug. 1, 1969, Pat. No. 3,804,900. This application Sep. 15, 1975, Ser. No. 613,662
Int. Cl.² C07C *93/06*
U.S. Cl. 260—567.6 P **11 Claims**

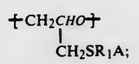
1. A polyether represented by the general statistical formula:



wherein R is hydrogen or the residue of an active hydrogen initiator selected from the group consisting of monohydric alkyl alcohols, polyhydric alkyl alcohols, hydroxyl terminated polyalkylene polyethers and haloalkyl alcohols; R_1 is alkylene, cycloalkylene, hydroxyalkylene, having 2 to 12 carbon atoms wherein the hydroxy group is bonded to a carbon at least one carbon removed from S, alkylenethioalkylene, poly(alkylenethio)alkylene, alkyleneoxyalkylene, poly(alkyleneoxy)alkylene, arylene or arylenealkylene wherein R_1 has at least 2 carbons and each of 2 valences exist on a different carbon; A is an ammonium salt radical represented by the general formula:



wherein R_2 and R_3 are individually hydrogen, alkyl or hydroxyalkyl, R_4 is hydrogen or alkyl and X is an anion of an ammonium salt group; R_5 is hydrogen or alkyl; a is a positive integer and d is 0 or a positive integer provided that the ratio of a to d is such that the polyether contains at least 10 mole percent of



b is a positive integer; c is a positive integer; and n is a positive integer from 1 to 4.

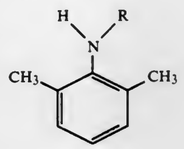
4,188,341

PROCESS FOR THE PRODUCTION OF (SUBSTITUTED) 2,6-DIMETHYLANILINES

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

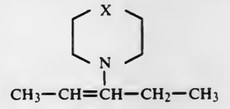
Continuation-in-part of Ser. No. 759,144, Jan. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 632,744, Nov. 17, 1975, abandoned. This application Jul. 11, 1978, Ser. No. 923,608
Int. Cl.² C07C *85/06, 85/08*
U.S. Cl. 260—573 **8 Claims**

1. Process for the production of aniline derivatives of the formula I



(I)

wherein
R represents hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl substituted by C_1–C_2-alkoxy,
in which process an enamine of the formula II



(II)

wherein X represents a methylene group, oxygen or a direct bond, is reacted at a temperature of between −30° C. and 150° C. with acrolein in the presence of an inert aprotic solvent, or in the absence of a solvent; and the reaction product obtained is subsequently heated to a temperature of between 100° and 400° C. in the presence of a hydrogen-transfer catalyst and in the presence of an amine of the formula III

$$R—NH_2 \qquad \text{(III)}$$

wherein R has the meaning given under formula I.

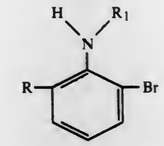
4,188,342

ORTHO-BROMINATION OF ORTHO-ALKYLATED ANILINES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

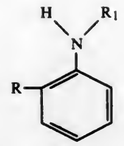
Filed Jan. 22, 1979, Ser. No. 5,057
Int. Cl.² C07C *87/28, 91/06, 91/16, 91/40*
U.S. Cl. 260—578 **10 Claims**

1. Process for the preparation of compounds having the formula



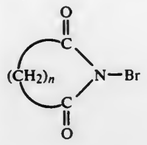
I

which comprises reacting a compound of the formula



II

with a compound of the formula



III

in an inert solvent at temperatures within the range of 31 25° C. to 125° C., wherein in the above formulae

R is C_{1-16} alkyl,

R_1 is hydrogen, C_{1-6} alkyl or an alkoxyalkyl radical of the formula $-(CR_2R_3)_mOR_4$ wherein R_2 and R_3 are hydrogen or C_{1-3} alkyl, m is 2, 3 or 4 and R_4 is C_{1-4} alkyl and n is an integer from 1 to 8 inclusive.

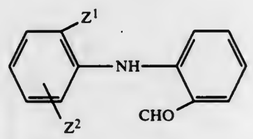
4,188,343

PROCESS FOR PREPARING ANTHRANYLALDEHYDE DERIVATIVES

Ryozo Sakoda; Isao Hashiba, and Kazuo Nagano, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

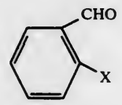
Filed Dec. 27, 1978, Ser. No. 973,599
Int. Cl.[2] C07C *91/161, 91/28*
U.S. Cl. 260—571 **7 Claims**

1. The process for preparing an anthranylaldehyde derivative of formula:

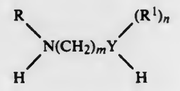


(wherein, Z^1 and Z^2 are same or different each other and each represent a hydrogen atom, a halogen atom, a methyl group or a trifluoromethyl group; Z^1 is attached to ortho position to the amino group and Z^2 may be positioned at any of 3-, 4-, 5- and 6-positions), which comprises steps of

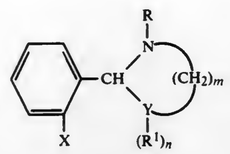
(1) reacting a o-halogenobenzaldehyde of the formula:



(wherein, X represents a halogen atom) with an alkylamine derivative of formula:

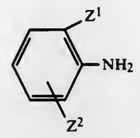


(wherein, R and R^1 each represents a lower alkyl group; Y represents a nitrogen, oxygen or sulfur atom; m represents an integer of 2 or 3; n represents 0 or 1, provided that n is 1 when Y is a nitrogen atom and n is 0 when Y is an oxygen or sulfur atom), affording a compound of formula:



(wherein, X, R, R^1, m and n are as defined above),

(2) reacting the thus obtained compound with an aniline derivative of formula:



(wherein, Z^1 and Z^2 are as defined above), giving a condensation product, and,

(3) treating the thus obtained condensation product with an acid.

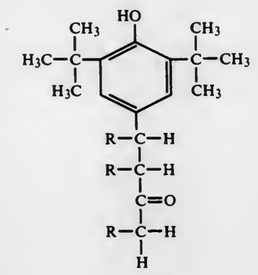
4,188,344

PRODUCTION OF 4-(M,M'-DITERT.-BUTYL-P-HYDROXYPHENYL)-BUTAN-2-ONES

Roman Fischer, Mutterstadt; Werner Fliege, Otterstadt; Wolfgang Koernig, Mannheim, and Bernd Meissner, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

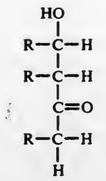
Continuation of Ser. No. 443,826, Feb. 19, 1974, abandoned. This application Jan. 3, 1978, Ser. No. 866,382
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309370
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—590 E **6 Claims**

1. A process for the production of a 4-(m,m'-ditert.-butyl-p-hydroxyphenyl)-butan-2-one of the formula (I):



(I)

in which the individual radicals R may be identical or different and each is hydrogen, an alkyl radical of 1–4 carbon atoms or the said alkyl bearing as substituents alkyl groups or alkoxy groups in each case of 1–3 carbon atoms, or nitro groups wherein 2,6-ditert.-butylphenol is reacted with a 4-hydroxybutanone-(2) of the formula (II):



(II)

in which R has the meanings given above, in the presence of acid having an acid exponent (pKs) of from −7 to +2.16 at an elevated temperature of from 30° to 160° C.

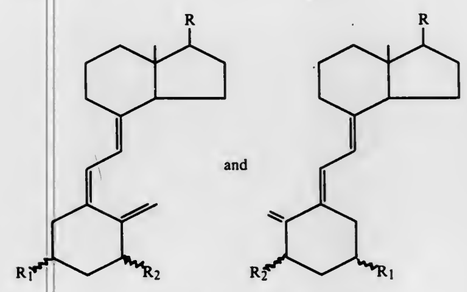
4,188,345

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

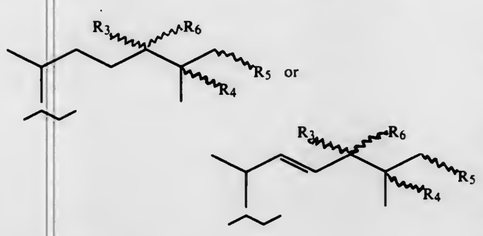
Filed Jul. 26, 1978, Ser. No. 928,279
Int. Cl.[2] C07C *41/00*
U.S. Cl. 568—665 **5 Claims**

1. A method for the preparation of fluorovitamin D compounds and fluoro-5,6-trans-vitamin D compounds of the formulae



and

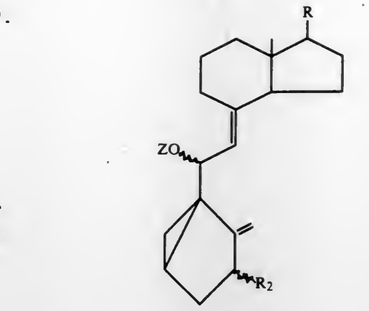
where R is a steroid side chain of the configuration



R_1 is O-acyl or hydroxy,

R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-lower O-acyl alkyl, and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be fluoro, and

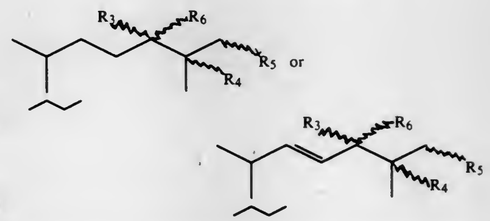
R_6 is hydrogen or lower alkyl, which comprises treating 3,5-cyclovitamin D compounds of the formula



where

Z is lower alkyl, and

R is a steroid side chain of the configuration



R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-acyl, O-lower alkyl and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be hydroxy, and

R_6 is hydrogen or lower alkyl, with a dialkylaminosulfur trifluoride, recovering the fluorinated product, subjecting the recovered product to acid catalyzed solvolysis whereby a product containing in admixture fluorovitamin D and fluoro-5,6-trans-vitamin D products is obtained, chromatographically separating said products and recovering each of them.

4,188,346

DEHYDROHALOGENATION OF (POLYHALOALKYL)BENZENES

Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1978, Ser. No. 906,894
Int. Cl.[2] C07C *25/00*
U.S. Cl. 260—651 F **6 Claims**

1. A process for the dehydrohalogenation of a (polyhaloalkyl)arene wherein in the polyhaloalkyl one halogen is a benzylic chlorine or benzylic bromine and at least one halogen is a non-benzylic halogen which process comprises contacting said (polyhaloalkyl)arene with a catalytic amount of a suitably active neat form of a Lewis acid selected from the group consisting of a halide of titanium treated with from about 0.1 to about 2 moles of water per mole of titanium halide and a halide of antimony under dehydrohalogenation conditions in the liquid phase at a temperature below 100° C. such that the benzylic halogen is selectively eliminated to form a (haloalkenyl)arene.

4,188,347

PROCESS FOR TREATING UNREACTED 1,2-DICHLOROETHANE FROM 1,2-DICHLOROETHANE CRACKING

Ludwig Schmidhammer, Haiming, and Hellmuth Frey, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,832

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754891

Int. Cl.² C07C *17/00*

U.S. Cl. 260—652 P **5 Claims**

1. A process for the removal of chloroprene from a stream comprising 1,2-dichloroethane recovered unconverted from the products of a 1,2-dichloroethane pyrolysis comprising:

(a) contacting the stream at a temperature of from about 0° C. to about 80° C. with chlorine in the presence of from about 0.0001 to about 0.01 weight percent relative to the unconverted 1,2-dichloroethane of a substance selected from the group consisting of ortho-cresol, meta-cresol, chlorinated derivatives of ortho- and meta-cresols, and mixtures thereof, the amount of chlorine utilized being such as to produce a maximum chlorine content in the stream, after contact, of 800 ppm by weight; and

(b) subjecting the chlorine-containing stream from step (a) to dechlorination by contact with an amount of ethylene equivalent to the chlorine content at a temperature of from about 0° C. to about 80° C.

4,188,348

HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE

Henry R. Menapace, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Flled Aug. 11, 1978, Ser. No. 932,874

Int. Cl.² C07C *5/06, 5/14, 5/16*

U.S. Cl. 585—274 **3 Claims**

1. In the process for selectively hydrogenating cyclopentadiene to form cyclopentene in the presence of a catalyst comprising (A) a hydrocarbon-soluble nickel compound selected from nickel salts of carboxylic acids and organo nickel compounds, (B) organo reducing agent corresponding to the formulae:



wherein R_1 is a monovalent hydrocarbon radical or hydrogen, and R_2 and R_3 are monovalent hydrocarbon radicals with 1 to 20 carbon atoms, and R-Li wherein R is a monovalent hydrocarbon radical with 1 to 20 carbon atoms and (C) pyridine, the improvement comprising employing the reducing agent, the soluble nickel compound and the pyridine in amounts wherein the mole ratio of aluminum or lithium to nickel ranges from 7/1 to 11/1, and the mole ratio of the pyridine to the nickel compound ranges from 1/1 to 2.5/1.

4,188,349

PROCESS FOR CURING UNSATURATED POLYESTERS UTILIZING NOVEL INITIATORS

Kenneth H. Markiewitz, and Alfred J. Restaino, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 673,539, Apr. 5, 1976. This application Jun. 21, 1977, Ser. No. 808,778

Int. Cl.² C08G *59/02, 59/13;* C08F *4/00;* C08G *18/04*

U.S. Cl. 525—366 **32 Claims**

1. A method of curing or crosslinking an ethylenically unsaturated ester resin susceptible to free radical polymerization which comprises initiating the curing or crosslinking by contacting the resin with an effective amount of dissolved initiating compound of the formula $R_1—N—(CH_2COOH)_2$ where R_1 is substituted or unsubstituted aryl radical, provided that the ethylenically unsaturated ester resin does not contain any group with which the acid group of the initiator will preferentially react chemically.

4,188,350

OLEFIN POLYMER BLENDS AND FILMS THEREFROM

Stephen J. Vicik, Darien; William J. Kohler, Westmont, both of Ill., and James O. Funderburk, Jr., Brookfield Center, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 17, 1978, Ser. No. 870,137

Int. Cl.² C08L *23/16*

U.S. Cl. 525—232 **26 Claims**

1. A polymer resin mixture comprising:

a propylene-ethylene copolymer having a high isotactic molecular structure, containing up to about 6% by weight ethylene, and having a melt flow of from about 1.5 to about 18 decigrams per minute;

a (butene-1)-ethylene copolymer having a high isotactic molecular structure, containing from about 1% to about 10% by weight ethylene, and having a melt flow of from about 0.1 to about 5.0 decigrams per minute; and

a thermoplastic elastomer selected from the group consisting of ethylene-propylene copolymers and ethylene propylene diene terpolymers, the ratio by weight of said propylene-ethylene copolymer to said (butene-1)-ethylene copolymer being from about 2:1 to about 1:2 and said thermoplastic elastomer being present from about 10% by weight to about 50% by weight.

4,188,351

ELASTOMER BLEND COMPOSITION OF A SULFONATED EPDM TERPOLYMER AND A POLYSTYRENE RESIN

Chan I. Chung, Schenectady, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 791,162, Apr. 26, 1977. This application Oct. 11, 1978, Ser. No. 950,419

Int. Cl.² C08L *23/16*

U.S. Cl. 260—33.6 AQ **16 Claims**

1. A process for forming a heterogeneous elastomeric blend composition, which comprises the following steps:

(a) dissolving a thermoplastic resin selected from the group consisting of polystyrene, poly alpha methylstyrene, poly t-butylstyrene or polyhalo-styrene in a non-reactive solvent to form a first solution;

(b) dissolving an EPDM terpolymer in said non-reactive solvent to form a second solution;

(c) sulfonating said EPDM terpolymer in said second solution with a suitable sulfonating agent to form an acid form of a sulfonated EPDM terpolymer, said acid form having about 0.2 to about 10.0 mole percent of sulfonate groups;

(d) quenching said second solution;

(e) blending said first solution into said second quenched solution to form a mixture of said thermoplastic resin and said acid form of said sulfonated elastomeric polymer in said blended solutions;

(f) neutralizing with a basic material said acid form of said sulfonated EPDM terpolymer in said blended solutions; and

(g) steam stripping said blended solutions to remove the elastomeric blend composition, said blend composition comprising said neutralized sulfonated EPDM terpolymer and about 1 to about 20 parts per hundred by weight of said thermoplastic resin based on 100 parts by weight of neutralized sulfonated EPDM terpolymer.

4,188,352

ELASTOMERIC COMPOSITION COMPRISING FLUOROELASTOMER AND EPICHOLOROHYDRIN ELASTOMER

Takeshi Suzuki, Nagaokakyo; Yasuyoshi Furukawa, Ikedaminamimachi; Masayasu Tomoda, Ootsu, and Yutaka Ueta, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 29, 1978, Ser. No. 974,239

Claims priority, application Japan, Dec. 30, 1977, 52/160343

Int. Cl.² C08L *27/14, 27/16, 27/20*

U.S. Cl. 525—187 **13 Claims**

1. An elastomeric composition which comprises a fluoroelastomer, an epichlorohydrin elastomer, an acid-acceptor, a curing accelerator and a fluorine-containing polyhydroxy compound wherein the proportion of the fluoroelastomer and the epichlorohydrin elastomer is from 95:5 to 5:95 by weight.

4,188,353

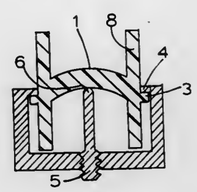
METHOD OF MAKING ASPHERIC LENSES

Charles W. Neefe, Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,598

Int. Cl.² B29D *11/00*

U.S. Cl. 264—1 **1 Claim**



1. A method of casting and removing from a resinous lens mold an aspheric optical lens of polymeric material, said mold of resinous material having at one end a cup-like molding cavity with a spherical optical surface and at the other end an opening, heating the resinous mold to a working temperature below the glass transition temperature of the resinous mold material, applying sufficient external pressure against the bottom non-optical surface of the cup-like molding cavity to change the spherical optical surface to an aspheric surface, allowing the resinous mold to cool before removing the external applied pressure, casting a liquid monomer in the molding cavity, polymerizing the monomer to form a rigid solid, having a first aspheric optical surface adhering to the optical surface of the mold with sufficient adhesive strength to allow cutting and polishing of a second optical surface, cutting and polishing the surface of the said rigid solid on the side opposite the first aspheric optical surface to form a second optical surface while the rigid solid is held by the mold, and then removing the thus formed aspheric lens by applying pressure against the sides of the mold to distort the shape of the optical surface of the mold to thereby release the aspheric lens from the mold.

4,188,354

METHOD FOR THE PREPARATION OF ASYMMETRICAL MEMBRANES

Stelio Munari; Fernando Vigo; Gustavo Capannelli; Claudio Uliana, and Aldo Bottino, all of Genoa, Italy, assignors to Tecneco S.p.A., Fano, Italy

Filed Jul. 29, 1977, Ser. No. 820,322

Claims priority, application Italy, Aug. 5, 1976, 12746 A/76; Oct. 27, 1976, 12862 A/76

Int. Cl.² B29D *27/04*

U.S. Cl. 264—22 **2 Claims**

1. A method for the preparation of asymmetric membranes, said method comprising the steps of:

(a) reacting polyvinylidene fluoride or polyvinyl fluoride with 20%—SO_3 oleum for a time period sufficient to sulphonate the polymer, said reaction being carried out at about 70° C. for a time period of about 30 minutes;

(b) dissolving the polymer in dimethylformamide in proportions which vary between about 4% and about 80% by weight per volume of solvent, said dissolution being carried out at about 90° C. and said proportion is between about 8% and about 20% by weight per volume of solvent;

(c) spreading the thus obtained solution to a thickness of about 10 microns to about 1,000 microns on a plate, said thickness being about 200 microns;

(d) evaporating the solvent from the solution on the plate for up to about 60 minutes at a temperature in the range of from about −20° C. to about +100° C., said evaporation being carried out for about 1 to about 8 minutes at a temperature of about 25° C.;

(e) precipitating the asymmetric membrane on the plate with a non-solvent, said asymmetric membrane having a separating power of about 10% towards sodium chloride, up to about 99% towards mineral oil and up to about 98% towards acrylonitrile-butadiene-styrene detergents, with a permeability of between about 7,000 and about 30,000 liters per square meter at a temperature of 45° C., under a pressure of 1 kilgram and with an oil concentration of 7%, said precipitation being carried out by immersing the plate in water and ice at about 0° C. for about 1 hour and then in running water for between about ½ and about 8 days.

4,188,355

MANUFACTURE OF FIBROUS WEBS

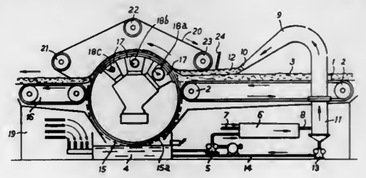
Robert Graham, Chester-le-Street, and Philip S. Hall, Langley Park, both of England, assignors to Newalls Insulation Company Limited, Manchester, England

Filed Oct. 7, 1977, Ser. No. 840,238

Claims priority, application United Kingdom, Oct. 9, 1976, 42064/76; Jun. 14, 1977, 24835/77

Int. Cl.² B29D *27/04;* D04H *1/68;* H05B *9/04*

U.S. Cl. 264—26 **10 Claims**



1. A process for the production of a bonded, foraminous non-woven mineral fiber mat, said process comprising the following steps, in combination:

forming a non-woven mineral fiber mat by a melt spinning process,

forming a binder foam from thermosettable binder composition in an aqueous medium,

applying a layer of said binder foam to one face of said mat,

forcing said layer into said mat, such that the binder foam is

caused to collapse so as to thoroughly impregnate the entire mat with said collapsed binder foam,

selectively removing by radio frequency heating a major portion of the aqueous medium from the impregnated mat, and thereafter

causing the binder to set in situ in the mat.

4,188,356

METHOD AND AN APPARATUS FOR THE PRODUCTION OF A FOAM-FORMING REACTION MIXTURE OR HOMOGENEOUS MATERIAL-FORMING REACTION MIXTURE AND FOR THE SUBSEQUENT INTRODUCTION THEREOF INTO A CAVITY

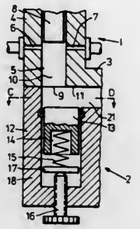
Gerd Weber, Leverkusen; Dieter Skoupi, Linde, and Hermann Schäfer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,252

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737616

Int. Cl.² B29D *27/00*

U.S. Cl. 264—40.1 **9 Claims**



1. In a method of producing a foam-forming or homogeneous material-forming reaction mixture from at least two liquid reactants and subsequently introducing it into a cavity, wherein the reactants are introduced into a mixing zone where they are mixed together, and wherein the mixture is subsequently fed through an outlet of regulated cross-section and charged into a cavity, the improvement wherein the outlet of the mixing zone is sealed before the reactants begin to be introduced into the mixing zone and is only opened at a predetermined pressure by the pressure building up therein as the reactants are introduced and wherein the outlet cross-section is automatically adjusted in response to said pressure buildup and remains adjustable throughout the delivery process.

3. An apparatus for mixing reacting materials, consisting of a mixing chamber arranged in a housing and having inlet openings for the reactants and an outlet opening for the reaction mixture to be introduced into a mold wherein an adjustable baffle plate is arranged opposite said outlet opening axially of the outlet opening, and further characterized in that the baffle plate is resiliently mounted, said outlet opening being sealed by said baffle plate and before the mixing process begins.

4,188,357

METHOD OF PREPARING HOLLOW ARTICLES FROM THERMOPLASTIC POLYESTERS

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 16, 1977, Ser. No. 861,141

Int. Cl.² B29C *5/06*

U.S. Cl. 264—540 **2 Claims**

1. In the method of forming hollow articles from a polyester made from terephtalic acid or its lower esters and one or more dioles by making a hollow preform and enclosing said preform in a softened temperature condition in a blow mold and thereafter blow molding said preform into conformance with said mold walls, the improvement comprising forming said hollow preform as a tubular shape by free extrusion of a thermoplastic copolyester consisting essentially of the polymeric reaction of

(A) reactant(s) selected from terephthalic acid and its C_1 to C_4 alkyl esters, and

(B) reactants, bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol, and

(C) reactant(s) selected from trimellitic acid, its anhydride, and its C_1 to C_4 alkyl esters, wherein the amount of said bis(4-beta-hydroxyethoxyphenyl) sulfone is 2–25 mol percent of the amount of A reactant(s), the combined amount of B reactants is about 110 to 300 mol percent of the amount of A reactant(s), and the amount of C reactant(s) is 0.1 to 0.7 mol percent of said A reactants,

said copolyester having oxygen (O_2) and CO_2 permeabilities in cc·mil/100 in.²·day·atm. of less than 9 and less than 62, respectively, a glass transition temperature, Tg, of at least 82° on an unoriented basis, said copolyester further having non-Newtonian flow properties.

4,188,358

METHOD OF MANUFACTURING A METALLIZED PLASTIC REFLECTOR

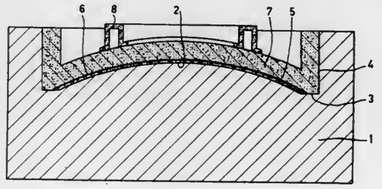
Wilhelmus H. C. Withoos; Gerhardus A. te Raa, and Johannes Sprengers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,036

Claims priority, application Netherlands, Mar. 29, 1979, 7603245

Int. Cl.² B22D *23/08*; B29C *24/00, 25/00*

U.S. Cl. 264—255 **6 Claims**



1. A method for fabricating an antenna reflector comprising the steps of coating a surface of a mold with a first layer of fibrous material, saturating said first layer with a thermo-hardening synthetic resin, partially hardening said resin and while said resin is still only partially hardened and has a slightly sticky surface, coating said sticky surface with a metal layer by flame spraying to form a reflector for electromagnetic radiation and applying a supporting layer onto said metal layer.

4,188,359

THIOETHER CONTAINING QUARTENARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES

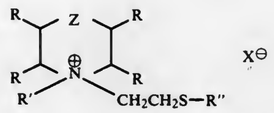
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 886,182, Mar. 13, 1978, Pat. No. 4,146,709. This application Dec. 4, 1978, Ser. No. 966,250

Int. Cl.² C23F *11/04*

U.S. Cl. 422—12 **5 Claims**

1. A process inhibiting corrosion which comprises treating a system with a composition characterized by the formula



where R is hydrogen, or a hydrocarbon group, R′ is a hydrocarbon group, R″ is a hydrocarbon group, Z is S, SO, or SO_2 and X is an anion.

4,188,360

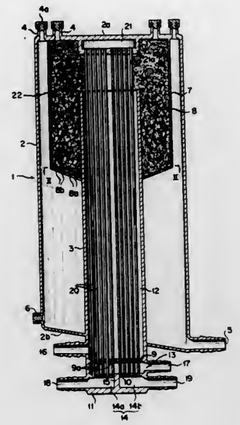
ARTIFICIAL LUNG WITH A BUILT-IN HEAT EXCHANGER

Motoji Kurata, Hiroshima, Japan, assignor to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Sep. 8, 1978, Ser. No. 940,737

Int. Cl.² A61M *1/03*

U.S. Cl. 422—46 **4 Claims**



1. An artificial lung provided with a built-in heat exchanger comprising an outer cylindrical member having top and bottom walls and an outlet for blood formed in a lower portion thereof;

an inner cylindrical member disposed within said outer cylindrical member with a lower portion thereof extending through the bottom wall of said outer cylindrical member, the lower portion of said cylindrical member having an oxygen dispenser plate, an intermediate plate and a bottom plate formed therein defining an oxygen inlet chamber and a heat-exchange medium chamber therebetween, respectively, the heat-exchange medium chamber having a partition wall formed therein to divide the same into a heat exchange medium inlet chamber and a heat exchange medium outlet chamber, the lower portion of said inner cylindrical member also having an inlet for blood formed therein, an inlet for oxygen connected to said oxygen inlet chamber, and an inlet and outlet for heat exchange medium connected to said heat exchange medium inlet chamber and said heat exchange medium outlet chamber, resectively, an intermediate cylindrical member disposed between said outer and inner cylindrical members, said intermediate cylindrical member including a bottom wall having spacings formed therein defining a defoaming chamber between said inner and intermediate cylindrical members; and

a plurality of tubes disposed within said inner cylindrical member through which heat exchange medium is passed, said plurality of tubes passing through said oxygen inlet chamber and said heat exchange medium chamber, wherein oxygen supplied to said inlet chamber through said oxygen inlet and blood supplied to said inner chamber through said blood inlet are in contact with said heat exchange medium carrying tubes prior to being brought into contact with one another.

4,188,361

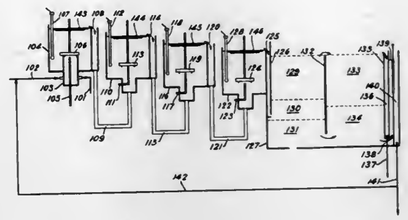
RECOVERY OF URANIUM VALUES

George A. Rowden, Stockton-on-Tees, England, assignor to Davy International (Oil and Chemicals) Limited, England

Filed Apr. 12, 1978, Ser. No. 895,721

Int. Cl.² B01D *11/04*

U.S. Cl. 423—9 **10 Claims**



1. A process for the recovery of uranium values from a uranium-loaded organic extractant phase containing an amine capable of forming a uranium-containing complex soluble in the organic extractant phase, which process comprises contacting the extractant phase in a plurality of mixing stages with an acidic aqueous stripping phase containing sulphate ions dissolved therein, the plurality of mixing stages including a first mixing stage and a final mixing stage, passing the phases in co-current through the mixing stages in turn from one mixing stage to the next, agitating the phases in each mixing stage so as to maintain therein a dispersion of droplets of one phase dispersed in the other, the droplets being of a size such that upon standing the dispersion disengages substantially completely under gravity into two separate layers, passing dispersion from the final mixing stage to a final settling stage to permit disengagement of the phases, maintaining the pH in the first mixing stage at a first predetermined value permitting stripping of uranium values from the extractant phase, maintaining the pH in the, or in at least one, subsequent mixing stage at a value greater than the first predetermined value but less than that at which precipitation of uranium values occurs, and recovering disengaged phases from the final settling stage.

8. Apparatus for effecting recovery of uranium values from a uranium-loaded organic extractant phase containing an amine capable of forming a uranium-containing complex soluble in the organic extractant phase, which apparatus comprises a first mixing chamber, a final mixing chamber, a final settling chamber for receipt of dispersion from the final mixing chamber, means for feeding to the first mixing chamber the extractant phase and an acidic aqueous stripping phase containing sulphate ions dissolved therein, means connecting the mixing chambers in series whereby the phases may flow in co-current through the mixing chambers in turn, mixing means in each mixing chamber for agitating the phases so as to maintain therein a dispersion of droplets of one phase dispersed in the other, the droplets being of a size such that the dispersion settles upon standing under gravity substantially completely into two separate layers, means for controlling the pH in the mixing chambers so as to permit maintenance in the first mixing chamber of a pH having a first predetermined value permitting recovery of uranium values from the organic extractant phase by the aqueous stripping phase and in the, or in at least one, subsequent mixing chamber of a pH greater than the first predetermined value but less than that at which precipitation of uranium values occurs, and means for recovering disengaged phases from the final settling chamber.

4,188,362

PROCESS FOR THE TREATMENT OF PLATINUM GROUP METALS AND GOLD

Roderick I. Edwards, Honeydew; Joe P. Loo, Sandton, and David I. Ossin, Johannesburg, all of South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa

Continuation-in-part of Ser. No. 825,151, Aug. 16, 1977, abandoned, which is a continuation of Ser. No. 652,283, Jan. 26, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 919,837

Claims priority, application South Africa, Jan. 29, 1975, 75/0593

Int. Cl.[2] **C01G** *55/00*

U.S. Cl. 423—22 **14 Claims**

1. A process for obtaining, by the action of an acid and an oxidizing agent, a solution of precious metals present in a precious metal concentrate which contains iridium, ruthenium or both together with base metals, said process comprising the steps of:

(1) heating the precious metal concentrate together with aluminium at a temperature of at least about 1000° C., and for a length of time sufficient to form a precious metal-/aluminium alloy,

(2) leaching the alloy with acid under conditions other than strongly oxidizing conditions to dissolve the base metals yielding a residue containing the major portion of the precious metals therein,

(3) separating the residue from the leach liquor, and thereafter,

(4) leaching the residue under strong oxidizing conditions with acid and an oxidant to dissolve at least a major portion of the iridium and ruthenium together with any other precious metals present in said residue.

3. A process as claimed in claim **1** in which the leach for the removal of the majority of the base metals in step (2) is hydrochloric or sulphuric acid.

4. A process as claimed in claim **3** in which the acid is contained in a recycle stream together with small amounts of precious metals which are cemented out during the leaching procedure of step (2).

4,188,363

RECOVERY OF RHODIUM COMPLEX CATALYSTS HOMOGENEOUSLY DISSOLVED IN ORGANIC MEDIA

Bernard Fell, Aachen, and Wilfried Dolkemeyer, Bornheim Uedorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 823,231, Aug. 9, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,339

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637262

Int. Cl.[2] **C01G** *55/00*

U.S. Cl. 423—22 **9 Claims**

1. A process for the separation of rhodium catalysts, having as ligands on the central rhodium atom a phosphine or phosphite which contains aliphatic and/or aromatic hydrocarbon radicals, from high-boiling and tarry distillation residues obtained in the processing of reaction products from organic catalytic reactions utilizing dissolved homogenous rhodium complex catalysts, which consists of passing a stream of hydrogen or a hydrogen-containing gas through the residue at an elevated temperature of between 100°–660° C. to thereby selectively remove the organic constituents, leaving a heterogenous solid residue containing the rhodium, and thereafter dissolving the heterogenous residue in an inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid, nitric acid, sulphuric acid and oleum to thereby form a water-soluble rhodium compound suitable for the production of a complex rhodium catalyst.

4,188,364

TWO-STAGE CATALYSIS OF ENGINE EXHAUST

John R. Gladden, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 802,205, May 31, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,420

Int. Cl.[2] **B01D** *53/34*

U.S. Cl. 423—213.2 **3 Claims**

1. A method of removing nitric oxide from a hydrocarbon burning engine exhaust stream, the engine operating under varying load conditions from a high load to a low load wherein the exhaust stream temperature varies from a high of about 800° C. to a low of about 200° C., comprising:

contacting a combusted gas stream comprising nitric oxide and oxygen with ammonia, the contacting over a first catalyst bed having a catalyst comprising a zeolite which catalyzes a reductive reaction of ammonia with nitric oxide, the amount of ammonia from about 0.5 to about 2 times the stoichiometric amount for the reductive reaction of ammonia with nitric oxide, the contacting at a temperature between about 200° C. to about 800° C., the first catalyst bed retaining ammonia when the temperature is above about 315° C. and desorbing a portion of the ammonia at a temperature from about 200° C. to about 315° C., to form an effluent gas stream having oxygen, a reduced amount of nitric oxide content, and having the desorbed portion of ammonia when said contacting is at a temperature from about 200° C. to about 315° C.; and

contacting said effluent gas stream with a second catalyst bed comprising a porous solid carrier having a catalytically active oxidation catalyst metal disposed thereon which is sufficiently active to catalyze the oxidation of the desorbed portion of ammonia to form a substantially nitric oxide free and ammonia free exhaust stream.

4,188,365

PROCESS FOR CATALYTIC VAPOR PHASE REDUCTION OF NITROGEN OXIDES AND CATALYST COMPOSITION USED THEREFOR

Toshihiro Yoshioka; Shikiho Itaya, both of Ohtake; Yusaku Arima, Onga, and Hirokazu Tanaka, Kitakyushu, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan and Catalysts & Chemical Industries, Tokyo, Japan

Division of Ser. No. 786,825, Apr. 12, 1977, Pat. No. 4,140,654. This application Jan. 12, 1978, Ser. No. 868,929

Claims priority, application Japan, Apr. 16, 1976, 51-42576; Nov. 27, 1976, 51-141777

Int. Cl.[2] **B01D** *53/34*

U.S. Cl. 423—239 A **9 Claims**

1. A process for the catalytic vapor phase reduction of nitrogen oxides in a waste gas, which comprises contacting the waste gas containing nitrogen oxides with a catalyst composition in the presence of ammonia gas at a temperature of 200° to 600° C., said catalyst composition consisting essentially of a non-noble transition metal compound supported on a shaped carrier comprising a titanium oxide and a clay mineral having an average particle size of 0.1 to 100 microns and an additional component which is an inorganic fibrous material or a mixture of the fibrous material and at least one member selected from the group consisting of silica hydrogel and silica sol, wherein the clay mineral is selected from the group consisting of montmorillonite clay minerals, kaolin clay minerals, silica halloysite clay minerals, pyrophyllite clay minerals and sericite clay minerals and the catalyst composition contains 0.1 to 20% by weight of the non-noble transition metal compound, 1 to 60% by weight of the clay mineral and 20 to 90% by weight of titanium oxide, all based on the weight of the catalyst composition, and 0.5 to 25% by weight of the additional component based on the total weight of the titanium oxide and clay mineral.

4,188,366

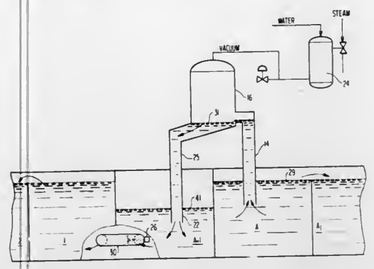
MANUFACTURE OF PHOSPHORIC ACID

Samuel V. Houghtaling, Lakeland, Fla., assignor to Société de Prayon, Foret-Trooz, Belgium

Filed Nov. 18, 1977, Ser. No. 852,613

Int. Cl.[2] **C01B** *25/22;* **C01F** *11/46*

U.S. Cl. 423—320 **15 Claims**



1. In a process for the manufacture of phosphoric acid from phosphate rock and sulfuric acid by the wet process in which there is an aqueous slurry reaction mixture containing phosphoric acid and undissolved calcium sulfate solids at substantially atmospheric pressure, and in which said reaction mixture is passed to a vacuum flash cooling zone for removing heat from the reaction system, the improvement comprising conducting said process with a level of liquid slurry in a first reaction zone of said reaction system, a level of liquid slurry in a second reaction zone of said reaction system which level is substantially below said liquid level in said first zone, a barometric column of liquid slurry extending from said first zone to said vacuum flash cooling zone which is substantially above said liquid level in said first zone, and a barometric column of liquid slurry between said vacuum flash cooling zone and said liquid slurry in said second zone, passing said reaction slurry without pumping from said first zone, through the vacuum flash cooling zone to said second zone at a rate of at least about 500% per hour of the total mixture in the reaction system to remove heat from said slurry, and maintaining said flow rate through said vacuum flash cooling zone and the level differential between said first and second zones of said reaction system at values at which the temperature differential of the reaction mixture passing into and out of said flash cooling zone is only up to about 6° F.

4,188,367

MANUFACTURE OF RED PHOSPHORUS

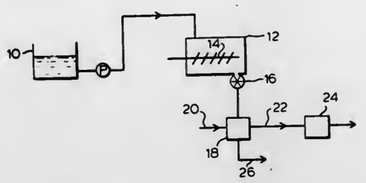
James D. McGilvery, Etobicoke, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Jan. 31, 1978, Ser. No. 873,870

Claims priority, application United Kingdom, Feb. 7, 1977, 4895/77

Int. Cl.[2] **C01B** *25/023*

U.S. Cl. 423—322 **4 Claims**



1. A continuous process for the production of red phosphorus, which comprises continuously injecting liquid white phosphorus onto a continuously agitated bed of red phosphorus particles located in a closed reaction vessel, continuously controlling the temperature of said particle bed within the range of about 300° to about 595° C. at least in part by controlling the rate of said continuous injection feed so that the concentration of white phosphorus in the bed is less than about 20% by weight, removing red phosphorus particles from said reaction vessel on an intermittent or continuous basis to control the quantity of phosphorus in said reaction vessel, and separating residual unreacted white phosphorus from said removed red phosphorus particles.

4,188,368

METHOD OF PRODUCING SILICON

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles B. Wolf, Irwin, and Thomas N. Meyer, Murrysville, both of Pa.

Filed Mar. 29, 1978, Ser. No. 891,373

Int. Cl.[2] **C01B** *33/02*

U.S. Cl. 423—350 **7 Claims**

1. A method of producing silicon comprising the steps of:

establishing an axially flowing stream of a heated carrier gas containing a dispersion of partially or completely vaporized reductant for $SiCl_4$ selected from sodium, magnesium or zinc upstream of the point of injection of $SiCl_4$, said carrier gas dispersion being at a temperature above the melting point of silicon;

injecting $SiCl_4$ as liquid spray transversely into the axially flowing dispersion stream from a plurality of radially directed nozzles, equally spaced around the periphery of the stream and each nozzle being sealingly mounted in a port in a wall portion surrounding said stream with the outlet tip of each nozzle being recessed at least 1 cm from the inner wall surface whereby said $SiCl_4$ liquid vaporizes within the stream;

reducing the vaporized $SiCl_4$ with the reductant within the axial stream to form liquid silicon;

depositing the liquid silicon downstream of the point of injection on a surface of a wall surrounding the axial stream and extending downstream of said point of injection;

flowing the liquid silicon down the surface of said wall; and collecting and recovering the liquid silicon.

4,188,369

METHOD OF MANUFACTURING VITREOUS CARBON

Jorma K. Rautavuori, Laulurastaantia 7, 36220 Suorama, and Pertti Törmälä, Viertolankatu 38,, 33750 Tampere, both of Finland

Filed Feb. 21, 1978, Ser. No. 879,701

Claims priority, application Finland, Feb. 21, 1977, 770554

Int. Cl.[2] **C01B** *31/02*

U.S. Cl. 423—449 **12 Claims**

1. A method of manufacturing a vitreous carbon body comprising the steps of

(a) providing a mixture of a thermosetting resin and an inert organic solvent;

(b) hardening the resin in the presence of the solvent while maintaining the temperature of the mixture below the boiling point of the solvent to produce a hardened resin body containing substantially all of said solvent dispersed therein;

(c) raising the temperature of the hardened resin body above the boiling point of the solvent to remove the solvent therefrom and to develop porosity in said hardened resin body; and

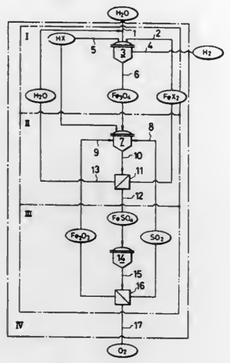
(d) carbonizing the porous hardened resin body in an inert atmosphere to form a vitreous carbon body.

4,188,370

THERMOCHEMICAL METHOD FOR PRODUCING HYDROGEN FROM WATER

Kinjiro Fujii, Komae; Wakichi Kondo, Isehara, and Toshiya Kumagai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,746
Claims priority, application Japan, Jun. 10, 1977, 52/68681
Int. Cl.[2] C01B *1/05, 13/02*
U.S. Cl. 423—579 14 Claims



1. A thermochemical method of producing hydrogen comprising:

(1) reacting ferrous halide and water to produce triiron tetraoxide, hydrogen halide and hydrogen;

(2) reacting the triiron tetraoxide produced in step (1) with ferric oxide, sulfur dioxide and hydrogen halide to produce ferrous halide, ferrous sulfate and water;

(3) thermally decomposing the ferrous sulfate produced in (2) to ferric oxide, sulfur dioxide and oxygen; and

(4)(a) recovering the hydrogen produced in said step (1),

(b) delivering the hydrogen halide produced in step (1) to step (2) and

(c) recycling the ferrous halide produced in step (2) to step (1), and ferric oxide and sulfur dioxide produced in step (3) to step (2).

4,188,371

IMMUNOLOGICAL DETECTION OF NEISSERIA BACTERIA VIA LABELLED ANTIBODIES

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,362
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 20 Claims

1. A method for detecting Neisseria bacteria in a sample via an immunoradiometric assay technique comprising the steps:

(a) preparing a lysate of the sample to be tested;

(b) bringing radiolabelled antiserum specific to 1,2-propanediol dehydrogenase into contact with the lysate obtained in step (a);

(c) incubating the mixture resulting from step (b);

(d) bringing a solid phase antigen or antigen immunoadsorbent into contact with the incubated mixture of step (c);

(e) incubating the mixture resulting from step (d); and

(f) monitoring the radioactivity of the supernatant.

4,188,372

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 754,651, Dec. 27, 1976, abandoned.
This application Aug. 31, 1978, Ser. No. 938,678
Int. Cl.[2] A61K *7/16, 7/18, 7/22, 7/24*
U.S. Cl. 424—54 16 Claims

1. An oral composition comprising an oral vehicle, at least one nitrogen-containing antibacterial antiplaque agent selected from the group consisting of cationic quaternary ammonium antibacterial antiplaque agent and long chain tertiary amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms, and mellitic acid or hexahydromellitic acid as an antistain additive.

4,188,373

CLEAR, WATER-MISCIBLE, LIQUID PHARMACEUTICAL VEHICLES AND COMPOSITIONS WHICH GEL AT BODY TEMPERATURE FOR DRUG DELIVERY TO MUCOUS MEMBRANES

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Cooper Laboratories, Inc., Palo Alto, Calif.

Continuation of Ser. No. 661,612, Feb. 26, 1976, Pat. No. 4,100,271. This application Nov. 18, 1977, Ser. No. 852,745
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.[2] A61K *31/74*
U.S. Cl. 424—78 4 Claims

1. A pharmaceutical composition for medicinally treating a mucous membrane or eye condition requiring pharmacologic treatment, comprising:

(a) a pharmacologically effective amount of a chemical material which is pharmacologically active against said condition; said material being selected from the group consisting of dexamethasone, pilocarpine HCl, phenylephrine HCl, clofazimine, pimaricin, amphotericin, neomycin sulfate, chloramphenicol, bacitracin, sulfacetamide, gentamycin, and polymixin B sulfate;

(b) from about 10% to about 26% by weight of a polyoxyethylene-polyoxypropylene block copolymer in which the number of polyoxyethylene units is at least about 50% of the total number of monomeric units in the total molecule, the block copolymer having an average molecular weight of from about 7,500 to about 15,500, a room temperature solubility in water of greater than about 10 grams per 100 ml. of water, and a cloud point in 1% aqueous solution of at least about 100° C.;

(c) up to about 10% sodium chloride equivalent of at least one water-soluble compatible salt selected from the group consisting of sodium halide, sodium sulfate, sodium nitrate, sodium phosphate, potassium halide, potassium sulfate, potassium nitrate, potassium phosphate, and mixtures thereof;

(d) an effective amount of a preservative to afford protection to the composition against bacterial contamination selected from the group consisting of benzalkonium chloride, a sodium salt of ethylenediaminetetraacetic acid, sorbic acid, and alkali metal salt of sorbic acid, boric acid, an alkali metal salt of boric acid, thimerosal sodium, phenylmercuric acetate, a methyl, ethyl or propyl ester of para-aminobenzoic acid, and mixtures thereof; and

(e) from about 74% to about 90% by weight water;

the composition having a pH of from about 6.0 to about 8.5 and a gel transition temperature in the range of from about 25° C. to about 40° C.

4,188,374

ATTRACTANT FOR THE POTATO MOTH AND THE PREPARATION OF THE FORMER

Simon Voerman, Wageningen; Cornelis J. Persoons, Delfgauw, and Fridolin J. Ritter, Waddinxveen, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer, The Hague, Netherlands

Filed Aug. 4, 1977, Ser. No. 821,954
Claims priority, application Netherlands, Aug. 6, 1976, 7608732
Int. Cl.[2] A01N *17/14*
U.S. Cl. 424—84 6 Claims

1. An attractant for the potato moth (*Phthorimaea operculella*), an active ingredient of which essentially consists of a mixture of trans-4, cis-7, cis-10-tridecatrienyl acetate and trans-4, cis-7-tridecadienyl acetate in a weight ratio of from about 1:10 to about 10:1.

4,188,375

PROCESS FOR THE PREPARATION OF VACCINES

Otto C. Straub, Tuebingen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 835,923
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643213
Int. Cl.[2] A61K *39/02, 39/12;* C25F *5/00*
U.S. Cl. 424—88 10 Claims

1. A process for the preparation of a vaccine which comprises subjecting, at a temperature of from 4° to 60° C. a suspension of the micro-organism to an alternating electrical current having a voltage of from 110 to 330 V and a strength of from 200 to 300 mA, and incorporating the resulting inactivated or attenuated micro-organism into a vaccine preparation.

4,188,376

STABLE LIQUID COMPOSITIONS CONTAINING SALTS OF 1,2-BENZISOTHIAZOLIN-3-ONE

David T. Payne, and Boris P. Brand, both of Manchester, England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Sep. 15, 1978, Ser. No. 942,811
Claims priority, application United Kingdom, Sep. 30, 1977, 40776/77
Int. Cl.[2] A61K *31/00;* A01N *9/12, 9/20*
U.S. Cl. 424—173 7 Claims

1. A biocidal composition for the protection of aqueous media against infection by microorganisms comprising a solution containing from 5% to 50% by weight of an alkali metal salt of 1,2-benzisothiazolin-3-one in a hydroxylic organic solvent selected from the group consisting of dipropylene glycol, tripropylene glycol, polyethylene glycol, of molecular weight 300, lower alkyl carbitols and mixtures of at least one of these solvents and a solvent selected from the group consisting of propylene glycol and water said solvent being present in an amount to prevent crystallization or solidification on prolonged exposure to temperatures as low as −10° C.

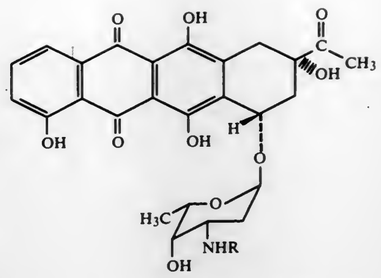
4,188,377

CARMINOMYCIN DERIVATIVES, THEIR PREPARATION AND USE

Antonino Suarato; Paolo Masi; Luigi Bernardi, and Federico Arcamone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jan. 26, 1978, Ser. No. 872,626
Claims priority, application United Kingdom, Feb. 1, 1977, 04104/77
Int. Cl.[2] A61K *31/70;* C07H *15/24*
U.S. Cl. 424—180 4 Claims

1. An N-acyl derivative of carminomycin having the formula:



wherein R is an acyl group selected from the group consisting of acetyl, mono, di and trichloroacetyl, trifluoroacetyl and benzoyl.

3. A method of treating a host afflicted with transplanted P_{388} lymphocytic leukemia which comprises intraperitoneally administering to a host afflicted with said tumor a therapeutically effective amount of an N-acyl derivative according to claim 1.

4,188,378

ANTICANCER AND ANTIVIRAL ACTIVITY OF 9-β-D-ARABINOFURANOSYL-2-FLUOROADENINE

John A. Montgomery, Birmingham, Ala., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 4, 1978, Ser. No. 866,907
Int. Cl.[2] A61K *31/70*
U.S. Cl. 424—180 6 Claims

1. A method of treating murine leukemias L1210 and P388 by medicating orally or intraperitoneally leukemic mice with 9-β-D-arabinofuranosyl-2-fluoroadenine, a metabolically stable drug, given over a treatment span of 1–10 days with dosage repeated 2–8 times per diem.

4,188,379

STEROLINS AND THEIR USE

Karl H. Pegel, Durban Natal, South Africa, assignor to Roecar Holdings (Netherlands Antilles) N.V., Curacao, Netherlands Antilles

Filed Oct. 19, 1977, Ser. No. 843,496
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659466
Int. Cl.[2] A61K *31/705;* C07J *17/00*
U.S. Cl. 424—182 54 Claims

1. A composition suitable for administration as an anti-inflammatory, gout-combatting or prostate hypertrophy combatting agent comprising a sterol glycoside or ester thereof together with a pharmaceutically acceptable carrier in dosage form, said dosage containing 0.1 to 0.75 mg of said sterol, said sterol being tall oil sterols glucosides, sitosterol glucoside, ergosterol glucoside, lanosterol glucoside, 24,25-dihydrolanosterol glucoside, stigmasterol glucoside, soya sterol glucosides, sitosterol-β-D-galactoside, sitosterol-β-D-maltoside, sitosterol-β-D-lactoside or sitosterol-β-D-cellobioside.

4,188,380

SURFACE ACTIVE QUATERNARY HIGHER DIALKYL PHOSPHONIUM SALT BIOCIDES AND INTERMEDIATES

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 493,253, Jul. 31, 1974, Pat. No. 3,998,754. This application Dec. 20, 1976, Ser. No. 752,627

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—198 **20 Claims**

1. A bactericidal and fungicidal composition comprising as an active ingredient a compound of the formula:

$$[(C_rH_{2r+1})_2P^+(C_sH_{2s+1})_2]X^-\bullet(HX)_x$$

wherein r is 8 to 30, s is 1 to 4 and X is an anion selected from the group consisting of halide, phosphate, sulfate, sulfonate, tetrafluoroborate, nitrate and nitrite; x is 0 or 1 except that if r is 12 to 14 and s is 1, X cannot be 0, in an amount sufficient to provide said bactericidal and fungicidal properties and an inert carrier therefor.

4,188,381

FUNGICIDES HYDRAZINIUM PHOSPHITES

Jacques Ducret, Lyons; Jean-Michel Gaulliard, Orlienas, and Jean Vial, Dardilly, all of France, assignors to Philagro, France

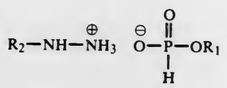
Filed Jan. 26, 1978, Ser. No. 872,435

Claims priority, application France, Feb. 14, 1977, 77 04981

Int. Cl.[2] A01N *9/36*

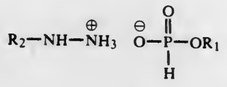
U.S. Cl. 424—199 **12 Claims**

1. A process for the treatment of crops against fungal diseases, which comprises applying to a crop a fungicidal composition containing as active material at least one compound of the formula



in which R_1 represents a hydrogen atom, or an alkyl radical containing from 1 to 4 carbon atoms, and R_2 represents a hydrogen atom, or a phenyl nucleus which is optionally substituted by one or more of the following atoms or radicals: halogen, alkyl radicals containing from 1 to 4 carbon atoms, and the nitro radical, provided that R_1 and R_2 do not simultaneously represent a hydrogen atom at a dose of between 10 g/hl and 300 g/hl.

4. A derivative of hydrazinium phosphite, of the formula:



in which R_1 represents a hydrogen atom, or an alkyl radical containing from 1 to 4 carbon atoms, and R_2 represents a hydrogen atom, or a phenyl nucleus which is optionally substituted by one or more of the following atoms or radicals: halogen, alkyl radicals containing from 1 to 4 carbon atoms, and the nitro radical, provided that R_1 and R_2 do not simultaneously represent a hydrogen atom.

4,188,382

THIAZOLINYL (THIAZOLYL) PHOSPHONAMIDATES AND PHOSPHORAMIDATES PESTICIDAL AND HERBICIDAL COMPOSITIONS BASED THEREON

Nikolai N. Melnikov; Artur F. Grapov; Ljudmila V. Razvodovskaya; Petr V. Popov; Aelita S. Sedykh; Galina K. Shapovalova; Galina M. Abelentseva; Tamara A. Siforova; Tatyana A. Nikolaeva; Valentina V. Galitsina; Leonid D. Stonov, and Ljudmila A. Bakumenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno, et al., Moscow, U.S.S.R.

Filed Feb. 25, 1977, Ser. No. 772,276

Int. Cl.[2] C07F *9/65;* **A01N** *9/36*

U.S. Cl. 424—200 **5 Claims**

1. O-phenyl-N-thiazolinyl-2-methylphosphonamidate.

2. O-phenyl-N-thiazolinyl-2-methylphosphonamidothioate.

3. A composition according to claim 1, containing as an active principle O-phenyl-N-thiazolinyl-2-methylphosphonamidate.

4,188,383

COMBATING ARTHROPODS WITH O-ALKYL-O-(6-DIALKYL-CARBAMOYLOXY-PYRIMIDIN-4-YL)-(THIONO)(THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Fritz Maurer, Wuppertal, and Ingeborg Hammann, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

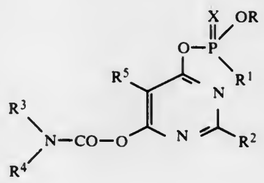
Filed Feb. 21, 1978, Ser. No. 879,423

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709908

Int. Cl.[2] A01N *9/36;* **C07F** *9/65*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-O-(6-dialkylcarbamoyloxy-pyrimidin-4-yl)-(thiono)(thiol)-phosphoric(phosphonic) acid ester or esteramide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R^1 is alkyl or alkoxy with 1 to 5 carbon atoms, alkylthio or alkylamino with 1 to 6 carbon atoms, or phenyl,

R^2 is hydrogen, alkyl or alkoxy with 1 to 6 carbon atoms, alkylthio or alkylamino with 1 to 5 carbon atoms, or phenyl,

R^3 and R^4 each independently is alkyl with 1 to 4 carbon atoms,

R^5 is hydrogen, methyl or halogen, and

X is oxygen or sulphur.

9. A method of combating arthropods, which comprises applying to the arthropods or to a habitat thereof, an arthropodically effective amount of a compound according to claim 1.

4,188,384

NITROGEN-CONTAINING POLYSACCHARIDE FOR PROMOTING DRUG-SENSITIVITY OF BACTERIA RESISTANT TO ANTIBIOTICS

Chikao Yoshikumi, Kunitachi; Yoshio Omura, Tanashi, and Tetsuya Hotta, Hoya, all of Japan, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 13, 1978, Ser. No. 896,209

Claims priority, application Japan, Apr. 13, 1977, 52-41513

Int. Cl.[2] A61K *31/70, 31/71*

U.S. Cl. 424—180 **3 Claims**

1. A method for treating a bacterial infection induced by an antibiotic resistant strain of bacteria, said process comprising administering to a host in need of such treatment an effective amount of an antibiotic in combination with a nitrogen-containing polysaccharide obtainable by extracting mycelia of basidiomycetes belonging to the genus Coriolus of Polyporaceae with an aqueous solvent, said polysaccharide having a molecular weight of from 5,000 to 300,000 as determined by ultracentrifugation, containing 42.0 to 46.0% carbon, 5.3 to 7.0% hydrogen and 0.5 and 8.0% nitrogen, having a specific rotatory power of 0° to +50.0°, having good solubility in water but being insoluble in acetone, pyridine, chloroform and hexane, showing characteristic absorption at 840 cm^{-1} and 890 cm^{-1} in the infrared spectrum and having a ratio of saccharide portion to protein portion of from 62/38 to 97/3 as indicated by nuclear magnetic resonance spectroscopy, said antibiotic being capable of combatting said antibiotic resistant strain when administered with said nitrogen-containing polysaccharide.

4,188,385

THIOETIANIC ACID DERIVATIVES

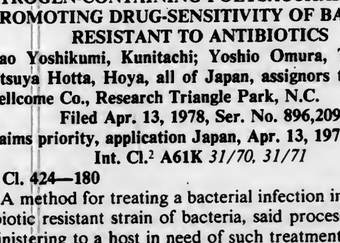
John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,388

Int. Cl.[2] A61K *31/58;* **C07J** *71/00*

U.S. Cl. 424—241 **41 Claims**

1. A compound chosen from those represented by the formula



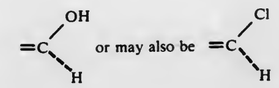
(I)

wherein

X^1 is hydrogen, fluoro or chloro;

X^2 is hydrogen, fluoro, chloro or bromo;

X^3 is =C=O or



when X^2 is chloro;

R' is alkyl of 1 through 6 carbon atoms or is phenyl or benzyl optionally substituted with one substituent on the phenyl ring chosen from the group consisting of alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms and halo;

R^1 is hydrogen or alkanoyl of 2 through 6 carbon atom when R^2 is hydrogen, alpha-methyl or beta-methyl;

OR^1 and R^2 together are 16 alpha, 17 alpha-isopropylidenedioxy; and there is a double or a single bond between C-1 and C-2.

22. An anti-inflammatory pharmaceutical composition which comprises a suitable pharmaceutical excipient in combination with the compound of claim 1 in an amount sufficient to effect an anti-inflammatory response when administered to a mammal having need thereof.

4,188,386

COMPOSITIONS CONTAINING THIOCYANIC ACID AND HEXAMETHYLENE-TETRAMINE, PRODUCTION PROCESS AND ADMINISTRATION THEREOF AS BACTERICIDE AND MYCOCIDE

Robert Engl, Wasserburg, and Hans Richter, Reitmehring, both of Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG, Reitmehring, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,262

Int. Cl.[2] A61K *31/53*

U.S. Cl. 424—249 **15 Claims**

1. A dry stable bactericidal and mycocidal composition comprised of (1) the unisolated reaction product of hexamethylenetetramine with an alkali or alkaline earth metal thiocyanate in the aqueous phase in the presence of acid and (2) a physiologically harmless carrier substance substantially inert towards the reaction compounds and the products thereof; wherein said composition is prepared by a process comprising:

(a) reacting hexamethylenetetramine with an alkali or alkaline earth metal thiocyanate in the aqueous phase in the presence of acid;

(b) combining the aqueous solution product obtained in said reaction, without isolation of reaction product, with a physiologically harmless carrier substance substantially inert towards the reaction compounds and the products thereof; and

(c) drying said combined carrier and aqueous solution at a temperature which does not exceed the boiling point of water in said solution;

whereby said composition possesses superior storage stability relative to compositions comprised solely of hexamethylenetetramine thiocyanate.

4,188,387

AMINO-ARYL 1,24-TRIAZINES USEFUL IN THE TREATMENT OF DIVERSE PAIN

Guy Pitet, Toulouse; Henri Cousse, Castres; Gilbert Mouzin, Castres, and Antoine Stenger, Castres, all of France, assignors to Pierre Fabre S.A., France

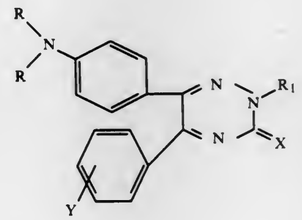
Filed Mar. 9, 1978, Ser. No. 884,732

Claims priority, application France, Mar. 9, 1977, 77 07245; Feb. 17, 1978, 78 04822

Int. Cl.[2] C07D *253/06, 413/10;* **A61K** *31/53*

U.S. Cl. 424—249 **24 Claims**

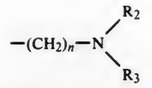
1. A chemical compound selected from the group having the formula:



in which:

R is a lower alkyl

R_1 is lower alkyl, allyl, aminoalkyl of the type



in which n=2 to 4 and R_2R_3 represent lower alkyl and may also form a heterocycle with the nitrogen atom, in which the carbon chain may be uninterrupted or interrupted by a single oxygen atom so as to form a morpholine radical with the oxygen in the 4 position thereof

Y is hydrogen, halogen, lower alkyl, or



wherein R is lower alkyl,

X=an oxygen or sulfur atom and salts thereof with therapeutically acceptable organic or inorganic acids.

10. A compound of claim **1** which is 2-methyl 3-thione 5,6-di(para-dimethylaminophenyl) as triazine.

4,188,388

PHENOXY PYRIDAZINONES AND ANOREXIGENIC USE THEREOF

Germaine Thuillier, born Nachmias, Paris, and Sylviane S. J. Mignonac, born Mondon, Chilly-Mazarin, both of France, assignors to Albert Rolland S.A., Paris, France

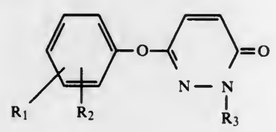
Filed Apr. 21, 1978, Ser. No. 898,988

Claims priority, application France, Apr. 28, 1977, 77 12888

Int. Cl.[2] **A61K** *31/50;* **C07D** *237/16*

U.S. Cl. 424—250 **18 Claims**

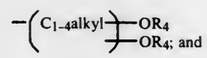
1. A compound of the formula



wherein

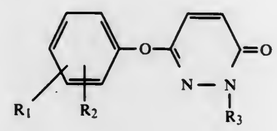
each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy and trifluoromethyl;

R_3 is $-(C_{1-4}$ alkyl$)-OR_4$ or



R_4 is hydrogen, benzoyl, (C_{1-4} alkyl)-benzoyl, halobenzoyl or (C_{1-4} alkoxy)-benzoyl.

10. A pharmaceutical composition suitable for treating an overweight patient which comprises an amount effective for providing an anorexigenic effect to said patient of a compound of the formula



wherein

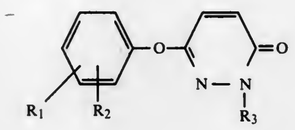
each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy and trifluoromethyl;

R_3 is $-(C_{1-4}$ alkyl$)-OR_4$ or

R_4 is hydrogen, benzoyl, (C_{1-4} alkyl)-benzoyl, halobenzoyl or (C_{1-4} alkoxy)-benzoyl;

and a pharmaceutically acceptable carrier for said compound.

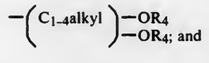
18. A pharmaceutical composition suitable for treating a patient requiring a psychoanaleptic effect which comprises an amount effective for providing said psychoanaleptic effect to said patient of a compound of the formula:



wherein

each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3}alkyl, C_{1-3}alkoxy and trifluoromethyl;

R_3 is $-(C_{1-4}$alkyl$)-OR_4$ or



R_4 is hydrogen, benzoyl, (C_{1-4}alkyl)-benzoyl, halobenzoyl or (C_{1-4}alkoxy)-benzoyl;

and a pharmaceutically acceptable carrier for said compound.

4,188,389

1,2,3,4-TETRAHYDROPYRROLO(1,2-A)PYRAZINES

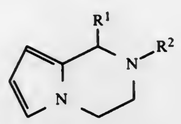
Ivo L. Jirkovsky, Montreal, Canada, assignor to Ayerst McKenna & Harrison, Inc., Montreal, Canada

Filed Nov. 3, 1978, Ser. No. 957,602

Int. Cl.[2] **A61K** *31/495;* **C07D** *487/04*

U.S. Cl. 424—250 **12 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl, cyclo(lower)alkyl, phenyl or phenyl mono-, di- or trisubstituted with lower alkyl or lower alkoxy and R^2 is hydrogen, lower alkyl, cyclo(lower)alkyl, 2-(indole-3-yl)ethyl or phenyl(lower) alkylene or a therapeutically acceptable acid addition salt thereof.

11. A method of treating depression in a mammal, which comprises administering to said mammal an effective antidepressant amount of a compound of claim **1**.

4,188,390

ANTIHYPERTENSIVE 4-AMINO-2-[4-(1,4-BENZODIOXAN-2-CARBONYL) PIPERAZIN-1-YL OR HOMOPIPERAZIN-1-YL]QUINAZOLINES

Simon F. Campbell, Deal, England, assignor to Pfizer Inc., New York, N.Y.

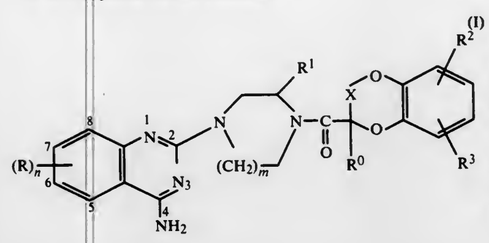
Filed Oct. 18, 1978, Ser. No. 952,317

Claims priority, application United Kingdom, Nov. 5, 1977, 46128/77; Denmark, Sep. 27, 1978, 4286/78

Int. Cl.[2] **A61K** *31/505;* **C07D** *405/14*

U.S. Cl. 424—251 **6 Claims**

1. A compound of the formula



(I)

wherein

$(R)_n$ is selected from the group consisting of 6,7-di(lower alkoxy) or 6,7,8-tri(lower alkoxy);

m is 1 or 2;

X is selected from the group consisting of $-CHR^1-$ or $-CH_2CH_2-$;

each of R^1 and R^0 is selected from the group consisting of hydrogen or lower alkyl;

and R^2 and R^3, which may the same or different, are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkanoyl, lower alkoxycarbonyl or a group of the formula $-CONR^4R^5$ or $-SO_2NR^4R^5$ wherein R^4 and R^5, which may the same or different, are selected from the group consisting of hydrogen or lower alkyl; and the pharmaceutically acceptable acid addition salts thereof.

6. A pharmaceutical composition comprising a cardiovascular regulating amount of a compound according to claim **1** or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable diluent or carrier.

4,188,391

4-[4-(SUBSTITUTED)PIPERIDINO]QUINAZOLINE CARDIAC STIMULANTS

Simon F. Campbell, Deal; John C. Danilewicz, Ash, Nr. Canterbury; Allan L. Ham, Broadstairs, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

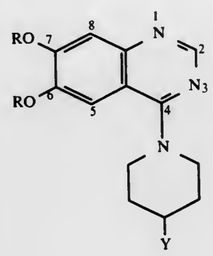
Filed Oct. 26, 1978, Ser. No. 954,931

Claims priority, application United Kingdom, Nov. 3, 1977, 45669/77

Int. Cl.[2] **A61K** *31/505;* **C07D** *401/04*

U.S. Cl. 424—251 **13 Claims**

1. A compound of the formula:



(I)

wherein R is a lower alkyl group; and

Y represents a group of the formula:

$-(CHR^1)_m-Z$

wherein R^1 is selected from the group consisting of hydrogen and lower alkyl; m is 1 or 2, with the proviso that when m is 2, each R^1 may be the same or different; and Z is selected from the group consisting of

$-OCONR^4R^5$;

$-N(R^2)COR^3$;

$-N(R^2)SO_2R^3$; and

$-N(R^2)CONR^4R^5$;

wherein R^2 is selected from the group consisting of hydrogen and lower alkyl; R^3 is selected from the group consisting of alkyl, benzyl and phenyl; and R^4 and R^5 are each independently selected from the group consisting of hydrogen and a group as defined for R^3 above; and the pharmaceutically acceptable acid addition salts thereof.

13. A pharmaceutical composition comprising a cardiac stimulating amount of a compound according to claim **1**, or a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutically acceptable diluent or carrier.

4,188,392

ANTIMICROBIAL COMPOSITIONS

Charles D. Hufford, Oxford, Miss., assignor to The University of Mississippi, University, Miss.

Continuation-in-part of Ser. No. 596,282, Jul. 16, 1975, Pat. No. 4,093,717. This application Mar. 17, 1978, Ser. No. 887,932

The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.[2] **A61K** *31/47*

U.S. Cl. 424—258 **10 Claims**

1. An antimicrobial composition comprising a compound or mixture of compounds selected from the group consisting of liriodenine, liriodenine methiodide, dehydroglaucine, oxoglaucine methiodide and mixtures thereof in admixture with a non-toxic pharmaceutically acceptable or non-phytoxic agriculturally inert carrier in a therapeutically effective concentration.

4,188,393

TREATING SPASTIC CONDITIONS OR RELAXING MUSCLES

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

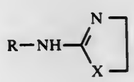
Continuation-in-part of Ser. No. 898,558, Apr. 21, 1978, Pat. No. 4,145,421. This application Dec. 18, 1978, Ser. No. 970,613

Claims priority, application United Kingdom, Apr. 22, 1977, 16914/77; Apr. 22, 1977, 16915/77

Int. Cl.[2] **A61K** *31/42, 31/47, 31/415*

U.S. Cl. 424—258 **7 Claims**

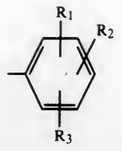
1. A method of treating spastic conditions in animals or relaxing muscles in animals which comprises administering a therapeutically effective amount of a compound of formula I,



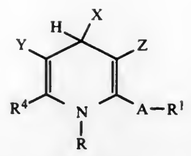
I

wherein either

(i) X is oxygen and R is a radical of formula II,



II

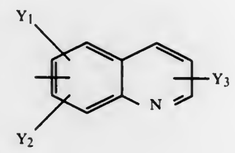


(I)

wherein each of R_1, R_2 and R_3, independently, is hydrogen, halogen, alkyl, alkoxy, nitro, cyano, hydroxy or alkylthio,

or (ii) X is imino and R is a radical of formula III,

III.



III

wherein

Y_1 and Y_2, independently, are hydrogen, halogen, alkyl, alkoxy, nitro, trifluoromethyl, cyano, hydroxy or alkylthio, and

Y_3 is hydrogen, alkyl or alkoxy,

in free base form or in pharmaceutically acceptable acid addition salt form thereof to an animal in need of such treatment.

4,188,394

OPHTHALMIC COMPOSITION AND METHOD OF USE

Kenneth E. Eakins, Sparkill, and Parimal Bhattacherjee, Nyack, both of N.Y., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 8, 1978, Ser. No. 903,586

Int. Cl.[2] A61K *31/475*

U.S. Cl. 424—262 **8 Claims**

1. A method for reducing intraocular pressure in humans and animals comprising topically administering to the eye of a human or animal having elevated intraocular pressure an effective, intraocular pressure reducing amount of vinblastine together with a suitable ophthalmic pharmaceutical carrier.

5. A method for treating glaucoma in humans comprising topically administering to the eye of a human having glaucoma an effective, intraocular pressure reducing amount of vinblastine together with a suitable ophthalmic carrier.

4,188,395

1,4-DIHYDROPYRIDINE DERIVATIVES SUBSTITUTED IN THE 2 POSITION, AND THEIR USE AS MEDICAMENTS

Friedrich Bossert, Wuppertal; Egbert Wehinger, Velbert; Horst Meyer, Wuppertal; Arend Heise, Wuppertal; Stanislav Kazda, Wuppertal; Kurt Stoepel, Wuppertal; Robertson Towart, Wuppertal; Wulf Vater, Leverkusen, and Klaus Schlossmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

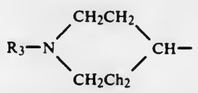
Filed Dec. 1, 1977, Ser. No. 856,559

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658183

Int. Cl.[2] C07D *213/55;* **A61K** *31/44*

U.S. Cl. 424—266 **13 Claims**

1. A 1,4-Dihydropyridine derivative of the formula (I)



or a pharmaceutically acceptable acid addition salt thereof, in which

R represents hydrogen, alkyl with 1 to 4 carbon atoms, or benzyl, A represents a straight-chain or branched alkylene radical with 1 to 6 carbon atoms,

R^1 represents a phthalimido radical, Y and Z individually represent the grouping $COOR^2$

wherein

R^2 represents alkyl, alkenyl, alkinyl, alkoxyalkyl, hydroxyalkyl, alkylmercaptoalkyl, aminoalkyl monoalkylaminoalkyl or dialkylaminoalkyl, the alkyl groups mentioned containing 1 to 6 carbon atoms and the alkenyl and alkinyl groups mentioned containing 2 to 4 carbon atoms, or represents phenyl or benzyl,

R^4 represents hydrogen, alkyl or alkoxyalkyl with 1 to 4 carbon atoms, or represents the radical $A—R^1$,

wherein

A and R^1 have the above-mentioned meaning, and X represents a phenyl radical which is optionally substituted by one or two identical or different substituents, selected from nitro, halogen, trifluoromethyl, cyano, phenyl, trifluoromethoxy, amino, alkylamino, alkyl, alkoxy or alkylmercapto with 1 or 2 carbon atoms in the alkyl radical in each case, or represents a naphthyl, pyridyl, thienyl, or benzyl radical which is unsubstituted or substituted by nitro or halogen.

4,188,396

NEW PHENYLAZACYCLOALKANES

Georges Haas, Binningen; Alberto Rossi, Oberwil; Pier G. Ferrini, Binningen, and Oswald Schier, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,644

Claims priority, application Switzerland, Jan. 17, 1977, 529/77

Int. Cl.[2] C07D *211/22;* **A61K** *31/445;* **C07D** *211/14*

U.S. Cl. 424—267 **7 Claims**

1. A compound of the formula I

$$R_1—Ph—R_2 \qquad (I)$$

wherein R_1 represents a radical of the formula

wherein R_3 represents hydrogen, Ph represents p-phenylene which is unsubstituted or is mono-substituted by lower alkyl having up to 4 carbon atoms, lower alkoxy having up to 4 carbon atoms or halogen up to atomic number 17, and R_2 represents lower alkyl having up to 4 carbon atoms, with the proviso, that R_2 contains at least 2 carbon atoms, when Ph is unsubstituted p-phenylene.

7. A pharmaceutical preparation comprising an antidepressive effective amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,188,397

2,2-ALKYLDIYLBIS(THIO)BIS(IMIDAZOLES)

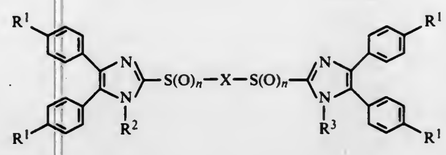
David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Sep. 22, 1978, Ser. No. 944,672

Int. Cl.[2] A61K *31/415;* **C07D** *233/84*

U.S. Cl. 424—273 R **17 Claims**

1. A compound of the formula:



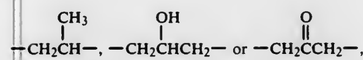
in which:

R^1 is methoxy, methylthio, trifluoromethyl, chloro, fluoro, bromo or methylenedioxy when taken with an adjacent position on the phenyl ring;

R^2 and R^3 are both hydrogen or one is hydrogen and the other is methyl;

n is 0, 1 or 2; and

X is selected from the group consisting of $—(CH_2)_m—$ where m is 0 to 4 provided that m is not 0 when R^1 is chloro,



or a non-toxic, pharmaceutically acceptable salt thereof.

16. A method of regulating cell-mediated immunity and/or producing anti-arthritic activity which comprises administering internally to an animal in need thereof a compound of claim 1 in an amount sufficient to produce said activity(ies).

4,188,398

METHOD FOR TREATING EPILEPSY

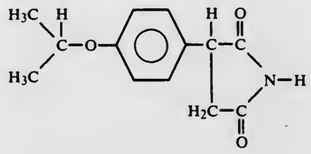
Oganes L. Mndzhoian, 2 proezd ulitsy Tumaniana, 5, kv. 6; Svetlana A. Avetisian, ulitsa Knuniantsa, 7, kv. 61; Nina E. Akopian, ulitsa Charentsa, 4, kv. 8, and Dzhemma A. Gerasimian, ulitsa Moskovskaya, 8, kv. 21, all of Erevan, U.S.S.R.

Filed Feb. 6, 1978, Ser. No. 875,412

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **1 Claim**

1. A method for treating epilepsy by administering to a patient an anticonvulsant containing as an active principle, 0.25 grams of α-/para-isopropoxyphenyl/succinimide of the formula:



in conjunction with a pharmaceutically effective carrier.

4,188,399

PROCESS FOR PREPARING A HEAT COAGULABLE VISCOUS PROTEIN

Michael Shemer, Worthington, Ohio, assignor to Miles Laboratories, Inc., Elkhart, Del.

Filed Dec. 23, 1974, Ser. No. 535,944

Int. Cl.[2] A23J *3/00, 1/14*

U.S. Cl. 426—276 **16 Claims**

1. A process for producing a heat coagulable viscous protein product substantially free of added salts which comprises:

a. forming an aqueous slurry of an oleaginous seed material present at a solids concentration of less than about 15 percent (weight/volume basis) based upon the total volume, said slurry having a pH of about 5.1 to about 5.9;

b. separating the liquid from the solids portion of said slurry; and

c. recovering said protein product from said separated liquid.

4,188,400

FURYLMETHYLOXIME ETHERS

Michael J. Bull, Lower Halstow, England, assignor to Shell Oil Company, Houston, Tex.

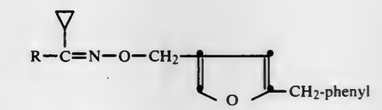
Filed Apr. 12, 1979, Ser. No. 29,172

Claims priority, application United Kingdom, May 18, 1978, 20510/78

Int. Cl.[2] C07D *307/52;* **A01N** *9/20*

U.S. Cl. 424—285 **4 Claims**

1. A compound of the formula



wherein R is naphthyl, phenyl, halophenyl, or alkylphenyl or alkoxyphenyl wherein the alkyl moiety contains from one to four carbon atoms.

4. A method for protecting plants from attack by insects which comprises applying to the plants to be protected an effective dosage of a compound of claim 1.

4,188,401

COMBATING FUNGI WITH 1-(ω-SUBSTITUTED PENTYL)-3-(2-CYANO-ACETYL)-UREAS

Wilhelm Brandes, Cologne, and Werner Daum, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

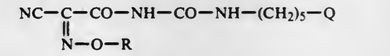
Filed May 25, 1978, Ser. No. 909,743

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725315; Dec. 24, 1977, 2758108

Int. Cl.[2] C07C *121/46, 121/34, 121/66;* **A01N** *9/20*

U.S. Cl. 424—304 **12 Claims**

1. A 1-(ω-substituted pentyl)-3-(2-cyano-acetyl)-urea of the formula



in which

R represents R^1, $CO—R^2$, $CO—NH—R^3$ or $CO—OR^4$,

R^1 represents unsubstituted alkyl with 1 to 10 carbon atoms; or represents alkyl with 1 to 4 carbon atoms substituted by a member selected from the group consisting of a vinyl group, an alkynyl group with up to 4 carbon atoms, an alkylcarbonyl group with 2 to 5 carbon atoms, an alkoxycarbonyl group with 2 to 5 carbon atoms, an alkenoxycarbonyl or alkynoxycarbonyl group with 4 to 5 carbon atoms, an aminocarbonyl group, an N-alkylaminocarbo-

nyl or N-cycloalkylaminocarbonyl group with up to 7 carbon atoms in either case, or a N-phenylaminocarbonyl group which can optionally have C_1–C_4 alkyl and/or chlorine as further substituents on said phenyl radical; or represents benzyl; or represents benzyl substituted in the aromatic part by a member selected from the group consisting of a methyl, methoxy, methylenedioxy, nitro, trifluoromethyl, benzoyl, monochlorobenzoyl, dichlorobenzoyl, phenyl or phenoxy group or by 1 to 4 chlorine atoms;

R^2 represents a straight-chain or branched, saturated or unsaturated hydrocarbon radical with up to 8 carbon atoms; or a straight-chain or branched, saturated or unsaturated hydrocarbon radical with up to 8 carbon atoms substituted by a member selected from the group consisting of chlorine, bromine or a cyano group,

R^3 represents a straight-chain or branched alkyl radical with up to 11 carbon atoms, or represents a straight-chain or branched alkyl radical with up to 11 carbon atoms substituted by a member selected from the group consisting of a cyano group or an alkoxycarbonyl radical with up to 5 carbon atoms, or represents a phenyl radical, or a phenyl radical substituted by member selected from the group consisting of a methyl, nitro or trifluoromethyl group or by chlorine,

R^4 represents a saturated or unsaturated aliphatic group with up to 4 carbon atoms,

Q represents CN, CO—NH_2, COOH or CO—OR^5, and

R^5 denotes an alkyl group with 1 to 4 carbon atoms.

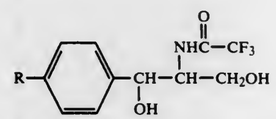
10. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim **1**.

11. The method according to claim **10**, in which said compound is

1-(5-cyanopentyl)-3-(2-cyano-2-methoxyiminoacetyl)-urea,
1-(5-cyanopentyl)-3-(2-cyano-2-hexyloximinoacetyl)-urea,
1-(5-cyanopentyl)-3-(2-cyano-2-ethoxyiminoacetyl)-urea or
1-(5-aminocarbonyl-pentyl)-3-(2-cyano-2-methoxyimino-acetyl)-urea.

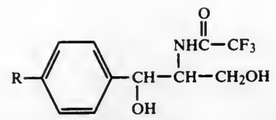
4,188,402
DERIVATIVES OF THE D-THREO-1-PHENYL-2-TRIFLUOROACETAMIDO-1,3-PROPANDEDIOL
Mario Portelli, Vicenza; Davide DellaBella, Milan; Giuseppe Cervato, Vicenza, and Gianfranco Marca, Vimercate, all of Italy, assignors to Clesa S.p.A., Vicenza, Italy
Filed Aug. 5, 1977, Ser. No. 822,258
Int. Cl.² A61K *31/165*
U.S. Cl. 424—324 **9 Claims**

1. A D-threo compound of the formula:



wherein R is methylmercapto or methanesulphonyl; and the non-toxic pharmacologically acceptable acid addition salts thereof.

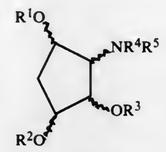
7. A method of treating bacterial infection, which comprises the oral, rectal or parenteral administration of an effective amount of a D-threo compound of the formula as the active ingredient;



wherein R is methylmercapto or methanesulphonyl; or a non-toxic pharmacologically acceptable acid addition salt thereof.

4,188,403
CYCLOPENTAN-1-AMINES
Dieter Orth; Hans-Eckart Radunz; Manfred Baumgarth; Jürgen Maisenbacher, and Reinhard Lissner, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany
Filed Dec. 21, 1977, Ser. No. 863,001
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658401
Int. Cl.² A61K *31/135*; C07C *91/16*
U.S. Cl. 424—330 **20 Claims**

1. A cyclopentane-1-amine of the Formula



and the physiologically acceptable salts thereof, wherein R^1 and R^2 each is hydrogen or benzyl; R^3 is alkyl of 5–10 C-atoms or 2-hydroxyalkyl of 5–10 C-atoms; R^4 is hydrogen, methyl or ethyl, R^5 is alkyl of 5–10 C-atoms; and the wavy line ( ) indicates that a bond can be in the α- or β-position.

19. A pharmaceutical composition comprising an amount of a compound of claim **1** effective for inhibiting the aggregation or adhesion of thrombocytes and a pharmaceutically acceptable carrier.

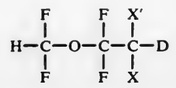
20. A method of inhibiting aggregation or adhesion of thrombocytes in mammals which comprises administering an amount of a compound of claim **1** effective for such inhibition.

4,188,404
TREATMENT OF SYMPTOMS OF AGING
Richard A. Guarino, Glen Ridge, N.J., assignor to USV Pharmaceutical Corporation, Tuckahoe, N.Y.
Filed Jun. 12, 1978, Ser. No. 914,339
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **2 Claims**

1. A method for improving the Sandoz Clinical Assessment-Geriatric rating in aged patients which comprises orally administering to aged patients requiring such improvement an effective amount of nylidrin hydrochloride.

4,188,405
DEUTERATED 1,1-DIFLUORO-2,2-DIHALOETHYL DIFLUOROMETHYL ESTERS
Eric R. Larsen, and Leslie P. McCarty, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 882,498, Mar. 1, 1978, which is a continuation-in-part of Ser. No. 803,926, Jun. 6, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,706
Int. Cl.² A61K *31/08*
U.S. Cl. 424—342 **12 Claims**

1. The process of anesthetizing an inhalation anesthetic susceptible animal which comprises administering an effective anesthetizing amount of a compound of the formula



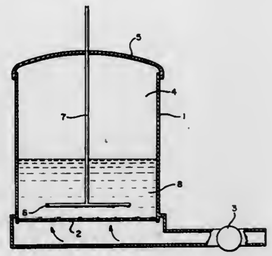
wherein X and X′ represent a halogen selected from the group consisting of chloro, fluoro, and bromo with the proviso that when X is chloro X′ is chloro or fluoro, and further when X is fluoro X′ is bromo or chloro, as a general inhalation anesthetic to said animal.

4,188,406
POLYMERIC BINDER FOR CHEWING GUM, METHOD FOR PREPARING SAME AND CHEWING GUM BASED ON SAID POLYMERIC BINDER
Levon A. Sarkisian; Stepan G. Matsoian; Vagram G. Gabzimalian; Shaen M. Mailian; Albert P. Galstian; Vazgen K. Azarian; Zorik S. Ter-Davtian; Raya G. Gevorkian; Ogden A. Gevorkian; Korjun L. Khudoian; Lavrenty A. Ovsepian; Amalia A. Arutjunova, and Foerbakh V. Mkrtchian, all of Erevan, U.S.S.R., assignors to Institut Organicheskoi Khimii Akademii Nauk Armyanskoi, Erevan, U.S.S.R.
Filed Jul. 10, 1978, Ser. No. 923,637
Int. Cl.² A23G *3/30*
U.S. Cl. 426—3 **3 Claims**

1. A polymeric binder for chewing gum consisting of an oligomer of vinylacetate with a molecular weight of from 2,500 to 6,000 and a plastifying agent, viz. water, at the following proportions between the components, percent by weight:

vinylacetate oligomer	70–80
water	30–20.

4,188,407
PROCESSES FOR PRODUCING ACTIVE DRIED YEAST
Frederick S. M. Grylls, Morden, England; Stanley D. Rennie, Menstrie, and Michael Kelly, Stirling, both of Scotland, assignors to The Distillers Company (Yeast) Limited, Morden
Continuation-in-part of Ser. No. 716,852, Aug. 23, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,802
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.² C12C *11/30*
U.S. Cl. 426—62 **7 Claims**



1. A method in which powdered active dried yeast having a dry matter content of 90 to 97% by weight is made by a process comprising drying moist yeast particles less than about 0.35 mm in size in a fluidised bed and subjecting the yeast particles in the fluidised bed to forces capable of disintegrating of yeast particles, said forces being applied continuously through at least most of the time that the dry matter content is between 50 and 70% and said forces being sufficient to prevent any substantial increase in particle size but insufficient to break the yeast cells themselves, with the resulting dried yeast particles substantially all passing through a sieve having a mesh size of 0.35 mm.

4,188,408
PROTECTED IRON TRACER COMPOSITION AND METHOD OF MAKING
Sylvan Eisenberg, San Francisco, Calif., assignor to Microtracers Inc., San Francisco, Calif.
Continuation-in-part of Ser. No. 542,357, Jan. 20, 1975, Pat. No. 4,029,820. This application Jul. 18, 1975, Ser. No. 597,298
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.² A23K *1/175*
U.S. Cl. 426—74 **12 Claims**

1. A composition of matter comprising a major portion of finely divided iron particles of about 35–325 mesh having adsorbed thereon a minor portion of a compound selected from the class consisting of sodium carbonate, tri-sodium phosphate and sodium silicate, said iron being selected from the class consisting of iron grits and reduced iron.

4,188,409
BEVERAGE PRODUCT AND PROCESS
Charles Kay, 9390 Whitneyville Ave., Alto, Mich. 49302
Continuation-in-part of Ser. No. 803,147, Jun. 3, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,166
Int. Cl.² A23F *1/14*
U.S. Cl. 426—78 **12 Claims**

1. A brewable coffee-type product comprising: matrix granules of shells of edible nuts having pulverized coffee retained at the surfaces thereof.

8. A method of producing a brewable coffee-type product comprising the steps of: pulverizing roasted coffee to powder form; forming an aqueous slurry liquor of the coffee powder; blending said slurry liquor with matrix granules of shells of edible nuts to form a damp mass; and evaporating the moisture from said damp mass to dry said damp mass to a flowable granular product.

4,188,410
FOAM FRYING
Joseph M. Rispoli, Massapequa Park; Morris A. Rogers, Mt. Vernon; Rex J. Sims, Pleasantville, and Reuben H. Waitman, Sr., Pearl River, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed Jun. 29, 1978, Ser. No. 920,527
Int. Cl.² A23L *1/01*
U.S. Cl. 426—296 **26 Claims**

1. A method for frying comestibles which comprises:
frying a comestible in a frying medium which comprises an oil or fat and an amount of an emulsifier effective to foam said oil or fat during frying, wherein the amount of fat or oil and emulsifier is effective to foam said fat or oil at a level sufficient to cook said comestible in the foaming frying medium and create an artificially high level of heat transfer medium, said level of foam creating at least a 25% increase in the height of the fat or oil.

4,188,411
METHOD OF PREPARING A PROTEIN-ENRICHED UNRIPENED CHEESE COMPOSITION
Arie Kuipers, and Karl Schröder, both of Reitmehring, Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG, Munich, Fed. Rep. of Germany
Filed Jan. 26, 1976, Ser. No. 652,181
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1975, 2503840
Int. Cl.² A23C *19/02, 19/12, 21/00*
U.S. Cl. 426—582 **7 Claims**

1. A method of making an unripened cheese which com-

prises: (a) adjusting a fluid, water-bearing concentrate of water-soluble whey protein to a pH value between 2.5 and 3.7, said value being below the isoelectric point of said whey protein; (b) heating the adjusted concentrate to an elevated temperature for a period sufficient to increase the viscosity thereof; and (c) dispersing the fluid concentrate of increased viscosity in unripened cheese.

4,188,412

NON-FOAMING, CLEAR, AEROSOL VEGETABLE OIL COMPOSITIONS CONTAINING LECITHIN, ETHYL ALCOHOL AND HYDROCARBON PROPELLENTS

Vasant D. Sejpal, Jersey City, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,701
Int. Cl.[2] A23J *7/02*
U.S. Cl. 426—609 **13 Claims**

12. A pan release and basting composition comprising:

A. From 3 to 15 percent by weight of a member selected from the group consisting of bleached and unbleached natural lecithin containing about 50 to 54 percent phosphatides, hydroxylated lecithin containing about 66 to 72 percent phosphatides and powdered and granular lecithin containing up to about 95 percent phosphatides;

B. From 7.5 to 25 percent by weight of an alcohol selected from the group consisting of 190° to 200° proof ethyl alcohol and ethyl alcohol denatured with a generally recognized as a safe food grade denaturant;

C. From 5 to 65 percent by weight of a liquid vegetable oil selected from the group consisting of soybean oil, corn oil, cottonseed oil, peanut oil, safflower oil, olive oil, sesame oil, peanut oil, coconut oil, coconut butter, palm nut oil and other glyceryl esters of lauric, linoleic, oleic, and linolenic acids, including their lightly hydrogenated liquid derivatives; and

D. From 10 to 75 percent by weight of a food grade hydrocarbon propellent selected from the group consisting of propane, butane, isobutane, isopentane and mixtures thereof.

4,188,413

ELECTROSTATIC-FLUIDIZED BED COATING OF WIRE

John H. Lupinski, Scotia, and Bernard Gorowitz, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 733,236, Oct. 18, 1976, Pat. No. 4,100,883. This application Jan. 20, 1978, Ser. No. 871,153
Int. Cl.[2] B05D *1/06*; B05B *5/02*; B05D *7/20*
U.S. Cl. 427—30 **24 Claims**

1. A process for continuously applying a controlled thickness coating on an elongate electrical conductor, comprising the steps of

(a) providing an upwardly extending hollow member having an upwardly facing port,

(b) providing a bed of powder about said hollow member,

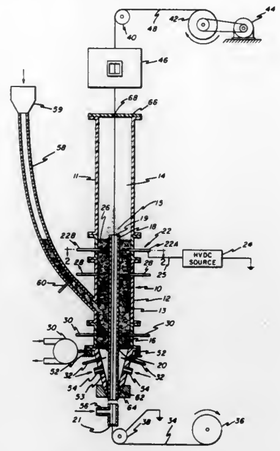
(c) fluidizing said bed to an extent such that the upper surface of the bed is below the port,

(d) electrically charging the fluidized bed with an electrical potential different from the electrical potential of the conductor by electrically charging electrode means disposed within said bed,

(e) said conductor being a rectangular wire having an elongate cross-sectional shape including opposite narrow ends interconnected by a pair of elongate opposite sides,

(f) disposing said electrode means in a angularly spaced apart, generally horizontal array with at least one charged electrode porjecting radially inwardly toward each elongate cross-section side of the rectangular wire and no electrode projecting inwardly toward either of said cross-sectional narrow sides,

(g) advancing the conductor along a path through said hollow member and upwardly out of said port to effect coating of the powder onto the conductor,



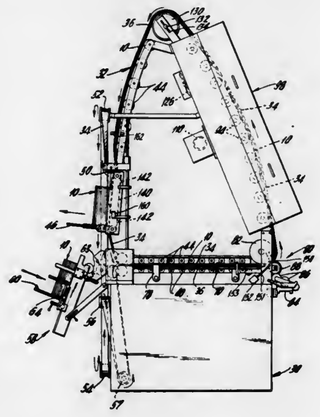
(h) adjusting the height of the port above the upper surface of the bed to control the thickness of the powder coating.

4,188,414

METHOD FOR APPLYING SEALING MATERIAL TO ENVELOPES

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 490,203, Jul. 19, 1974, Pat. No. 3,965,851. This application Jan. 2, 1976, Ser. No. 646,153
The portion of the term of this patent subsequent to Mar. 12, 1999, has been disclaimed.
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—45.1 **4 Claims**



1. A method for applying sealing material to the flap closures and opposed body portions of a plurality of envelopes, each envelope having a folded edge portion opposite the flap closure, comprising the steps of:

feeding a linear array of envelopes to a continuous, generally triangular closed loop conveying means including upper and lower conveyor belts which respectively grip the opposed surfaces of the body portion of each envelope along the folded edge portion thereof, with the flap closure being disposed below the plane of said envelope;

rotating each flap closure through 180° about said fold line to a generally horizontal position;

rotating each envelope around the first apex of said generally triangular closed loop conveying means and simultaneously stamping strips of sealing material respectively to the flap portion and body portion of each envelope;

consecutively heating said linear array of envelopes by dielectric dryer means to dry the sealing material applied to each envelope;

rotating each envelope around the second apex of the generally triangular closed loop conveying means; and

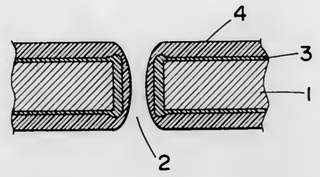
consecutively removing said envelope from said conveying means at a point adjacent the initial feeding position of said envelopes.

4,188,415

BASEBOARD FOR PRINTED CIRCUIT BOARD AND METHOD OF PRODUCING THE SAME

Hiroshi Takahashi, Kasama; Kiyoshi Nakao, Yuki, and Masaaki Katagiri, Houya, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,359
Claims priority, application Japan, Sep. 14, 1976, 51-110268
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—97 **27 Claims**



1. A method of producing a baseboard for a printed circuit board comprising applying onto the surface of a metal substrate a resin coating, characterized in that the application of a resin coating is effected by dipping a metal substrate having through-holes in a solution of a resin in a solvent which solution has a resin concentration of not more than 50% by weight and a viscosity of not more than 50 centipoises and taking the metal substrate out of said solution in a direction of at an angle of 90°±30° with respect to the axis of the through-holes of said metal substrate at a velocity of not more than 1,000 mm/min to form a resin coat layer covering the overall surface of the metal substrate and filling the through-holes which, upon drying, forms a membrane over said holes which breaks and results in the formation of a coating on the inner wall surfaces of the through-holes and in the formation, at the circumferential edges formed by the intersection of the upper and lower surfaces of said metal substrate with the inner walls of said through-holes, of a coating having a thickness larger than the thickness of said coating on said upper and said lower surface of the metal substrate.

4,188,416

SPRAYABLE MATERIAL FOR REPAIRING BASE PLATES OF INGOT MOLDS

Paul G. Adams, Birmingham, Ala., and Kenneth A. Gebler, Munster, Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 5, 1978, Ser. No. 966,679
Int. Cl.[2] B26D *7/38*
U.S. Cl. 427—135 **2 Claims**

1. A process for repairing ingot mold stools which comprises:

A. Spraying onto the stool a composition comprising:

(1) 49.5%—20 mesh alumina-silicate refractory grain;

(2) 11.56%—200 mesh alumina-silicate refractory grain;

(3) 13.21%—325 mesh Al_2O_3;

(4) 1.75%—325 mesh bentonite clay;

(5) 11.99% of a binder having a composition comprising:

a. 75% phosphoric acid—77.0%;

b. alumina/trihydrate—11.2%;

c. powdered boric acid—2.35%; and,

d. water—9.45%;

(6) 11.99%—water; said composition being fluid and sprayable through a 1 inch hose having a length of 75 feet;

B. Allowing said composition to cure utilizing the residual heat in said ingot mold stool; and,

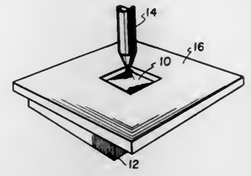
C. Recovering a repaired ingot mold stool.

4,188,417

METHOD OF APPLYING A DIELECTRIC LAYER TO A SUBSTRATE AND A MASK-FORMING COATING FOR THE APPLICATION OF A DIELECTRIC LAYER

Wolfgang Lichtenberg, Balzers, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiegesellschaft, Liechtenstein

Continuation of Ser. No. 793,510, May 4, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,560
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—229 **8 Claims**



1. A method of applying a dielectric layer to a substrate which can be heated to a temperature above ambient, comprising applying a mask of a suspension of metal in an organic binder to a substrate in areas not to receive the dielectric layer, heating the suspension to decompose the binder and to leave a metal deposit on a portion of the surface of the substrate in an area which is not to receive the dielectric layer and leaving an uncovered remaining area, applying the dielectric layer to the substrate on the uncovered remaining area at the elevated temperature by vapor deposition, and thereafter removing the mask by applying a solvent to dissolve the metal deposit of the mask.

4,188,418

SEPARATION PROCESS

Robert M. Livingston, Welwyn, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 773,037, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 708,797, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 385,014, Aug. 2, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,657
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—245 **2 Claims**

1. A method of preparing an ultra-filtration membrane of improved flux comprising the steps of:

(a) applying to a support surface a slurry of a finely divided inert, impervious and water-isoluble solid particulate flux improver contained in a volatile solvent,

(b) evaporating said solvent whereby a thin layer of the flux improver is left on said support surface,

(c) applying a film of a casting dope consisting essentially of a solution of a film-forming organic polymer in a non-volatile solvent over the said layer of flux improver, and

(d) promptly thereafter contacting the said film with water to leach out the said non-volatile solvent.

4,188,419

METHOD FOR PREVENTING CRACKS BELOW SEAMS DURING PLATING AND WELDING

Klaus Detert, Neu-Isenburg; Wolfgang Bertram, Grossauheim, and Hermann Fischdick, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 457,176, Apr. 2, 1974, abandoned, which is a continuation of Ser. No. 225,600, Feb. 11, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,811

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1971, 2106600

Int. Cl.[2] **C21D** *9/50*

U.S. Cl. 427—287 **22 Claims**

1. Method for preventing crack formation during stress relief annealing of weld claddings and connecting welds, comprising: conducting a welding operation, cooling the welding zone and adjacent regions after the welding operation, locally heating the regions adjacent to and extending up to a depth of no more than about 10 mm from the welding zone to temperatures of from about 700° C. and up to 1000° C. after the welding zone and adjacent regions have cooled and before the stress relief annealing of said welding zone and adjacent regions, thereby refining the coarse grained structure in said regions before the said stress relieving step, and then stress relief annealing said welding zone and adjacent regions after the local heating.

4,188,420

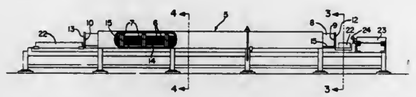
METHOD FOR COATING WIRE ON A SPOOL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 682,710, May 3, 1976, Pat. No. 4,109,609. This application Apr. 20, 1978, Ser. No. 898,273

Int. Cl.[2] **B05C** *3/10*

U.S. Cl. 427—295 **1 Claim**



1. The method of treating wire tire cord comprising providing a plurality of spools each containing an indefinite running length of said wire tire cord wound continuously therearound, inserting said spools endwise in tandem into one end of an elongated hollow cylindrical pipe so as to fill the length of said pipe, closing the ends of the pipe, circulating liquid coating around said wire tire cord on said spools in said pipe, effecting a vacuum in said pipe, draining surplus of said liquid coating from said wire tire cord on the spools and from said pipe, heating said pipe to dry said liquid coating on said wire tire cord wound about said spools, and pushing said plurality of spools with dried coating thereon from the other end of said pipe by inserting a next plurality of spools into said pipe by way of said first end.

4,188,421

PROCESS FOR TREATING THE SURFACE OF GLASS FIBRE TO IMPART RESISTANCE TO ALKALIS

Katsuji Matsuura, Kamagaya, and Kunihito Arai, Tokyo, both of Japan, assignors to Daiichikasei Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1978, Ser. No. 889,027

Claims priority, application Japan, Apr. 5, 1977, 52/038802

Int. Cl.[2] **B05D** *3/02*

U.S. Cl. 427—385 A **4 Claims**

1. A method of producing an alakli resistant glass fiber for use in cement products to improve the strength thereof which comprises the steps of coating said glass fiber with an aqueous solution of white muddy composition consisting of

CONSTITUENT	PARTS (% by weight)
Water-soluble acrylate resin	50–60
Styrene-acrylate copolymer resin	5–10
Zirconium oxide	2–5
Titanium oxide	3–5
Calcium carbonate	5–10
Plasticizer	5–10
Solvent	5–10

and drying the said coated glass fiber.

4,188,422

SHRINK-RESISTANT TEXTILES CONTAINING POLYPROPYLENE PROTEINOUS FIBER BLEND PRODUCED BY IMMERSING TEXTILE IN AN INERT LIQUID AT HIGH TEMPERATURE

William L. Wasley, Pacific Grove, and Walter W. Ingenthron, Jr., Albany, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,289

Int. Cl.[2] **B05D** *1/18*

U.S. Cl. 28—167 **3 Claims**

1. A process for imparting improved properties to proteinous animal fibers, which comprises:

(a) blending polypropylene with the proteinous animal fiber such that the blend contains about 5–50% of polypropylene based on the weight of the blend, and

(b) heating the blend to a temperature of about 165°–250° C. for a period of about 0.1 to 60 seconds by immersing it in an inert liquid.

4,188,423

SOLVENT EXTRACTED HEAT FUSER MEMBER

Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1977, Ser. No. 784,999

Int. Cl.[2] **B05D** *3/04, 3/10;* **G03G** *15/20*

U.S. Cl. 427—444 **9 Claims**

1. The method of improving the release properties of a silicone rubber coated fuser member comprising placing a cured silicone rubber coated fuser member in an environment containing an organic solvent which dissolves low molecular weight polysiloxane and siloxane components in the cured silicone rubber which interfere with the release properties of the silicone rubber, the organic solvent being one which does not react with, degrade or dissolve the cured silicone rubber, and removing the organic solvent containing the dissolved low molecular weight polysiloxane and siloxane components from the cured silicone rubber coated fuser member.

4,188,424

METAL CARRIER FOR TRIM

Tsuneo Ohno, Anjio; Kunio Maeno, Jushiyama; Takahiko Kasuya, and Takao Nakajima, both of Ichinomiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nagoya, Japan

Filed Dec. 20, 1977, Ser. No. 862,590

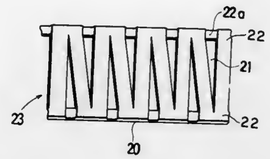
Claims priority, application Japan, Dec. 21, 1976, 51/171577[U]; Apr. 30, 1977, 52/55146[U]

Int. Cl.[2] **B60R** *13/02;* **B32B** *3/02, 3/10, 3/24, 15/06*

U.S. Cl. 428—572 **9 Claims**

1. A metal carrier to be embedded into rubber or plastic for use as trim, said metal carrier comprising: an elongated metal strip, a plurality of transverse slots across said strip in the central portion thereof, and link means adjacent the central portion of said strip on each side thereof, each said link means being continuous and including a plurality of first link portions having a thickness equal to the thickness of said strip, a plurality of second thin link portions having a thickness less than the thickness of said strip, and a plurality of intermediate link portions having a thickness equal to the thickness of said strip

for connecting said first and second link portions, wherein said link means are positioned with respect to said plurality of slots such that a said first link portion of said link means is adjacent to one end of a first of said slots and a said second thin link portion of said link means is adjacent to the other end of said



first of said slots and a said second thin link portion of said link means is adjacent to the one end of a second one of said slots and a said first link portion of said link means is adjacent to the other end of the second of said slots wherein the first and second ones of said slots are adjacent to each other.

4,188,425

DOUBLE-WALLED SHAPED PLASTIC ARTICLES

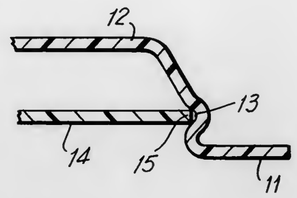
Friedrich Hanstein, Gross-Zimmern; Theodor P. Moench, Griesheim B. Darmstadt, and Günter Schreyer, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,618

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718949

Int. Cl.[2] **B32B** *17/00, 27/06;* **E06B** *3/24;* **C03C** *27/12*

U.S. Cl. 428—34 **5 Claims**



1. A double-walled shaped plastic glazing article comprising a first-sheet of a translucent synthetic resin of substantially uniform thickness having a geometrically regular depression formed therein having a base portion connected to surrounding planar portions of said sheet by a peripheral side wall, said side wall having a circumferential groove of uniform cross-section formed therein facing inwardly of said depression, and a second sheet of synthetic translucent resin having a peripheral edge portion which is generally complementary to the peripheral configuration of the groove being pressure fitted into said circumferential groove, said groove being spaced from said base portion of the depression to define an air chamber in the glazing article.

4,188,426

COLD PLASMA MODIFICATION OF ORGANIC AND INORGANIC SURFACES

Robert A. Auerbach, Fairview, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 860,261

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 427—40 **3 Claims**

1. A method for reducing the coefficient of friction and increasing the hydrophobicity of the surfaces of organic substrates comprising

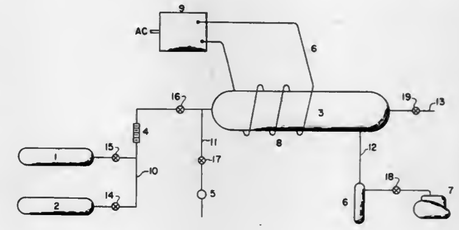
(a) introducing into a reaction zone a vaporized material consisting essentially of fragmentable fluorine-containing monomers;

(b) subjecting said fluorine-containing monomer to an electrical glow discharge, whereby there is formed a reactive species wherein said fluorine-containing monomer is perfluorocyclobutane and said reactive species is difluorocarbene;

(c) contacting in said reaction zone an organic substrate disposed in said zone with said reactive species; and

(d) depositing a thin, solid continuous fluorocarbon film on said substrate.

2. A method for reducing the coefficient of friction and increasing the hydrophobicity of the surfaces of inorganic substrates comprising



(a) disposing within a reaction zone at least one inorganic substrate;

(b) introducing into such reaction zone a vaporized material consisting essentially of fragmentable fluorine-containing monomer;

(c) subjecting said monomer to an electrical glow discharge, whereby there is formed a plasma comprising difluorocarbene reactive species;

(d) contacting said substrate in said reaction zone with said reactive species; and

(e) depositing a thin, solid continuous fluorocarbon film on said substrate.

4,188,427

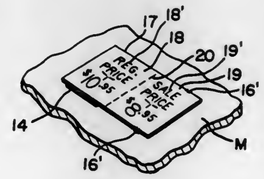
COMPOSITE WEB OF PRESSURE SENSITIVE LABELS

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,608

Int. Cl.[2] **B32B** *3/10;* **A44C** *3/00*

U.S. Cl. 428—41 **8 Claims**



1. In a composite web of pressure sensitive labels adapted to be used in a hand-held label applying apparatus, the composite web including a longitudinally extending web of supporting material having a release coating, printable label material having pressure sensitive adhesive releasably adhering the label material to the release coating on the supporting material web, longitudinally spaced laterally extending lines of severing in the label material to provide a series of labels carried on the supporting material web, a longitudinally extending line of partial severing in the label material between the side edges of

the label material and providing each label with first and second label parts, only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the labels securely to merchandise, and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, the improvement wherein each laterally extending line of severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of a label without knife cutting, the first and second label parts being held together relatively securely at the longitudinal line of partial severing to prevent the second label part from being accidentally detached from the related first label part until ready to be detached and removed by the user, the force required to pull apart the second label parts of adjacent labels being substantially less than the force required to pull apart the first and second parts of each label.

4,188,428

BOARD ELEMENT

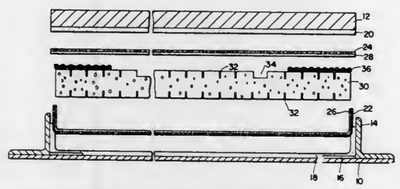
Peter Wolf, Am Galgenfeld 13, 6460 Gelnhausen, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,850

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736842

Int. Cl.² B32B *3/00, 31/10*

U.S. Cl. 428—71 **9 Claims**



1. A lightweight board element comprising a lightweight core having a plurality of cellular cavities and a covering layer provided on the upper and lower surfaces of the core, said layer comprising synthetic resin and resin-impregnated glass fiber mat coextensive with the core, and further comprising wire fabric embedded in said synthetic resin covering layer for receiving fastening screws, said core comprising a rigid plastic foam board-like element having a first grid pattern of intersecting grooves on its upper surface and a second grid pattern of intersecting grooves on its lower surface, the first and second grid patterns being formed in the respective upper and lower surfaces of the core and being separated from one another, each of said first and second grid patterns being formed by a series of longitudinal and transverse grooves extending across the respective upper and lower surface of the core, each of said grooves having a width of about 1 to 3 mm, a depth of about 3–6 mm, and being separated by a distance of about 0.5 to 1.5 cm, said longitudinal and transverse grooves intersecting and forming said grid patterns.

4,188,429

PILE TEXTILE ELEMENTS WITH FUSED WRAPPER AND BASE

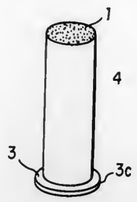
Daniel Braconnier, Ecully; Rene Guillermin, Bron, and Sylvio Sangalli, Caluire, all of France, assignors to Rhone-Poulenc-Textile, Lyons, France

Filed Jun. 14, 1978, Ser. No. 915,525

Claims priority, application France, Feb. 8, 1978, 78 03738

Int. Cl.² B32B *3/02*

U.S. Cl. 428—85 **22 Claims**



1. In a pile textile element for decorative pile articles comprising a bundle of a plurality of substantially parallel, heat-fusible filamentary textile materials and a removable wrapper encasing the bundle over at least a portion of its length, the improvement comprising:

(a) the wrapper comprised of heat-fusible material; and

(b) the heat-fusible filamentary textile materials at one end of said bundle being fused together with the heat-fusible wrapper to form a flat base.

4,188,430

MULTILEVEL COLORWAY CARPET SYSTEM

Lewis M. DeBernard, Jr., Richmond, and Donald G. Mercer, Chester, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 800,268, May 25, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,452

Int. Cl.² B32B *3/02*

U.S. Cl. 428—88 **57 Claims**

1. A carpet selected from the group consisting of cut/loop and cut pile carpet having a beneath-the-surface patterning effect, said carpet comprising at least two yarn groups of differing characteristics said yarn groups comprising

(A) a multiple ply heat-set yarn having a relatively light dye affinity combined with a nonheat-set yarn having a first relatively darker dye affinity, and

(B) a heat-set yarn having a relatively light dye affinity combined with a nonheat-set yarn having a second relatively darker dye affinity,

so that said nonheat-set yarns shrink to a lower pile height in said carpet than said heat-set yarn due to the heat and moisture of dyeing and drying said carpet, whereby at least two colorways are established in said carpet pile.

4,188,431

LATENT IMAGE PRINTING AND DEVELOPMENT

Phillip E. Sokol, Rockville, and Robert F. Farmer, Gaithersburg, both of Md., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 24, 1975, Ser. No. 616,197

Int. Cl.² D21H *5/10;* **B44F** *1/10*

U.S. Cl. 428—29 **5 Claims**

1. A reusable paper-based feedback system comprising a paper substrate having a water solubility acidity-alkalinity of from 0.08% acid as sulfur trioxide to 0.05% base as sodium hydroxide, said paper substrate bearing

a. a visible image and

b. an invisible image derived from printing on said paper substrate an ink comprising from 0.1 to 9.0% by weight phenolphthalein.

4,188,432

ARTICLES RESISTANT TO ATTACK BY FATTY SUBSTANCES, MADE FROM POLYSTYRENE BLENDS, AND COMPOSITIONS

Geoffrey Holden, Houston, Tex., and Lam H. Gouw, Laren, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1978, Ser. No. 892,045

Int. Cl.² B65D *81/02;* **C08L** *53/02*

U.S. Cl. 428—35 **5 Claims**

1. An article resistant to attack by fatty substances, produced by extrusion or injection molding from a composition consisting essentially of

(A) 60 to 93 parts by weight, per 100 parts of the compositions, of a polystyrene component consisting of 100 to about 45% of a thermoplastic styrene-diolefin elastomer graft copolymer with 0 to about 55% of thermoplastic styrene homopolymer;

(B) 2 to 30 parts by weight, per 100 parts of the composition, of a polyolefin component selected from the group consisting of low density polyethylene, high density polyethylene and polypropylene and

(C) 5 to 20 parts by weight, per 100 parts of the composition, of a block copolymer X-Y-X where each X is a polystyrene block of about 5,000 to 10,000 molecular weight and Y is a hydrogenated polybutadiene block of about 25,000 to 50,000 molecular weight, the total molecular weight of the block copolymer being less than about 60,000.

said article being characterized by having a skin layer substantially enriched in polyolefin, which imparts resistance to fatty substances.

2. Extruded sheet according to claim 1.

3. Hollow articles produced from extruded sheet according to claim 2.

4,188,433

RECORD CARRIER IN DISK FORM HAVING COVER LAYERS

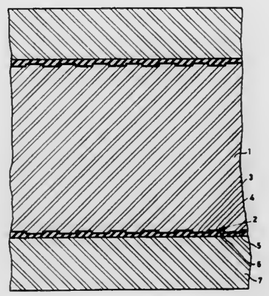
Rinse Dijkstra; Arnoldus J. M. van den Broek, and Gerardus J. M. Lippits, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,953

Claims priority, application Netherlands, Dec. 12, 1977, 7713710

Int. Cl.² G11B *7/24;* **B32B** *27/08, 27/30*

U.S. Cl. 428—64 **4 Claims**



1. A disk shaped record carrier comprising a substrate, a radiation-reflecting layer of metal on said substrate containing at least one optically readable information path, a radiation-transparent cover plate of a thickness of 0.2–1 mm, formed of glass or a transparent synthetic resin material, covering said reflective metal layer and joined to said reflective metal layer by an ultraviolet curable lacquer composition layer of at most 30μ in thickness.

4,188,434

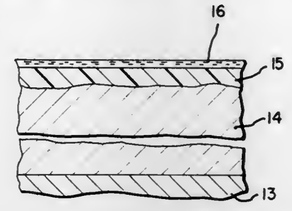
LUBRICANT FOR A MAGNETIC MEMBER

Thomas J. Loran, Boulder, Colo., assignor to Storage Technology Corporation, Boulder, Colo.

Filed May 15, 1978, Ser. No. 906,022

Int. Cl.² H01F *1/26;* **B32B** *27/28*

U.S. Cl. 428—65 **12 Claims**



1. A magnetic record member for recording and reproducing signals therefrom comprising:

a substrate of said magnetic record member; and

a smooth continuous layer of solid lubricant on said substrate, a smooth continuous layer of luquid lubricant on top of the layer of solid lubricant, each of said layers having a thickness of between 1/10 microinches and twenty microinches.

8. The method of lubricating a magnetic record member comprising:

providing a magnetic record member substrate;

dispersing solid lubricant in a carrier;

dispersing liquid lubricant in a carrier; and

spraying said solid lubricant, and said liquid lubricant, and their carrier onto said substrate in separate layers with the liquid lubricant on top of a layer of solid lubricant on said substrate, the thickness of each of said layers being between 1/10 microinches and twenty microinches.

4,188,435

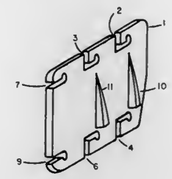
LOST END RETHREAD CLIP

Norman G. Bartrug, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1979, Ser. No. 7,081

Int. Cl.² B32B *3/30;* **B65H** *57/00*

U.S. Cl. 428—167 **5 Claims**



1. A clip for rethreading a broken strand from a group of parallel strands being passed through a process wherein the strands are maintained in spaced parallel relationship during their passage through the process comprising a generally flat body provided with a series of slots on its upper and lower ends; the slots being aligned with each other and adapted to engage strands placed therein, an external rib for each set of slots provided on the external surface of said body and on each side thereof, said ribs being raised from the surface of said body a sufficient distance to enable them to run in a pulley channel when passed into it, a set of parallel slots on one side of said

body located near the top and bottom of said body and each of these slots being aligned with the slots provided on the upper and lower end of said body.

4,188,436

NON WOVEN FABRICS WITH PATTERN OF DISCRETE FUSED AREAS

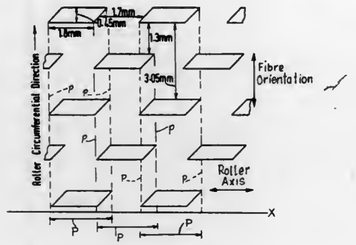
Peter M. Ellis, and Alan Selwood, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 3, 1978, Ser. No. 921,517

Claims priority, application United Kingdom, Apr. 8, 1976, 14360/76

Int. Cl.² B32B *7/14*

U.S. Cl. 428—198 **13 Claims**



1. Non-woven fabric comprising at least two layers of fibres bonded in a pattern of discrete fused areas, wherein the fibres in at least the outer layers exhibit a predominating direction of orientation and at least one layer includes or consists of fibres having an orientation orthogonal to the predominating direction of orientation in the outer layer or layers and the maximum distance between bonded areas at at least one surface measured in the direction of fibre orientation is not more than 10 mm and the bonded areas are so arranged that a projection of the bonded areas within this maximum distance, in the direction of fibre orientation, onto a line perpendicular to the predominating direction of fibre orientation is continuous.

4,188,437

THERMOTROPIC ADHESIVE TAPE

Stanley E. Robowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed May 25, 1978, Ser. No. 909,481

Int. Cl.² B32B *3/14*; G01K *11/12*

U.S. Cl. 428—199 **22 Claims**

1. A thermotropic adhesive tape comprising a base layer of a material selected from the group consisting of polymers and metals, an adhesive coating on one surface of said base layer, and colored markings on either the outer surface of said base layer or the surface of said adhesive layer adjacent said base layer so as to be visible thereon;

said markings being formed from an ink composition comprising a solution of (1) about 3–30% by weight of an alcohol-soluble resole binder resin; (2) about 0.1–5% by weight of a colorant selected from the group consisting of (a) a reactive thermotropic dye capable of exhibiting a visible color change upon exposure to steam at a temperature of at least about 215° F. and (b) a combination of dyes of different color capable of exhibiting a visible color change upon exposure to water or steam *at a temperature* of at least about 120° F., said dye *combination including at* cyclic ketones, aldehydes, acetals, ethers and esters; and (4) about 0.01–0.1% of a surfactant;

said ink composition being disposed on the outer surface of said base layer when said base layer is a metallic material and also being disposed on said base layer when said ink composition comprises said combination of dyes, said ink composition being adhered to said base layer when said base layer comprises a polymeric material by softening and swelling the surfaces of the polymer to allow penetration of the ink; said composition being capable of undergoing a visible and permanent color change as seen on said base layer upon exposure to water at a temperature sufficient to activate a change in color of the colorant.

4,188,438

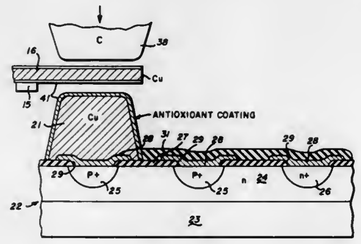
ANTIOXIDANT COATING OF COPPER PARTS FOR THERMAL COMPRESSION GANG BONDING OF SEMICONDUCTIVE DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 2, 1975, Ser. No. 582,634

Int. Cl.² B32B *3/10*; H01L *21/02, 21/60*

U.S. Cl. 428—209 **17 Claims**



1. In a method for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of a type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to underlying patterns of metallization on the semiconductive device, and wherein at least one copper portion operatively associated with the semiconductive device is to be thermal compression gang bonded to a second metal portion operatively associated with the semiconductive device, the steps of:

coating said first copper portion with an antioxidant coating to inhibit oxidation of the copper portion, such antioxidant coating being applied to a thickness and of a material compatible with thermal compression bonding therethrough so that the completed thermal compression bond to be effected between said first copper portion and said second metal portion is bonded through said antioxidant coating, said first copper portion forming a bonding interface with said second metal portion.

12. In an apparatus for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of the type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to patterns of metallization on the semiconductive device:

a first copper portion operatively associated with the semiconductive device and which is to be thermal compression

to be effected between said first copper portion and the second metal portion is bonded through said antioxidant coating with said first copper portion forming a bonding interface with said second metal portion.

4,188,439

ADHESIVE TAPE

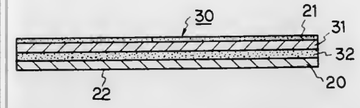
Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,688

Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.² B32B *7/02*

U.S. Cl. 428—215 **6 Claims**



1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m², a film of high density polyethylene having a density of not less than 0.94 g/cc elongated to sixteen times only transversely to the longitudinal direction of the tape and having a thickness of 15 to 30μ, said elongated film being attached to one side of said base paper material with a layer of low density polyethylene being extruded between the base paper material and the elongated film, and a layer of pressure sensitive adhesive adhesive applied to the other side of said base paper material.

4,188,440

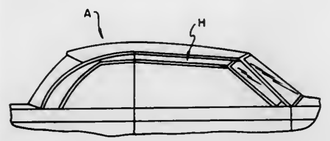
SELF-SUPPORTING AUTOMOTIVE LINER PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 886,137, Mar. 13, 1978, which is a continuation-in-part of Ser. No. 592,611, Jul. 2, 1975, abandoned. This application Jan. 24, 1979, Ser. No. 5,956

Int. Cl.² B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—215 **9 Claims**



1. A laminated self-supporting, automotive liner panel of predetermined contour consisting of an outer substrate layer of a heat resistant, expanded styrene copolymer formed by the copolymerization of styrene and maleic anhydride which is relatively rigid and has a substantial resistance to bending, an intermediate layer of relatively soft, compressible, flexible urethane foam bonded to one side of said substrate layer in direct surface-to-surface contact therewith, said intermediate layer being of sufficient thickness to provide heat and sound insulation, to provide a soft feel and to conceal imperfections in said substrate layer, and an outer flexible decorative finish cover layer bonded to the side of said intermediate layer oppo-

said substrate layer has a thickness of 0.150"–0.180" and a density of 4 pounds per square foot, and said intermediate layer has a thickness of 0.060"–0.500" and a density of 1 to 4 pounds per cubic foot.

7. The automotive liner panel defined in claim **5**, wherein said cover layer is a vinyl skin having a thickness of 0.005"–0.010".

4,188,441

FLEXIBLE PACKAGING FILMS OF HIGH DENSITY POLYETHYLENE CAPABLE OF FORMING EASILY OPENABLE HEATSEALS

Stephen O. Cook, Mill Valley, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 17, 1976, Ser. No. 658,549

Int. Cl.² B32B *27/08, 27/32*

U.S. Cl. 428—216 **9 Claims**

1. A flexible packaging film comprising a

base layer consisting essentially of high density polyethylene, and a

heatseal layer having a thickness between about 0.25 and 0.75 mil and consisting essentially of a physical blend of a first and second copolymer,

the first copolymer being a copolymer of ethylene and a comonomer selected from the group consisting of vinyl acetate, methyl acrylate, ethyl acrylate, methyl methacrylate, and ethyl methacrylate, the comonomer content being between 10 and 30 mole percent,

the second copolymer in the blend being an ionomer which is a copolymer of at least 50 mole percent of an olefin having up to 9 carbon atoms and an ethylenically unsaturated monocarboxylic acid wherein at least 10% of the carboxylic acid groups are neutralized by an alkali metal ion,

the ratio of the first copolymer to the second copolymer (ionomer) being between 40:60 and 80:20,

the film being formed by coextruding the base layer and the heatseal layer adjacent to each other,

the film being capable of forming a blend-to-blend heatseal by the application of a pressure of 20 psi for one second at a film temperature of less than 245° F., which heatseal is openable by rupture of the heatseal layer and delamination between the base layer and the heatseal layer by the application of a force between one and five pounds per inch width, but not openable by the application of a force of one pound per inch width or less, the heatseal having a peel strength of at least 0.3 pounds per inch width,

the heatseal layer having a tack strength at a temperature at which a heatseal can be formed which is sufficient to maintain the seal without application of pressure until the seal has cooled.

4,188,442

ADHESIVE TAPE

Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kamakura, Japan

Continuation-in-part of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,648

Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.² B32B *7/02*

U.S. Cl. 428—216 **6 Claims**

1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m², a film of high density polyethylene

substrate an ink comprising from 0.1 to 9.0% by weight phenolphthalein.

4,188,432

ARTICLES RESISTANT TO ATTACK BY FATTY SUBSTANCES, MADE FROM POLYSTYRENE BLENDS, AND COMPOSITIONS

Geoffrey Holden, Houston, Tex., and Lam H. Gouw, Laren, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1978, Ser. No. 892,045
Int. Cl.[2] B65D *81/02;* C08L *53/02*
U.S. Cl. 428—35 **5 Claims**

1. An article resistant to attack by fatty substances, produced by extrusion or injection molding from a composition consisting essentially of

(A) 60 to 93 parts by weight, per 100 parts of the compositions, of a polystyrene component consisting of 100 to about 45% of a thermoplastic styrene-diolefin elastomer graft copolymer with 0 to about 55% of thermoplastic styrene homopolymer;

(B) 2 to 30 parts by weight, per 100 parts of the composition, of a polyolefin component selected from the group consisting of low density polyethylene, high density polyethylene and polypropylene and

(C) 5 to 20 parts by weight, per 100 parts of the composition, of a block copolymer X-Y-X where each X is a polystyrene block of about 5,000 to 10,000 molecular weight and Y is a hydrogenated polybutadiene block of about 25,000 to 50,000 molecular weight, the total molecular weight of the block copolymer being less than about 60,000.

said article being characterized by having a skin layer substantially enriched in polyolefin, which imparts resistance to fatty substances.

2. Extruded sheet according to claim 1.

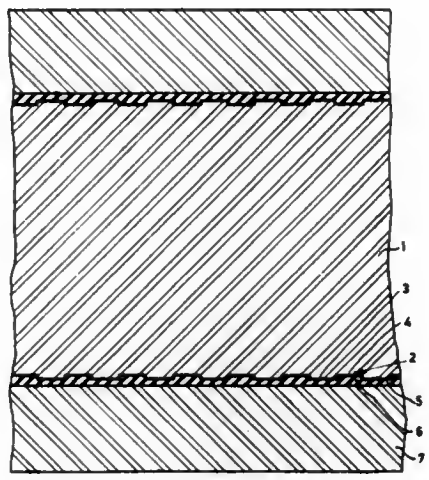
3. Hollow articles produced from extruded sheet according to claim 2.

4,188,433

RECORD CARRIER IN DISK FORM HAVING COVER LAYERS

Rinse Dijkstra; Arnoldus J. M. van den Broek, and Gerardus J. M. Lippits, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,953
Claims priority, application Netherlands, Dec. 12, 1977, 7713710
Int. Cl.[2] G11B *7/24;* B32B *27/08, 27/30*
U.S. Cl. 428—64 **4 Claims**



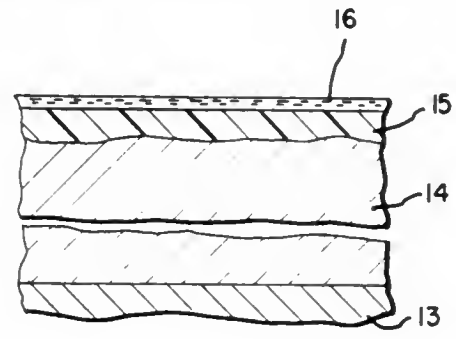
1. A disk shaped record carrier comprising a substrate, a radiation-reflecting layer of metal on said substrate containing at least one optically readable information path, a radiation-transparent cover plate of a thickness of 0.2–1 mm, formed of glass or a transparent synthetic resin material, covering said reflective metal layer and joined to said reflective metal layer by an ultraviolet curable lacquer composition layer of at most 30μ in thickness.

4,188,434

LUBRICANT FOR A MAGNETIC MEMBER

Thomas J. Loran, Boulder, Colo., assignor to Storage Technology Corporation, Boulder, Colo.

Filed May 15, 1978, Ser. No. 906,022
Int. Cl.[2] H01F *1/26;* B32B *27/28*
U.S. Cl. 428—65 **12 Claims**



1. A magnetic record member for recording and reproducing signals therefrom comprising:

a substrate of said magnetic record member; and

a smooth continuous layer of solid lubricant on said substrate, a smooth continuous layer of luquid lubricant on top of the layer of solid lubricant, each of said layers having a thickness of between 1/10 microinches and twenty microinches.

8. The method of lubricating a magnetic record member comprising:

providing a magnetic record member substrate;

dispersing solid lubricant in a carrier;

dispersing liquid lubricant in a carrier; and

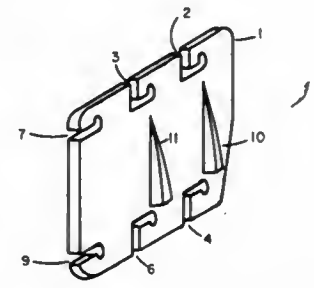
spraying said solid lubricant, and said liquid lubricant, and their carrier onto said substrate in separate layers with the liquid lubricant on top of a layer of solid lubricant on said substrate, the thickness of each of said layers being between 1/10 microinches and twenty microinches.

4,188,435

LOST END RETHREAD CLIP

Norman G. Bartrug, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1979, Ser. No. 7,081
Int. Cl.[2] B32B *3/30;* B65H *57/00*
U.S. Cl. 428—167 **5 Claims**



1. A clip for rethreading a broken strand from a group of parallel strands being passed through a process wherein the strands are maintained in spaced parallel relationship during their passage through the process comprising a generally flat body provided with a series of slots on its upper and lower ends; the slots being aligned with each other and adapted to engage strands placed therein, an external rib for each set of slots provided on the external surface of said body and on each side thereof, said ribs being raised from the surface of said body a sufficient distance to enable them to run in a pulley channel when passed into it, a set of parallel slots on one side of said

body located near the top and bottom of said body and each of these slots being aligned with the slots provided on the upper and lower end of said body.

4,188,436

NON WOVEN FABRICS WITH PATTERN OF DISCRETE FUSED AREAS

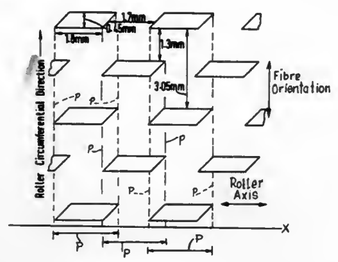
Peter M. Ellis, and Alan Selwood, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 3, 1978, Ser. No. 921,517

Claims priority, application United Kingdom, Apr. 8, 1976, 14360/76

Int. Cl.² B32B *7/14*

U.S. Cl. 428—198 **13 Claims**



1. Non-woven fabric comprising at least two layers of fibres bonded in a pattern of discrete fused areas, wherein the fibres in at least the outer layers exhibit a predominating direction of orientation and at least one layer includes or consists of fibres having an orientation orthogonal to the predominating direction of orientation in the outer layer or layers and the maximum distance between bonded areas at at least one surface measured in the direction of fibre orientation is not more than 10 mm and the bonded areas are so arranged that a projection of the bonded areas within this maximum distance, in the direction of fibre orientation, onto a line perpendicular to the predominating direction of fibre orientation is continuous.

4,188,437

THERMOTROPIC ADHESIVE TAPE

Stanley E. Rohowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed May 25, 1978, Ser. No. 909,481

Int. Cl.² B32B *3/14*; G01K *11/12*

U.S. Cl. 428—199 **22 Claims**

1. A thermotropic adhesive tape comprising a base layer of a material selected from the group consisting of polymers and metals, an adhesive coating on one surface of said base layer, and colored markings on either the outer surface of said base layer or the surface of said adhesive layer adjacent said base layer so as to be visible thereon;

said markings being formed from an ink composition comprising a solution of (1) about 3–30% by weight of an alcohol-soluble resole binder resin; (2) about 0.1–5% by weight of a colorant selected from the group consisting of (a) a reactive thermotropic dye capable of exhibiting a visible color change upon exposure to steam at a temperature of at least about 215° F. and (b) a combination of dyes of different color capable of exhibiting a visible color change upon exposure to water or steam at a temperature of at least about 120° F., said dye combination including at least one dye which is water-extractible at said temperature and at least one other dye which is not water-extractible at said temperature; (3) about 65–97% by weight of a solvent blend consisting essentially of (a) about 25–75% of an aliphatic alcohol having 1 to 3 carbon atoms or a mixture thereof and (b) about 25–75% of an organic compound selected from the group consisting of aliphatic and cyclic ketones, aldehydes, acetals, ethers and esters; and (4) about 0.01–0.1% of a surfactant;

said ink composition being disposed on the outer surface of said base layer when said base layer is a metallic material and also being disposed on said base layer when said ink composition comprises said combination of dyes, said ink composition being adhered to said base layer when said base layer comprises a polymeric material by softening and swelling the surfaces of the polymer to allow penetration of the ink; said composition being capable of undergoing a visible and permanent color change as seen on said base layer upon exposure to water at a temperature sufficient to activate a change in color of the colorant.

4,188,438

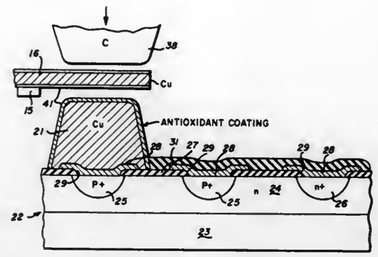
ANTIOXIDANT COATING OF COPPER PARTS FOR THERMAL COMPRESSION GANG BONDING OF SEMICONDUCTIVE DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 2, 1975, Ser. No. 582,634

Int. Cl.² B32B *3/10*; H01L *21/02, 21/60*

U.S. Cl. 428—209 **17 Claims**



1. In a method for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of a type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to underlying patterns of metallization on the semiconductive device, and wherein at least one copper portion operatively associated with the semiconductive device is to be thermal compression gang bonded to a second metal portion operatively associated with the semiconductive device, the steps of:

coating said first copper portion with an antioxidant coating to inhibit oxidation of the copper portion, such antioxidant coating being applied to a thickness and of a material compatible with thermal compression bonding therethrough so that the completed thermal compression bond to be effected between said first copper portion and said second metal portion is bonded through said antioxidant coating, said first copper portion forming a bonding interface with said second metal portion.

12. In an apparatus for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of the type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to patterns of metallization on the semiconductive device:

a first copper portion operatively associated with the semiconductive device and which is to be thermal compression gang bonded to a second metal portion operatively associated with the semiconductive device;

said first copper portion having an antioxidant coating thereon to inhibit oxidation of said copper portion, such antioxidant coating being of a thickness and of a material compatible with thermal compression bonding therethrough so that the completed thermal compression bond to be effected between said first copper portion and the second metal portion is bonded through said antioxidant coating with said first copper portion forming a bonding interface with said second metal portion.

4,188,439

ADHESIVE TAPE

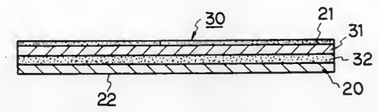
Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,688

Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.² B32B *7/02*

U.S. Cl. 428—215 **6 Claims**



1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m², a film of high density polyethylene having a density of not less than 0.94 g/cc elongated to sixteen times only transversely to the longitudinal direction of the tape and having a thickness of 15 to 30μ, said elongated film being attached to one side of said base paper material with a layer of low density polyethylene being extruded between the base paper material and the elongated film, and a layer of pressure sensitive adhesive applied to the other side of said base paper material.

4,188,440

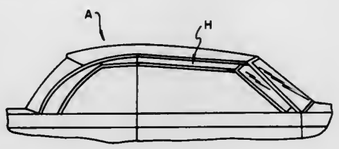
SELF-SUPPORTING AUTOMOTIVE LINER PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 886,137, Mar. 13, 1978, which is a continuation-in-part of Ser. No. 592,611, Jul. 2, 1975, abandoned. This application Jan. 24, 1979, Ser. No. 5,956

Int. Cl.² B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—215 **9 Claims**



1. A laminated self-supporting, automotive liner panel of predetermined contour consisting of an outer substrate layer of a heat resistant, expanded styrene copolymer formed by the copolymerization of styrene and maleic anhydride which is relatively rigid and has a substantial resistance to bending, an intermediate layer of relatively soft, compressible, flexible urethane foam bonded to one side of said substrate layer in direct surface-to-surface contact therewith, said intermediate layer being of sufficient thickness to provide heat and sound insulation, to provide a soft feel and to conceal imperfections in said substrate layer, and an outer flexible decorative finish cover layer bonded to the side of said intermediate layer opposite said substrate layer in direct surface-to-surface contact therewith.

2. The automotive liner panel defined in claim 1, wherein said copolymer contains about 6%–20% by weight of maleic anhydride.

5. The automotive liner panel defined in claim 2, wherein said substrate layer has a thickness of 0.150"–0.180" and a density of 4 pounds per square foot, and said intermediate layer has a thickness of 0.060"–0.500" and a density of 1 to 4 pounds per cubic foot.

7. The automotive liner panel defined in claim 5, wherein said cover layer is a vinyl skin having a thickness of 0.005"–0.010".

4,188,441

FLEXIBLE PACKAGING FILMS OF HIGH DENSITY POLYETHYLENE CAPABLE OF FORMING EASILY OPENABLE HEATSEALS

Stephen O. Cook, Mill Valley, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 17, 1976, Ser. No. 658,549

Int. Cl.² B32B *27/08, 27/32*

U.S. Cl. 428—216 **9 Claims**

1. A flexible packaging film comprising a

base layer consisting essentially of high density polyethylene, and a

heatseal layer having a thickness between about 0.25 and 0.75 mil and consisting essentially of a physical blend of a first and second copolymer,

the first copolymer being a copolymer of ethylene and a comonomer selected from the group consisting of vinyl acetate, methyl acrylate, ethyl acrylate, methyl methacrylate, and ethyl methacrylate, the comonomer content being between 10 and 30 mole percent,

the second copolymer in the blend being an ionomer which is a copolymer of at least 50 mole percent of an olefin having up to 9 carbon atoms and an ethylenically unsaturated monocarboxylic acid wherein at least 10% of the carboxylic acid groups are neutralized by an alkali metal ion,

the ratio of the first copolymer to the second copolymer (ionomer) being between 40:60 and 80:20,

the film being formed by coextruding the base layer and the heatseal layer adjacent to each other,

the film being capable of forming a blend-to-blend heatseal by the application of a pressure of 20 psi for one second at a film temperature of less than 245° F., which heatseal is openable by rupture of the heatseal layer and delamination between the base layer and the heatseal layer by the application of a force between one and five pounds per inch width, but not openable by the application of a force of one pound per inch width or less, the heatseal having a peel strength of at least 0.3 pounds per inch width,

the heatseal layer having a tack strength at a temperature at which a heatseal can be formed which is sufficient to maintain the seal without application of pressure until the seal has cooled.

4,188,442

ADHESIVE TAPE

Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kamakura, Japan

Continuation-in-part of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,648

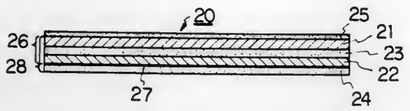
Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.² B32B *7/02*

U.S. Cl. 428—216 **6 Claims**

1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m², a film of high density polyethylene having a density of not less than 0.94 g/cc elongated six to sixteen times only transversely to the longitudinal direction of the tape and having a thickness of 15 to 30μ, said elongated film being attached to one side of said base paper material with a first layer of low density polyethylene of a thickness of 7 to

50μ being extruded between the base paper material and the elongated film, a second layer of low density polyethylene of thickness of 7 to 50μ being extruded and attached to said



elongated film so that the elongated film is sandwiched between the first and second layers of low density polyethylene, and a layer of pressure sensitive adhesive applied to the other side of said base paper material.

4,188,443

MULTI-LAYER POLYESTER/POLYOLEFIN SHRINK FILM

Walter B. Mueller, Taylors; Henry G. Schirmer, Spartanburg; Julian H. Schoenberg, and Alan S. Weinberg, both of Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Aug. 30, 1978, Ser. No. 938,191

Int. Cl.[2] B65D *65/02;* **B32B** *31/28, 27/36, 27/32*

U.S. Cl. 428—216 **11 Claims**

1. A heat shrinkable, multi-layer, flexible, thermoplastic packaging film comprising:
(a) at least three layers of polymeric material;
(b) at least one of said layers being an inner layer and comprising a polymer selected from the group consisting of: (i) homopolymers, copolymers, and terpolymers of ethylene and (ii) blends of ethylene homopolymers or copolymers with butylene homopolymers or copolymers, said inner layer comprising 50% to 90% of the total thickness of said laminate;
(c) another of said layers comprising a polymer selected from the group consisting of polyesters and copolyesters, said layer being stretch oriented;
(d) said multi-layer film having shrink tension in the range from 100 to about 400 p.s.i.; and,
(e) said film having a total thickness in the range between 0.1 mil and 2.0 mil.

4,188,444

METHOD OF COATING GLASS AND GLASS COATED THEREBY

Manfred Landau, Southport, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Feb. 23, 1978, Ser. No. 880,430

Claims priority, application United Kingdom, Mar. 1, 1977, 8641/77

Int. Cl.[2] C03C *17/30*

U.S. Cl. 428—428 **19 Claims**

1. In a method of coating glass with a silicon-containing coating, comprising moving the glass past a coating station while the temperature of the glass is at least 400° C., and releasing silane-containing gas close to the glass surface at a substantially constant pressure across the glass surface and under non-oxidising conditions so that the silane pyrolyses to deposit a silicon-containing coating on the glass surface, the improvement comprising including in the silane-containing gas a proportion of a gaseous electron-donating compound selected from the group consisting of olefin compounds, acetylenic hydrocarbons, aromatic hydrocarbons and ammonia, said compound imparting a predetermined alkali resistance to the silicon-containing coating.

16. Glass coated with a silicon-containing coating according to the method of claim 1, wherein the silicon-containing coating has a refractive index in the range 2.5 to 3.5, and has an alkali-resistance such that it shows no sign of damage to the unaided eye after immersion in 1 Normal sodium hydroxide at 90° C. for at least 60 seconds.

4,188,445

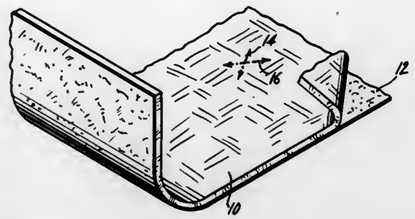
LAMINATED FABRIC OF POLYPROPYLENE

Philip R. Hill, Nuremberg, Pa., assignor to Chromatex, Inc., W. Hazeltine, Pa.

Continuation of Ser. No. 859,851, Dec. 12, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 971,804

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—246 **7 Claims**



5. A laminated fabric formed by the process of bonding a pre-formed layer of woven polypropylene yarns to a pre-formed layer of non-woven polypropylene material using a solvent-based adhesive at a temperature less than 200° F. to produce a unitary fabric structure having greater strength and stability characteristics than the layer of woven polypropylene yarns without shrinkage or distortion of the characteristics of the polypropylene yarns.

4,188,446

PAPER HAVING IMPROVED STRENGTH

Norman J. Friedman, Monmouth Junction, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 793,676, May 4, 1977, abandoned. This application Apr. 25, 1978, Ser. No. 900,042

Int. Cl.[2] D04H *1/58*

U.S. Cl. 428—288 **6 Claims**

1. A non-woven sheet material suitable for use in disposable garments, said sheet material comprising:
(a) cellulosic paper-making fibers;
(b) a cross-linked ethylene/vinyl acetate latex polymer binder; and
(c) in an amount sufficient to increase the strength of said sheet material, as measured by at least one of tensile strength, tear strength, or Mullen burst strength, an alkali metal monoalkylnaphthalene sulfonate, the alkyl group having from 3 to 8 carbon atoms.

4,188,447

POLYMERIC FOAM CLEANING PRODUCT

Peter Ehlenz, Konigswinter-Vinxel, Fed. Rep. of Germany, assignor to Collo GmbH, Bornheim-Hersel, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,262

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632545

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—310 **6 Claims**

1. A sustained release cleaning product for the controlled release of a surfactant comprising active substance depots which are porous particles with at least one absorbed surfactant, said porous particles being coated with a thin protective powder coating, said active substance depots being dispersed in a polymeric foam, said protective powder coating comprising powders of inorganic materials selected from the group consisting of sodium chloride, sodium sulfate and ammonium chloride.

4. A sustained release cleaning composition for the controlled release of a surfactant comprising a mixture of a flexible polyurethane adhesive having dispersed therein active substance depots, said depots comprising porous particles with at least one absorbed surfactant, said porous particles being coated with a thin protective powder coating of a substance selected from the group consisting of sodium chloride, sodium sulfate, ammonium chloride, and silica, said composition being coated on a substrate selected from the group consisting of polymer films, paper, fabric, fleeces and foams.

4,188,448

STEREO RETICULATED POLYMERIC LACE-LIKE STRUCTURE AND PROCESS FOR MAKING THE SAME

Paul T. Stricharczuk, Solon, and Dennis L. Lawson, Brunswick, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 659,412, Feb. 19, 1976, Pat. No. 4,062,915. This application Jun. 30, 1977, Ser. No. 812,024

Int. Cl.[2] B32B *3/26, 5/18*

U.S. Cl. 428—311 **6 Claims**



1. A stereo reticulated lace-like structure formed from a polymeric blend of (A) a polyurethane substantially free of cross-links made by the reaction of (1) an essentially linear hydroxyl terminated polyester made by the reaction of a dicarboxylic acid having the formula HOOC—R—COOH wherein R is an alkylene radical containing 2 to 8 carbon atoms with a glycol having the formula $HO(CH_2)_xOH$ wherein x is a number from 4 to 8; (2) a free glycol containing from 4 to 10 carbon atoms; and (3) a diphenyl diisocyanate, (B) an acrylic polymer comprising in 100 weight parts of polymer from about 40 to 97 weight parts of a lower acrylic acid ester, from 0 to 45 weight parts of a methacrylic acid ester, and from about 3 to 15 weight parts of an α,β-olefinically unsaturated carboxylic acid having a terminal $CH_2{=}C<$ group and containing from 3 to 4 carbon atoms, and (C) from about 0.1 to about 3.0 parts by weight, based on the weight of the polyurethane of a lubricant, said structure being non-woven containing a multiplicity of overlapping oriented fibrils in the plane of the non-woven structure and having a single ply basis weight in the range of about 0.2 to 4.0 ounces per square yard.

4,188,449

PHOSPHORESCENT SCREENS

Chen-i Lu, Rochester; Harry J. Krall, Webster, and Herman R. Osmers, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,875

Int. Cl.[2] B05B *5/00;* **D06L** *3/12*

U.S. Cl. 428—314 **35 Claims**

1. A phosphorescent screen comprising a support and a layer of finely-divided particles of a phosphor dispersed in a cross-linked, void-containing polymeric matrix, said layer having been formed by:
(1) coating said support with a radiation-curable composition comprising a suspension of said finely-divided phosphor particles in a viscous liquid composition, said viscous liquid composition comprising a first component that is capable of being radiation-cured to form a cross-linked polymeric matrix surrounding said phosphor particles and a second component that is capable of being evaporated to generate voids within said matrix,
(2) irradiating said coating to cure said first component and form thereby a cross-linked polymeric matrix surrounding said phosphor particles, and
(3) evaporating said second component simultaneously with or subsequent to said irradiating to thereby generate voids within said matrix.

4,188,450

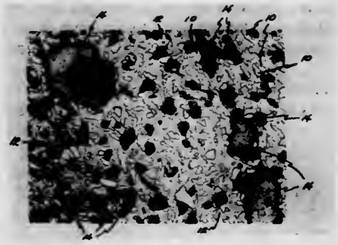
SHELL INVESTMENT MOLDS EMBODYING A METASTABLE MULLITE PHASE IN ITS PHYSICAL STRUCTURE

Charles D. Greskovich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1976, Ser. No. 698,909

Int. Cl.[2] B22C *13/08;* **B28B** *7/34, 7/36*

U.S. Cl. 428—329 **18 Claims**



1. A shell investment mold suitable for the casting and directional solidification of superalloys therein comprising
a ceramic material formed in situ as a reaction product of the chemical reaction between a mixture of alumina and a silica binder material which produces two solid phases consisting of mullite and unreacted alumina,
the reaction product has a microstructure which exhibits irregular shaped alumina particles disposed in a mixture of a mullite phase and an alumina liquid phase when the alumina-silica mixture is fired at about 1725° C. for up to 2 hours,
the composition of the alumina-silica material mixture when dried, and before firing, being from 80 to 90 weight percent alumina, the balance silica,
the average particle size of the alumina in the mixture is less than 100 microns, and
the average particle size of the silica in the mixture is less than 1000 A.

4,188,451

POLYCARBONATE ARTICLE COATED WITH AN ADHERENT, DURABLE, SILICA FILLED ORGANOPOLYSILOXANE COATING AND PROCESS FOR PRODUCING SAME

James S. Humphrey, Jr., Clemmons, N.C., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 895,790, Apr. 4, 1978, abandoned. This application Feb. 15, 1979, Ser. No. 12,579

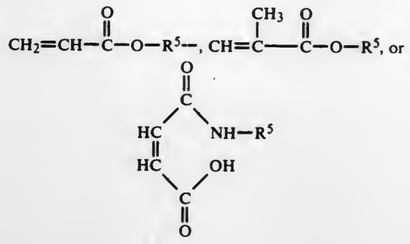
Int. Cl.[2] B32B *27/30, 27/08;* **G02B** *1/08*

U.S. Cl. 428—331 **43 Claims**

1. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having deposited thereon: (i) an ultraviolet radiation cured primer layer which contains the photoreaction products of (a) at least one polyfunctional acrylic acid ester monomer, and (b) at least one organic silicon compound represented by the general formula

$$R^4_cSiX_{4-c}$$

wherein c is an integer from 1 to 3 inclusive, X is an alkoxy, acyloxy or aryloxy radical, and R^4 represents a radical selected from



wherein R^5 is a divalent saturated aliphatic hydrocarbon radical; and (ii) having deposited on said primer layer a cured top coat containing a colloidal silica filled thermost organopolysiloxane.

16. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having thereon (i) an ultraviolet radiation cured primer layer, said cured primer layer being the photoreaction product of a primer composition containing at least one polyfunctional acrylic acid ester monomer, at least one organic silicon compound containing at least one organic group having olefinic unsaturation, a photoinitiator, and a compound selected from resorcinol monobenzoate, lower alkyl substituted resorcinol monobenzoate, or mixtures thereof; and (ii) a cured colloidal silica filled thermoset organopolysiloxane top coat on said cured primer layer, said top coat being the thermally cured product of a top coat composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of alkyl radicals containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

25. A process for producing a mar, abrasion, scratch and chemical solvent resistant polycarbonate article comprising the steps of:

(i) applying onto the polycarbonate an ultraviolet radiation curable primer composition containing (a) at least one polyfunctional acrylic acid ester monomer, (b) at least one organic silicon compound containing at least one organic group having olefinic unsaturation, (c) resorcinol monobenzoate, alkyl substituted resorcinol monobenzoate, or mixtures thereof, and (d) a photo-initiator;

(ii) curing said primer composition by exposure to ultraviolet radiation to form a cured primer layer;

(iii) applying onto said cured primer layer a silica filled further curable organopolysiloxane top coat composition comprising a dispersion of colloidal silica in a lower aliphatic-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of an alkyl radical containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of said silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0;

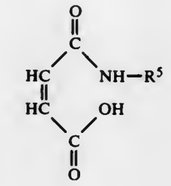
(iv) evaporating the volatile solvents from said composition; and,

(v) applying heat to said composition to cure said composition, whereby said silanol is condensed further to a silsesquioxane.

34. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having thereon (i) an ultraviolet radiation cured primer layer, said cured primer layer being the photoreaction product of a primer composition containing at least one polyfunctional acrylic acid ester monomer; at least one organic silicone compound containing at least one organic group having olefinic unsaturation and represented by the general formula $R^4_cSiX_{4-c}$ wherein X represents an alkoxy, acyloxy or aryloxy radical, R^4 represent a compound represented by the formula

$$CH_2{=}CYCOO{-}R^5{-},$$

and



wherein Y is hydrogen or methyl and R^5 is a divalent saturated aliphatic hydrocarbon radical, and c is an integer from 1 to 3, a photoinitiator, and a compound selected from resorcinol monobenzoate, lower alkyl substituted resorcinol monobenzoate, or mixtures thereof; and, (ii) a cured colloidal silica filled thermoset organopolysiloxane top coat on said cured primer layer, said top coat being the thermally cured product of a top coat composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of alkyl radicals containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

4,188,452

HEAT-REFLECTING GLASS PANE

Rolf Groth, Bochum-Wattenscheid, Fed. Rep. of Germany, assignor to BFG Glassgroup, Paris, France

Filed Oct. 6, 1977, Ser. No. 839,938

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646513

Int. Cl.[2] **G02B** *27/00;* **B32B** *9/04*

U.S. Cl. 428—336 **7 Claims**

1. A heat reflecting pane comprising a substantially transparent glass substrate, a layer of silicon oxide on the glass substrate, the thickness of said silicon oxide layer being such that interference effects are not caused thereby, and a layer of TiO_2 on the side of the layer of silicon oxide remote from said glass substrate, said layer of TiO_2 being at least predominantly in the rutile form and having been formed by applying a Ti layer to said silicon oxide layer by vapor deposition in vacuo and subsequently oxidizing said Ti layer at a temperature of at least 400° C.

4,188,453

Patent Not Issued For This Number

4,188,454

ORGANO SILANE COUPLING AGENTS OVERCOATED ON ALUMINUM SILICATE COATING ON GLASS FIBERS

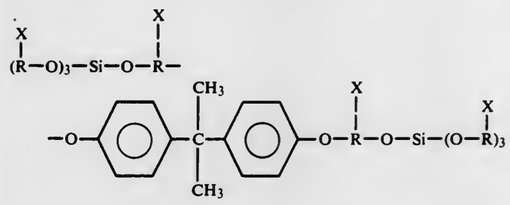
Kevin M. Foley, Toledo, and Homer G. Hill, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 612,077, Sep. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,102, May 24, 1974, abandoned. This application Feb. 13, 1978, Ser. No. 877,201

Int. Cl.[2] **B32B** *9/00*

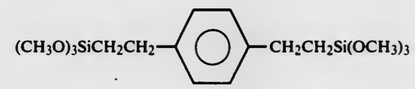
U.S. Cl. 428—391 **9 Claims**

1. A cementitious product comprising: a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcement materials is glass fibers having on their surfaces a uniform coating of organo silanes, containing at least two hydrolyzable silane groups represented by the formula:



wherein each R is an alkyl radical having 1 to 10 carbon atoms and each X is hydrogen, chlorine, bromine, fluorine, or iodine, and a coating of aluminum silicate between the organo silane coating and the cementitious matrix.

8. A cementitious product comprising: a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcement materials is glass fibers having on their surfaces a uniform coating of an organo silane having the following formula:



and a coating of aluminum silicate between the organo silane coating and the cementitious matrix.

4,188,455

ACTINIC RADIATION-CURABLE FORMULATIONS CONTAINING AT LEAST ONE UNSATURATED POLYETHER-ESTERURETHANE OLIGOMER

Dennis D. Howard, Girard, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 866,575, Jan. 3, 1978, Pat. No. 4,133,723. This application Jan. 9, 1979, Ser. No. 2,114

Int. Cl.[2] **C08G** *18/00, 63/00*

U.S. Cl. 428—423.1 **12 Claims**

1. A coating composition comprising

(a) at least one unsaturated resin comprising the reaction product of

(i) at least one organic isocyanate compound having at least two isocyanate groups;

(ii) at least one polyetherester polyol having at least two hydroxy groups and having the residue of at least one poly(alkylene oxide) polyol integrated into the backbone chain of such polyetherester polyol; and

(iii) at least one unsaturated addition-polymerizable monomeric compound having a single isocyanate-functional active hydrogen group;

there being present an excess of isocyanate compound with respect to the hydroxy groups of said polyetherester polyol;

said unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive hydrogen group being present in an amount sufficient to provide at least one molar equivalent of active hydrogen group with respect to isocyanate reactivity;

(b) a reactive diluent system comprising at least one unsaturated addition-polymerizable monomeric compound which is copolymerizable with said unsaturated urethane resin;

the amount of unsaturated urethane resin being in the range from about 30 to about 90 weight percent, based on total weight of unsaturated urethane resin and reactive diluent systems; and

(c) a photocatalyst system selected from the group consisting of

(i) at least one compound which promotes free radical addition polymerization through bimolecular photochemical reactions of the energy donor or energy transfer type, of the hydrogen abstraction type, or by the formation of a donor-acceptor complex with monomers or additives leading to ionic or radical species; and

(ii) at least one compound which promotes free radical addition polymerization through bimolecular photochemical reactions of the energy donor or energy transfer type, of the hydrogen abstraction type, or by the formation of a donor-acceptor complex with monomers or additives leading to ionic or radical species in association with at least one compound which promotes free radical addition polymerization by generating reactive specie by way of unimolecular homolysis.

4,188,456

PRESSURE-SENSITIVE RECORDING SHEET

Rashmikant R. Patel, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1977, Ser. No. 863,949

Int. Cl.[2] **B32B** *27/10, 27/42;* **B41M** *5/16*

U.S. Cl. 428—530 **12 Claims**

6. A pressure-sensitive record sheet material comprising a supporting web material having adhesively bound on the surface thereof a coating composition comprising a zinc-modified para-alkylphenol formaldehyde resin in which the alkyl moiety is selected from the group consisting of octyl and nonyl and about 0.5 to 6 parts by dry weight per 100 parts by dry weight of the composition of a metallic compound selected from the group consisting of calcium oxide, calcium hydroxide, and magnesium oxide, said resin and metallic compound combining to produce a color response when contacted with a color-producing material.

4,188,457

CLOSURES FOR LIQUID PRODUCT CONTAINERS

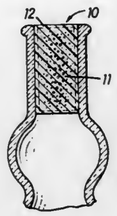
Arnold M. Throp, Harrow, England, assignor to Metal Box Limited, Reading, England

Filed Apr. 14, 1977, Ser. No. 787,630

Claims priority, application United Kingdom, Apr. 29, 1976, 17415/76

Int. Cl.² A23L *3/34*

U.S. Cl. 428—542 **22 Claims**



1. In a closure for a container of a wine or a wine-based product, at least a part of said closure intended to contact the product being in the form of a moulded stopper of a thermoplastics material having a foamed core within a liquid-impervious skin, the improvement comprising the feature that the foamed core has been produced by blowing the thermoplastics material with a blowing agent including a thermally decomposable metabisulphite and a water-producing compound, whereby said foamed core contains sulphur dioxide and water enabling the sulphur dioxide to act as an oxygen scavenger.

4,188,458

PROTECTIVE COATING ON A STEEL SURFACE

Evald Hugosson, Sankt Olof, and Anders Kullendorf, Finspong, both of Sweden, assignors to Stal-Laval Turbin AB, Sweden

Filed Apr. 6, 1977, Ser. No. 785,155

Claims priority, application Sweden, Apr. 8, 1976, 7604116

Int. Cl.² B32B *15/18*

U.S. Cl. 428—556 **25 Claims**

1. A steel surface coated with a protective coating which comprises at least three adjacent metallic layers of substantially increasing normal potential under the expected conditions of use in the presence of hot moist steam wherein the normal potential of the base layer adjacent the steel surface is the lowest of the three metallic layers and the normal potential of that layer located farthest from the steel surface of said at least three metallic layers is the highest of the three metallic layers; and wherein the base layer lying on the steel surface has approximately the same normal potential as does the steel surface, and wherein said base layer is at least one member selected from the group consisting of nickel-aluminum alloy, nickel, and molybdenum.

4,188,459

CORROSION RESISTANT PLATING AND METHOD UTILIZING ALLOYS HAVING MICRO-THROWING POWER

Jacob Hyner, Waterbury; Steven Gradowski, Torrington, and Thomas F. Maestrone, East Hartford, all of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.

Filed Sep. 27, 1978, Ser. No. 946,396

Int. Cl.² B32B *15/00, 15/18*

U.S. Cl. 428—648 **11 Claims**

1. A multi-layer plating for providing improved corrosion resistance to a ferrous metal substrate comprising, in sequence:

(a) a layer of an alloy having micro-throwing power,

(b) a layer of a galvanically protective metal which is selected from the group consisting of cadmium, cadmium-tin alloy, a dual layer of cadmium and tin, zinc or zinc alloy,

(c) a layer of copper,

(d) a layer of nickel, and

(e) a layer of chromium or a metallic chromium substitute selected from the group consisting of a ternary alloy comprising cobalt, tin and a third metal selected from antimony, zinc or a metal of Periodic Group III_A or VI_B, and a binary alloy comprising cobalt or tin.

4,188,460

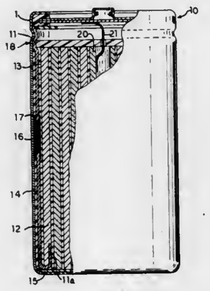
INTERNAL BATTERY FUSE

Hong Y. Kang, Newton, and Per Bro, Andover, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 1, 1978, Ser. No. 901,404

Int. Cl.² H01M *2/34*

U.S. Cl. 429—7 **7 Claims**



1. An electrochemical cell comprising a container containing a first electrode, a second electrode, liquid electrolyte and one or more current collectors electrically connected to at least one of said electrodes with said current collector electrically engaged with a section of said container characterized in that a portion of said current collector between said electrical connection and electrical engagement is enclosed by thermal shielding means and said enclosed portion is immersed in said electrolyte whereby excessive heat generated by ohmic dissipation within said current collector caused by a short circuit of said cell is retained within said enclosed portion to fuse said portion and interrupt the circuit.

4,188,461

LEAD-ACID BATTERIES

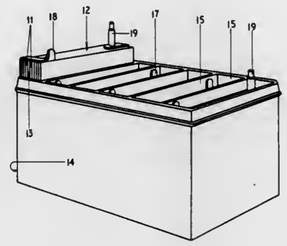
John A. Bant, Solihull, and Victor J. Raban, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

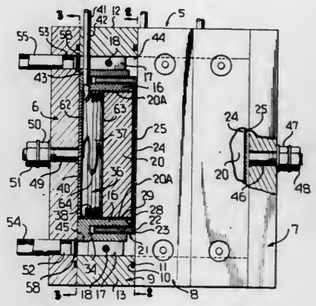
Filed Jan. 12, 1978, Ser. No. 868,784

Claims priority, application United Kingdom, Jan. 20, 1977, 2333/77

Int. Cl.² H01M *10/06, 10/44*

U.S. Cl. 429—48 **10 Claims**





1. A method of producing a lead-acid battery capable of activation by the addition of electrolyte thereto, comprising the steps of:

(a) starting with battery container accommodating at least one pack of battery plate grids having insulating separators interposed between adjacent grids, each of said grids carrying the lead-acid battery paste required to produce a positive or a negative battery plate after conversion of the paste into the active material of the plate,

(b) with the grids immersed in an aqueous solution of sulphuric acid, passing an eletric current between the grids so that the solution rises to a temperature in excess of 180° F. but not greater than 210° F., the passage of the electric current converting the paste on the grids to the active matrial of the plates,

(c) ceasing the passage of the electric current when sufficient of the paste has been converted to provide the plates with a charge in excess of 50% of the charge present when the battery is fully charged, then

(d) allowing the plates to stand in said solution for at least 15 minutes, then

(e) repeating the passage of an electric current so as to bring the plates to fully charged condition, and thereafter

(f) draining the sulphuric acid solution from the plates and then sealing the container against the ingress of air.

8. A lead-acid battery capable of storage by the addition of electrolyte thereto produced by a method as claimed in claim 1.

4,188,462

POWER MODULE ASSEMBLY WITH MONOPOLAR CELLS

Ronald I. Klootwyk, San Jose, Calif., assignor to The Continental Group, Inc., New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,564

Int. Cl.² H01M *2/38*

U.S. Cl. 429—68 **15 Claims**

1. A power module assembly comprising a pair of spaced end plates and a plurality of identical power cells mounted between end plates, each of said power cells comprising a tubular cell frame, means for sealing each cell frame to an adjacent cell frame, each cell frame including first and second sides, an anode guide means positioned within each cell frame in spaced relation to each first side and defining with each adjacent cell frame first side an electrolyte flow passage, an expendable anode mounted between said anode guide means for sliding movement through said cell frame, a screen supported on said anode guide means and engaged by a face of said anode, a cathode plate supported on said anode guide means in face-to-face engagement with said screen, electrolyte flow control means carried by said anode guide means for controlling the flow of electrolyte from one of said electrolyte flow passages to said screen and from said screen to the other of said electrolyte flow passages, a force exerting means within each cell frame and reacting on an associated anode for exerting a constant force on said associated anode to hold each anode in constant pressure contact with a respective one of said screens, and manifold means coupled to said electrolyte flow passages for supplying to and receiving electrolyte therefrom.

4,188,463

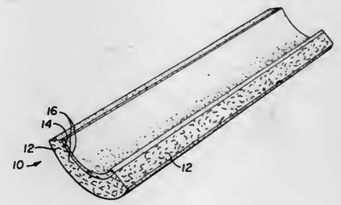
SODIUM-SULFUR BATTERY AND METHOD OF MAKING A DOUBLE CARBON MAT-COMPOSITE SULFUR ELECTRODE FOR USE IN SODIUM-SULFUR CELLS

Joseph D. Arcuri, Jr., Rexford, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 1, 1979, Ser. No. 8,379

Int. Cl.² H01M *4/36*

U.S. Cl. 429—104 **10 Claims**



1. A method for making a composite sulfur electrode for a

sodium-sulfur battery having a containment vessel and a solid electroyte element within said vessel comprising the steps of:

fluffing a selected amount of electrically conductive fibrous matrix material to establish an elastic porous structure having memory of expansion;

packing said porous structure under compression within a mold having a shape conforming to at least a portion of an interior of said containment vessel wherein said mold has a wall conforming to the shape of a surface portion of said solid electrolyte element within said vessel;

introducing molten sulfur into the porous structure in an amount sufficient to substantially permeate said porous structure; and thereafter

allowing the molten sulfur to solidify to form a composite sulfur electrode segment adapted to be inserted into said containment vessel.

4. An improved sodium-sulfur battery comprising a containment vessel, a solid electrolyte element within said containment vessel, and a sulfur electrode formed by the method of:

fluffing a selected amount of electrically conductive fibrous matrix material to establish an elastic porous structure having memory of expansion;

compressing said porous structure within a mold having a shape defining a segment, said segment conforming to a portion of an interior of said containment vessel, wherein said mold has a wall conforming to the shape of a surface portion of said solid electrolyte element within said vessel;

introducing a relatively thin layer of relatively high electrically resistive fibrous material between said porous structure and said electrolyte-shape-conforming wall;

introducing molten sulfur into said mold in an amount sufficient to substantially completely permeate said layer and said porous structure;

allowing said sulfur to cool to a solid to form a composite sulfur electrode segment adapted to be inserted into said containment vessel;

inserting a plurality of said segments into said containment vessel with said fibrous material impinging upon said solid electrolyte element; and

melting said sulfur in said plugs in order to allow said porous structure to expand within said contaiment vessel to form a sulfur electrode in said containment vessel having substantially uniform structure distribution and electrical contact with said electrolyte element.

4,188,464

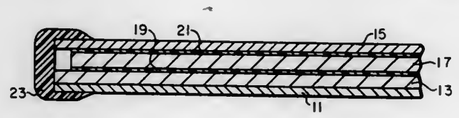
BIPOLAR ELECTRODE WITH INTERMEDIATE GRAPHITE LAYER AND POLYMERIC LAYERS

Robert G. Adams, Niagara Falls; Dirk Pouli; Dana H. Ridgley, both of Williamsville, and Donald E. Stephens, Grand Island, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,589

Int. Cl.[2] H01M *6/48*

U.S. Cl. 429—210 **11 Claims**



1. A composite electrode for use in a bipolar electrolytic cell comprising

(a) an anode face, comprised of a layer of a platinum group metal, metal oxide, or mixtures thereof, deposited on

(b) one face of a valve metal layer, the opposite face of said valve metal layer joined, and in electrical contact, along substantially its entire surface with

(c) one face of graphite layer, the opposite face of said graphite layer joined, and in electrical contact, along substantially its entire surface with

(d) one face of a cathode material layer, the opposite face of said cathode material layer, providing a cathode face, said valve metal layer, graphite layer, and cathode material layer being joined by a polymeric material on each face of said graphite layer.

4,188,465

STABILIZED UREASE COMPOSITION

Walter Schneider, Weilheim; Albert Roder, Seeshaupt; Hans Mollering, Tutzing, and Ingeborg Gutmann, Percha, uber Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,222

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612726

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—12 **14 Claims**

1. Stabilized urease composition comprising urease of a specific activity of from 25–1500 U/mg and, as a stabilizing agent, a stabilizing mixture of glutathione, ethylenediaminetetraacetic acid and citrate, wherein said citrate is present in stabilizingly effective amount.

4,188,466

AUTOMATIC METHOD FOR THE DETERMINATION OF STARCH

Pierre Thivend, Romagnat; Christiane Mercier-Greenwood, Antony, and André Guilbot, Nantes, all of France, assignors to I.N.R.A., Paris, France

Filed Jul. 6, 1977, Ser. No. 813,275

Claims priority, application France, Jul. 7, 1976, 76 21361

Int. Cl.[2] C12D *13/02*; G01N *31/14*

U.S. Cl. 435—18 **12 Claims**

1. The method of analyzing a series of substrates containing starch to determine the weight of the starch in each substrate therein, said method comprising the steps of:

A. suspending a sample of each substrate in particulate form in an aqueous medium to disperse said starch to produce a series of samples to be tested;

B. hydrolyzing the starch dispersion of each sample with an enzymatic hydrolysis preparation containing glucoamylase to convert the dispersed starch into glucose dissolved in the aqueous medium to obtain a hydrolysate, the hydrolyzing step carried out continuously by (1) forming a segmented flow, each segment of which is a mixture of a respective sample of the starch dispersion in the series thereof and the hydrolysis preparation, the segmented flow being constituted by the series of mixture segments isolated by gas-filled gaps which segregate the segments from each other, and (2) causing the segmented flow thus formed to circulate in a hydrolysis enclosure for a period sufficient to convert the dispersed starch in the aqueous medium in each of said mixture segments into glucose dissolved in said aqueous medium to produce a hydrolysate;

C. preparing a glucose solution from the hydrolysate obtained in each of said segments which contains at least a predetermined part of the glucose resulting from the hydrolysis; and

D. determining the weight of the glucose in said glucose solution to deduce therefrom the weight content of the starch in each substrate of said series thereof.

4,188,467

PROCESS FOR TEMPERING TISSUE FOR HEPARIN PRODUCTION

William E. Melby; Charles E. Isdale, Sr., and Vernon K. Collins, all of Champaign, Ill., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 743,373, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,807, Oct. 31, 1975, abandoned. This application Apr. 5, 1978, Ser. No. 893,652

Int. Cl.[2] C12B *1/00*; C08B *37/10*

U.S. Cl. 435—274 **8 Claims**

1. A process for tempering frozen heparin-bearing animal lung tissue without addition of water, preservatives or enzymes in preparation for isolation of heparin and to maximize heparin availability which comprises the steps of

(1) particulating said lung tissue,

(2) thawing and warming the particulated tissue from step 1, without added water or preservatives, in a heat exchanger and warming said lung tissue to 60°–85° F. within 2 to 30 minutes time using heat exchanger surfaces which do not exceed 140° F. and

(3) fermenting the warmed lung tissue from step 2 without added water or preservatives by spontaneous action of enzymes and bacteria endogenous to the tissue, no additional enzymes or bacteria being added, by holding it at a temperature within the range of about 60° to 85° F. for a period of 5 to 12 hours to substantially effect enzymatic conditioning of said tissue to maximize heparin availability.

4,188,468

PHENYL-SUBSTITUTED 5,6-DIHYDRO-PROSTACYCLIN ANALOGS

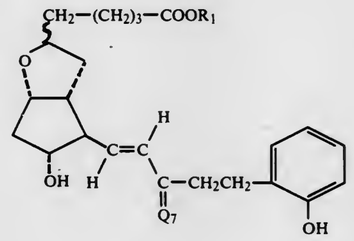
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 857,203, Dec. 5, 1977, Pat. No. 4,125,713, which is a continuation-in-part of Ser. No. 788,147, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,399, Jun. 1, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,373

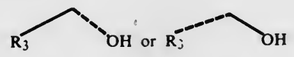
Int. Cl.[2] C07D *307/93*

U.S. Cl. 542—429 **15 Claims**

1. A compound of the formula



wherein Q_7 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_{19} is

(a) alkyl of one to 12 carbon atoms, inclusive,

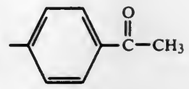
(b) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(c) aralkyl of 7 to 12 carbon atoms, inclusive,

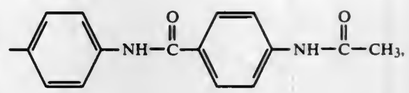
(d) phenyl,

(e) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

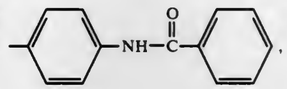
(f)



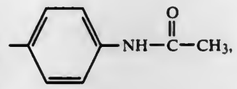
(g)



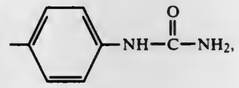
(h)



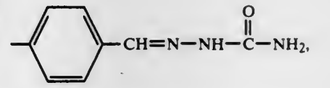
(i)



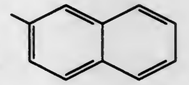
(j)



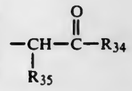
(k)



(l)



(m)



wherein R_{34} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{35} is hydrogen or benzoyl,

(n) hydrogen; or

(o) a pharmacologically acceptable cation and wherein ~ indicates attachment in alpha or beta configuration.

4,188,469

COMPOSITION OF HYDROPHILIC FLUOROPOLYMERS WITH FIBROUS MATTER AND LIQUID CARRIER

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,468

Int. Cl.[2] C08F *8/42, 8/40, 8/34*; C25B *13/08*

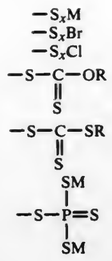
U.S. Cl. 526—18 **2 Claims**

1. A composition suitable for preparing a diaphragm for a chlor-alkali cell, the composition comprising

(a) a hydrophilic fluoropolymer containing nonterminal units represented by the structure



where Z is



where
M is hydrogen, sodium, potassium, lithium, calcium or magnesium;
R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and
x is 1, 2, 3, 4 or 5,
the hydrophilic fluoropolymer having a sulfur or phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.;
(b) a fibrous material resistant to attack by the cell liquor; and
(c) a liquid carrier.

4,188,470

PROCESS FOR POLYMERIZING ETHYLENE IN A GASEOUS PHASE

Amilcare Collina, Milan; Arrigo Soverini, Novara, and Francesco Rosati, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 11, 1978, Ser. No. 868,618
Claims priority, application Italy, Jan. 12, 1977, 19217 A/77
Int. Cl.² C08F *2/34, 4/02, 10/02*
U.S. Cl. 526—64 **6 Claims**

1. Process for the polymerization of ethylene in a gaseous phase, in a tubular reactor in which the flow of the gas consisting of ethylene or a mixture of ethylene with other gases, and having a flow rate comprised between 2 and 5 m/sec., carries the catalyst and the polymer particles that are formed at a mean velocity about equal for all the particles, the polymerization being conducted in the presence of a catalyst obtained by mixing at least one compound of a transition metal selected from the group consisting of titanium, vanadium, zirconium and chromium, with an organometallic compound or hydride of a metal belonging to Groups I to III of the Mendelyeev Periodic System, and having a starting polymerization speed such that a yield of at least 100,000 g of polymer/g of transition metal is obtained within the first 15 minutes of the polymerization reaction.

4,188,471

ORGANOCHROMIUM ON TITANIUM-IMPREGNATED BASE AS OLEFIN POLYMERIZATION CATALYST

Benny E. Nasser, Jr., and Joseph A. Delap, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1974, Ser. No. 529,551
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—96 **8 Claims**

1. A process for producing a catalyst comprising:
impregnating a particulate support of a silica coprecipitated with a titanium compound with a nonaqueous solution of tetraisopropyl titanate in an amount sufficient to give 0.5 to 3 weight percent titanium based on the weight of said support;
calcining said titanium-impregnated support in air at a temperature within the range of 900° to 1700° F.;
thereafter impregnating the thus calcined titanium-treated support with a nonaqueous solution of a π-bonded organochromium compound selected from dibenzene chromium or dicumene chromium in an amount sufficient to give 0.1 to 10 percent by weight of the organochromium compound per 100 parts by weight of said calcined support; and
thereafter heating the thus-organochromium-impregnated support in a nitrogen atmosphere at a temperature within the range of 300° to 400° F. for 0.5 to 20 hours to activate same.

4,188,472

CURABLE LACTONE DERIVED RESINS

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1978, Ser. No. 949,181
Int. Cl.² C08G *18/42*
U.S. Cl. 528—75 **23 Claims**

1. A curable lactone derived resin which is the reaction product of:
(a) from about 30 percent to about 95 percent by weight of a lactone modified resin of formula

wherein X is the organic radical formed by removing at least one hydroxyl hydrogen atom from an ester containing from 1 to 3 acrylyl or alpha-substituted acrylyl groups and one or two hydroxyl groups, R is hydrogen or an alkyl group having from 1 to 12 carbon atoms, x is from 4 to 7 and at least (x+2) R's are hydrogen, n has an average value of from about 0.2 to about 5, and a is 1 or 2; and
(b) from about 5 percent to about 70 percent by weight of an isocyanate.

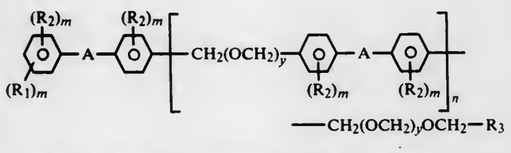
4,188,473

HIGH TEMPERATURE POLYMERS

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 394,011, Sep. 4, 1973, abandoned. This application Jan. 13, 1978, Ser. No. 869,337
Int. Cl.² C08G *65/00*
U.S. Cl. 528—86 **12 Claims**

1. A polymer derived by heating, in the presence of an acid catalyst at between about 140° and 165° C., a mixture consisting essentially of one monomeric compound selected from each of two or all four of the following groups
A. methoxy methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
B. methoxy poly(methoxy)methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
C. di[methoxy poly(methoxy)methyl] diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
D. methoxy methyl poly(phenoxyphenyl methylene) phenoxybenzene, any one of which A to D may contain unreacted diphenyl oxide or sulfide and bis(phenoxy phenyl) methane,
said compounds falling within the following generic formula



wherein each A represents a chalcogen independently selected from the group oxygen and sulfur; R_1 represents a member selected from the group hydrogen, $-CH_2(OCH_2)_yOCH_2-R_3$; each R_2 represents a member independently selected from the group consisting of R_1, halogen and an alkyl group of 1 to 10 carbon atoms; R_3 represents a member selected from the group consisting of H, methyl, ethyl and propyl; each m represents an independently selected integer from 1 to 2; n represents an integer from 0 to 60 and y represents an integer from 0 to 3.

4,188,474

EPOXY CURING ACCELERATOR

Harold G. Waddill, and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,819
Int. Cl.² C08G *59/56, 59/58*
U.S. Cl. 528—111 **8 Claims**

1. A method for accelerating the cure of an anhydride cured epoxy resin composition which comprises
(a) adding to the epoxy resin-anhydride composition an amount of oligomeric poly(ethylenepiperazine) effective for accelerating the cure of the composition and
(b) heating the resulting mixtures from (a) to effect a cure.

4,188,475

PROCESS FOR THE PREPARATION OF FLAME-RETARDANT POLYCARBONATES

Dieter Margotte, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 920,932
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732556
Int. Cl.² C08G *63/62*
U.S. Cl. 528—175 **8 Claims**

1. In a process for the preparation of an aromatic polycarbonate from diphenols by a two-phase interface process, the improvement wherein an aromatic monosulphonic acid chloride is used as a chain stopper in an amount of from about 2 mol % to 20 mol %, relative to the number of mols of diphenol.

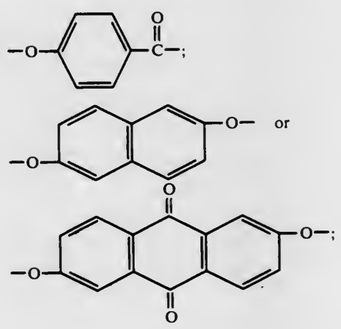
4,188,476

AROMATIC POLYESTER CONSISTING ESSENTIALLY OF P-OXYBENZOYL UNITS, TEREPHTHALOYL UNITS, 2,6-DIOXYNAPHTHALENE OR 2,6-DIOXYANTHRAQUINONE UNITS AND M-OXYBENZOYL OR 1,3-DIOXYPHENYLENE UNITS

Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

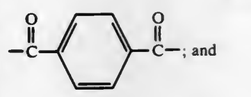
Filed Apr. 6, 1979, Ser. No. 27,939
Int. Cl.² C08G *63/18, 63/60*
U.S. Cl. 528—190 **8 Claims**

1. Fiber-forming copolyesters consisting essentially of units I, II, III and IV having the structural formulas:

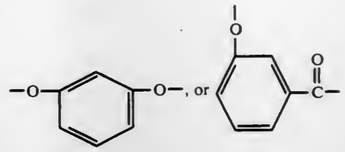


-continued

III



IV



in the proportions of about 50–70 mol % of Unit I, about 10–23 mol % of Unit II, about 15–25 mol % of Unit III and from about 2 to 10 mol % of Unit IV.

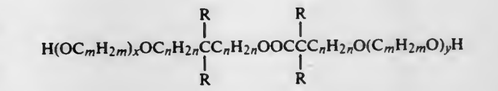
4,188,477

ISOCYANATE DERIVATIVES OF ESTER DIOL ALKOXYLATES AND COMPOSITIONS THEREOF

Oliver W. Smith, South Charleston; Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 837,720, Sep. 29, 1977. This application Jan. 4, 1979, Ser. No. 882
Int. Cl.² C08G *63/68*
U.S. Cl. 528—288 **20 Claims**

1. An isocyanate modified ester diol alkoxylate comprising the reaction product of (A) an ester diol alkoxylate of the general formula:



wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20 and R is an alkyl group having from 1 to 8 carbon atoms; and (B) from 0.025 to 0.9 isocyanato equivalent per hydroxyl equivalent of a polyisocyanate.

4,188,478

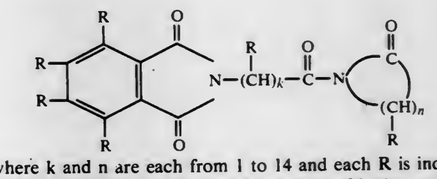
INITIATORS FOR LACTAM POLYMERIZATION HAVING FIRST FUNCTIONAL GROUP, INTERMEDIATE GROUP, SECOND FUNCTIONAL GROUP

Charles V. Goebel, Jr., Wyomissing, Pa., assignor to The Polymer Corporation, Reading, Pa.

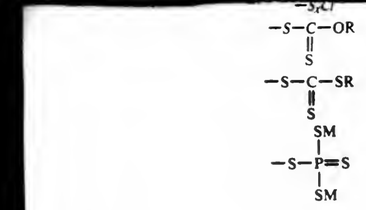
Filed Nov. 20, 1978, Ser. No. 961,868
Int. Cl.² C08G *69/18*
U.S. Cl. 528—314 **4 Claims**

1. A method for the base catalized polymerization of lactams to form solid products comprising reacting a lactam in the presence of catalyst with an initiator of the general formula:

II



where k and n are each from 1 to 14 and each R is independently selected from the group consisting of hydrogen, alkyl having 1 to 13 atoms, aryl, substituted aryl, halogen, nitro, nitroso, amino, alkyl substituted amino, carboxyl, and carboalkoxy.



where
M is hydrogen, sodium, potassium, lithium, calcium or magnesium;
R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and
x is 1, 2, 3, 4 or 5,
the hydrophilic fluoropolymer having a sulfur or phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.;
(b) a fibrous material resistant to attack by the cell liquor; and
(c) a liquid carrier.

4,188,470

PROCESS FOR POLYMERIZING ETHYLENE IN A GASEOUS PHASE

Amilcare Collina, Milan; Arrigo Soverini, Novara, and Francesco Rosati, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 11, 1978, Ser. No. 868,618
Claims priority, application Italy, Jan. 12, 1977, 19217 A/77
Int. Cl.² C08F *2/34, 4/02, 10/02*
U.S. Cl. 526—64 **6 Claims**

1. Process for the polymerization of ethylene in a gaseous phase, in a tubular reactor in which the flow of the gas consisting of ethylene or a mixture of ethylene with other gases, and having a flow rate comprised between 2 and 5 m/sec., carries the catalyst and the polymer particles that are formed at a mean velocity about equal for all the particles, the polymerization being conducted in the presence of a catalyst obtained by mixing at least one compound of a transition metal selected from the group consisting of titanium, vanadium, zirconium and chromium, with an organometallic compound or hydride of a metal belonging to Groups I to III of the Mendelyeev Periodic System, and having a starting polymerization speed such that a yield of at least 100,000 g of polymer/g of transition metal is obtained within the first 15 minutes of the polymerization reaction.

4,188,471

ORGANOCHROMIUM ON TITANIUM-IMPREGNATED BASE AS OLEFIN POLYMERIZATION CATALYST

Benny E. Nasser, Jr., and Joseph A. Delap, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1974, Ser. No. 529,551
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—96 **8 Claims**

1. A process for producing a catalyst comprising:
impregnating a particulate support of a silica coprecipitated with a titanium compound with a nonaqueous solution of tetraisopropyl titanate in an amount sufficient to give 0.5 to 3 weight percent titanium based on the weight of said support;
calcining said titanium-impregnated support in air at a temperature within the range of 900° to 1700° F.;
thereafter impregnating the thus calcined titanium-treated support with a nonaqueous solution of a π-bonded organochromium compound selected from dibenzene chromium and bis(cyclopentadienyl) chromium; and thereafter heating the thus-organochromium-impregnated support in a nitrogen atmosphere at a temperature within the range of 300° to 400° F. for 0.5 to 20 hours to activate same.

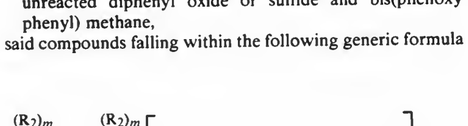
4,188,472

CURABLE LACTONE DERIVED RESINS

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1978, Ser. No. 949,181
Int. Cl.² C08G *18/42*
U.S. Cl. 528—75 **23 Claims**

1. A curable lactone derived resin which is the reaction product of:
(a) from about 30 percent to about 95 percent by weight of a lactone modified resin of formula



wherein X is the organic radical formed by removing at least one hydroxyl hydrogen atom from an ester containing from 1 to 3 acrylyl or alpha-substituted acrylyl groups and one or two hydroxyl groups, R is hydrogen or an alkyl group having from 1 to 12 carbon atoms, x is from 4 to 7 and at least (x+2) R's are hydrogen, n has an average value of from about 0.2 to about 5, and a is 1 or 2; and
(b) from about 5 percent to about 70 percent by weight of an isocyanate.

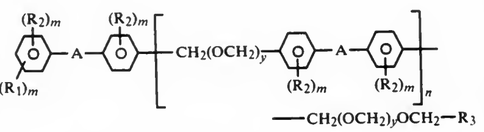
4,188,473

HIGH TEMPERATURE POLYMERS

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 394,011, Sep. 4, 1973, abandoned. This application Jan. 13, 1978, Ser. No. 869,337
Int. Cl.² C08G *65/00*
U.S. Cl. 528—86 **12 Claims**

1. A polymer derived by heating, in the presence of an acid catalyst at between about 140° and 165° C., a mixture consisting essentially of one monomeric compound selected from each of two or all four of the following groups
A. methoxy methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
B. methoxy poly(methoxy)methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
C. di[methoxy poly(methoxy)methyl] diphenyl oxide or sulfide or their alkyl or halogenated derivatives;
D. methoxy methyl poly(phenoxyphenyl methylene) phenoxybenzene, any one of which A to D may contain unreacted diphenyl oxide or sulfide and bis(phenoxy phenyl) methane,
said compounds falling within the following generic formula



wherein each A represents a chalcogen independently selected from the group oxygen and sulfur; R_1 represents a

and propyl; each m represents an independently selected integer from 1 to 2; n represents an integer from 0 to 60 and y represents an integer from 0 to 3.

4,188,474

EPOXY CURING ACCELERATOR

Harold G. Waddill, and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,819
Int. Cl.² C08G *59/56, 59/58*
U.S. Cl. 528—111 **8 Claims**

1. A method for accelerating the cure of an anhydride cured epoxy resin composition which comprises
(a) adding to the epoxy resin-anhydride composition an amount of oligomeric poly(ethylenepiperazine) effective for accelerating the cure of the composition and
(b) heating the resulting mixtures from (a) to effect a cure.

4,188,475

PROCESS FOR THE PREPARATION OF FLAME-RETARDANT POLYCARBONATES

Dieter Margotte, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 920,932
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732556
Int. Cl.² C08G *63/62*
U.S. Cl. 528—175 **8 Claims**

1. In a process for the preparation of an aromatic polycarbonate from diphenols by a two-phase interface process, the improvement wherein an aromatic monosulphonic acid chloride is used as a chain stopper in an amount of from about 2 mol % to 20 mol %, relative to the number of mols of diphenol.

4,188,476

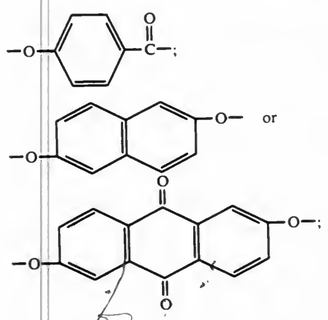
AROMATIC POLYESTER CONSISTING ESSENTIALLY OF P-OXYBENZOYL UNITS, TEREPHTHALOYL UNITS, 2,6-DIOXYNAPHTHALENE OR 2,6-DIOXYANTHRAQUINONE UNITS AND M-OXYBENZOYL OR 1,3-DIOXYPHENYLENE UNITS

Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

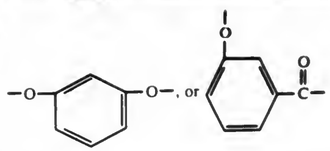
Filed Apr. 6, 1979, Ser. No. 27,939
Int. Cl.² C08G *63/18, 63/60*
U.S. Cl. 528—190 **8 Claims**

1. Fiber-forming copolyesters consisting essentially of units I, II, III and IV having the structural formulas:

I



II



in the proportions of about 50–70 mol % of Unit I, about 10–23 mol % of Unit II, about 15–25 mol % of Unit III and from about 2 to 10 mol % of Unit IV.

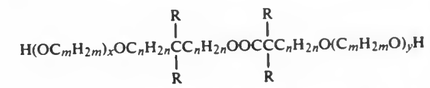
4,188,477

ISOCYANATE DERIVATIVES OF ESTER DIOL ALKOXYLATES AND COMPOSITIONS THEREOF

Oliver W. Smith, South Charleston; Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 837,720, Sep. 29, 1977. This application Jan. 4, 1979, Ser. No. 882
Int. Cl.² C08G *63/68*
U.S. Cl. 528—288 **20 Claims**

1. An isocyanate modified ester diol alkoxylate comprising the reaction product of (A) an ester diol alkoxylate of the general formula:



wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20 and R is an alkyl group having from 1 to 8 carbon atoms; and (B) from 0.025 to 0.9 isocyanato equivalent per hydroxyl equivalent of a polyisocyanate.

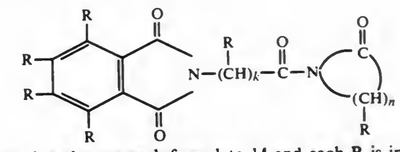
4,188,478

INITIATORS FOR LACTAM POLYMERIZATION HAVING FIRST FUNCTIONAL GROUP,INTERMEDIATE GROUP, SECOND FUNCTIONAL GROUP

Charles V. Goebel, Jr., Wyomissing, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Nov. 20, 1978, Ser. No. 961,868
Int. Cl.² C08G *69/18*
U.S. Cl. 528—314 **4 Claims**

1. A method for the base catalized polymerization of lactams to form solid products comprising reacting a lactam in the presence of catalyst with an initiator of the general formula:



where k and n are each from 1 to 14 and each R is independently selected from the group consisting of hydrogen, alkyl having 1 to 13 atoms, aryl, substituted aryl, halogen, nitro, nitroso, amino, alkyl substituted amino, carboxyl, and carboalkoxy.

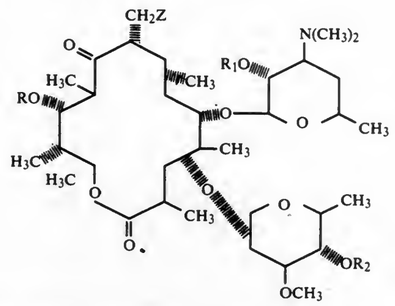
4,188,479

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C_8 MODIFICATIONS

Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Apr. 10, 1978, Ser. No. 894,897
Int. Cl.² C07H *17/08*
U.S. Cl. 536—9 **2 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms; and

Z is —Cl.

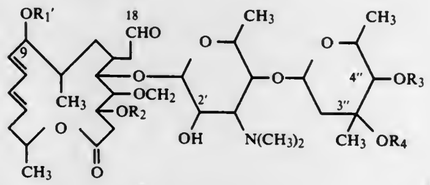
4,188,480

PROCESS FOR THE PRODUCTION OF A 9,3″-DI-ACYL DERIVATIVE OF A MACROLIDE ANTIBIOTIC

Takeshi Nakamura; Satoru Nakabayashi, both of Yokohama; Shunzo Fukatsu, and Shigeo Seki, both of Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 933,188
Claims priority, application Japan, Aug. 15, 1977, 52-97071
Int. Cl.² C07H *1/00*
U.S. Cl. 536—17 R **10 Claims**

1. A process for the production of a 9,3″-di-acyl derivative of a macrolide antibiotic of the formula:



wherein R_1' and R_4 are each a group

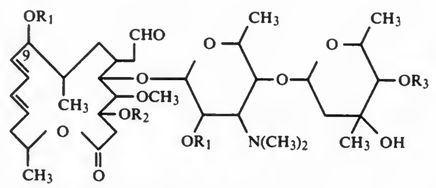


in which R is alkyl of 1–6 carbon atoms, aralkyl of 6–10 carbon atoms or phenyl-alkenyl of 8–11 carbon atoms; R_2 is acetyl or propionyl; and R_3 is a group



in which R′ is methyl, ethyl, propyl, isopropyl or isobutyl, which comprises:

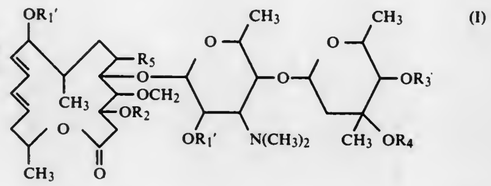
(a) acylating a macrolide antibiotic or a monoacyl derivative thereof of the formula:



where R_1 is hydrogen or a group

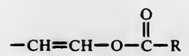


in which R is as defined above, and R_2 and R_3 are each as defined above, by reacting the macrolide antibiotic or its monoacyl derivative with an organic acid halide of the formula RCOX wherein R is alkyl of 1–6 carbon atoms; aralkyl of 6–10 carbon atoms or phenyl-alkenyl of 8–11 carbon atoms and X is halogen, in an inert organic solvent under anhydrous conditions and in the presence of a molecular sieve consisting essentially of a synthetic zeolite having a pore diameter of 3–5 Angstroms at a temperature of 50°–90° C. to produce at least one acylation product of the formula:



(I)

wherein R_1', R_2, R_3 and R_4 are as defined above and R_5 is $-CH_2CHO$ or



in which R is as defined above, and

(b) partially deacylating the resultant acylation product by partially and selectively hydrolyzing it in an aqueous alkanol to remove the 2′-acyl group R_1' and the 18-acyl group when present to produce the 9,3″-di-acyl derivative of the macrolide antibiotic.

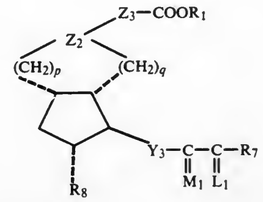
4,188,481

PYRAN ANALOGS OF 2,3,4,5-TETRADEHYDRO-PGI₁ COMPOUNDS

John C. Sih, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,541, Aug. 3, 1977, Pat. No. 4,109,082. This application May 8, 1978, Ser. No. 904,190
Int. Cl.² C07D *311/94*
U.S. Cl. 542—426 **79 Claims**

1. A prostacyclin analog of the formula



wherein one of p and q is one and the other is zero; wherein Z_3 is trans—CH=CH—; wherein Y_3 is

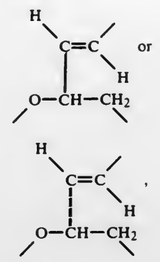
(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

(4) —C≡C—,

wherein Z_2 is



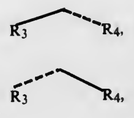
(1) or (2)

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl; wherein M_1 is

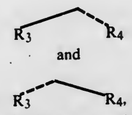


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is



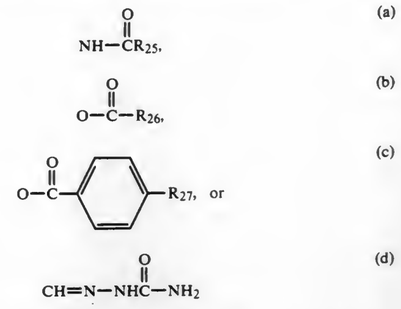
or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

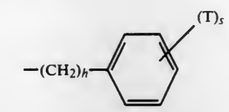


(a), (b), (c), or (d)

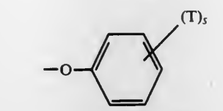
wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl; phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

wherein R_7 is

(1) $—(CH_2)_m—CH_3$,



(2)



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl .

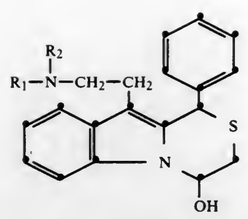
4,188,482

THIAZINO INDOLE COMPOUNDS

Harold Zinnes, Rockaway, and Martin L. Schwartz, Parsippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 4, 1978, Ser. No. 902,584
Int. Cl.² A61K *31/54;* C07D *513/04*
U.S. Cl. 544—32 **8 Claims**

1. A compound of the formula



where R_1 and R_2 are alkyl groups having 1 to 6 carbon atoms and the corresponding pharmaceutically acceptable acid addition salts.

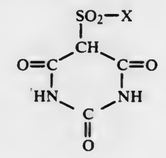
4,188,483

5-ALKYLSULPHONYL- AND 5-ALKENYLSULPHONYLBARBITURIC ACIDS AND DERIVATIVES THEREOF

Karl Hoegerle, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 8, 1978, Ser. No. 903,633
Claims priority, application Luxembourg, May 9, 1977, 77288
Int. Cl.[2] C07D *239/62*
U.S. Cl. 544—302 **8 Claims**

1. A compound of the formula I



(I)

or a salt thereof, wherein X represents alkenyl having 2–4 carbon atoms, alkyl having 1–6 carbon atoms, which is unsubstituted or substituted by substituents selected from the group consisting of 1 to 3 halogen atoms, alkoxy having a 1–6 carbon atoms, phenyl or naphthyl.

4,188,484

(2-PYRIMIDINYL-THIO)-ALKANOIC ACID AMIDES AND THEIR PREPARATION

Carlo Scolastico, and Giovanni Tronconi, both of Milan, Italy, assignors to L'Instituto Farmaceutico S.p.A., Balsamo, Italy

Continuation of Ser. No. 771,579, Feb. 24, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,094
Claims priority, application Italy, Mar. 17, 1976, 21317 A/76
Int. Cl.[2] A61K *31/505;* **C07D** *239/42, 413/12;* **A61K** *31/535*
U.S. Cl. 544—317 **11 Claims**

1. A compound selected from the group consisting of
[4-chloro-6-(2,3-xylidino-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N,N-bis-β-hydroxyethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-N-α-methyl-β-hydroxyethyl)-acetamide,
[4-chloro-6-(p-chloroanilino)-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-benzylamino-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-anilino-2-pyrimidinyl-thio](N-β-hydroxyethyl)-acetamide,
[4-chloro-6-p-methoxyanilino)-2-pyrimidinyl-thio]-(N-β-hydroxyethyl-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-β-mercaptoethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-3-hydroxypropyl)-acetamide, and
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-4-hydroxybutyl)-acetamide.

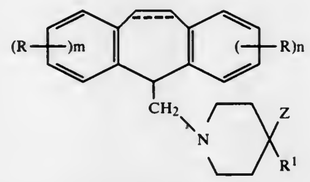
4,188,485

1-[(10,11-DIHYDRO-5H-DIBENZO[A,D]-CYCLOHEPTEN-5-YL)METHYL]-4-SUBSTITUTED PIPERIDINES AND RELATED COMPOUNDS

Michael J. Kukla, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 16, 1978, Ser. No. 916,040
Int. Cl.[2] C07D *405/06, 409/06, 211/58, 211/48*
U.S. Cl. 546—202 **14 Claims**

1. A compound having the formula



or a non-toxic pharmaceutically acceptable acid addition salt thereof; wherein R in each occurrence represents hydrogen, halogen, alkyl radical of 1 to 7 carbon atoms, or trifluoromethyl, alike or different; R^1 is hydrogen or alkyl radical of 1 to 7 carbon atoms; Z is hydroxy or NR^2R^3 group wherein R^2 and R^3 are each hydrogen or alkyl radical of 1 to 7 carbon atoms or R^2 and R^3 together with the N-atom represent an azamonocyclic ring which contains from 4 to 6 carbon atoms; m and n are each alike or different integer from 1 to 4 inclusive; and the dotted line represents optional double bond.

4,188,486

2-SUBSTITUTED BENZIMIDAZOLE COMPOUNDS

Goro Tsukamoto, Toyonaka; Koichiro Yoshino, Settsu; Toshihiko Kohno, Sakai; Masahiro Taguchi, Settsu; Katsumi Dezawa, Settsu; Hajime Kagaya, Settsu; Keiso Ito, Osaka, and Takashi Nose, Suita, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,969
Claims priority, application Japan, Dec. 7, 1976, 51-148495; Apr. 7, 1977, 52-40072
Int. Cl.[2] C07D *401/02*
U.S. Cl. 546—271 **6 Claims**

1. An anti-inflammatory compound selected from the group consisting of
2-(6-methylpyridin-2yl)-5(6)-methylbenzimidazole;
2-(6-methylpyridin-2yl)-5(6)-methylbenzimidazole;
2-(6-methylpyridin-2-yl)-5(6)-chlorobenzimidazole;
2-(5-ethylpyridin-2-yl)-benzimidazole; and
2-(6-ethylpyridin-2-yl)-benzimidazole.

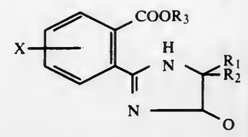
4,188,487

IMIDAZOLINYL BENZOIC ACIDS, ESTERS AND SALTS AND THEIR USE AS HERBICIDAL AGENTS

Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 822,458, Aug. 8, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,244
Int. Cl.[2] C07D *233/04*
U.S. Cl. 548—301 **20 Claims**

1. A compound having the structure:



wherein X is hydrogen, alkyl C_1–C_3, halogen or nitro; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, or when R_1 and R_2 are taken together with the carbon to which they are attached they may represent cycloalkyl C_3–C_6 optionally substituted with methyl; R_3 is hydrogen, alkyl C_1–C_{12} optionally substituted with one C_1–C_3 alkoxy group or one C_3–C_6 cycloalkyl group or one phenyl group, alkenyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituents(s), alkynyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s), benzyl, cyclohexenylmethyl, ethynylcyclohexyl, ethynylallyl or pentadienyl, cycloalkyl C_3–C_6 optionally substituted with one or two C_1–C_3 alkyl group(s); or a salt-forming cation of alkali metals, ammonium and lower aliphatic ammonium, and when R_1 and R_2 are not the same the optical isomers thereof, and the isomeric mixtures thereof; and except when R_3 is a slat-forming cation, the acid addition salts thereof.

4,188,488

ODORANT AND/OR FLAVORING DISULPHIDES, COMPOSITIONS CONTAINING SAME AND PROCESS FOR MAKING SAME

Paul Dubs, Züg, and Heiner Kuntzel, Dübendorf, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 726,100, Sep. 24, 1976, Pat. No. 4,130,562. This application May 15, 1978, Ser. No. 906,294
Claims priority, application Switzerland, Oct. 1, 1975, 12728/75; Jul. 20, 1976, 9280/76
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—337 **5 Claims**

1. A disulfide having the formula:

$$R_1—(Y)_n—S—S—R_2$$

wherein R_1 is C_{1-6}-alkyl substituted 2-imidazolyl group, Y is an optionally mono- or di-C_{1-6}alkyl substituted methylene group, n is an integer from 0 to 5, and R_2 is a C_{1-6}-alkyl group.

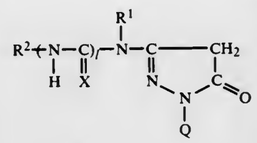
4,188,489

PROCESS FOR THE PRODUCTION OF 3-SUBSTITUTED AMINO-5-PYRAZOLONES

Masatoshi Sugiyama, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

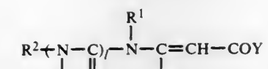
Filed Apr. 16, 1976, Ser. No. 677,452
Claims priority, application Japan, Apr. 16, 1975, 50-45996
Int. Cl.[2] C07D *231/52*
U.S. Cl. 548—360 **12 Claims**

1. A process for producing 3-substituted amino-5-pyrazolones containing at least one sulfo group represented by formula (I) which comprises reacting a β-substituted amino-β-alkoxy acrylic acid derivative represented by formula (II) and a hydrazine containing at least one sulfo group represented by formula (III) in a mixture of acetic acid and triethylamine,



(I)

-continued



(II)

(III)

wherein

R^1 is a hydrogen atom, a perfluoroalkyl group containing 1 to 12 carbon atoms, an alkyl group containing 1 to 18 carbon atoms, a cycloalkyl group containing 5 to 7 carbon atoms, an aralkyl group containing 7 to 13 carbon atoms or a monocyclic aryl group;

R^2 is a perfluoroalkyl group containg 1 to 12 carbon atoms, an alkyl group containing 1 to 18 carbon atoms, an alkenyl group containing 2 to 5 carbon atoms, a cycloalkyl group containing 5 to 7 carbon atoms, an aralkyl group containing 7 to 13 carbon atoms, a monocyclic or bicyclic aryl group or a carboxylic acyl group containing 2 to 8 carbon atoms, an alkylsulfonyl group containing 1 to 4 carbon atoms or an aryl sulfonyl group; l is 0 or 1 and where l is 0, R^1 and R^2 may combine with each other to form a pyrrolidine, piperidine, morpholine or piperazine ring;

R^3 is an aliphatic group containing 1 to 6 carbon atoms or an aralkyl group containing 7 to 8 carbon atoms;

X is oxygen or sulfur;

Y is a hydroxy group, an alkoxy, an aralkoxy group or a primary, secondary or tertiary amino group; and

Q is an alkyl group containing 1 to 6 carbon atoms and at least one sulfo group, a substituted alkyl group containing 2 to 5 carbon atoms and one substituent thereof is a sulfo group and another substituent is a hydroxy group, an alkoxy group, a halogen atom or an alkenyl group, whose total carbon atom number exclusive of those in the substituents is not more than 5, an aryl group containing at least one sulfo group, or an aralkyl group containing at least one sulfo group.

4,188,490

CATALYTIC OXIDATION OF ETHYLENE TO MIXTURES OF ACETIC ACID AND VINYL ACETATE

James A. Hinnenkamp, Cincinnati, Ohio, and John A. Scheben, Erlanger, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 27, 1977, Ser. No. 801,282
Int. Cl.[2] C07C *53/08, 67/00*
U.S. Cl. 560—245 **9 Claims**

1. A process for catalytically oxidizing ethylene to mixtures of acetic acid and vinyl acetate which comprises reacting ethylene and oxygen in the presence of steam within the temperature range of from about 150° C. to about 250° C. in the vapor phase in contact with a catalytically effective amount of a catalyst system comprising palladium metal on a zinc oxide support in the presence of a sulfur-containing catalyst modifier having from two to four atoms of oxygen associated with each sulfur atom.

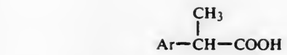
4,188,491

PREPARATION OF THERAPEUTIC COMPOUNDS

John S. Nicholson, Beeston, and John L. Turner, East Leake, both of England, assignors to The Boots Company Limited, England

Continuation of Ser. No. 672,300, Mar. 31, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,644
Claims priority, application United Kingdom, Apr. 4, 1975, 13817/75
Int. Cl.[2] C07C *63/33*
U.S. Cl. 562—492 **6 Claims**

1. A process for preparing a compound of formula I



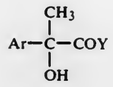
I

wherein Ar is a 4-biphenylyl group which comprises reacting a Grignard compound obtained from Ar_1Br and magnesium, wherein Ar_1 is Ar, with a compound of formula II



II

wherein Z is ONa, and acidifying the mixture to give a compound of formula III



III

where Y is OH and converting this to the compound of formula I.

4,188,492

PROCESS FOR CONVERTING 2,2-DICHLOROVINYLCYCLOPROPANES TO DIBROMOVINYL ANALOGS

Kiyoshi Kondo, and Kiyohide Matsui, both of Kanagawa, Japan, assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 875,650, Feb. 6, 1978, abandoned. This application Jan. 3, 1979, Ser. No. 737

Int. Cl.[2] C07C *51/00, 67/30*

U.S. Cl. 562—506 **6 Claims**

1. A process for preparing 3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylic acid or a lower alkyl ester thereof which comprises exchanging the chlorine atoms in 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylic acid or a lower alkyl ester thereof with bromine atoms wherein said exchange is effected in a solvent with HBr and the product of the reaction of HBr with aluminum or an aluminum salt.

4,188,493

PROCESS FOR RECOVERING CMOS

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 28, 1977, Ser. No. 781,574

Int. Cl.[2] C07C *59/23, 51/42*

U.S. Cl. 562—580 **16 Claims**

1. In a process for recovering water soluble salts of carboxyalkyloxy succinic acids from an aqueous system thereof containing a precipitate of alkaline earth metal or zinc carbonate, the improvement of adjusting the pH of the aqueous system to about 6 to 9, treating the pH-adjusted system with an alkali metal carbonate, maintaining the treated system at a temperature of from about 70° to about 125° C. and separating precipitated alkaline earth metal carbonate from the system while maintaining the temperature within said temperature range.

4,188,494

HYDROGEN FLUORIDE REMOVAL FROM GLYCOLIC ACID

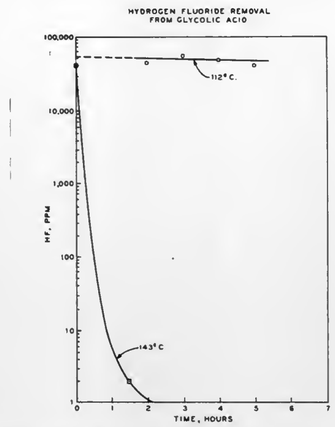
Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 790,221, Apr. 25, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,333

Int. Cl.[2] C07C *59/06*

U.S. Cl. 562—580 **4 Claims**

1. In a process for the removal of hydrogen fluoride by inert gas stripping or distillation from a crude glycolic acid obtained by the hydrogen fluoride catalyzed reaction of formaldehyde and carbon monoxide, the improvement which comprises effecting said removal at a temperature in excesss of about 130° C. at atmospheric pressure to produce polyglycolide, thereafter hydrolyzing said polyglycolide and recovering pure glycolic acid.



4,188,495

1,9-DIHYDROXYOCTAHYDROPHENANTHRENES AND INTERMEDIATES THEREFOR

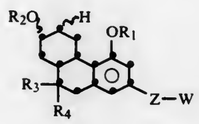
Thomas H. Althuis, Groton; Charles A. Harbert, Waterford; Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,503

Int. Cl.[2] C07C *43/20;* A61K *31/085*

U.S. Cl. 568—633 **13 Claims**

1. A compound selected from the group consisting of those having the formulae



I

wherein

R_1 is hydrogen, benzyl, benzoyl or alkanoyl of 1 to 5 carbon atoms;

R_2 is selected from hydrogen, alkanoyl of 1 to 6 carbon atoms and benzoyl;

R_3 is selected from hydrogen, methyl and ethyl;

R_4 is selected from hydrogen, alkyl of 1 to 6 carbon atoms and benzyl;

Z is selected from:

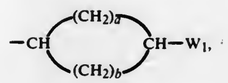
(a) alkylene having from one to nine carbon atoms;

(b) $-(alk_1)_m-X-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from 1 to 9 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 9;

m and n are each 0 or 1;

X is selected from O, S, SO and SO_2; and

W is selected from hydrogen, methyl, phenyl, monochlorophenyl, monofluorophenyl and



wherein W_1 is selected from hydrogen, phenyl, monochlorophenyl and monofluorophenyl; a is an integer from 1 to 5 and b is 0 or an integer from 1 to 4, with the proviso that the sum of a and b is not greater than 5.

4,188,496

PROCESS FOR PREPARING 2,2-BIS(4-HYDROXY-PHENYL) PROPANE FROM DISTILLATION BY-PRODUCTS THEREOF

Donald B. G. Jaquiss, New Harmony, and Lawrence C. Mitchell, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,667

Int. Cl.[2] C07C *37/44, 37/24*

U.S. Cl. 568—723 **6 Claims**

1. A process for the production of 2,2-bis(4-hydroxyphenyl)-propane from by-products which contain products isomerizable to 2,2-bis(4-hydroxyphenyl)propane and which remain after purification distillation of 2,2-bis(4-hydroxyphenyl)propane produced by the condensation of phenol and acetone, said process comprising

(i) preparing a starting mixture of by-products and phenol, said by-products containing products isomerizable to 2,2-bis(4-hydroxyphenyl)propane;

(ii) adding anhydrous hydrogen bromide to the starting mixture and isomerizing said by-products to 2,2-bis(4-hydroxyphenyl)propane at ambient pressure; and

(iii) subsequently recovering said 2,2-bis(4-hydroxyphenyl)-propane.

4,188,497

PURIFICATION OF 3,5-XYLENOL

Leendert Huizer; Dirk J. Van Namen, and Pieter J. D. Oranje, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1978, Ser. No. 872,132

Claims priority, application United Kingdom, Feb. 2, 1977, 4201/77

Int. Cl.[2] C07C *37/06, 37/22*

U.S. Cl. 568—799 **4 Claims**

1. In the process in which isophorone is heated to a temperature of about 450° C. to about 650° C. in the presence of a homogeneous catalyst comprising a halogen having an atomic number of at least 17 or an organic compound containing said halogen to produce a liquid reaction mixture containing 3,5-xylenol and halogen residues from which reaction mixture the halogen residues are subsequently removed, the improvement which comprises contacting, at a temperature of from about 100° to about 200° C. for a period of approximately 0.5 to 5 hours, the reaction mixture with at least one metal selected from the group consisting of zinc, iron, magnesium, cadmium, cobalt, and nickel, using from about 0.01% to about 5% by weight of the metal, based on the weight of 3,5-xylenol in the reaction mixture, thereby removing halogen residues from the reaction mixture.

4,188,498

PROCESS FOR PRODUCING LINALOOL

Atsuo Murata; Shuji Tsuchiya; Hideo Suzuki, and Hisao Ikeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,753

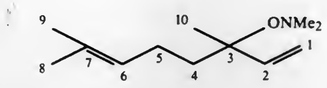
Claims priority, application Japan, May 18, 1977, 52-57385

The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.

Int. Cl.[2] C07C *33/02*

U.S. Cl. 568—875 **10 Claims**

1. A process for producing linalool which comprises hydrogenating O-linalyl-N,N-dimethyl hydroxylamine having the formula



(I)

wherein Me represents a methyl group and the reference numerals 1 to 10 represent 1 to 10 carbon positions, under a hydrogen partial pressure of lower than 30 kg/cm^2 in the presence of a catalyst which is a combination of a first component selected from the group consisting of Ni, Co and mixtures thereof with a modifying component selected from the group consisting of Al, Ge, Sn, As, Sb, S, Se and Cr.

4,188,499

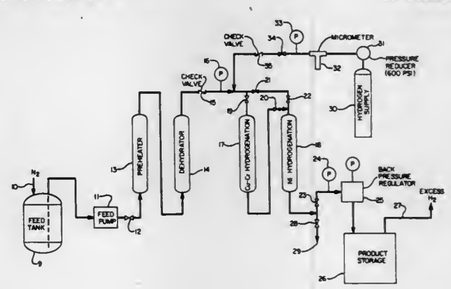
PURIFICATION OF ALCOHOL

Thomas J. Walter, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 678,148, Apr. 19, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,269

Int. Cl.[2] C07C *29/24*

U.S. Cl. 568—914 **15 Claims**



1. A process for treating alcohol containing at least an impurity amount of radicals of the type (>CHOH) to provide a product having a lesser amount of (>CHOH) radicals which comprises, contacting said alcohol at a temperature of from about 200° to about 300° C., in the liquid phase with an uncalcined alkali metal hydroxide treated alumina catalyst.

12. A process in accordance with claim 1 wherein the alcohol is subjected to hydrogenation concurrently with the treatment or subsequent thereto to reduce the iodine value of the alcohol.

4,188,500

CONVERSION OF SULFONIC ACIDS INTO A HYDROCARBON OIL OF SUPERIOR OXIDATION STABILITY

David S. Bosniack, and Paul F. Korbach, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 749,595, Dec. 10, 1976, Pat. No. 4,110,196. This application Mar. 30, 1978, Ser. No. 891,583

Int. Cl.[2] C10G *23/00*

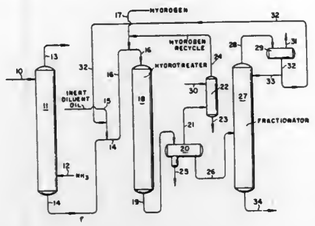
U.S. Cl. 585—1 **7 Claims**

1. A process for converting a sulfonic acid or a mixture of sulfonic acids into a hydrocarbon oil of superior oxidation stability comprising:

(a) transforming said sulfonic acid or mixture of sulfonic acids into a sulfonic acid ester or a mixture of sulfonic acid esters;

(b) reacting said ester or mixture of esters with hydrogen in

the presence of a hydrotreating catalyst to cleave the carbon-sulfur bonds of said ester or esters; and



(c) recovering a hydrocarbon oil or superior oxidation stability from the reaction products of step (b).

4,188,501

PURIFICATION OF MONOOLEFIN-CONTAINING HYDROCARBON STREAM

Mark R. Rycheck, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1978, Ser. No. 936,954
Int. Cl.[2] C07C *3/62*; C10G *29/16*
U.S. Cl. 585—643 **10 Claims**

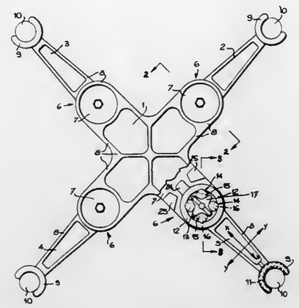
1. A process for the removal of catalyst poisons from hydrocarbons which comprises contacting under vapor phase conditions a monoolefin-containing hydrocarbon stream contaminated with catalyst poisons with a solid adsorbent selected from the group consisting of the stable oxides of calcium, titanium, zinc and zirconium at a temperature not exceeding about 300° C. and for a period of time sufficient to yield an olefin-containing stream substantially free of said catalyst poisons.

4,188,502

SPACER-DAMPER

Jean-Guy Gagne, Montreal, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Dec. 18, 1978, Ser. No. 970,734
Int. Cl.[2] H02G *7/14, 7/12*
U.S. Cl. 174—42 **30 Claims**



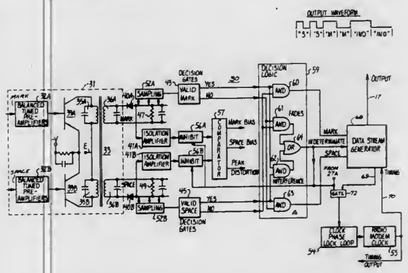
1. A spacer-damper of the type for separating bundled subconductors of a power transmission line and for damping vibrations generated in those subconductors, comprising a metallic frame; a plurality of metallic arms mounted around said frame, each arm having one extremity shaped so as to receive one of said subconductors and another extremity which is connected to said frame by means of a joint; each joint comprising a cheek wherein a ring is fitted, four shoulder means disposed radially and symmetrically on the inner wall of said ring, four pairs of elastomers mounted inside said ring and making a right angle with respect to one another, the elastomers of each pair being spaced from one another by one of said shoulder means, a central pivot set between the pairs of elastomers and inside the ring of said joint, and means for fixing said pivot to said cheek of each joint.

4,188,503

DIGITAL DATA COMMUNICATIONS SYSTEM

Carmine N. Pagano, Newark, and Anthony D. Di'Giorgio, East Brunswick, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,150
Int. Cl.[2] H04L *27/14*; H03D *3/00*
U.S. Cl. 178—88 **6 Claims**



1. A digital data communications system for reception of mark information of a first frequency and space information of a second frequency, comprising:

a first frequency discriminator means tuned to said first frequency for providing a first output level representative of available mark information;

a second frequency discriminator means tuned to said second frequency for providing a second output level representative of available space information;

a first decision gating circuit means in the output of said first frequency discriminator means for producing one pair of binary outputs indicating the presence and absence, respectively, of a corresponding mark-representative output level;

a second decision gating circuit means in the output of said second frequency discriminator means for producing another pair of discrete binary outputs indicating the presence and absence, respectively, of a corresponding space-representative output level; and

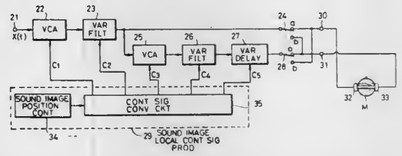
decision logic circuit means connected to said pairs of discrete binary outputs of said decision gating circuit means and having a ternary output circuit, and ternary output circuit including a first terminal at which a mark output signal appears during the presence of a mark-representative binary output only, a second terminal at which a space output signal appears during the presence of a space-representative binary output level only, and a third output terminal at which an information indeterminate condition-indicating output signal appears indicative of either the simultaneous presence of mark and space information or the simultaneous absence of mark and space information.

4,188,504

SIGNAL PROCESSING CIRCUIT FOR BINAURAL SIGNALS

Masao Kasuga, Sagamihara; Nobuaki Takahashi, Yamato; Masaaki Sato, Yokohama; Kohji Seki, Ichikawa; Toshinori Mori, Fujisawa, and Makoto Iwahara, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 25, 1978, Ser. No. 899,892
Claims priority, application Japan, Apr. 25, 1977, 52-47585; Apr. 25, 1977, 52-47586; Apr. 25, 1977, 52-47587; Apr. 25, 1977, 52-47588; May 6, 1977, 52-51862; May 6, 1977, 52-51863
Int. Cl.[2] H04R *5/04*
U.S. Cl. 179—1 GP **6 Claims**



1. A binaural signal processing circuit comprising:

first means for imparting an input signal with a first transfer characteristic equal to the transfer characteristic hL (t; θ, r) from a sound source to one of the ears of a listener who is near the sound source, where θ represents an angle between the front direction of the listener and the sound source, and r represents a distance between the sound source and the listener; said first transfer characteristic being variable and corresponding to first control signals applied to said first means;

second means for imparting the input signal with a second transfer characteristic equal to the transfer characteristic hR (t; θ, r) from the sound source to the other ear of the listener, said second transfer characteristic being variable and corresponding to second control signals applied to said second means;

sound image position control device means for producing signals corresponding to coordinates of a position where a sound image is to be localized, wherein the listener lies at the origin of the coordinate system;

control signal conversion means for converting the output

signals of said sound image position control device means into the first and second control signals; and

means for deriving binaural signals from said first and second transfer characteristic imparting means.

4,188,505

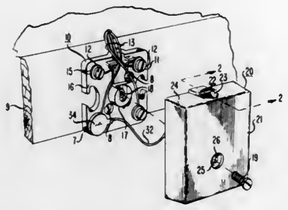
MODULAR JACK CONVERTER

Robert J. O'Connor, Greenfield, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,410

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—1 PC **12 Claims**



1. A jack assembly (**20**) for connecting to a telephone terminal block (**10**) having a plurality of screw terminals (**11**) with screw heads (**12**), where each screw terminal electrically connects to a predetermined one of a plurality of incoming telephone distribution wires (**13**), the jack assembly being of the type comprising:

a housing (**21**) made of dielectric material;

a jack (**22**) included in the housing, the jack having contact elements (**27**) for forming electrical connection with conductors from a station set or the like; and

a plurality of leads (**32**) each having a first end (**31**) and a second end (**33**), the first end of the leads being electrically connected to respective contact elements (**27**) and the second ends being electrically connected to connectors (**34**) which effect electrical contact with the assigned screw terminals, characterized in that each connector comprises:

a contact body (**37**), made of a conductive material, comprising:

a base (**40**); and

a plurality of resilient members (**42**), each with one end connected to the base and the other end being free-standing, the members at their free end portions (**45**) defining an opening (**48**) for snugly receiving its assigned screw head, where the free end portions can bear against the screw head to effect electrical connection.

4,188,506

METHOD AND INSTALLATION FOR MASKED SPEECH TRANSMISSION OVER A TELEPHONE CHANNEL

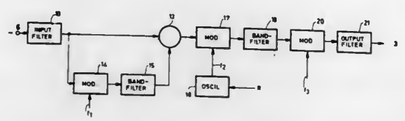
Pierre Schmid, Oberweningen; Eduard Brunner, Oberengstringen, and Walter Stofer, Buchs, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Continuation of Ser. No. 482,873, Jun. 25, 1974. This application May 20, 1976, Ser. No. 688,347

Claims priority, application Switzerland, Jul. 2, 1973, 9627/73

Int. Cl.[2] H04K *1/00, 1/04*

U.S. Cl. 179—1.5 R **26 Claims**



1. A method for the masked or scrambled transmission of spoken information over a telephone channel with the aid of control signals generated at the transmitting end and at the receiving end which comprises the steps of:

(a) dividing the original speech band at the transmitting end into at least two first spectral sub-bands,

(b) delaying one of said sub-bands in time with respect to the other sub-band,

(c) adding the signals of said sub-bands up to provide an aggregate signal,

(d) dividing said aggregate signal by means of a plurality of modulation operations into at least two second complementary sub-bands,

(e) interchanging the relative position of said second sub-bands within the band-width of said aggregate signal,

(f) controlling the ratio of the width of said second sub-bands by said control signal generated at the transmitting end,

(g) transmitting said second interchanged sub-bands as a transmission signal over the telephone channel,

(h) subjecting said transmission signal at the receiving end to the same modulation operations as the aggregate signal at the transmitting end,

(i) dividing the aggregate signal thereby recovered at the receiving end into said at least two sub-bands,

(j) delaying said other sub-band in time with respect to said one sub-band, and

(k) adding said delayed and undelayed sub-bands thereby to form a signal which is at least similar to the original speech signal.

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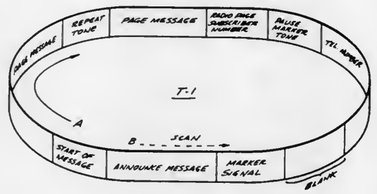
REMOTELY CONTROLLED TELEPHONE ANSWERING APPARATUS

Kalju Meri, Maspeth, and Richard G. Allen, Pound Ridge, both of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,444

Int. Cl.[2] H04M *1/64, 3/42*

U.S. Cl. 179—6 D **28 Claims**



1. Telephone answering apparatus adapted to be coupled to a telephone communication channel, and comprising:

a first record medium having an announcement message recorded thereon, followed by telephone number information representing a predetermined telephone number, followed by a page message;

first transducer means associated with said first record medium for reproducing said announcement message, said telephone number information and said page message;

first drive means selectively energizable to drive said first record medium relative to said first transducer means;

a second record medium for storing incoming messages received from said telephone communication channel;

second transducer means associated with said second recording medium and selectively operative to record said incoming messages thereon and to reproduce recorded messages therefrom;

second drive means selectively energizable to drive said second record medium bidirectionally relative to said second transducer means;

line seizing means actuable in response to an incoming telephone call for seizing said telephone communication channel to operably connect said telephone answering apparatus thereto and for initiating a telephone answering cycle whereby said first drive means is energized for an announce period such that said announcement message is reproduced and transmitted over said telephone communication channel and then said second drive means is energized to enable an incoming message to be recorded on said second record medium;

means for sensing the termination of said incoming telephone call to de-energize said second drive means and de-actuate said line seizing means;

timing means responsive to the energizing of said second drive means for timing the duration of the incoming message of said incoming telephone call said timing means being de-energized in response to the de-actuation of said line seizing means if said duration is less than a predetermined time and being energized to provide an energize signal if said duration exceeds said predetermined time;

means for applying said energize signal to said line seizing means to re-seize said telephone communication channel and to re-energize said first drive means such that said telephone number information and said page message are reproduced and transmitted over said telephone communication channel;

code detecting means for detecting a first coded signal transmitted over said seized telephone communication channel to said telephone answering apparatus for energizing said second drive means to drive said second record medium such that said recorded incoming messages are reproduced therefrom; and

programmable repeat means selectively operable to re-energize said first drive means and to re-actuate said line seizing means for re-connecting said telephone answering apparatus to said telephone communication channel to transmit said telephone number information and said page message over said telephone communication channel, said repeat means operating either a number of times, preselected as desired, following the completion of an incoming telephone call or until said second drive means is energized, prior to said preselected number of operations, for recording or reproducing incoming messages on said second record medium.

4,188,508

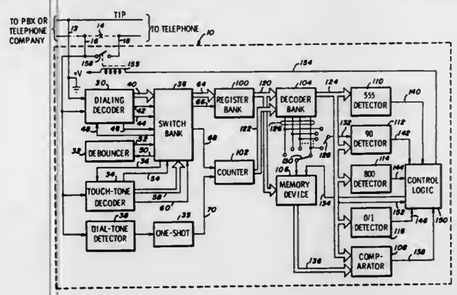
TELEPHONE CALL RESTRICTING APPARATUS

Herbert I. Rogers, 558 Hawthorne Ave., Palo Alto, Calif. 94301; Michael C. Chappelle, 9464 Laguna Cr. Dr., Elk Grove, Calif. 95624; Robert G. Brindle, 915 Burnett, San Francisco, Calif. 94131, and Patrick A. Brindle, Abbey of the Holy Trinity, Huntsville, Utah 84317

Filed Aug. 21, 1978, Ser. No. 935,656

Int. Cl.[2] H04M *1/66*

U.S. Cl. 179—18 DA **8 Claims**



1. A telephone call restricting apparatus for connection to a telephone line for preventing the completion of a toll call by a telephone device connected to the line, the apparatus comprising:

decoder means for connection to the line, said decoder means being responsive to signals develpoed on said line as each digit of a telephone number is dialed including pre-prefix digits, prefix digits, area code digits, central office digits and local number digits and operative to generate decoded digit signals;

means for storing at least some of said decoded digit signals;

means for comparing the decoded digit signals when stored with a prestored list including information relative to whether a predetermined combination of central office digits correspond to a permissible local call, and for developing a first signal when the central office digits portion of said stored digit signals does not correspond to that of a local call;

first detector means for monitoring said stored decoded digit signals and for developing a second signal when the first digit of said stored decoded digit signals corresponds to a "0" or to a "9" followed by a "0";

second detector means for monitoring said stored decoded digit signals and for developing a third signal when the second area code digit of said stored decoded digit signals corresponds to a "0" or a "1";

third detector means for monitoring said stored decoded digit signals and for developing a fourth when the central office digits of said stored decoded digit signals correspond to the number "555";

fourth detector means for monitoring said stored decoded digit signals and for developing a fifth signal when the area code digits of said stored decoded digit signals correspond to the number "(800)";

logic means responsive to said first signal or said second signal and operative to develop a sixth signal and responsive to said third signal and operative to develop said sixth signal in the absence of said fourth signal and said fifth signal; and

means responsive to said sixth signal and operative to abort the call so as to prevent completion of a toll call.

4,188,509

TONE SIGNALLING ARRANGEMENT FOR A TELECOMMUNICATIONS EXCHANGE

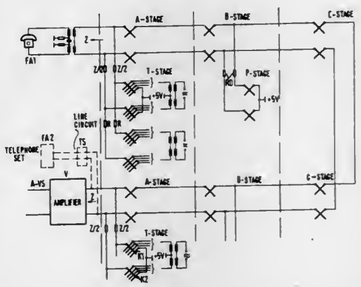
Peter Münchow, Stuttgart, and Walter Kaiser, Leinfelden, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,287

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2740104

Int. Cl.[2] H04M *3/58*

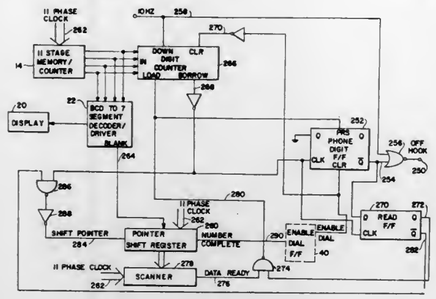
U.S. Cl. 179—18 AD **7 Claims**



1. A multiple stage, processor controlled crosspoint switching network having an inlet side for coupling to stations and an outlet side for folding connection through the network to complete a path therethrough, an auxiliary crosspoint stage for tone transmission coupled in parallel with a first stage of the network and coupled to the inlet side of the network, a source of tones coupled to said auxiliary stage to pass tone signals through crosspoints of the auxiliary stage to a station coupled

to the inlet side of said network, and in which there are terminating resistors of said auxiliary stage coupled to said inlet side of the network.

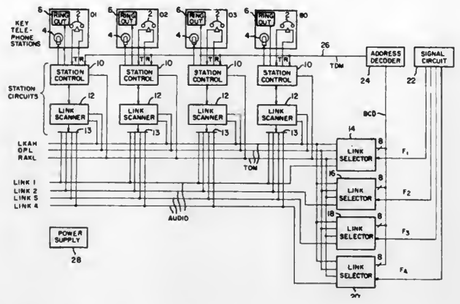
4,188,510
TELEPHONE SEQUENTIAL NUMBER DIALER WITH NUMBER INCREMENTING
David S. Bower, Sunrise, and Fred J. Smith, Plantation, both of Fla., assignors to Digital Products Corporation, Fort Lauderdale, Fla.
Division of Ser. No. 799,141, May 23, 1977. This application Jul. 3, 1978, Ser. No. 921,561
Int. Cl.[2] H04M *1/27*
U.S. Cl. 179—90 BD **5 Claims**



1. Automatic telephone dialing apparatus comprising:
means for storing a telephone number to be called;
a counter;
a shift register having a leading end and a trailing end, the number of bit positions in said shift register being one more than the maximum number of digits to be dialed;
means for inserting in said shift register a plurality of consecutive ONES starting at said leading end, the number of ONES equaling the difference between the number of shift register bit positions and the number of digits of the telephone number to be called;
means for scanning said shift register bit positions starting at the leading end;
means for inserting into said counter from said storing means the digits of the stored telephone number in sequence in synchronism with the scanning of said shift register whenever a ONE is detected in a bit position of said shift register;
means for decrementing said counter;
means responsive to said counter being decremented for generating a dial pulse; and
means responsive to said counter reaching a count of zero for terminating said dial pulse generation.

4,188,511
MULTI-LINK TELEPHONE INTERCOM SYSTEM
Maurice I. Smith, Redmond; John D. Gillen, Kirkland, and Gerald L. Edwards, Seattle, all of Wash., assignors to Tone Commander Systems, Inc., Redmond, Wash.
Filed Jan. 27, 1978, Ser. No. 873,157
Int. Cl.[2] H04M *9/06*
U.S. Cl. 179—99 A **20 Claims**

1. A communication system for providing communication between a plurality of stations, the system comprising: means providing a plurality of communication links; a plurality of station circuits respectively operable with separate stations, each said station circuit including link scanner means for seizing an available link, and effecting a connection with a seized link; and a plurality of link selector circuits respectively associated with separate links, each said link selector circuit including means responsive to seizure of its associated link by a calling station link scanner for causing a called station link

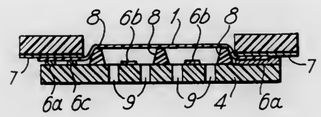


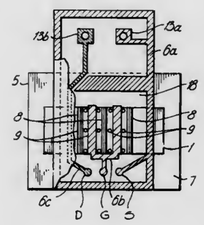
scanner to effect connection with the link seized by the calling station link scanner.

4,188,512
TELEPHONE HOOKSWITCH ACTUATOR AND HANDSET SUPPORT ASSEMBLY
John M. Lord, Bensenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Nov. 22, 1978, Ser. No. 962,818
Int. Cl.[2] H04M *1/08*
U.S. Cl. 179—100 C **8 Claims**

1. An actuator and support assembly for use in a telephone instrument allowing said telephone instrument to be usable in a horizontal or alternatively a vertical position, said telephone instrument including a handset unit having receiving means thereon, a base unit having a top surface arranged to accept said handset unit and an aperture in said top surface and including switching means within said base unit, said actuator and support assembly comprising:
a first actuator for operating said switching means, outwardly extending from said aperture;
a second actuator in mutual association with said first actuator outwardly extending from said aperture and operable in a first condition when said telephone instrument is used in a horizontal position and alternatively in a second condition when said telephone instrument is used in a vertical position;
retaining means selectively positionable out of contact with said second actuator placing said second actuator in said first condition or into contact with said second actuator placing said second actuator in said second condition; and
said second actuator in said first condition responsive to positioning said retaining means, and said handset unit manually positioned on said base unit top surface, to displace said first actuator inwardly, operating said switching means and said second actuator simultaneously following said first actuator, and alternatively said second actuator in said second condition responsive to positioning said retaining means, and said handset unit manually positioned on said base unit top surface, to displace said first actuator inwardly operating said switching means and said second actuator retained outwardly to accommodate said handset unit receiving means thereon supporting said handset unit on the base unit.

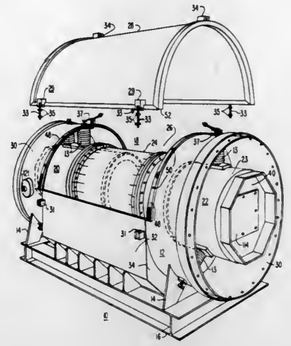
4,188,513
ELECTRET MICROPHONE WITH SIMPLIFIED ELECTRICAL CONNECTIONS BY PRINTED CIRCUIT BOARD MOUNTING
Ronald J. Morrell, Romoka; Beverley W. Gumb, and Algirdas J. Dragunevicius, both of London, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Nov. 3, 1978, Ser. No. 957,539
Int. Cl.[2] H04R *19/04*
U.S. Cl. 179—111 E **15 Claims**





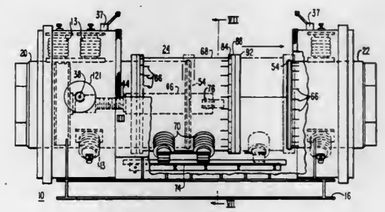
1. An electret microphone assembly comprising:
a first circuit board having a first conducting pattern on an obverse surface thereof and at least one perforation therethrough;
a second circuit board having a second conducting pattern on an obverse surface thereof and at least one perforation therethrough;
an electret diaphragm located between said circuit boards with a charged surface thereof facing the first circuit board conducting surface and a conducting surface thereof facing the second circuit board conducting surface;
spacing means adjacent said first circuit board to space one portion of the electret from a first conducting area of said first conducting pattern, said spacing means and said spaced electret part being accommodated in the perforation of at least one of the boards; and
clamping means clamping said first and second circuit boards together said circuit boards having matched contours at a junction region, in which region another portion of said electret is clamped to mount said one portion of the electret over the spacing means and in which region said conducting patterns electrically contact and cooperate with said electret conducting surface to electrically connect first and second terminals located on the reverse side of one of the circuit boards respectively to the first conducting area and to the electret conducting surface.

4,188,514
TELESCOPING DISCONNECT SWITCH WITH GASKETED COVERED ACCESS PORT
Jayant M. Patel, Cincinnati, Ohio; Jerome K. Wolfe, Murrysville, and Paul P. Koren, North Strabane Township, Washington County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 1, 1978, Ser. No. 956,815
Int. Cl.[2] H02B *1/08;* H01H *9/02, 31/00*
U.S. Cl. 200—48 R **9 Claims**



1. An isolated phase bus disconnect switch comprising:
a housing of conductive material, said housing comprising an access port for maintenance and inspection;
a fixed center conductor disposed within said housing and electrically insulated therefrom;
a movable center conductor disposed within said housing and electrically insulated therefrom, said movable conductor cooperating with said fixed conductor to perform a switching function therewith;
a cover of conductive material removably covering said access port;
a conductive gasket of metal braid disposed between said housing and said cover; and
means for applying contact pressure upon said cover, said conductive gasket, and said housing to provide a low resistance electrical path therethrough.

4,188,515
TELESCOPING DISCONNECT SWITCH WITH LOW RESISTANCE CENTER CONDUCTOR
Jayant M. Patel, Cincinnati, Ohio, and James R. Farley, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 1, 1978, Ser. No. 956,818
Int. Cl.[2] H01H *1/04, 1/06, 51/02*
U.S. Cl. 200—48 R **7 Claims**



1. A conductor assembly for a telescoping disconnect switch, comprising:
a conductor member constructed of a first conductive mate-

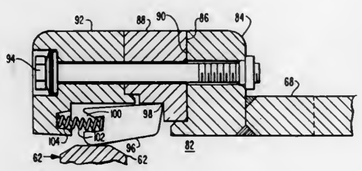
rial having a first thermal coefficient of expansion and adapted for fixed series connection to an electrical circuit being switched;
a contact member constructed of a second conductive material having a second thermal coefficient of expansion and adapted for separable series connection to an electrical circuit being switched, said contact member being fixedly connected to said conductor member;
low-resistance conductive material plated upon the portion of said conductor member held in contact with said contact member; and
low-resistance conductive material plated upon the portion of said contact member held in contact with said conductor member;
said conductor member comprising a plurality of slots formed therein to permit said conductor member to flex in response to resistance heating while reducing relative motion between said conductor member and said contact member.

4. An isolated phase bus disconnect switch, comprising:
a pair of axially spaced cylindrical fixed conductor members, each having first contact means fixedly attached thereto, said conductor members and said contact means being constructed of conductive materials having different thermal coefficients of expansion, adjoining surfaces of said conductor members and said first contact means being plated with material having high electrical conductivity; and
a cylindrical telescoping sleeve assembly axially movable to bridge said fixed conductor members, said assembly comprising a cylinder and a pair of second contact means, each of which is fixedly attached to respective ends of said cylinder and adapted to establish electrical contact with said first contact means, said cylinder and said second contact means being constructed of material having different thermal coefficients of expansion, adjoining surfaces of said cylinder and said second contact means being plated with material having high electrical conductivity;
said fixed conductor members and said cylinder each comprising a plurality of axially extending slots.

4,188,516
TELESCOPING DISCONNECT SWITCH WITH HIGH CURRENT CONTACT SYSTEM

Jayant M. Patel, Cincinnati, Ohio; Jerome K. Wolfe, Murrysville, and Forrest E. Coyle, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,819
Int. Cl.[2] H01H *1/38, 1/46, 31/00*
U.S. Cl. 200—48 R **10 Claims**

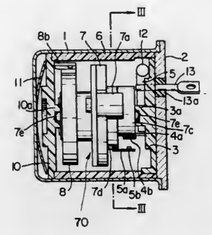


1. An isolated phase bus disconnect switch, comprising:
an enclosure of conductive material;
first and second cylindrical fixed conductor members disposed in said enclosure and axially spaced from each other, the adjacent ends of said conductor members comprising contact surfaces;
a telescope section coaxially mounted with respect to said fixed conductor members within said enclosure and axially movable to bridge said fixed conductor members;
a plurality of individual contact fingers circumferentially positioned around the ends of said telescope section and cooperating with said contact surfaces to establish electrical contact therewith;
annular means fixedly attached to said telescope section for removably securing said contact fingers to said telescope section and for positioning said contact fingers in axial and radial directions; and
a plurality of stabilizer pads located about the circumference of said annular means and fixedly attached thereto, said pads positioning said contact fingers in the circumferential direction.

4,188,517
COLLISION DETECTING INERTIA SWITCH

Seiichi Narita, Toyohashi, and Norio Kumita, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 23, 1978, Ser. No. 936,097
Claims priority, application Japan, Sep. 23, 1977, 52-128653[U]
Int. Cl.[2] H01H *35/10*
U.S. Cl. 200—61.45 R **6 Claims**



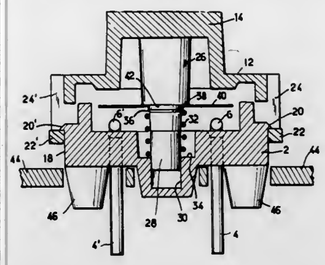
1. A collision detecting apparatus comprising:
a housing assembly;
a rotational member rotatably supported by a shaft within said housing assembly, both ends of said shaft being supported by said housing assembly, said rotational member comprising a weight member positioned eccentrically from said shaft and cam members having cam profiles formed on peripheral surfaces thereof;
a spring member disposed within said housing assembly, one end of which spring member is fixed to said housing assembly and the other end of which spring member is fixed to a portion of said rotational member, thereby applying a counteracting rotational force to said rotational member depending on an angle of rotation through which said rotational member has rotated;
electrical contact means disposed within and fixed to said housing assembly and actuated by said cam members of said rotational member to be opened or closed when the rotation of said rotational member reaches a predetermined angle of rotation; and
means for holding said housing assembly together.

4,188,518
MINIATURE ELECTRICAL PUSH BUTTON CONTACTOR

Christian du Temple de Rougemont, Paris, France, assignor to Isostat, Cucq, France

Continuation of Ser. No. 804,396, Jun. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,751
Claims priority, application France, Jun. 16, 1976, 76 18206
Int. Cl.[2] H01H *3/12, 1/18*
U.S. Cl. 200—159 R **8 Claims**

1. An electrical push button contactor comprising:
(a) a base having an inner axial recess;
(b) a button telescopically mounted on said base and formed with an axially inwardly projecting guide post which is stepped down in diameter to provide two longitudinally spaced inwardly facing annular shoulders separated by a short intermediate post length portion which terminates in an axial post extension having a sliding fit in said inner recess of said base;
(c) spring means surrounding said extension and positioned between said inner recess of said base and the lower shoulder of said post for normally biasing said button away from said base;
(d) at least two spaced stationary contact members positioned within said base and having portions extending outwardly therefrom;
(e) a movable contact member comprising a flexible, resilient, ring-shaped disc positioned on said intermediate post length for bridging said stationary contact members; the inner diameter of said disc being greater than the diameter of said intermediate post length portion but smaller than

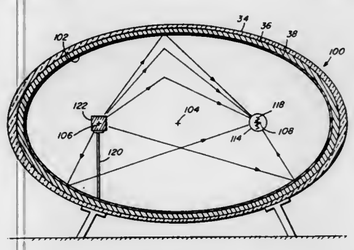


the diameter of the upper annular shoulder and also smaller than the outer diameter of said spring means;
whereupon further movement of said movable contact member in the same direction as causes said movable member to contact said stationary members tends to flex said movable contact member thereby providing a wiping action between said movable contact member and said stationary contact members; and
(f) abutment means for stopping said further movement of said movable contact member when the flexion thereof has attained a predetermined degree at which the movable contact member exerts on each of said stationary contact members a contact pressure at least equal to the requisite minimum contact pressure even where the effective contact areas of said stationary contact members lie at different heights relative to said base.

4,188,519
PROCESS AND APPARATUS FOR CONTROLLABLY EXCHANGING HEAT BETWEEN TWO BODIES

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Filed Mar. 20, 1978, Ser. No. 888,212
Int. Cl.[2] H05B *9/02, 11/00*
U.S. Cl. 219—10.47 **23 Claims**

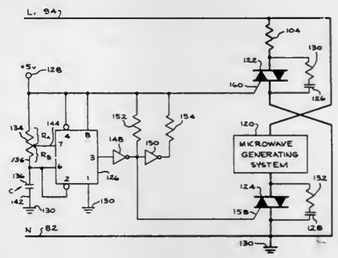


1. Apparatus for conserving heat in a system wherein a plurality of workpieces are sequentially transported by a conveyor means through a heating station and a working station and are subsequently cooled, said apparatus comprising:
a tunnel having a longitudinal axis parallel to which workpieces are transported by portions of said conveyor means prior to entering the heating station and after exiting the working station in a heated condition,
said tunnel having an interior infrared radiation reflective surface which, in planes perpendicular to the axis, describes an ellipse having a pair of separated foci,
the portions of said conveyor means passing through said tunnel being located adjacent said foci so that workpieces on the conveyor means prior to entering the heating station and after exiting the working station pass along respective focal lines in said tunnel,
said apparatus being operable to transfer heat from workpieces exiting from the working station to workpieces entering the heating station by reflecting infrared radiation emitted by exiting workpieces at the interior surface and directing said radiation at the focal line along which entering workpieces pass.

4,188,520
EFFECTIVE CONCURRENT MICROWAVE HEATING AND ELECTRICAL RESISTANCE HEATING IN A COUNTERTOP MICROWAVE OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 31, 1978, Ser. No. 911,555
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **8 Claims**



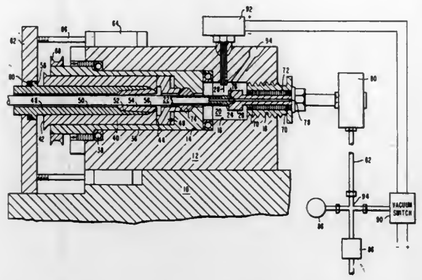
1. A cooking oven having both microwave and electrical resistance heating capabilities, which is adapted for operation from a power source insufficient to supply both the microwave and electrical resistance heating capabilities simultaneously at their respective full rated power levels, and wherein effective microwave and electrical resistance heating can be accomplished concurrently without exceeding the power source capability, said oven comprising:
means for establishing the overall duration of a cooking operation;
a microwave energy generating system;
an electrical resistance heating element;
duty cycle power control means for periodically energizing said microwave energy generating system from the power source, said microwave energy generating system being energized a plurality of times during each cooking operation; and
means for energizing said electrical resistance heating element only during those periods when said microwave energy generating system is not energized.

4,188,521

APPARATUS FOR WELDING AN END PLUG IN A NUCLEAR FUEL TUBE

Denis Yeo, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1977, Ser. No. 824,592
Int. Cl.² B23K *37/04*
U.S. Cl. 219—60 A **5 Claims**



1. Apparatus for controlling the position of a fuel tube-end plug seam on a fuel rod relative to a stationary welding electrode in a welding chamber comprising:

a housing having a welding chamber therein, said chamber being arranged to communicate with a bore in the housing which contains means for grasping and rotating a fuel rod and for sealing the end plug side of the fuel rod in the welding chamber to thereby prevent leakage of gas therefrom during a welding operation;

a stop member in said welding chamber positioned to be engaged by the end plug on said fuel rod, the distance being arranged such that when the end plug is seated in the stop member, the fuel tube-end plug seam is precisely positioned with respect to a stationary electrode in the welding chamber;

fuel rod position detecting means connected to said stop member for sensing the position of said rod in the stop member, and for assuring that the plug is located in said precise position with respect to said electrode before commencement of the welding process; and

said detecting means being operatively connected to an electric circuit and said electrode for selectively energizing the electrode when the detecting means senses that the fuel tube-end plug seam is in said precise position for welding.

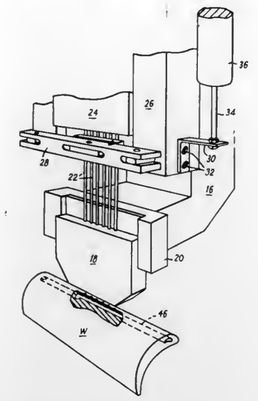
4,188,522

METHOD OF MACHINING A WORKPIECE TO A PREDETERMINED DEPTH USING A MACHINING PROCESS IN WHICH MACHINE TOOL WEAR OCCURS

George E. Baker, Ashfordby, near Melton Mowbay, England, assignor to Amchem Company Limited, Sileby, England

Continuation-in-part of Ser. No. 739094, Nov. 5, 1976, abandoned. This application Nov. 15, 1977, Ser. No. 851,788
Claims priority, application United Kingdom, Nov. 6, 1975, 46117/75
Int. Cl.² B23P *1/00*
U.S. Cl. 219—69 M **5 Claims**

1. A method of machining a workpiece to a predetermined depth using an electrical discharge machining process in which machine tool wear occurs and wherein said machine tool includes a plurality of electrodes, said method comprising utilizing the machine tool machining a workpiece to a first level less than a predetermined depth to which the machine tool is to progress, withdrawing the machine tool from the workpiece, refeeding the machine tool by the steps of inserting a refeed member having a surface matched to that of the workpiece being machined over a bore being machined into the workpiece by each electrode, aligning the electrodes on the surface of the refeed member, clamping each electrode in the aligned position, raising each electrode on a machine head and removing the refeed member, machining the workpiece to a



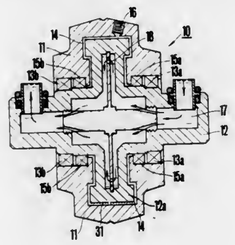
second level, and repeating the refeeding of the electrodes until the predetermined depth has been achieved.

4,188,523

ROLL ELECTRODE FOR USE IN A SEAM WELDING MACHINE

Jun Kawai; Jun-ichi Homma; Saburo Watanabe, all of Tokyo, and Masahiro Watanabe, Yokohama, all of Japan, assignors to Nippon Electric Co., Ltd. and Fuji Industry Co., Ltd., both of Yokohama, Japan

Filed Jun. 15, 1978, Ser. No. 915,746
Claims priority, application Japan, Jun. 15, 1977, 52-71371; Jun. 15, 1977, 52-71372; Jul. 27, 1977, 52-90701; Jul. 27, 1977, 52-90702; Jul. 27, 1977, 52-90703; Jul. 27, 1977, 52-90704
Int. Cl.² B23K *11/06*; H01R *39/30*; C22C *28/00*
U.S. Cl. 219—83 **8 Claims**



1. In a roll electrode for use in a seam welding machine comprising a stator member, a rotor member surrounding said stator member with an annular gap therebetween, a bearing member for rotatably supporting said rotor member to rotate about the axis of said stator member, and electrical conductive liquid filled in said annular gap for electrically connecting said rotor member to said stator member, the improvement wherein said electrical conductive liquid comprises a liquid metal consisting of 69.5±5.0 atomic % of Ga, 15.2±1.0 atomic % of In, 6.1±1.0 atomic % of Sn, 4.5±0.8 atomic % of Zn, 3.2±0.5 atomic % of Ag and 1.5±0.5 atomic % of Al, and wherein a substance comprising one or more of W, Mo, V, Ti, mixture thereof and alloys therefrom is secured to the lower portion of the outer surface of said stator member which defines said annular gap.

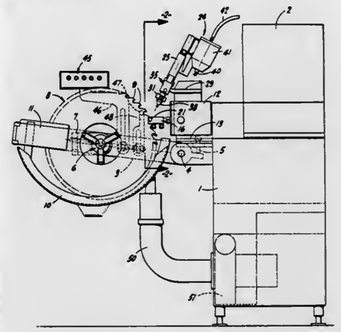
6. A method of operating a seam welding machine including a water cooled roll electrode filled with an electroconductive liquid metal, said method comprising the steps of passing welding current of a predetermined value through said roll electrode for a predetermined time before commencing welding operation, operating said welding machine by passing said welding current and cooling water through said roll electrode, stopping the operation of said welding machine and then passing a constant current having a value of from 0.01 to 0.1% of said welding current through said roll electrode for a predetermined time.

4,188,524

METHOD OF BRAZING TIPS ON CIRCULAR SAW TEETH

Luigi Trinchera, Stockton, Calif., assignor to California Cedar Products Company, Stockton, Calif.

Division of Ser. No. 678,160, Apr. 19, 1976, Pat. No. 4,110,591. This application Jul. 17, 1978, Ser. No. 925,117
Int. Cl.² B23K *1/02*
U.S. Cl. 219—85 CM **7 Claims**



1. A method of brazing a tip on the tooth of a movably mounted, circular saw blade comprising the sequential steps of clamping an initially separate tip between two opposed electrodes interposed in an electrical resistance circuit, closing the circuit whereby the clamped-in-place tip is heated, opening the circuit, delivering a quantity of brazing paste onto the heated tip, moving the circular saw blade until a selected tooth thereof bears on the clamped-in-place tip, and again closing the circuit whereby the tip is re-heated and brazes to the tooth.

4,188,525

WELDING TORCH OSCILLATION APPARATUS

George J. Merrick, Franklin; George E. Cook, Brentwood, and Donald D. Modglin, Nashville, all of Tenn., assignors to Merrick Welding International, Nashville, Tenn.

Division of Ser. No. 654,975, Feb. 3, 1976, Pat. No. 4,145,593. This application Dec. 5, 1977, Ser. No. 857,359
Int. Cl.² B23K *9/12*
U.S. Cl. 219—125.12 **3 Claims**

1. Apparatus for oscillating a welding torch across a weld path, comprising:

means for supporting a welding torch in relation to a weld path;

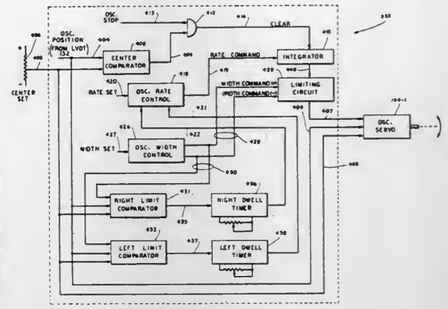
motive means operatively connected to move said torch support means laterally of the weld path in a selected first or second direction and at a selected rate of movement;

position sensing means responsive to the lateral position of said torch support means to provide a location signal corresponding to said lateral torch position;

position control means responsive to an input command signal to provide said motive means with position command signals which cause said torch support means to move alternately in first and second lateral directions at a predetermined rate;

center adjustment means operative to provide a selectably variable center signal corresponding to a selectably variable center location of said torch support means at a selected location on the path of said lateral movement;

center coincidence means responsive to said selectively variable center signal and to said location signal from said position sensing means to provide a center coincidence signal in response to signals indicating that said torch support means is at said selected center location; and



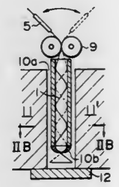
center stop means operative in response to the occurrence of said center coincidence signal in the presence of an oscillation stop signal to interrupt said position command signal and to maintain said center signal, so that said torch support means stops at said variable center location on said path of lateral movement in response to said oscillation stop signal.

4,188,526

NARROW WELD-GROOVE WELDING PROCESS

Isao Asano, Kure, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Japan

Filed Mar. 11, 1977, Ser. No. 776,921
Claims priority, application Japan, Mar. 15, 1976, 51/27178; Jul. 22, 1976, 51/96881; Jul. 27, 1976, 51/88685; Sep. 27, 1976, 51/114675; Oct. 19, 1976, 51/124494; Oct. 19, 1976, 51/124495; Nov. 22, 1976, 51/139556
Int. Cl.² B23K *9/00*
U.S. Cl. 219—137.8 **11 Claims**



1. In a narrow weld-groove welding process, wherein a bare welding wire is fed through a contact tube into a weld groove defined between opposed surfaces of two pieces of metal, and then an arc is caused therebetween, while moving the contact tube along the weld groove, for melting the bare welding wire to thereby effect the welding of the metals,

the improvement comprising the steps of:

rocking, with respect to a motor-driven roller means for feeding the welding wire to the contact tube, a welding wire feeding means adapted to guide the welding wire to said roller means;

forcing the welding wire upon the outer periphery of rollers in the roller means to thereby impart a wavy plastic deformation to said welding wire; and

feeding the plastically deformed wire into the contact tube by means of said roller means immediately after imparting

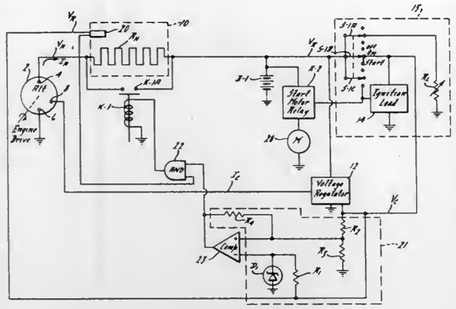
the deformation to the welding wire, while preventing contact between said wire and any structure other than said contact tube and preventing apexes of the deformed wire from appearing outside of the contact tube in a space between the roller means and the contact tube.

4,188,527

AUTOMOTIVE ELECTRIC QUICK HEAT SYSTEM

William C. Follmer, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1977, Ser. No. 862,705
Int. Cl.[2] B60L *1/02*
U.S. Cl. 219—202 **11 Claims**



1. In an automotive electrical system, including a storage battery, a mechanically driven alternator having a rectified DC voltage output, a voltage regulator electrically connected between a voltage terminal of said battery and field coil of said alternator, and a voltage regulated load connected in parallel with said battery;

an improvement comprising:

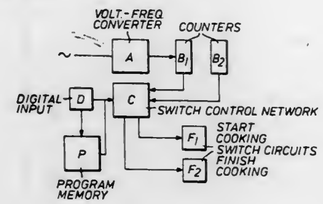
a resistive load connected between said DC voltage output of said alternator and said voltage regulated terminal of said battery and means connected in parallel with said resistive load for selectively shunting said resistive load in response to a control signal.

4,188,528

ELECTRONIC CONTROL DEVICE FOR ELECTRIC RANGES

Dieter Wierzchowski; Klaus Fischer, both of Nüremberg; Günther Formanek, Grosshabersdorf, and Leonhard Scheumann, Nüremberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,960
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605533
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—490 **5 Claims**



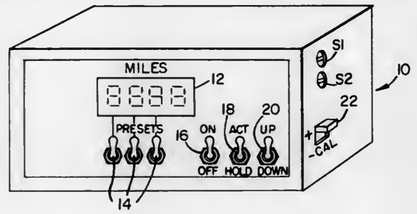
1. In an electronic control device for an electric cooking appliance including at least one heating element arranged to be supplied with electric power for heating at a selected one of a plurality of different heat settings corresponding to respectively different heating levels, and digital input means for controlling the power supplied to the element in accordance with a selected heat setting by causing power pulses having a respectively different power-on to power-off ratio for each heat setting to be supplied to the element, the improvement comprising switching means connected for supplying in sequence to the element, at each heat setting, initial heating power, at the start of a heating operation, which is supplied continuously, and has a constant power level, for a selected time duration and, after the selected duration, a train of pulses of heating power having a selected, constant pulse duration and pulse repetition rate, said switching means including: control means connected to said input means for responding to the selected heat setting for causing the train of pulses to have the same repetition rate at all heat settings and for causing both the duration of each pulse of the pulse train and the duration of the initial heating power to differ from one heat setting to another; a first counter for producing output signals defining the pulse repetition rate of a train of pulses; a second counter for producing output signals defining the duration of each pulse of a train of pulses; and a voltage-frequency converter connected to monitor the voltage of the electric power supplied to the appliance and connected to said second counter for varying its counting rate as a function of changes in that voltage.

4,188,529

ELECTRONIC CB TWENTY METER

Nathaniel E. Schochat, 620 Forest Hill Rd., Macon, Ga. 31210, and Fred L. Martin, 8101 Elderberry Dr., Knoxville, Tenn. 37919

Filed Apr. 18, 1978, Ser. No. 897,542
Int. Cl.[2] H03K *21/36*; G06F *15/20*
U.S. Cl. 235—92 DN **3 Claims**



1. An electronic indicator for maintaining the exact mile post position of a vehicle in relation to mile post indicators comprising:

(a) pulse means for generating a pulse based upon the distance travelled by the vehicle;

(b) electronic counter means connected to said pulser means for counting the pulses generated by said pulser means and converting said pulses to BCD outputs;

(c) display means connected to said electronic counter means for displaying the count present in said counter as a mileage position indicator; and

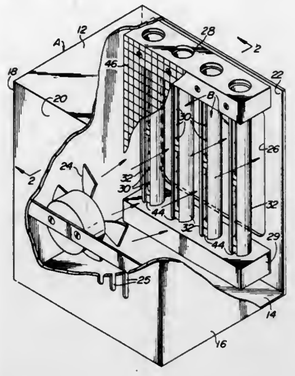
(d) calibration means connected between said pulser means and said electronic counter means, said calibration means operating in either a positive or negative mode and including pulse inhibiting means for preventing a number of the pulses generated by said pulser means to be presented to said electronic counter means when the calibration means is operating in its negative mode and pulse generating means for presenting additional pulses to said electronic counter means when said calibration means is operating in its positive mode.

4,188,530

LIGHT-SHIELDED EXTENDED-RANGE STATIC ELIMINATOR

Bruce H. Miller, Hatfield, Pa., assignor to The Simco Company, Inc., Lansdale, Pa.

Filed Nov. 14, 1978, Ser. No. 960,578
Int. Cl.[2] H01T *19/04*; H01J *27/00*
U.S. Cl. 250—324 **6 Claims**



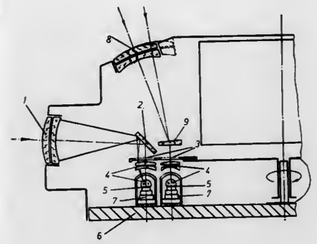
1. A light-shielded, extended-range static eliminator for impinging a stream of ionized air upon light sensitive articles to be neutralized comprising a housing having an opening therein, blower means for directing a stream of air through the opening, a plurality of discharge electrodes supported in said housing across the opening thereof so that the electrodes face in an opposite direction to the air stream, including means for coupling said discharge electrodes to one side of an A.C. high voltage source, and a generally tubular conductive casing connected to the other side of the high voltage power source and at least partially encircling said means for coupling so as to shield the high voltage field thereof from ions emitted in the air gap between said discharge electrodes and said conductive casing and further shielding the articles exposed to the ionized air stream from corona developed in the air gap.

4,188,531

APPARATUS FOR SCANNING AN AIR SPACE FOR DETECTING LOW-FLYING AIRPLANES AND FLYING BODIES

Günter Pusch, Bannholzweg 12, 6903 Neckargemund-Dilsberg, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,674
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—334 **8 Claims**



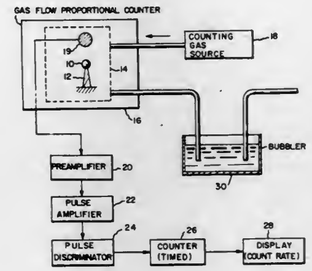
1. In a device for scanning an air space to detect low-flying objects comprising objective lens means distributed over a surface for scanning the air space and producing images thereof, modulation means for modulating the images of the scanned air space from said objective lens means to discriminate the presence of a target, and detector means receiving the modulated images for indicating the presence of a discriminated target and the location thereof, the improvement wherein said modulation means comprises a planar disc with a modulation screen thereon, and optical deflecting means for deflecting light rays coming from said objective lens means to said planar disc in a path perpendicular to said disc.

4,188,532

METHOD FOR THE NON-DESTRUCTIVE ASSAYING OF LASER FUSION TARGETS

Harry W. Deckman, Fanwood, and Gerald M. Halpern, Sommerville, both of N.J., assignors to The University of Rochester, Rochester, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,567
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—336 **3 Claims**



1. The method of measuring the content of active fuel material in a laser fusion target which comprises the steps of measuring the flux of beta particles emitted by said target by counting the rate at which said beta particles are emitted, said content being the mass of said active material of said target, and dividing said count rate by the product of the escape probability of said particles from said target (P), the efficiency of counting (ϵ), and the specific activity of said active material (A), said target being a hollow shell containing a gas including tritium gas under pressure greater than atmospheric pressure therein as said active material, and subtracting the contribution to the measured count rate from tritium trapped in said shell, S, prior to said dividing step to obtain the mass of said tritium.

4,188,533

WINDOW TRANSMITTANCE TESTER

Ernest W. Ashenfelter, Wichita; Fred M. Dickey, Derby, and Jerry R. White, Wichita, all of Kans., assignors to The Boeing Company, Wichita, Kans.

Filed Jan. 9, 1978, Ser. No. 867,794
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—338 **10 Claims**

1. A window transmittance tester for testing the infrared radiation transmission through a test window, the tester comprising:

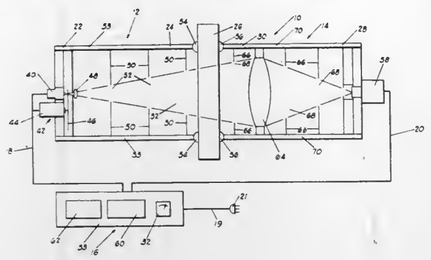
a hand held self-contained portable radiation source head having a first end portion and an open second end portion, the open second end portion of the said head disposed adjacent and tangent the test window;

a radiation source connected to an electrical power source and mounted in the first end portion of said radiation source head, said radiation source directed through said head outwardly through the open second end portion of said head and through the test window, said radiation source providing a spectral range of radiation;

a hand held self-contained portable detector head having a first end portion and an open second end portion, the open second end portion of said detector head disposed adja-

cent and tangent the test window and on the opposite side of the test window from the second end portion of said radiation source head and in alignment therewith;

a detector connected to an electrical power sorce and mounted in the first end portion of said detector head for receiving said radiation through the test window and converting said radiation to an electrical signal;



an optical lens mounted in said detector head between the open second end portion and said detector for receiving said radiation from the test window and optically conveying said radiation to said detector; and

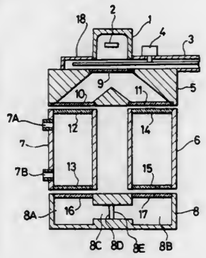
an electrically operated meter mounted in an electronics housing and connected to said detector for receiving the electrical signal therefrom and measuring the radiation transmitted through the test window.

4,188,534

INFRARED GAS ANALYZER

Atsuo Watanabe; Hidenori Ishizawa, and Masahiro Uno, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1978, Ser. No. 898,045
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—345 **8 Claims**



1. An infrared gas analyzing device of the type comprising a light source portion, a cell portion having measuring and reference cells and a detector portion and wherein said light source portion comprises a light source and a light divider, the latter having an inlet opening in a surface facing said light source for receiving light emitted from said light source and first and second light passages having center axes and communicating with said inlet opening for supplying separate beams of light to said measuring and reference cells, respectively, wherein the improvement comprises:

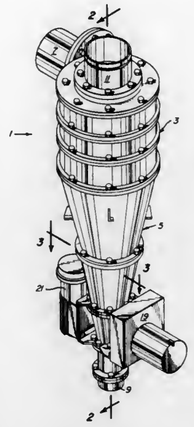
the center axes of said first and second light passages intersecting at said light source.

4,188,535

METHOD AND APPARATUS FOR MONITORING DENSITY FLUCTUATIONS IN MATERIAL FLOWING SPIRALLY WITHIN A HYDROCYCLONE

Peter C. Wilson, and Robert P. Hughart, both of 2045 W. 9th Ave., Denver, Colo. 80204

Filed Nov. 3, 1977, Ser. No. 848,024
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—359 **46 Claims**



1. A method for monitoring density fluctuations in a flow of material and carrier liquid moving along a substantially symmetrical spiral path within a cyclone separator, said cyclone separator having an inlet and at least first and second outlets whereby material being conveyed in said carrier liquid enters said cyclone separator through said inlet in response to a pressure differential set up between said inlet and said first and second outlets, moves along said spiral path within said cyclone separator toward said first outlet, and has a portion thereof separated from said carrier liquid, said separated portion of said material exiting said cyclone separator through said first outlet and said separated carrier liquid and remaining portion of said material exiting said cyclone separator through said second outlet, said spiralling flow of material and carrier liquid further creating an air column within said hydrocyclone extending substantially along a portion of the axis of symmetry of said spiral path, said method comprising the steps of:

(a) providing a source of radiation,

(b) directing a beam of said radiation along a path intersecting at least a portion of said spiral path and spaced from said air column, and,

(c) monitoring fluctuations in the intensity of at least a portion of said beam at a location along said radiation path downstream of said intersected portion of said spiral path, said intensity fluctuations in the monitored portion of said beam being proportional to density fluctuations in the material and carrier liquid flowing along said intersected portion of said spiral path.

4,188,536

DENTAL X-RAY APPARATUS

Dennis G. DallaPiazza, Oconomowoc, Wis., assignor to General Electric Company, Schenectady, N.Y.

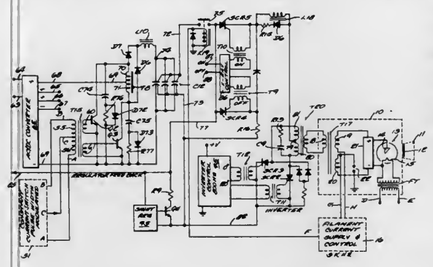
Filed Feb. 3, 1978, Ser. No. 874,778
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—402 **1 Claim**

1. Dental x-ray apparatus comprising a housing, an x-ray tube having an anode and a cathode filament disposed in said housing for projecting x-radiation therefrom, a stepup transformer in said housing having a primary winding and at least a pair of secondary windings and a loop circuit connecting said

secondary windings in series, rectifier means in said housing, having input means coupled with said secondary windings and d-c output terminals to which said anode and cathode of said tube are connected, respectively, and a low voltage filament transformer in said housing having its secondary winding connected for energizing said filament and having a primary winding, a filament control and safety shutdown system including:

(a) an output transformer having a secondary winding connected to said primary winding of said filament transformer and a primary winding connected to a source of voltage in the range of one to four kHz,

(b) a microprocessor control and means controlled by said control to energize said cathode filament and said anode in sequence in response to an operator initiated signal, said



x-tube being operative to produce x-radiation when said anode is energized,

(c) a time delay circuit connected to said control and operative to start measurement of a predetermined time interval when said anode is energized,

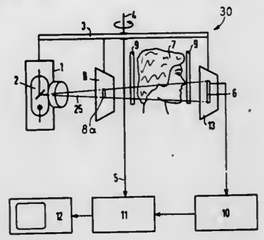
(d) a voltage comparator circuit having input means for a voltage proportional to the current flowing through said x-ray tube when its anode is energized, said time delay circuit enabling said voltage comparator circuit to sense the value of said proportional current after said interval is initiated, said comparator being operative to provide a signal to said control for enabling said control to maintain energization of said anode and said cathode filament only if the value of the current flowing between said anode and said cathode filament during said time interval is sufficient to provide useful radiographs.

4,188,537

DENTAL APPARATUS FOR X-RAY DIAGNOSIS

Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,314
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646638
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—416 TV **3 Claims**



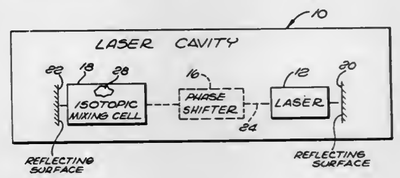
1. In a dental apparatus for x-ray diagnosis including a head support for supporting a head of a patient in a given position, and a unit having an x-ray tube and carrier for a radiation receiver, said unit being rotatable about a vertical axis with the x-ray tube and carrier rotating about the head support, said apparatus including an operative sequence mechanism for fixing the exposure time in advance as the apparatus prepares a dental survey image, the improvement comprising the radiation receiver including transducer means for measuring radiation intensities and forming electrical signals corresponding to the measured radiation intensities, said transducer means being connected to a data processing installation having means for storing electrical signals for one exposure sequence and means for creating a dental survey image from the stored electrical signals, said transducer means consisting of a plurality of detectors arranged on a vertical extending line with the number of detectors being selected to correspond to the desired image resolution, said unit further including a diaphragm with a vertically extending slit-shaped aperture disposed on the unit between the x-ray tube and the support for the head so that a beam of radiation passing through the patient has a strip shape and impinges on all detectors of the transducer means, and the apparatus including an image reproduction device connected to the data processing installation for displaying the created dental survey image.

4,188,538

EFFICIENT PARTICLE EXCITATION

Jean-Claude Diels, Pacific Palisades, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Mar. 30, 1977, Ser. No. 782,869
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—423 P **17 Claims**

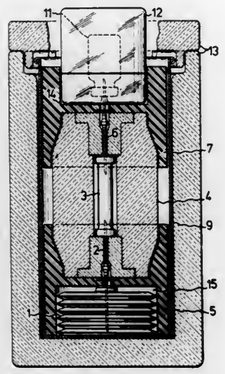


1. In a method of separating a particle species from a mixture with other particles through irradiation of said mixture with light, isolating said particle species at a predetermined location spatially distinct from that of said other particles, and collecting said other particles species from said predetermined location, said other particles being capable of substantially absorbing light at a wavelength corresponding to single or multiphoton absorption, said particle species being capable of substantially absorbing light at a wavelength close to, but not equal to, said wavelength and absorbing light differently at said wavelength, the improvement comprising disposing said mixture in a cavity of a mode-locked laser and irradiating said mixture with a plurality of repetitious coherent light pulses of said wavelength, applied to said mixture at said wavelength, each of a duration of less than 10 nanoseconds with a frequency spectrum sufficiently broad to contain energy at the light absorption wavelength of said particle species, the path of said light pulses traversing and reflecting back through said cavity whereby as said mixture is irradiated by said light pulses said particle species initially absorbs then restitutes light of said wavelength during said reflection to impart momentum characteristics to said particle species distinguishing it from the momentum characteristic of said other particles.

4,188,539
NUCLIDE GENERATOR FOR PREPARING RADIO-NUCLIDES

Helmut Strecker, Seeheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,756
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712635
Int. Cl.² H01J *27/00*
U.S. Cl. 250—432 PD **6 Claims**



1. A nuclide generator for preparing a sterile and pyrogen-free radioactive solution, comprising a vessel; a radiation shield disposed in said vessel; a generator column positioned within said radiation shield; a first centering device positioned at one end of said vessel; a second centering device positioned at the other, opposite end of said vessel remote from said first centering device, said generator column being located between said first and second centering devices and being fixedly positioned by said first and second centering devices; said first centering device having a recess therein; an eluting agent container disposed in the recess of said first centering device and fixedly positioned thereby relative to said generator column; a first cannula connecting said generator column to said eluting agent container; said second centering device having a recess therein adapted to receive an eluate container; and a second cannula for connecting said generator column to said eluate container; said generator column and said first and second cannulae extending generally in the axial direction of said vessel.

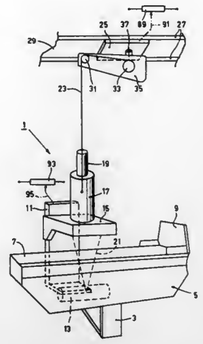
4,188,540
X-RAY APPARATUS COMPRISING A WEIGHT COMPENSATION DEVICE

Friedrich Reiniger, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,289
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742642
Int. Cl.² G01N *21/00, 23/00;* G21K *5/06, 5/08*
U.S. Cl. 250—439 R **5 Claims**

1. In X-ray apparatus of the type which includes a carriage which is suspended from and displaceable along a ceiling; motor means which function to displace said carriage along said ceiling; a flexible connecting member having a first end attached to said carriage; and a displaceable component suspended from a second end of said flexible member, the improvement comprising:

transducer means which generate an output signal which represents a relative horizontal displacement between the carriage and the displaceable component and control circuit means which receive the output signal from the transducer and operate the motor means to decrease

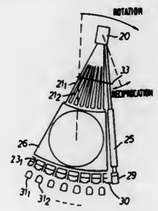


said relative displacement whenever said relative displacement exceeds a reference value.

4,188,541
APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 780,971, Mar. 24, 1977, abandoned, which is a continuation of Ser. No. 657,543, Feb. 12, 1976, Pat. No. 4,052,618, which is a division of Ser. No. 468,005, May 7, 1974, Pat. No. 3,944,833, which is a division of Ser. No. 349,198, Apr. 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 21, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,358, Aug. 21, 1969, abandoned. This application Dec. 8, 1977, Ser. No. 858,612
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **13 Claims**



1. A medical diagnostic X-ray machine for examining a patient and for building up and displaying a two-dimensional picture of the X-ray absorption coefficients of the elements into which a substantially planar slice of the patient is divided by a finite Cartesian notional matrix superimposed on the slice, said machine comprising:

X-ray source means producing X-radiation originating at an origin scanning around the patient, said X-radiation passing through the patient while the origin scans at least half way around the patient, and means for detecting the X-radiation and for producing electrical signals corresponding to the absorption suffered by the X-radiation in passing through the patient along beam paths which are in or substantially in the slice, at least some of these beam paths intersecting each other and the neighboring beam paths overlapping each other;

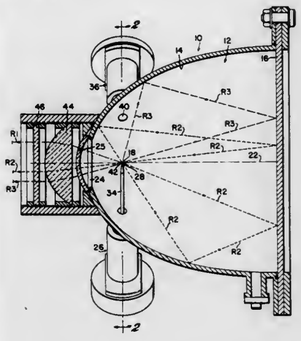
signal receiving meshes corresponding to the slice elements and means for allocating, for each given beam path, to the meshes corresponding to the slice elements through which the given beam path passes, allocations determined by a correction signal weighted in accordance with the relative disposition of the given beam path and the slice elements through which the given beam path passes, said correction signal being determined by modifying the electrical signal corresponding to the given beam path in accordance with other electrical signals, corresponding to beam paths which pass through slice elements other than those through which the given beam path passes, and for accumulating said allocations to each signal receiving mesh to thereby build up said picture; and

means for displaying the so accumulated allocations to the signal receiving meshes to thereby display said two-dimensional picture of the X-ray absorption coefficients of the elements of the patient slice examined by the X-ray machine.

4,188,542
MIRROR IMAGE ELLIPSOID RADIATION COLLECTOR AND METHOD

Walter R. Hogg, South Miami, and Albert Brunsting, Miramar, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 888,566, Mar. 20, 1978, abandoned. This application Apr. 24, 1978, Ser. No. 899,583
Int. Cl.² G01J *1/58;* G01N *21/38, 33/16*
U.S. Cl. 250—458 **24 Claims**



1. A radiation collector apparatus for analyzing particulate material wherein irradiation of the particulate material produces a source of detectable radiation, comprising:

a reflector chamber having a first reflector surface and a second reflector surface,

said first reflector surface substantially having a configuration of a half portion of an ellipsoid of revolution generated by rotating about a major axis of an ellipse a portion of the ellipse extending to and terminating at a minor axis of the ellipse,

said first reflector surface having a primary focus and a secondary focus with said primary focus being positioned within said reflector chamber at the source of detectable radiation,

said second reflector surface having a substantially planar configuration,

said second reflector surface being positioned so that any position thereon is substantially disposed in equally spaced relationship to said primary focus and said secondary focus,

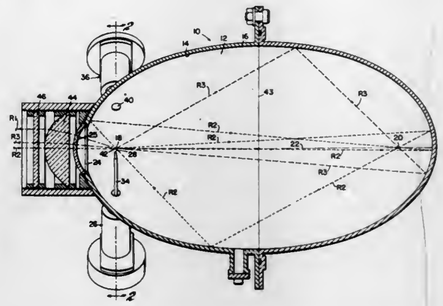
a window formed in one of said reflector surfaces and aligned in intersecting relationship with a symmetry axis defined by said primary focus and said secondary focus,

wherein the detectable radiation emanating from the primary focus proceeds either directly or after one or more reflections through said window.

4,188,543
ELLIPSOID RADIATION COLLECTOR APPARATUS AND METHOD

Albert Brunsting, Miramar, and Walter R. Hogg, South Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 888,567, Mar. 20, 1978, abandoned. This application Apr. 24, 1978, Ser. No. 899,584
Int. Cl.² G01J *1/58;* G01N *21/38, 33/16, 21/00*
U.S. Cl. 250—458 **21 Claims**



1. A radiation collector apparatus for analyzing individually isolated particles wherein irradiation of the particles produces a source of detectable radiation, comprising:

a reflector chamber having a substantially ellipsoidal reflector surface with a pair of foci defining a symmetry axis,

a window formed in said reflector chamber and aligned in intersecting relationship with said symmetry axis,

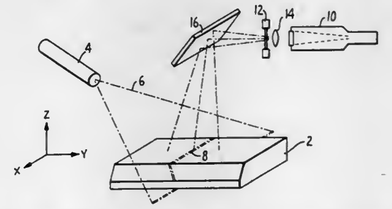
said window being dimensioned and configured to provide for a portion of the detectable radiation to reflect within said reflector chamber more than once,

whereby almost all of the detectable radiation emanating from one of said foci proceeds either directly or after one or more reflections through said window in an organized beam to be analyzed.

4,188,544
METHOD AND APPARATUS FOR AUTOMATICALLY PROCESSING A WORKPIECE EMPLOYING CALIBRATED SCANNING

Leon H. Chasson, Los Altos Hills, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 22, 1977, Ser. No. 826,554
Int. Cl.² G01B *11/00;* G01N *21/30*
U.S. Cl. 250—560 **26 Claims**



18. A system for scanning a three-dimensional workpiece comprising

means having a field of view for scanning said workpiece in said field of view to generate signals related to the three-dimensional spatial coordinates of said workpiece, and

means for modifying said signals to calibrate said scanning means,

said means for modifying including memory means storing calibration information derived by comparing scanning signals of a known three-dimensional reference piece with

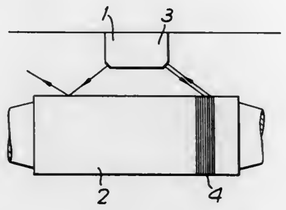
previously stored three-dimensional spatial coordinates of said known reference piece.

4,188,545

YARN PROCESSING, METHOD AND APPARATUS

Arthur J. McClean, Harrogate, England, and Kenneth F. Montgomery, Carrickfergus, Ireland, assignors to Imperial Chemical Industries Limited, Great Britain

Continuation of Ser. No. 701,046, Jun. 29, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,206
Claims priority, application United Kingdom, Jun. 30, 1975, 27544/75
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **8 Claims**



1. A method for detecting the presence of yarn wraps on the peripheral surface of a rotating roll and consequently severing the yarn being wrapped at a point upstream of the roll wherein the improvement comprises continuously directing light from a source thereof towards the moving peripheral surface of the roll, continuously monitoring by photosensitive means, reflecting light from said moving surface, detecting any change in the intensity of light which returns from the roll in the absence of a yarn wrap and that arising from the presence of such a wrap, said light being directed such that substantially no light is received by the detecting means in the absence of a yarn wrap, and converting such change into an electrical signal to activate yarn severing means to severe said yarn at a point prior to reaching said roll.

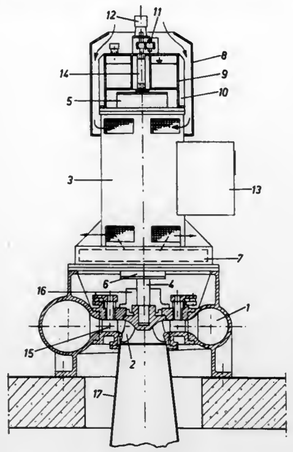
4,188,546

HYDRAULIC TURBINE WITH VERTICAL AXIS

Erich Kössler, Tauberstrasse 2, A-3151 St. Pölten - St. Georgen, Austria

Filed Aug. 18, 1977, Ser. No. 825,780
Int. Cl.[2] H02K *7/18*
U.S. Cl. 290—52 **16 Claims**

1. A water turbine-generator set for the generation of electrical power, comprising:
- a vertical rigid shaft;
- a water turbine disposed at the lower end of said shaft and having a turbine rotor connected thereto;
- a flywheel connected directly to said shaft above said rotor;
- an electric current generator surrounding said shaft and connected thereto above said flywheel, said generator having a generator rotor;
- an oil pump connected directly to said shaft for supplying oil under pressure to regulate the output of said set; and
- a speed control for said turbine connected directly to said shaft, said oil pump being disposed on said shaft above said generator,
- an intake scroll surrounding said water turbine; and



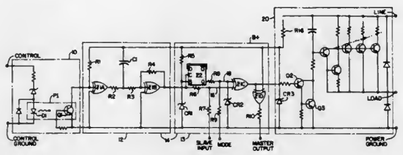
- a plurality of support feet mounted on a foundation and supporting said shaft, said turbine and the rotor of said generator.

4,188,547

MULTI-MODE CONTROL LOGIC CIRCUIT FOR SOLID STATE RELAYS

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 698,227, Jun. 21, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 856,155
Int. Cl.[2] H03K *5/153, 17/18, 17/60;* **H01H** *47/18*
U.S. Cl. 307—239 **8 Claims**



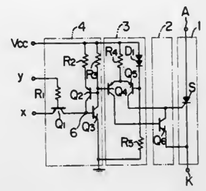
1. A control logic circuit capable of controlling the operation of a solid state relay in any one of a plurality of modes of operation, said circuit comprising:
- threshold sensing means for responding to an input voltage signal of a given polarity and at least a given magnitude by producing a logic signal of a relatively fixed, predetermined magnitude that follows the input in polarity;
- a logic gate having a first input terminal operatively connected to receive said logic signal from said threshold sensing means and a second input terminal, said second input terminal having a fixed interconnection to means for generating a first signal changing in logic state only upon a predetermined change in the waveform of said logic signal from said threshold sensing means, means for selectively overriding said first signal comprising a line connected to said second input terminal with an externally available MODE terminal on said line, said logic gate also having an output terminal providing an output signal for operation of a solid state relay;
- said MODE terminal requiring no connection for an output signal from said logic gate to provide latching type operation of the relay.

4,188,548

SEMICONDUCTOR SWITCHING CIRCUIT

Ichiro Ohninata, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 26, 1977, Ser. No. 845,722
Claims priority, application Japan, Oct. 29, 1976, 51-129529
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 C **11 Claims**



1. A semiconductor switching circuit comprising:
- a gate-turnoff thyristor having an anode terminal, a cathode terminal and a gate terminal, the anode-cathode path of which is turned on or off in accordance with the direction of the current flowing through said gate terminal;
- a holding circuit including therein a semiconductor element having an equivalent four-layer structure of a PNPN conductivity type and having an input terminal and an output terminal, which element has a self-holding function for holding alternately its conductive and non-conductive states to store binary information and which determines the state to be held in accordance with an input signal applied to said input terminal to indicate the state to be held; and
- a gate control circuit coupled between the output terminal of the holding circuit and the gate terminal of the gate-turnoff thyristor to control the direction of the current flowing through the gate terminal of said gate-turnoff thyristor,
- wherein the gate control circuit includes a gate switching circuit having two terminals and a constant current switching circuit having an input terminal and two output terminals, said input terminal of the constant current switching circuit being connected to said output terminal of said holding circuit, one of said output terminals of the constant current switching circuit being connected to said gate terminal of said gate-turnoff thyristor, the other one of said output terminals of said constant current switching circuit being connected to one of said two terminals of said gate switching circuit, the other one of said two terminals of said gate switching circuit being connected to said gate terminal of said gate-turnoff thyristor, thereby turning on or off said gate-turnoff thyristor in accordance with the state of the holding circuit.

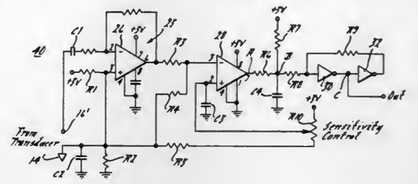
4,188,549

ACOUSTICALLY RESPONSIVE SENSOR SWITCH

Mark V. Dorais, Detroit, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Nov. 11, 1977, Ser. No. 850,666
Int. Cl.[2] H03K *3/26*
U.S. Cl. 307—308 **4 Claims**

1. An acoustically responsive sensor switch comprising:
- transducer means for detecting a localized acoustic sound and producing an electrical audio signal in response thereto; and
- circuit means connected to said transducer means for producing a switching signal in response to said audio signal including magnitude comparator means for comparing the magnitude of said audio signal with the magnitude of a threshold signal and producing a square-wave output signal, integrator means having a response time greater than the duration of a single pulse of said square-wave signal connected to said comparator means for integrating said square-wave signal, and trigger circuit means connected to said integrator means for producing an output signal that is initiated when the magnitude of said integrated signal decreases below (exceeds) a predetermined turn-on level and is terminated when the magnitude of said integrated signal exceeds (decreases below) a predetermined turn-off level greater (less) than said predetermined turn-on level.

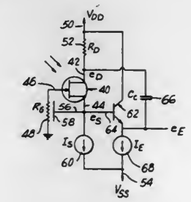


4,188,550

PHOTODETECTOR CIRCUIT

Jackson Lum, Fresh Meadows, N.Y., assignor to Medfare, Inc., Westbury, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,591
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—311 **9 Claims**



1. A photodetector circuit comprising,
- photodetector means having first and second main electrodes and a photoresponsive control electrode, and
- circuit means intercoupling said main and control electrodes for effecting a bootstrap action between said control and main electrodes and for substantially equalizing the AC voltages at said main and control electrodes to reduce the effective value of the stray capacitances between the electrodes.

4,188,551

AMPLIFIER CIRCUIT HAVING PHOTOELECTRIC CONVERTER

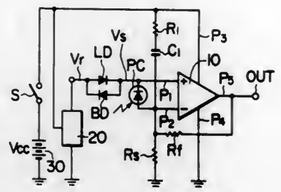
Takashiroh Iwasaki, Tokyo, and Jun-ichi Mameda, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 29, 1978, Ser. No. 920,248
Claims priority, application Japan, Jul. 29, 1977, 52/90327
Int. Cl.[2] H01J *39/12*
U.S. Cl. 307—311 **10 Claims**

1. A photometric amplifier circuit for amplifying an electric signal in response to a quantity of light, comprising:
- a differential amplifier having inverting and noninverting input terminals, and an output terminal;
- a photoelectric converting element for converting the quantity of light to an electric signal, said element being connected between the inverting and noninverting input terminals of said differential amplifier;
- closed circuit means provided to form a closed circuit across said photoelectric converting element, to permit the flow of the converted electric signal of said converting element;

a power supply for energizing said differential amplifier, wherein the power voltage is supplied via a power switch to said differential amplifier;

a negative feedback circuit including a first impedance means connected between the output terminal and inverting input terminal of said differential amplifier and a second impedance means connected between a reference



potential source and the inverting input terminal of said differential amplifier; and

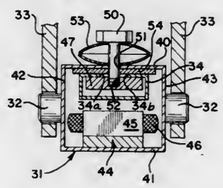
voltage supplying means, connected to the inverting input terminal of said differential amplifier, for supplying a voltage to the inverting input terminal of said differential amplifier transiently when said power switch is closed to prevent the build-up of accumulated charge in the photoelectric converting element.

4,188,552

GARAGE DOOR OPENER INCLUDING A LINEAR ACTUATOR

Claude M. Brimer, Bryan, Ohio, assignor to Linear International Corporation, Rancho La Costa, Calif.

Filed Oct. 26, 1977, Ser. No. 845,625
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **8 Claims**



1. A door operator of the type utilizing a conventional single-phase power supply for driving a garage door or other large door between open and closed positions in a building or other structure comprising:

a stationary motor mounting;

a linear induction motor pivotally secured on said mounting, said motor including

a rigid frame;

a stator mounted in insulated manner on said frame and including a pair of conductive windings mounted thereon;

a flux return member mounted on said frame in spatial relation to said stator and defining a gap therebetween;

at least a portion of an electric circuit connected with said pair of windings which when energized produces a magnetic flux across said gap; and

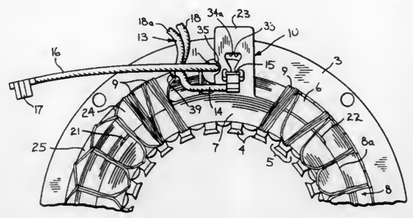
an elongate armature disposed in said gap for moving traversely therethrough in response to said magnetic flux, and said armature including pivotal mounting means adjacent at least one end thereof adapted for connection to a door member.

4,188,553

POCKET RECEPTACLE FOR SECURING A SENSING ELEMENT WITHIN ELECTRICAL WINDINGS

William H. Wheaton, Sharpsburg, Ky., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 8, 1978, Ser. No. 875,995
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 C **3 Claims**



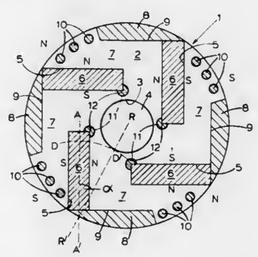
1. An electrical insulating pocket receptacle for receiving and securing a sensing element within an electrical winding of a dynamoelectric rotary machine, said receptacle having a body support portion provided from a sheet of flat flexible material, a pocket formed from a second sheet, means fixedly securing said pocket to the body portion of the sheet, said pocket providing an internal cavity open at one end to receive the sensing element and of a configuration conforming in general to that of the sensing element to securely hold the sensing element within the pocket, said support portion including a pair of support tabs extending in opposite directions from said pocket, a wire holding tab offset from the pocket and connected to one of said pair of tabs and adapted to be folded about itself in overlying relationship to said tab to form a multiple layer channel to accept leads of said windings, said folded wire holding tab being adapted to be secured abutting the exterior of the windings, and an insulating separate tab having a width greater than the width of the pocket back wall portion, and means to interconnect the tab to the back wall portion with said tab extended beyond the bottom of the pocket and support portion and adapted to be folded over the pocket to additionally insulate the front and back of the sensing element received in the pocket from the winding.

4,188,554

ALTERNATING CURRENT ROTATING ELECTRIC MACHINE

Kenneth J. Binns, Chandler's Ford, England, assignor to The University of Southampton, Southampton, England

Filed Dec. 13, 1977, Ser. No. 860,072
Int. Cl.[2] H02K *21/08*
U.S. Cl. 310—156 **11 Claims**



1. An alternating current rotating electric machine having a permanent magnet rotor comprising a generally cylindrical body of magnetic material having a plurality of regularly spaced, inwardly extending open ended slots formed around its

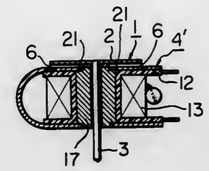
circumference so as to define pole-pieces there between with adjacent pole-pieces connected by magnetic material of the body at the base of the slot between said adjacent pole-pieces; a plurality of permanent magnets which are located in said open ended slots so as to induce poles of alternate polarity in the pole-pieces, the central axes of the slots being uniformly inclined relative to respective radii of the body which pass through the centers of the outer open ends of the slots, and the magnetic axes of the magnets extending transversely of the respective central axes of the slots with the pole-faces of the magnets abutting opposite sides of the slots; and a peripheral portion of each pole-piece being formed with a notch that extends circumferentially from that side of the open end of a slot facing an adjacent slot towards said adjacent slot so as to restrict the cross-sectional area of the pole-piece and localize the corresponding pole to a region opposite the outwardly directed pole-face of a magnet in said adjacent slot.

4,188,555

STATOR OF UNI-DIRECTIONAL SELF STARTING SYNCHRONOUS MOTOR

Yasuo Suzuki, and Tosihisa Hirai, both of Shijonawate, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Jan. 24, 1977, Ser. No. 761,796
Claims priority, application Japan, Jan. 30, 1976, 51/11297[U]
Int. Cl.[2] H02K *19/00*
U.S. Cl. 310—162 **4 Claims**



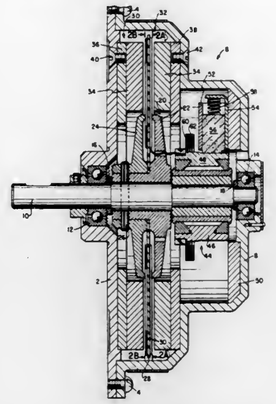
1. A unidirectional self-starting synchronous motor comprising, in combination, an annular coil having flat end surfaces, a cylindrical bearing of magnetic material containing a hole, said cylinder bearing being fitted into the coil extending between the end surfaces, a unitary yoke including a single continuous strip of magnetic material having a "U" shaped cross-section with the free ends thereof defining opposed flat parts being spaced to lie flatly adjacent the respective end surfaces of the coil, said yoke including an annular part containing a hole, a plurality of inner pole teeth extending radially outwardly from said annular part, and a plurality of outer pole teeth extending inwardly toward said annular part, each said inner pole tooth being substantially wider in the circumferential direction than each said outer pole tooth, said outer pole teeth being positioned to be between said inner pole teeth, respectively, said annular part and said inner pole teeth being separated from the remaining portion of said yoke except for a plurality of connecting parts for connecting said annular part to some of said teeth and the remaining portion of said yoke, said connecting parts being less in number than the number of said outer pole teeth, said teeth forming poles of alternate polarity when the coil is energized, a rotor in the form of a disc-shaped body having a number of magnetizations thereon cooperating with the poles of alternate polarity and having a shaft extending perpendicularly to the disc-shaped body, the shaft extending through the hole in said annular part and being rotatably journaled in the hole of the cylindrical bearing, said outer pole teeth being positionally deviated, from an equally spaced position relative to said inner pole teeth, toward said inner pole teeth in the desired direction of rotation of said rotor, said yoke including said annular part and said inner and outer pole teeth forming one integral stator.

4,188,556

ELECTRO-MECHANICAL MACHINE

James H. Hahn, Ft. Lauderdale, Fla., assignor to ACR Electronics, Inc., Hollywood, Fla.

Filed Jul. 18, 1977, Ser. No. 816,610
Int. Cl.[2] H12K *23/04*
U.S. Cl. 310—268 **11 Claims**



1. An electro-mechanical machine comprising:

first and second flat spaced parallel stator members, each having a circular array of 2N magnetic poles of alternately opposite polarity, where N is a number of pairs of such poles, each pole of one stator member being opposite and spaced from an opposite-polarity pole of the other stator member,

a disc armature rotor between said stator members having an array of coils on each face thereof, and

a commutator rotatable together with said rotor and having 4N segments, with N sequential sets of four sequential segments each, the N corresponding (i.e., first, second, third, or fourth) segments of each set being interconnected,

the coil array on one rotor face being angularly displaced relative to the coil array of the other rotor face by one half of the angular pitch between two adjacent coils, the coils on one half of one face of said rotor being connected together and to one pair of segments of said commutator segment sets, the coils on the other half of said one face of said rotor being connected together and to the remaining pair of segments of said segment sets, the coils on one half of the other face of said rotor being connected together and to a segment of said one pair and a segment of said remaining pair, and the coils on the other half of said other rotor face being connected together and to the other segment of said one pair and the other segment of said remaining pair.

4,188,557

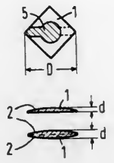
PIEZOELECTRIC OVERTONE RESONATOR WITH AT LEAST A CONVEX SURFACE AND SPECIFIC THICKNESS AND DIAMETER OR DIAGONAL

Werner Mattuschka, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,384
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752734
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—368 **6 Claims**

1. A thickness shear crystal overtone resonator for use in a quartz stabilized oscillator in the MHz range and wherein the resonator is used in cooperation with an essentially aperiodic

oscillator circuit without additional frequency selection means through specified dimension ratios of the resonator, comprising: a thin plate-like crystal having a convex surface and an opposed plane surface; the resonator having a maximum resonator thickness in millimeters of approximately (n·1700)/f where f is an operating frequency in kHz and n is an ordinal number of a desired harmonic; a radius of the convex surface of



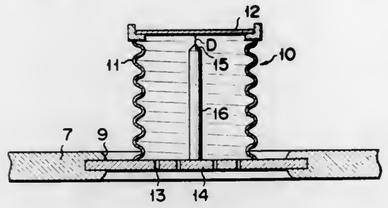
the resonator in millimeters being approximately 140 to 180 times a reciprocal value of said maximum resonator thickness; and the resonator diameter in the case of an essentially circular disk-shaped resonator and the rectangular diagonal in the case of an essentially rectangular resonator being dimensioned to be equal approximately to (54 to 72)/n times said maximum resonator thickness.

4,188,558

X-RAY TUBE

Toshio Yamamura, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,208
Claims priority, application Japan, Jun. 11, 1977, 52-69275
Int. Cl.² H01J *35/16*
U.S. Cl. 313—55 **15 Claims**



1. An X-ray tube comprising an evacuated envelope having an anode and cathode sealed therein, said envelope having an opening therein at a predetermined position in a wall portion of said envelope, a vertically movable flexible member extending from said wall portion at said opening and sealed to said wall portion, a rod having a sharp edge, said rod being supported at said wall portion and serving to pierce through said flexible member when the difference between the internal and external pressure of said envelope becomes greater than a predetermined value, and wherein the sharp edge of said rod is spaced from said flexible member by a predetermined distance.

4,188,559

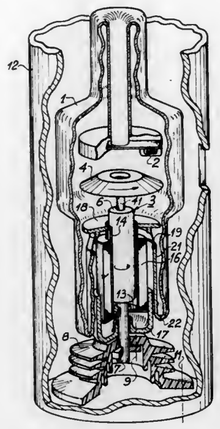
ROTARY ANODE X-RAY TUBE

Charles Carville, and André Laffitte, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jul. 28, 1978, Ser. No. 928,216
Claims priority, application France, Jul. 29, 1977, 77 23444
Int. Cl.² H01J *35/10, 35/16*
U.S. Cl. 313—60 **1 Claim**

1. In an X-ray tube disposed within a grounded metal casing including a sealed enclosure having a glass portion in which are positioned a fixed cathode, a motor having a rotor and a stator disposed outside of the enclosure and a rotary anode secured to the rotor, a fixed shaft extending outside of and tightly connected to the enclosure with the rotor rotatably mounted on the fixed shaft, the rotor and stator being at the same DC potential as the anode and separated by a separating wall of non-magnetic metal forming part of the sealed enclosure, the improvement which comprises,

a U-shaped glass fold having two branches in said sealed enclosure glass portion, said U-shaped fold arranged to extend around the assembly comprising said rotor, said stator and said separating wall whereby said two branches are interposed between said assembly and said metal casing,



a metal plate for tightly connecting the free end of said U-shaped glass fold to the extremity of said separating wall closest to said anode so as to provide a thermal screen between said anode and said motor,

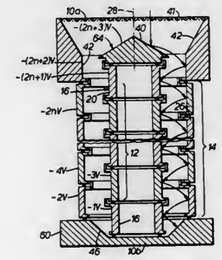
said U-shaped glass fold interposed between said motor and said metal casing permitting the application of a high DC voltage, necessary for operating the tube, between said anode and said cathode symmetrically with respect to ground whereby said tube can be operated at very high voltages.

4,188,560

FLANGED CYLINDRICAL ELECTRON MULTIPLIERS

Donald L. Swingler, Park Orchards, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Aug. 25, 1978, Ser. No. 936,911
Claims priority, application Australia, Aug. 24, 1977, 1373/77
Int. Cl.² H01J *43/10*
U.S. Cl. 313—105 R **24 Claims**



1. An electron multiplier of the kind in which, in use of the multiplier, a charge current is amplified by passage to, and by secondary emission of electrons from, surfaces of successive

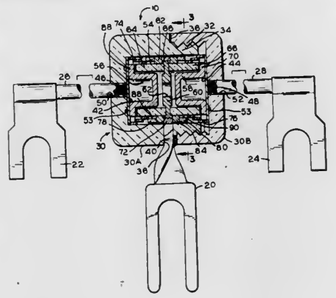
dynodes of a dynode array, there being two generally parallel rows of said dynodes, the dynodes in each row being in side-by-side position, said successive dynodes being dynodes in alternate ones of said rows and succeeding adjacent ones of the dynodes in each row receiving said charge current in use of the multiplier; said dynodes being shaped such that electric potentials which are in use applied to the dynodes generate an electric field between the two rows such as to effect substantial direction of secondary electrons produced at said surface to the surface of the next successive dynode, wherein the surfaces of dynodes in one said row are substantially cylindrical in configuration on a common axis, dynodes of the one row being spaced along said axis, the surfaces of dynodes of the other said row also being substantially cylindrical in form and coaxial with surfaces of dynodes of the first row, the said surfaces of the dynodes of the other said row being of greater diameter than those of dynodes of the first row and dynodes of the said other row being spaced lengthwise along the said axis, the surfaces of dynodes of said one row facing away from said axis and the surfaces of dynodes of the other row facing towards said axis in opposed relationship to the surfaces of dynodes of said one row; said surface of each dynode being linear and parallel to said axis when viewed in axial section, with first and second flanges positioned along edges of the surface at opposite axial ends thereof, said first flange extending substantially normally to the surface from one said opposite edge and said second flange having a first portion extending substantially normally to the surface from the other opposed edge in the same direction as said one flange and a second portion extending from an outer longitudinal edge of the first portion parallel to said surface and directed in the direction away from the first flange.

4,188,561

STATION PROTECTOR SPARK GAP APPLIQUE

Walter T. Pranke, and Manfred W. Wilms, both of Goleta, Calif., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Continuation of Ser. No. 759,533, Jan. 14, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,160
Int. Cl.² H01J *17/00, 21/00*
U.S. Cl. 313—325 **39 Claims**



1. A spark gap protector applique adapted for connecting to a station protector and including lead wires for connection to said station protector, said applique comprising:

a gas tube spark gap device including end terminals,

an insulated enclosure for receiving said gas tube spark gap device, said enclosure being provided with connection means which are substantially unitary with said lead wires for making connection with said end terminals of said spark gap device,

and a fail safe shorting means located within said enclosure and activated by heat for bringing about shorting of said spark gap device under predetermined discharge conditions,

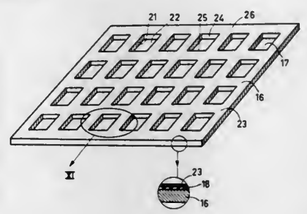
said fail safe shorting means including fusible metal means in heat exchanging relation with said spark gap device and a bias spring and a perforated insulated member located between said spring and said fusible metal means, wherein said spring causes flow of fusible metal through perforations of said insulated member to complete shorting of said spark gap device via said spring when said fusible metal means is fused.

4,188,562

COLOR DISPLAY TUBE AND METHOD OF MANUFACTURING SUCH A COLOR DISPLAY TUBE

Karel J. Van Oostrum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,670
Claims priority, application Netherlands, Oct. 27, 1977, 7711772
Int. Cl.² H01J *29/07, 31/20, 9/14*
U.S. Cl. 313—402 **4 Claims**



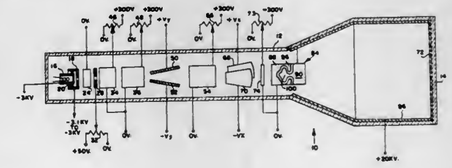
1. A colour display tube comprising in an evacuated envelope means for generating a plurality of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means comprising a metal plate having a large number of apertures therein which assign each electron beam to luminescent regions of one colour, an insulating film covering one side of said metal plate and a metal film provided on said insulating film, said insulating film and metal film extending on two opposite portions of the wall of each aperture, said plate and said metal film defining a pair of electrodes for producing an electron lens in said apertures.

4,188,563

CATHODE RAY TUBE HAVING AN ELECTRON LENS SYSTEM INCLUDING A MESHLESS SCAN EXPANSION POST DEFLECTION ACCELERATION LENS

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 757,425, Jan. 6, 1977, Pat. No. 4,137,479, Jan. 30, 1979. This application Aug. 31, 1978, Ser. No. 938,607
Int. Cl.² H01J *29/56, 29/62*
U.S. Cl. 313—460 **9 Claims**



8. An accelerating quadrupole lens for use in a cathode ray tube, comprising:

tubular members disposed adjacent each other and being positioned along a common axis;

bilobular section means provided by one of said tubular members defining opposing bilobular sections, each of said opposing bilobular sections including a necked-down section having lobes extending outwardly and slightly

upwardly from said necked-down section with said lobes having the same radius; and

means connecting said tubular members together to maintain said tubular members in position relative to each other to provide said quadrupole accelerating lens.

4,188,564

CATHODE RAY TUBE HAVING LOW RESISTANCE CONTACT AREA BENEATH HIGH VOLTAGE CONTACT SPRING

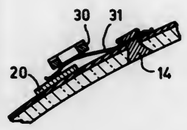
Antonius P. F. Zegers, and Johannes M. A. A. Compen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 764,347, Jan. 31, 1977, abandoned. This application May 26, 1978, Ser. No. 910,081

Claims priority, application Netherlands, Dec. 13, 1976, 7613806

Int. Cl.[2] H01J *29/07, 29/00*

U.S. Cl. 313—479 **5 Claims**



1. A color television display tube comprising an evacuated envelope, an electrode system disposed in said envelope for generating at least two electron beams, a display screen on an internal wall portion of said envelope, an electrically resistive layer for restricting currents produced during electric flashovers provided on a portion of the internal wall of said envelope disposed between said electrode system and said display screen, a color selection means positioned in said envelope a predetermined distance from said screen, at least one metal contact spring disposed opposite said resistive layer, means for electrically connecting said spring to said color selections means, a contact face having an electrical conductivity at least ten times greater than the conductivity of said resistive layer and an area of at least 5 cm^2 applied on said resistive layer between said layer and said spring for reducing the contact resistance therebetween to thereby reduce electromagnetic interference radiation generated by the display tube and means arranged in said envelope for maintaining said spring in engagement with said contact face to thereby electrically connect said color selection means of said resistive layer.

4,188,565

OXYGEN ATOM CONTAINING FILM FOR A THIN-FILM ELECTROLUMINESCENT ELEMENT

Etsuo Mizukami, Tenri; Hiroshi Kishishita; Masashi Kawaguchi, both of Nara; Yoshihiro Endo, Osaka, and Kinichi Isaka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1978, Ser. No. 884,475

Claims priority, application Japan, Sep. 16, 1977, 52/112018; Oct. 11, 1977, 52/122084

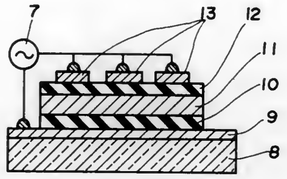
Int. Cl.[2] H05B *33/02, 33/22*

U.S. Cl. 313—509 **14 Claims**

1. A thin-film electroluminescent element comprising:

a thin-film electroluminescent layer including a luminescent center;

first and second dielectric layers, said electroluminescent layer being disposed between said dielectric layers, at least one of said dielectric layers containing oxygen in the atomic state which provides a bonding force between the dielectric layer and the thin-film electroluminescent layer; and



first and second electrodes provided on said dielectric layers, respectively.

4,188,566

METHOD FOR DETECTING COORDINATES OF GAS DISCHARGE PANELS AND APPARATUS FOR CARRYING OUT THE SAME

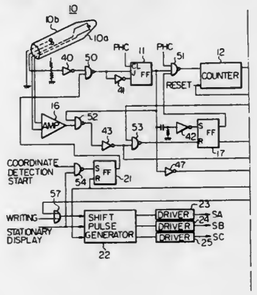
Hirohide Miwa, and Toshiaki Terakawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

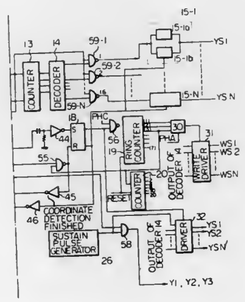
Filed Dec. 20, 1977, Ser. No. 862,499

Claims priority, application Japan, Dec. 22, 1976, 51-154702

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **12 Claims**





1. A method of determining the coordinates of a position in a self shift type gas discharge display panel comprising a group of X electrodes connected periodically in common to define subgroups of commonly connected ones of said X electrodes, at least one group of displaying Y electrodes and a corresponding scanning Y electrode, said Y electrodes crossing said X electrodes across a discharge gap, write electrodes crossing said Y electrodes, pulse means for selectively writing, shifting and sustaining discharge points at said crossing points between said electrodes, light pen means for designating said position whose coordinates are to be determined and for detecting discharge spots at said position, and counter means for determining information concerning the number of write and shift pulses applied prior to such detecting of discharge spots by said light pen, said method comprising:

writing, shifting and displaying information in the form of discharge spots selectively along said displaying Y electrodes by means comprising said writing electrodes crossing with said displaying Y electrodes;

bringing said light pen into sufficient proximity with one of said scanning Y electrodes for designating said position whose coordinates are to be determined,

stopping said writing, shifting and displaying of said information in the form of discharge spots,

firstly operating said pulse means for writing at least one discharge spot into, and shifting said discharge spot(s) along, selected sequential ones of said scanning Y electrodes from each respective one of said crossing points with said write electrode,;

detecting with said light pen said at least one discharge spot being shifted along the one of said scanning Y electrodes in proximity with said pen,

firstly operating said counter means to determine the x coordinate of said position designated by said light pen from the number of said shifts along said proximate scanning Y electrode in, and

recommencing said writing, shifting and displaying of said information in the form of discharge spots along said displaying Y electrodes.

4,188,567

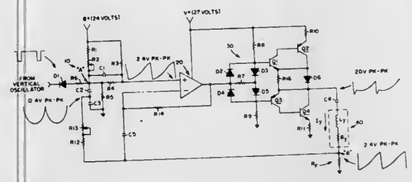
CONSTANT-CURRENT VERTICAL AMPLIFIER

Tex K. Monroe, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 3, 1977, Ser. No. 838,549

Int. Cl.[2] H01J *29/70, 29/72*

U.S. Cl. 315—396 **7 Claims**



1. In a television receiver having a vertical deflection yoke winding and a constant-current vertical amplifier circuit for developing, in response to a current-commanding signal at the amplifier input, a yoke current independent of the yoke impedance, an improved current-sensing feedback resistance comprising:

a first resistor connected between one end of the yoke winding and a reference potential;

a parallel-connected second resistor and first diode connected at one end to the junction of the yoke winding and first resistor;

a third resistor connected between another end of the parallel-connected second resistor and first diode and said potential whereby a feedback voltage is developed across the third resistor and a greater proportion of feedback voltage is developed in response to greater amplitudes of yoke current whereby a substantially S-shaped yoke current waveform is developed in response to a substantially sawtooth current-commanding signal.

4,188,568

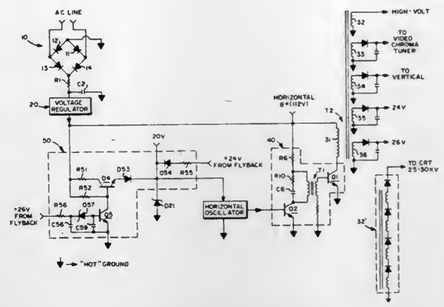
POWER SAVING CIRCUIT

David E. Manners, Alexander, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 14, 1978, Ser. No. 933,220

Int. Cl.[2] H01J *31/00*

U.S. Cl. 315—411 **12 Claims**



1. In a television receiver having a first voltage source, Horizontal B^+, for powering the horizontal output stage and voltage dropping circuit for dropping the value of the Horizontal B^+ to a value required to accommodate the horizontal oscillator, a power-saving improvement comprising:

a steering network having one input coupled to the dropping circuit, another input coupled to one of one or more derivative voltage sources derived from a flyback transformer secondary winding and an output coupled to the horizontal oscillator power supply terminal, and

a startup detector coupled to the voltage dropping circuit and also coupled to a derivative voltage source derived from a flyback winding so that during startup of the receiver the supply current for the horizontal oscillator is provided by the Horizontal $B+$ through the voltage dropping circuit and subsequent to the time at which the voltage developed by the derivative voltage source coupled to the startup detector exceeds a predetermined value, the oscillator supply current is provided by a derivative voltage source.

4,188,569

CONTROL CIRCUIT FOR AN ELECTRIC VEHICLE TRACTION MOTOR

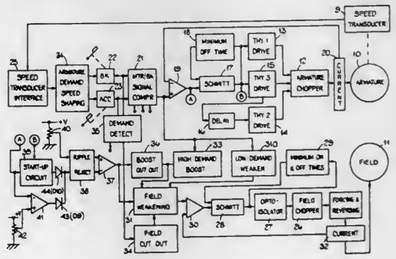
Graeme R. Campbell, Tettenhall, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 15, 1977, Ser. No. 861,041

Claims priority, application United Kingdom, Dec. 24, 1976, 54179/76

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—375 **3 Claims**



1. A control circuit for an electric vehicle traction motor having separate armature and field windings, comprising an

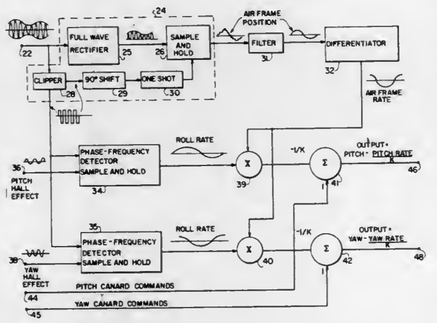
armature winding current control, a braking contact which is in series with the armature winding and which is closed or opened according to whether motoring or braking is required, an alternative path being provided for current generated by the motor during braking, reversing switch means connected in circuit with the field winding, a field current control and logic circuit means arranged to operate during a change from braking mode to motoring mode so as sequentially to reverse said reversing switch means when the field current is below a predetermined level, commence field current flow in the required direction for motoring mode and then close the brake contact whereby any residual magnetism in the field structure is reversed before the brake contact is closed.

4,188,570

GIMBAL ANGLE RATE FEEDBACK BY CAGE COIL DEMODULATION

Blake W. Masters, King George, and Robert D. Moran, Dahlgren, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 928,921
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—616 **12 Claims**



1. In an automatic guidance system for projectiles or missiles including a guidance gyro having a rotating magnetic mass, a cage coil, pitch and yaw hall effect elements and precession coils, and means for providing guidance commands to pitch and yaw canards, the improvement comprising:

a synchronous demodulator for receiving the cage coil output and for providing a sinusoidal output signal representative of the airframe position relative to the gyro axis, said cage coil output during guidance being a signal with a carrier at the gyro spin frequency and a modulation at the airframe natural frequency;

a differentiator for converting the output of said synchronous demodulator into a signal representative of the rate of airframe movement;

a pair of phase—frequency detectors for sampling the pitch and yaw hall effect element outputs with the cage signal carrier as a sample to provide phase references for the circuit;

a pair of multipliers for multiplying the rate amplitude from said differentiator by the phase references from said phase detectors to resolve the rate into pitch and yaw command components; and

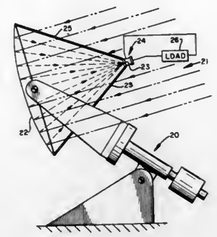
a pair of summation circuits for scaling and subtracting the rate commands provided by said multipliers from the guidance commands to the pitch and yaw canards whereby negative rate feedback is obtained.

4,188,571

RADIANT ENERGY TO ELECTRICAL POWER CONVERSION SYSTEM

Raymond D. Brunson, 9104 Joyce Phillips Ct., Springfield, Va. 22152

Filed Sep. 8, 1976, Ser. No. 721,800
Int. Cl.[2] H02N *3/00, 7/00*
U.S. Cl. 322—2 R **23 Claims**



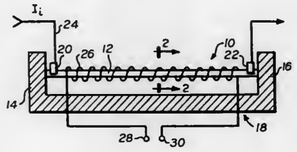
1. In an energy to electrical power transducer for a radiant energy to electrical power conversion system; cathode means having a cathode face; anode means having an anode face; housing means structured to hold said cathode and anode faces as closely spaced faces of said cathode means and said anode means in a highly evacuated vacuum state; said cathode means being of high work function high melt temperature material; said anode being a relatively low work function material; with said cathode face and said anode face spaced no more than approximately 0.002 of an inch apart to minimize space charge buildup and to optimize cross transfer of electrons from cathode to anode in a thermionic conversion process; wherein said cathode means is a relatively thin flat member having said cathode face at one side and a radiation receiving face on a radiation receiving side with both said cathode face and said radiation receiving face held in a vacuum state within said housing means and with said cathode means of high work function high melt temperature material of the class including molyvdenum, niobium, and tungsten for cathode operation with radiant energy cathode means heating up into the range of approximately 2400° to 3600° Kelvin; and means for focusing solar radiated energy to a high energy elevated temperature spot on said radiation receiving face of said cathode means with said cathode spot area being substantially less than that of the face area of said cathode.

4,188,572

CURRENT SENSING DEVICE

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Division of Ser. No. 488,209, Jul. 12, 1974, Pat. No. 3,961,297.
This application Oct. 22, 1975, Ser. No. 624,525
Int. Cl.[2] H01H *55/00*
U.S. Cl. 323—9 **5 Claims**



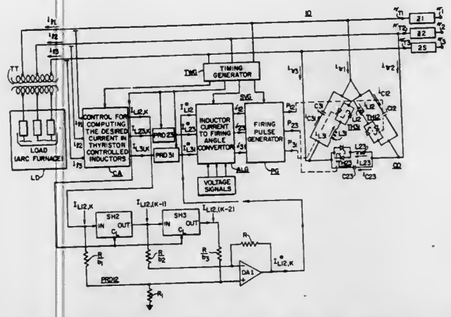
1. A current sensing device comprising a current conductive rod which exhibits magnetic anisotropy in other than a purely circular or longitudinal direction, a conductive coil wound about said rod, and means for applying an alternating current through said rod which is dependent on the size of the current being sensed, said applied alternating current being of sufficient magnitude to produce a helical magnetization of said rod in a given direction during one half cycle of said current and for reversing the direction of said helical magnetization during the next half cycle of said current, to produce a change in the linkage of axial flux in said rod with said conduction coil to cause an AC output signal at the terminals thereof.

4,188,573

STATIC VAR GENERATOR WITH TIME-RELATED-ERROR MINIMIZER

Laszlo Gyugyi, Penn Hills, and Michael B. Brennen, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 892,804
Int. Cl.[2] H02J *3/18*
U.S. Cl. 323—119 **29 Claims**



1. A VAR generator of the type which is connected to an electrical system for the purpose of supplying reactive power to the electrical system, comprising:

(a) calculating means for determining an estimated amount of reactive power that is to be provided to said electrical system during a given period of time, said calculating means providing an estimated reactive power output signal which is related to said estimated amount of reactive power;

(b) predictor means connected to receive said estimated reactive power output signal from said calculating means for weighing said later signal by a first amount and for adding said weighed later signal to a previously stored estimated reactive power output signal which has been weighed by a second amount to form a predictor means output signal; and

(c) reactive power producing means connected to said electrical system and said predictor means for providing reactive power during said time period in correspondence to said predictor means output signal.

4,188,574

AC DETECTOR FOR DC GROUND FAULTS AND HIGH CAPACITANCE IN HIGH-VOLTAGE DC POWER SUPPLIES

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 27, 1978, Ser. No. 890,071
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **11 Claims**

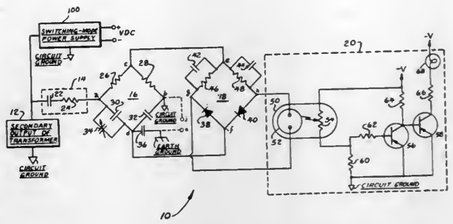
1. The combination of a ground fault detector and a DC power supply comprising:

a power supply transformer having a primary winding for coupling to an AC power source and a secondary winding;

said power supply transformer being part of said DC power supply;

said DC power supply having a floating secondary circuit with a circuit ground and a chassis ground;

means coupled between said secondary winding and circuit ground and responsive to the AC signal from said secondary winding for detecting a relatively low alternating current impedance between said secondary winding of said transformer and chassis ground; and



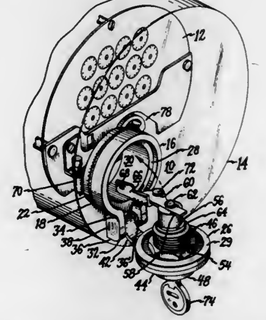
indicator means electrically connected to said means for detecting for providing an indication of said low impedance representing the existence of a ground fault current between a point in the secondary circuit of said DC power supply and chassis ground.

4,188,575

KEY OPERATED METER ACCESS LOCK AND RESET MECHANISM

Ansell W. Palmer, Hampton, N.H., and Francis J. Stevens, North Berwick, Me., assignors to General Electric Company, Somersworth, N.H.

Filed Jun. 9, 1978, Ser. No. 914,218
Int. Cl.[2] G01R *11/64;* **G06C** *15/42*
U.S. Cl. 324—103 R **17 Claims**



1. In combination with a meter of the type including a register disposed inside a housing, apparatus for gaining access to said register and for carrying out a control function of said register from the outside of said housing comprising:

(a) actuable control means mounted inside said housing, said control means communicating with said register to impart a control function thereto when actuated; and

(b) a register access and control assembly including,

(1) an apertured base extending through said housing and being mounted thereto adjacent said control means, said base having an inside wall formed by the aperture therein, and having a cam surface on the end thereof extending inside said housing,

(2) an apertured hatch assembly pivotally attached to said base and configured to mate therewith when said hatch assembly is pivoted to a closed position and serving to provide access to said register through the aperture of said base when pivoted to an open position,

(3) a rotatable bolt having an actuator-lock arm mounted on one end thereof for coaxial rotation with said bolt,

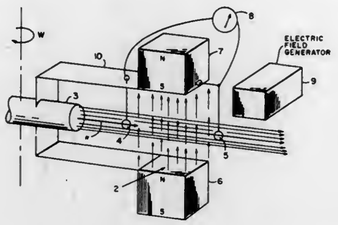
said bolt being mounted in the aperture of said hatch assembly, whereby said actuator-lock arm can extend inside said housing when said hatch assembly is closed, said actuator-lock arm being rotatable with said bolt to a first position whereby said actuator-lock arm clears the cam surface and the inside wall of said base to allow said hatch assembly to be pivoted opened and closed, said actuator-lock arm, with said hatch assembly closed, being rotatable from said first position to a second position to contact said cam surface to securely hold said hatch assembly closed and further being rotatable through said second position to actuate said control means to impart a control function to the register while maintaining contact with said cam surface.

4,188,576

ANGULAR RATE SENSOR

Paul L. Jacobs, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 11, 1978, Ser. No. 941,531
Int. Cl.[2] G01P *3/46*
U.S. Cl. 324—163 **4 Claims**



1. A sensor device comprising an electrically conducting fluid flowing in a given direction; first means for producing a magnetic field transverse to the direction the fluid is flowing; sensor means located in said fluid so as to detect any electric current flowing through said fluid; a nozzle means for ejecting said fluid in a free flowing jet; said nozzle means and said first means are connected in a fixed relationship to each other; said nozzle means and said first means being subject to movements which cause relative movement between the free flowing jet and said magnetic field; and said sensor means detecting the current flow caused by said relative movement.

4,188,577

PULSE EDDY CURRENT TESTING APPARATUS FOR MAGNETIC MATERIALS, PARTICULARLY TUBES

Girish P. Mhatre, Yonkers, and Robert A. Brooks, Rye, both of N.Y., assignors to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 639,796, Dec. 11, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,702
Int. Cl.[2] G01N *27/86*
U.S. Cl. 324—220 **19 Claims**

1. Apparatus for the eddy current testing of objects of magnetic material for variations therein which comprises

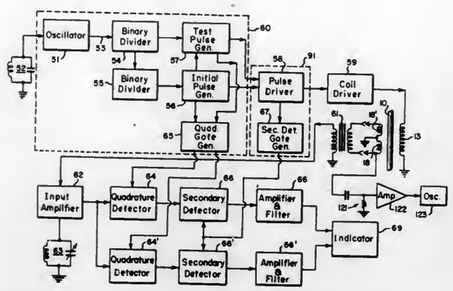
(a) a test head including coil means adapted to be magnetically coupled with a said object to be tested,

(b) means for applying to said coil means intermittent DC voltage pulses for producing magnetic flux in the object and a voltage having a substantial AC component for inducing eddy currents therein,

(c) said AC component occurring at least during respective DC pulses and having a period which is short compared to the duration of a said pulse,

(d) means connected with said coil means for producing a signal corresponding to variations in said eddy currents,

(e) quadrature detecting and gating means for producing quadrature detected signals from said signal at predetermined gated intervals prior to or at the ends of said DC pulses respectively and delayed with respect to the respective initiations of said DC pulses and AC components occurring during the DC pulses,



(f) said quadrature detected signals being produced at quadrature-related points synchronized with said applied AC component and the delay of said intervals being at least a plurality of periods of said AC component,

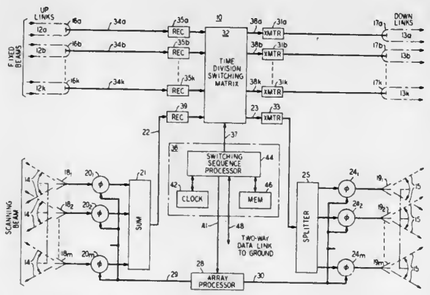
(g) and means responsive to said detected signals for indicating variations in said object.

4,188,578

SATELLITE COMMUNICATION SYSTEM WHICH CONCURRENTLY TRANSMITS A SCANNING SPOT BEAM AND A PLURALITY OF FIXED SPOT BEAMS

Douglas O. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1978, Ser. No. 907,796
Int. Cl.[2] H04B *7/00*
U.S. Cl. 325—4 **10 Claims**



1. An antenna means for a satellite repeater comprising in combination

a first antenna section (**16***a*–**16***k*, **17***a*–**17***k*) capable of concurrently receiving and transmitting a plurality of k paired first type directional up-link and down-link spot beams of radiated energy (**12***a*–**13***a*; . . . ; **12***k*–**13***k*) containing signals within a predetermined frequency spectrum, where each pair of up-link and down-link directional spot beams is associated with a separate one of a plurality of k spaced-apart first type remote ground station areas; and

a second antenna section capable of concurrently receiving and transmitting a separate second type up-link and down-link beam (**14**, **15**) of radiated energy, respectively, containing signals within the predetermined frequency spectrum for providing communication with plurality of x spaced-apart second type remote ground station areas; characterized in that

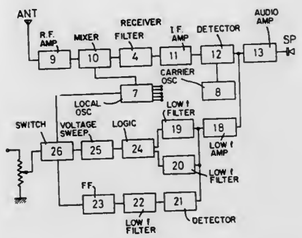
the second antenna section comprises a first portion (**18**$_1$–**18**$_m$) which is capable of being directionally changeable to scan over the plurality of x second type spaced-apart remote ground station areas in a first predetermined scanning format and in synchronism with the expected arrival of up-link signals from each of the second type spaced-apart remote ground station areas on a time-division multiple access basis, and a second portion (**19**$_1$–**19**$_m$) which is capable of being directionally changeable to scan over the plurality of x second type spaced-apart remote ground station areas in a second predetermined scanning format and in synchronism with the transmission of signals destined for each of the second type spaced-apart remote ground station areas.

4,188,579

SSB TRANSCEIVER

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,408
Claims priority, application Japan, Aug. 20, 1976, 51/99513
Int. Cl.[2] H04B *1/40*
U.S. Cl. 325—17 **10 Claims**



1. In an SSB transceiver having a transmission mode and a receiving mode, comprising tuning means operable in said receiving mode for adjusting the frequency of a received signal, said tuning means including an oscillator having a variable output frequency which is manually adjustable, the improvement comprising means for producing two pilot signals having predetermined frequencies differing by a predetermined amount, means operable in said transmission mode for superposing said pilot signals on a transmitted signal, means operable in said receiving mode for demodulating such pilot signals from a received signal, means operable in said receiving mode for switching said tuning means from a manual operating mode to an automatic operating mode in response to a signal having a frequency equal to the predetermined frequency difference between said two pilot signals, means including a voltage sweeping circuit for supplying a varying voltage to said oscillator to correspondingly vary the output frequency thereof, control means receiving said pilot signals demodulated from said received signal and stopping the change in output voltage of said sweeping circuit when said pilot signals are of said predetermined frequencies, whereby said tuning means will automatically adjust the frequency of the received signal to that of the transmitted signal.

4,188,580

SECURE COMMUNICATION SYSTEM

Carl R. Nicolai, Seattle, Wash.; William M. Raike, Carmel, Calif., and David L. Miller, Seattle, Wash., assignors to Telesync Corporation, Carmel Valley, Calif.

Filed Oct. 20, 1977, Ser. No. 843,800
Int. Cl.[2] H04K *1/00*
U.S. Cl. 325—32 **16 Claims**

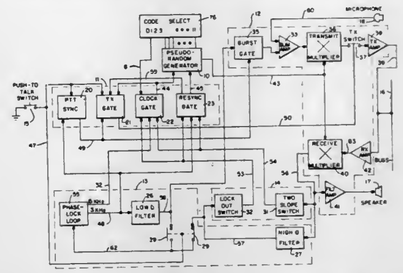
1. A communication system for encoding and decoding a source of information to render the communication of same secure between a transmitting location and a receiving location comprising:

means for generating predetermined user-selectible pseudorandom digital signal codes having pseudorandom first and second states at said transmitting and receiving locations,

means for multiplying the information with one of said codes thereby forming encoded information,

means for transmitting and receiving said encoded information,

means for synchronizing the generation of said pseudorandom code at said transmitting and receiving locations, said transmitting location including means for generating a



synchronizing preamble code for a predetermining period of time whereupon said preamble code becomes a tracking signal said transmitting location including means for transmitting said synchronizing preamble code and said tracking signal, said receiving location including means for detecting when said preamble code has become said tracking signal, thereby initiating generation of said pseudorandom code, said receiving location including means responsive to said tracking signal for maintaining generation of said pseudorandom code at said receiving location thereby maintaining said synchronization, and

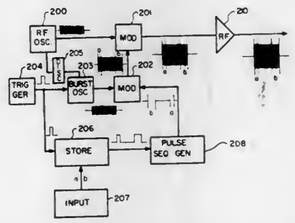
means for recovering the information from said received encoded information.

4,188,581

SIGNALLING SYSTEM

Roy A. Stevenson, 809 E. Tujunga, Burbank, Calif. 91501

Filed May 16, 1977, Ser. No. 796,996
Int. Cl.[2] H03K *5/20;* **H04B** *1/00*
U.S. Cl. 325—38 R **15 Claims**



1. In a signalling system for alphanumeric data including means for generating a pulse having a length related to a specific alphanumeric symbol;

means for modulating a radio frequency carrier with said pulse to produce a radio frequency signal;

means for transmitting the pulse modulated carrier;

a receiver including means for demodulating the radio frequency signal to detect the received pulse;

the improvement comprising means introducing said pulse into a transmission line having a reflective termination;

said transmission line having at least one detector tap spaced from said termination at a distance related to half the length of said pulse at the propagation rate of the pulse along said transmission line;

means connected to said tap for detecting coincidence between the leading and trailing edge of said pulse; and

means responsive to detected coincidence by said means for detecting coincidence for registering the alphanumeric symbol, corresponding to said top.

4,188,582

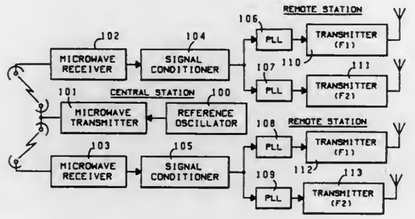
SIMULCAST TRANSMISSION SYSTEM HAVING PHASE-LOCKED REMOTE TRANSMITTERS

Gary A. Cannalte, Hoffman Estates; Ronald H. Chapman, Wheaton, and Walter J. Rozanski, Jr., Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1978, Ser. No. 894,671

Int. Cl.[2] H04B *7/00*

U.S. Cl. 325—58 **15 Claims**



10. In a transmission system for distributing a reference signal from a central station to a plurality of remote stations via communication paths therebetween, each remote station including a signal conditioner for providing a conditioned reference signal from the reference signal received thereat, said signal conditioner comprising:

(a) phase-locked loop means coupled to the received reference signal, said phase-locked loop means including a forward path having phase comparator means, analog switch means, loop filter means, sample and hold means and voltage-controlled crystal oscillator (VCXO) means coupled in series, and a feedback path having a first dividing means coupled to the VCXO means for providing a feedback signal to the phase comparator means;

(b) second dividing means coupled to the VCXO means for providing the conditioned reference signal;

(c) means coupled to the received reference signal for detecting the presence of the received reference signal and providing an activity indication signal when the received reference signal is present; and

(d) control means for opening the analog switch means, enabling the sample and hold means to maintain the frequency of the VCXO means and providing a reset signal to reset the first dividing means to a predetermined state in the absence of the activity indication signal, the control means thereafter closing the analog switch means, enabling the sample and hold means to sample the output of the loop filter means for controlling the frequency of the VCXO means, and removing the reset signal from the first dividing means in response to the presence of the activity indication signal.

4,188,583

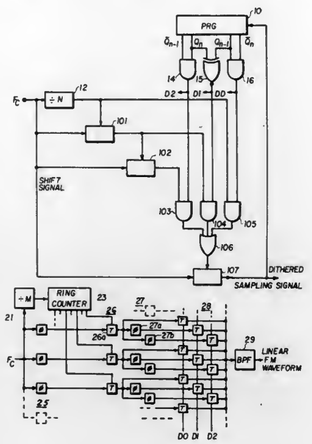
SAMPLING METHOD AND APPARATUSES

Robert J. McCurdy, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,904

Int. Cl.[2] H04L *27/12*

U.S. Cl. 325—163 **11 Claims**



1. A method for sampling a signal during each of a plurality of successive time periods of equal duration comprising the steps of:

generating a plurality of pseudo random pulses of equal duration with successive ones of said pseudo random pulses occurring during successive ones of said successive time periods of equal duration; and

sampling the signal during each of said pseudo random pulses, the period of a pseudo random pulse during which the sampling occurs being known as a sampling interval, each sampling interval occurring at an essentially random time within said time period, whereby harmonics at the time period recurrence frequency are substantially lessened.

4,188,584

MIXER

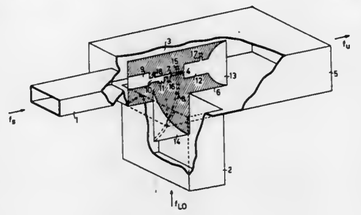
Hendrik Hoogstraate, Delden, Netherlands, assignor to N. V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed Apr. 20, 1978, Ser. No. 898,472

Claims priority, application Netherlands, Apr. 28, 1977, 7704644

Int. Cl.[2] H04B *1/26*

U.S. Cl. 325—446 **6 Claims**



1. A mixer comprising a first waveguide part for transmission of an input signal to be converted to a lower frequency band, a second waveguide part for transmission of a signal supplied by a local oscillator, said first and second waveguide parts opening into a cavity, a substrate positioned in said cavity and a first unencapsulated semiconductor for producing an output signal of frequency (f_u) which is a linear combination of the frequency (f_s) of the input signal and the local oscillator frequency (f_{LO}) mounted on said substrate, said mixer further including a transmission line for said output signal, and at least two microwave integrated circuits provided on said substrate and forming a connection between said first semiconductor and the two waveguide parts said microwave integrated circuit forming the connection between said first semiconductor and said first waveguide part including a slot-line mounted on one side of the substrate which contains therewithin said first semiconductor.

4,188,585

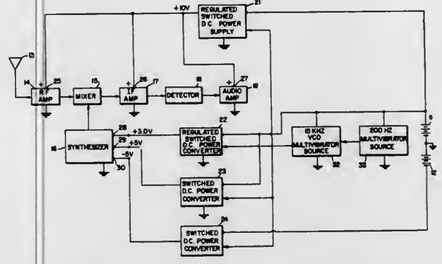
SYNCHRONIZED RECEIVER POWER SYSTEM

Frank A. Wissel, Cincinnati, Ohio, and Charles A. Bucher, Scottsdale, Ariz., assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Mar. 16, 1978, Ser. No. 887,669

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—492 **18 Claims**



1. A portable radio receiver adapted to be powered by a battery comprising an IF amplifier having a predetermined center frequency and bandpass, circuit means for supplying signals to and responsive to signals derived from the amplifier, a first switching power converter powered by the battery for deriving a first DC power supply voltage that powers a load including the IF amplifier, a second switching power converter powered by the battery for deriving a second DC power supply voltage that powers another load including at least some of the circuit means, a source powered by the battery for synchronizing the switching of said first and second power supplies at the same time, said synchronizing source having a fundamental and harmonics with substantial amplitude outside of the passband of the circuit means powered by the second power supply and the bandpass of the IF amplifier to minimize spurious signals injected by the power converters into the amplifier and circuit means.

4,188,586

DEMODULATOR CIRCUIT FOR CHOPPER AMPLIFIER

Tsuneyuki Egami, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 8, 1978, Ser. No. 932,292

Claims priority, application Japan, Aug. 23, 1977, 52/100884

Int. Cl.[2] G01R *19/18;* **H02M** *7/06;* **H03D** *1/10*

U.S. Cl. 329—192 **1 Claim**

1. A demodulator circuit for a chopper amplifier comprising:

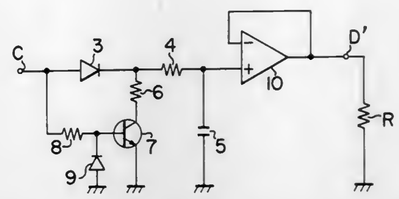
a rectifier having an input terminal to receive an amplitude-modulated AC voltage signal,

a smoothing circuit connected to said rectifier and having a serially connected resistor and a capacitor,

said rectifier having a polarity to charge said capacitor during positive half-cycles of said amplitude-modulated AC voltage signal applied thereto,

an operational amplifier having a noninverting input terminal connected to a junction between the resistor and capacitor of said smoothing circuit, an inverting input terminal of said operational amplifier being connected to an output terminal thereof, and

a discharge circuit for the capacitor of said smoothing circuit connected to a junction between said rectifier and



said smoothing circuit, said discharge circuit including a serially connected resistor and switching transistor, a base of said switching transistor being connected to the input terminal of said rectifier whereby to render said transistor conductive at each positive half-cycle of the amplitude-modulated AC voltage signal applied thereto.

4,188,587

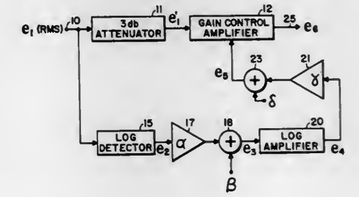
LINEAR GAIN CONTROL APPARATUS UTILIZING FEED FORWARD LEVEL CONTROL

James R. Palmer, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1978, Ser. No. 918,857

Int. Cl.[2] H03G *3/20*

U.S. Cl. 330—136 **6 Claims**



1. Substantially linear gain control apparatus comprising:

(a) gain control amplifier circuitry including cascaded multipliers configured as gain control elements having an input, an output and a control terminal providing a predetermined transfer function therethrough;

(b) logarithmic detector means having an input connected to the input of said gain control amplifier circuitry and an output, said detector means providing a signal at the output thereof which is a logarithmic function of any signals supplied to the input;

(c) logarithmic amplifier means having an input coupled to the output of said detector means and an output coupled to the control terminal of said gain control amplifier circuitry, said logarithmic amplifier means providing an output signal which is a logarithmic function of the logarithmic function of the signal applied to the input thereof; and

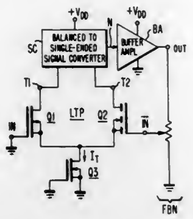
(d) means coupled to said logarithmic amplifier means for adjusting the signal applied to the control terminal of said gain control amplifier circuitry to alter the predetermined transfer function to a substantially linear function.

4,188,588

CIRCUITRY WITH UNBALANCED LONG-TAILED-PAIR CONNECTIONS OF FET'S

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,784
Int. Cl.² H03F 3/45
U.S. Cl. 330—253 **11 Claims**



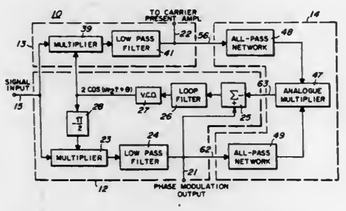
1. In combination:
first and second field effect transistors of the same conductivity type, each having respective gate and source and drain electrodes, said first and second field effect transistors being respectively of depletion-mode and enhancement-mode; and
means for connecting said first and second transistors in long-tailed-pair configuration, including means for supplying tail current to an interconnection to which the source electrodes of said first and second field effect transistors connect without substantial intervening impedance, wherein said means for supplying tail current essentially comprises
a third field effect transistor being a depletionmode transistor of the same conductivity type as said first and second field effect transistors, having a source electrode connected to a point of reference potential to which the gate electrode of said first field effect transistor connects, having a drain electrode connected to said tail interconnection, and having a gate electrode to which the potential at its source electrode is applied as its gate potential.

4,188,589

AUTOMATIC SIGNAL ACQUISITION MEANS FOR A PHASE LOCKED LOOP WITH ANTI-SIDEBAND LOCK PROTECTION

Kenneth H. Brown, Scottsdale; Michael E. Carr, Tempe, and Charles W. Rook, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1978, Ser. No. 939,081
Int. Cl.² H03B 3/04
U.S. Cl. 331—12 **7 Claims**



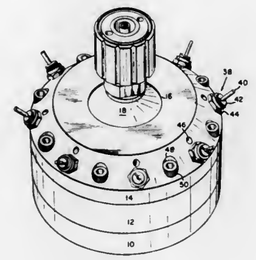
7. Improved automatic signal acquisition means for a phase-locked loop with anti-sideband lock protection including a voltage controlled oscillator, comparison means for comparing an input signal to a signal from the voltage controlled oscillator, filtering means and a summing network connected in a phase-locked loop and providing an output signal at an output thereof at the input of said summing network, a signal multiplying network connected to receive the input signal and a signal from the voltage controlled oscillator in the phase-locked loop for providing a first signal at an output thereof, a multiplier having first and second inputs and an output, and the summing network in the phase-locked loop connected to the output of the multiplier for combining the multiplier output signal with the phase-locked loop output signal, the improvement comprising coupling means including all-pass network means and coupling the output of the signal multiplying network to one input of the multiplier and the output of the phase-locked loop to the other input of the multiplier, said all-pass network means shifting the phase of signals applied thereto so that the signals applied to the inputs of the multiplier are approximately in phase.

4,188,590

CONICAL POWER COMBINER

Robert S. Harp, Westlake Village, and Kenneth J. Russell, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 25, 1977, Ser. No. 855,054
Int. Cl.² H03B 7/14
U.S. Cl. 331—56 **19 Claims**



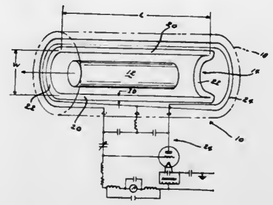
1. A microwave power combiner comprising:
(a) a conical support structure having an apex region and a conical surface extending from said apex region for receiving a plurality of selectively spaced power sources,
(b) a conical housing structure having a conical surface area or areas thereof facing said conical surface of said support structure and spaced therefrom to define a common waveguide energy propagating region for said power sources,
(c) an inner coaxial conductor joined to said apex region of said conical support structure,
(d) an outer coaxial conductor surrounding said inner coaxial conductor to define an output coaxial line and further joined to said conical surface area or areas of said housing structure,
(e) a plurality of microwave power sources selectively disposed at predetermined locations on said conical surface of said support structure, and
(f) microwave circuit means electrically connected and coupled to said power sources for energizing said power sources and for coupling energy from said power sources and via said waveguide region to said coaxial line, whereby the electrical distance between said power sources and said coaxial line is minimized.

4,188,591

RF EXCITED MERCURY LASER LAMP

Anthony E. Siegman; Neil C. Holmes, both of Stanford, and Max T. Artusy, Mt. View, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 7, 1977, Ser. No. 840,353
Int. Cl.² H01S 3/092
U.S. Cl. 331—94.5 P **6 Claims**



1. In an optically pumped mercury laser having a laser tube, a lasing medium located within said laser tube and means operably connected to said laser tube for optically pumping said lasing medium, the improvement therein residing in said optical pumping means, said optical pumping means comprising a mercury discharge lamp in operable relationship with said laser tube, said mercury discharge lamp having a pair of hollow elongated legs spaced apart from each other and being disposed on opposite sides of and lying in the same plane as said laser tube, a hollow end portion interconnecting said legs at each end thereof, each of said end portions being positioned substantially perpendicular to the longitudinal axis of said legs, said discharge lamp thereby forming a closed rectangular loop surrounding and being substantially coaxial with said laser tube, a gas contained within said hollow legs and said end portions of said lamp, a radio-frequency excited coil, said coil being wound around the outside of said lamp in a direction substantially parallel to said legs and said end portions, respectively, of said lamp, thereby being in operable relationship with said lamp and a radio-frequency power supply operably connected to said coil whereby said radio-frequency excited coil forms the primary coil and said lamp forms the secondary coil of an air-core transformer, the current in said lamp being excited entirely by radio-frequency magnetic fields passing through said lamp.

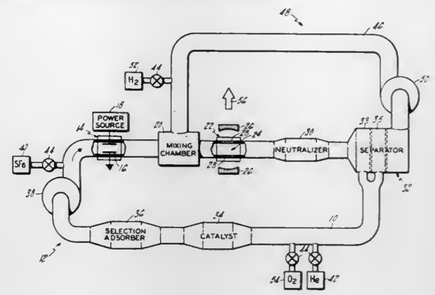
4,188,592

CLOSED CYCLE CHEMICAL LASER

Carl J. Buczek, Manchester, Conn.; Robert J. Freiberg, Palm Beach Gardens, Fla.; David W. Fradin, Exton, Pa., and Peter P. Chenausky, Avon, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 10, 1978, Ser. No. 894,776
Int. Cl.² H01S 3/095
U.S. Cl. 331—94.5 G **24 Claims**

1. A chemical laser system of the mixing type for continuous wave operation comprising:
a first closed loop through which a gaseous medium may be repeatedly circulated;
means for controllably supplying a first gas to the first closed loop;
a dissociation chamber including means for dissociating at least a portion of the first gas to provide a reaction gas, said dissociating means being downstream of the position at which the first gas is admitted to the first closed loop;
a mixing chamber located downstream the means for dissociating the first gas wherein the mixing chamber is adapted for combining the reaction gas with a second gas to provide a working gas having excited energy levels from which laser radiation can be extracted;
optical means located either immediately downstream of or coincident with the mixing chamber for extracting laser radiation from the working gas;
a neutralizer located downstream the optical means adapted for removing the working gas from the effluent passing therethrough;
a separator located downstream of the neutralizer for separating the second gas from the effluent;
scrubber means for removing undesired constituents in the effluent passing therethrough, said scrubber means being located downstream of the separator;



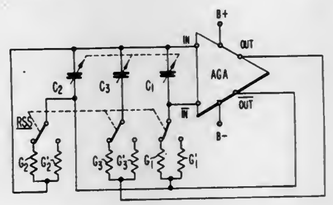
means for controllably providing a third gas to the first closed loop;
a first circulating means for continuously pumping the effluent through the first closed loop; and
a second closed loop for passing the second gas separated from the effluent by the separator to the mixing chamber wherein the second closed loop includes a second circulating means for pumping the second gas through the second loop and means connected to the second loop for controllably providing the second gas to the second closed loop from a source of second gas.

4,188,593

RC OSCILLATOR

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,140
Int. Cl.² H03B 5/26
U.S. Cl. 331—108 D **9 Claims**



1. An RC oscillator comprising:
an amplifier having a high-impedance input circuit between first and second terminals and having an output circuit, and exhibiting a voltage gain of A between its input and output circuits;
a first resistor with a conductance G_1 and a first capacitor with a capacitance C_1 connected in a first series combination;
a secnd resistor with a conductance G_2 and a second capacitor with a capacitance C_2 parallelly connected with each other and said first series combination in a first parallel combination;
a third resistor with a conductance G_3 and a third capacitor

with a capacitance C_3 serially connected with each other and said first parallel combination in a second series combination;

means for applying potential appearing across the output circuit of said amplifier across said second series combination; and

means for applying the potential appearing across said first capacitor to the input circuit of said amplifier to complete a regenerative loop for oscillating at a frequency of ω radians per second.

4,188,594

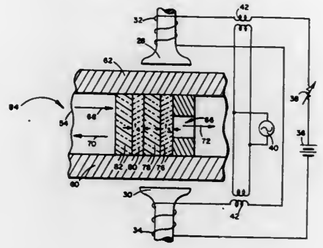
FIXED FREQUENCY FILTERS USING EPITAXIAL FERRITE FILMS

Wayne L. Bongianni, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 17, 1978, Ser. No. 870,144

Int. Cl.[2] H03C *3/00, 1/00;* **H01P** *1/20, 1/22*

U.S. Cl. 332—16 R **13 Claims**



1. A filter for electromagnetic waves comprising:

a wave guide;

a thin film of monocrystalline hexagonal ferrite disposed within said wave guide normal to the direction of propagation of radiant energy therein, wherein said thin ferrite film is epitaxially deposited on a single crystal substrate; and

conductive means for reflecting radiant energy incident on and transmitted through said thin ferrite film back through said thin ferrite film.

4,188,595

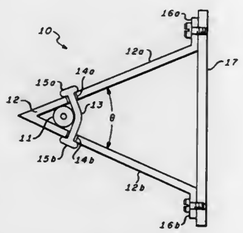
SHIELDED SURFACE WAVE TRANSMISSION LINE

Harry M. Cronson; Basrur R. Rao, and Gerald F. Ross, all of Lexington, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,238

Int. Cl.[2] H01P *5/18, 3/10;* **H04B** *7/26*

U.S. Cl. 333—113 **10 Claims**



1. A transmission line apparatus comprising:

a wedge-shaped shield of dielectric material having an internal angle and an external apex formed by the intersection of the two sides thereof;

means positioned within said internal angle for the propagation of surface waves; and

means for maintaining said surface wave propagation means within said internal angle and in contact with each side of said wedge-shaped shield.

4,188,596

ELASTIC SURFACE WAVE DEVICE

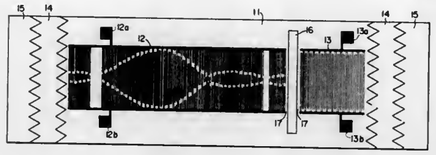
Michiyori Miura, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 7, 1978, Ser. No. 884,274

Claims priority, application Japan, Mar. 7, 1977, 52-23812

Int. Cl.[2] H03H *9/26, 9/30, 9/32;* **H01L** *41/04*

U.S. Cl. 333—151 **7 Claims**



1. An elastic wave device comprising a substrate of piezoelectric material, an input electrode disposed on the substrate surface for converting an electrical signal into an elastic surface wave, and an output electrode disposed in an elastic surface wave propagation path on the substrate surface for converting a propagating elastic surface wave into the electrical signal again, wherein at least two kinds of ultrasonic wave absorbing materials are disposed in closely adjacent relation in a region on the substrate surface where neither the input and output electrodes nor the elastic surface wave propagation path exists and where unnecessary elastic surface wave propagate, said ultrasonic wave absorbing materials having different acoustic impedances so that the unnecessary elastic surface wave is scattered at an abrupt change in the acoustic impedance between the ultrasonic wave absorbing materials.

4,188,597

PROCESS FOR THE OPERATION OF A TRANSVERSAL FILTER

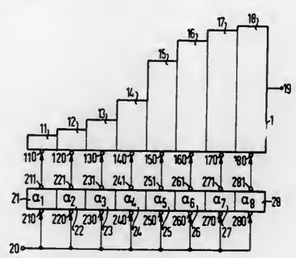
Karl Knauer, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,234

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644284

Int. Cl.[2] H03H *7/28;* **G11C** *27/00;* **H01L** *29/78*

U.S. Cl. 333—165 **4 Claims**



1. A process for the operation of a transversal filter, wherein the latter is provided with at least one analogue shift register which possesses a plurality of storage positions having parallel inputs and further possesses a series output, wherein a number of individual, predeterminable evaluating circuits is provided, where each evaluating circuit possesses a signal input for the input of the signal to be filtered and an output for providing an output signal weighted according to an evaluation factor, where the output of every evaluating circuit can be connected via a switching element to an associated one of said parallel inputs, wherein the analogue shift register is operated in known manner to effect a charge shift process where charge is shifted toward the series output, wherein the input of every evaluating circuit is connected with the input signal, wherein an evaluating circuit is in each case read into the shift register as a result of the closure of a switching element, and wherein the filtered signal is withdrawn from the series output, characterized in that each evaluating circuit is read-in several times between two consecutive charge shift processes to effect a multiple read-in process, where a charge shift process is in each case carried out between two such multiple read-in processes, and wherein no charge shift process is carried out during each multiple read-in process.

4,188,598

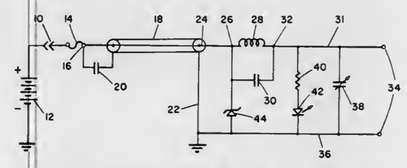
ELECTRICAL FILTER

Morris C. Hunt, 41926 Camino Santa Barbara, Fremont, Calif. 94538

Filed Nov. 7, 1977, Ser. No. 849,181

Int. Cl.[2] H03H *7/10;* **H01P** *1/20, 7/04*

U.S. Cl. 333—207 **14 Claims**



1. In a band rejection filter for use in the power leads to a radio apparatus, in combination:

a pair of input terminals and a pair of output terminals;

the parallel combination of a coil and a capacitor;

a length of coaxial cable having its center conductor connected, at one end of said cable, to a respectively associated end of said coil;

the outer conductor of said cable, at said one end of said cable, being connected to one input terminal and to one output terminal;

the other input terminal being connected to the inner conductor of the cable at the other end of the cable;

the other end of said coil being connected to the other output terminal; and

a series circuit including a current limiting resistor connected across said output terminals and magnetically coupled to said coil.

4,188,599

INDUCTANCE COIL FOR TELECOMMUNICATION SYSTEM AND METHOD OF MAKING SAME

Franco Papa, Cusano Milanino, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 15, 1977, Ser. No. 860,836

Claims priority, application Italy, Dec. 17, 1976, 30517 A/76

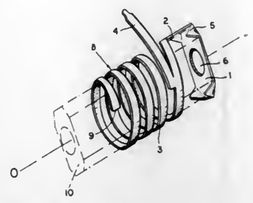
Int. Cl.[2] H01P *7/00;* **H01F** *15/10, 27/78*

U.S. Cl. 333—219 **8 Claims**

1. An inductance coil for high-frequency filtering, comprising:

a helical body with several turns consisting of a flat metal strip with broad faces wound about an axis parallel to said broad faces, said strip terminating in a free end;

an enlarged terminal tab of one piece construction with said strip adjoining said body opposite said free end and lying substantially perpendicular to and centered on said axis; and



a branch lead of one piece construction with said strip extending at an acute angle from one of said turns.

4,188,600

CAVITY RESONATOR HAVING ANCILLARY CYLINDER FOR SUPPRESSING PARASITIC MODE

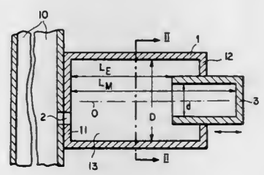
Enzo Cavalieri D'Oro, Monza, Italy, assignor to Società Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 23, 1977, Ser. No. 863,623

Claims priority, application Italy, Dec. 24, 1976, 30852 A/76

Int. Cl.[2] H01P *1/16, 706*

U.S. Cl. 333—228 **5 Claims**



1. A cavity resonator comprising:

a hollow cylindrical body of conductive material forming a resonant cavity provided at one end with an inlet for coupling said cavity to a guide path traversed by microwaves of a predetermined operating frequency, said cavity being substantially closed at its opposite end; and

a solid ancillary conductive cylinder of smaller inner diameter than said cavity inserted into said opposite end, said cylinder being provided with an open end confronting said inlet and with a closed end farther from said inlet than said opposite end, said cavity being dimensioned to sustain a preferred mode of propagation for microwaves in a frequency band centered on said operating frequency, the inner diameter of said ancillary cylinder being less than that required for the propagation of waves at said operating frequency in said preferred mode while facilitating such propagation in a parasitic mode.

4,188,601

MERCURY-WETTED RELAY CONSTRUCTION

Larry L. Wiese, Pickerington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

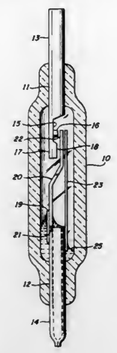
Filed Oct. 13, 1978, Ser. No. 951,123

Int. Cl.[2] H01H *29/00*

U.S. Cl. 335—51 **8 Claims**

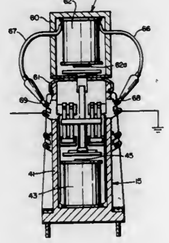
1. A mercury-wetted relay construction comprising a magnetic pole-piece member (**11**), a magnetic stem member (**12**), means (**10**) for oppositely supporting said stem and pole-piece members, said last-mentioned members presenting corresponding first and opposite, second sides, an electrical contact (**16**) mounted on the end and on said first side of, said pole-piece member (**11**), a substantially flattened "Z" shaped armature (**20**) presenting oppositely extending legs, and a magnetic hinge (**19**) for flexibly mounting said armature member (**20**) to said

stem member (12) to extend one leg of said armature member in a spaced-apart relation over said contact (16), characterized in that said hinge (19) is affixed to the other, opposite leg of said armature member (20) to position said last-mentioned leg



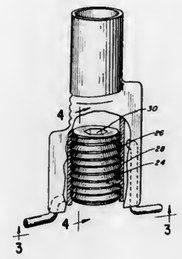
adjacent the end, and on said second side of, said stem member (12) and in that a nonmagnetic bumper member (23) is mounted on said first side of said stem member to extend along said one leg of said armature member (20) in a spaced relation with said one leg.

4,188,602
RELAY REPAIR APPARATUS
Cecil E. Shroyer, Rte. #3, Coshocton, Ohio 43812
Filed Jan. 20, 1978, Ser. No. 870,938
Int. Cl.² H01H *45/04*
U.S. Cl. 335—132 **10 Claims**



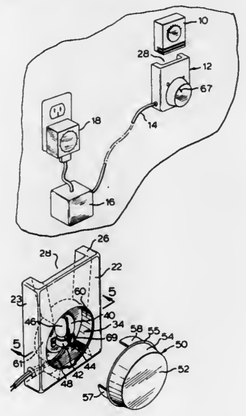
1. For use with an electrical relay of a variety including a housing, an electrical coil mounted within said housing and energizable from a source connectable with electrical contacts positioned upon said housing, a movable member within said housing for selectively carrying out switching logic, having a first biased switching position and movable to a second switching position upon the energization of said coil, said movable member including a projecting portion movable therewith and said housing having an opening over which may be mounted a cap, said cap, when so mounted, being situated at a location adjacent said movable member projecting portion, the improved auxiliary assembly comprising:
a casing mountable over said opening;
an auxiliary electrical coil mounted within said casing;
means for connecting said auxiliary electrical coil with said source when said casing is mounted over said opening; and
an operative member mounted within said casing, extensible to said movable member where said casing is mounted over said opening and having a first position exhibiting no operational influence over said movable member such that said movable member is in said first biased switching position when said auxiliary coil is unenergized, said operative member being movable into a second position in contact against said movable member projecting portion when said auxiliary coil is energized from said source to cause said movable member to move to said second switching position.

4,188,603
INDUCTOR WITH CONDUCTING CORE OF SINTERED POWDERED METAL
Peter A. Tsoutsas, Orland Park, Ill., assignor to Permacor, Inc., Oak Lawn, Ill.
Filed Jul. 26, 1978, Ser. No. 928,063
Int. Cl.² H01F *21/04*
U.S. Cl. 336—75 **5 Claims**



1. An inductor comprising in combination
an inductor body,
a winding forming a plurality of helical turns disposed about the inductor body, and
a core disposed in the body and surrounded by the winding, the core being formed of sintered aluminum powdered metal.

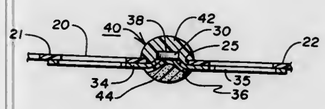
4,188,604
THERMOSTAT REGULATOR
Richard C. Maybee, Burlington, Canada, assignor to Polygauge Industries Ltd., Oakville, Canada
Filed Oct. 17, 1977, Ser. No. 842,563
Int. Cl.² H01H *37/16*
U.S. Cl. 337—377 **7 Claims**



1. A regulator for wall thermostats, comprising:
a housing adapted to be affixed to a wall under a thermostat, the housing defining within it a passage for air, the passage

having an inlet and an outlet with the inlet situated below the outlet,
a manually rotatable member at least partly translucent and mounted to the housing in the path defined by said passage, the rotatable member defining a passageway which may be adjusted by rotating the member to positions between that of alignment with said passage and that of blocking said passage; the rotatable member including two part-cylindrical partitions each covering about 90° of arc, and being spaced apart by intervals of about 90°, the housing defining a cylindrical guideway in which said partitions can rotate, the guideway being part of said passage, the passage having side walls which intersect the guideway so as to open through about 90° of the cylinder, whereby each partition is able to assume a position in which the passage is completely blocked,
and means including a light source within the passageway of the member for simultaneously (a) heating the air within said passageway thus promoting convective flow from the inlet to the outlet, and (b) illuminating said rotatable member.

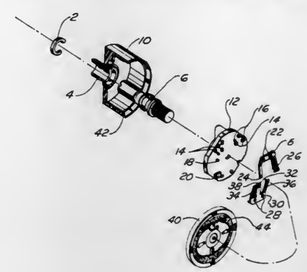
4,188,605
ENCAPSULATED HALL EFFECT DEVICE
Glenn M. Stout, 2000 Argonne Dr., Columbia Heights, Minn. 55421
Filed Jul. 21, 1978, Ser. No. 926,658
Int. Cl.² H01L *43/04*
U.S. Cl. 338—32 H **15 Claims**



1. An encapsulated Hall effect device comprising:
a thin substrate with an aperture;
a semiconductor chip, having a plurality of connection leads and including a Hall effect element having a sensing surface, said chip being disposed in registration with the aperture; and
encapsulation material surrounding the chip and aperture, the encapsulation material comprising:
a nonmagnetic portion of the encapsulation material surrounding the sensing surface of the chip, and
a magnetically active portion of the encapsulation material surrounding the surface of the chip opposite the sensing surface, said magnetically active portion of the encapsulation material comprising a mixture of a finely divided magnetic conductor material and a binder,
whereby the chip is fully enclosed by the nonmagnetic and magnetically active portions of the encapsulation material.

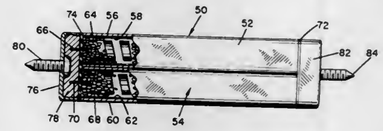
4,188,606
PHASEABLE IMPEDANCE DEVICE
Richard L. Bomar, Riverside, and Jesus Duarte, Pomona, both of Calif., assignors to Bourns, Inc., Riverside, Calif.
Filed Oct. 31, 1977, Ser. No. 846,951
Int. Cl.² H01C *10/00*
U.S. Cl. 338—137 **9 Claims**

1. In combination:
a rotor to be used with a variable impedance device;
a fixed wiper contact spring mounted upon said rotor;
at least a pair of locator and heat staking pegs formed on said rotor for positioning and fastening said fixed wiper contact spring thereto;
a plurality of heat staking patches for securing said fixed wiper contact spring to said rotor;
a first pick-off element contact member integral with and forming a part of said fixed wiper contact spring;
a first output contact member integral with and forming a part of said fixed wiper contact spring;
an adjustable wiper contact spring mounted upon said rotor;
at least one critically positioned pivot point heat staking peg formed on said rotor;
a pivot arm member, integral with and forming a part of said adjustable wiper contact spring, having an aperture to receive said at least one critically positioned pivot point heat staking peg and permitting small angular pivotal movement of said adjustable wiper contact spring about



said at least one critically positioned pivot point heat staking peg;
a latch formed on said rotor so as to constrain pivotal movement of said adjustable wiper contact spring to the plane of said rotor;
a second output contact member integral with and forming a part of said adjustable wiper contact spring;
a second pick-off element contact member integral with and forming a part of said adjustable wiper contact spring; and
means employing said latch, to fix the position of said adjustable wiper contact spring.

4,188,607
VARIABLE IMPEDANCE DEVICE
David L. Cannom, 276 Cabrillo #C, Costa Mesa, Calif. 92627, and Carlos M. Del Rio, Pipila No. 113, Irapuato, Guanajauto, Mexico
Filed Dec. 1, 1978, Ser. No. 965,683
Int. Cl.² H01C *8/00*
U.S. Cl. 338—224 **11 Claims**



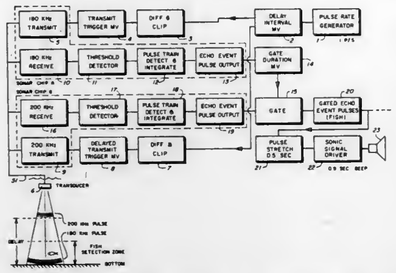
1. A variable impedance device comprising a pair of electrodes electrically interconnected by a length of a compacted conductive mixture of granulated silica and the metal constituents of bronze, and enclosure means for retaining said mixture.

4,188,608
FISH DETECTION APPARATUS
Joseph D. Richard, 3613 Loquat Ave., Miami, Fla. 33133
Filed Jun. 19, 1978, Ser. No. 916,704
Int. Cl.² G01S *9/70*
U.S. Cl. 367—93 **8 Claims**

1. In an echo sounder for selectively detecting fish within a predetermined depth zone relative to the bottom in a body of water, apparatus for excluding signals indicative of bottom echoes comprising:
means for transmitting first and second ultrasonic pulses into a body of water, said ultrasonic pulses being separated by a predetermined time delay interval;

means for receiving ultrasonic echo signals from within the aforementioned body of water resulting from reflections of the said ultrasonic pulses;

means for providing a gate interval initiated by the repeption of the first bottom echo from among the said received echo signals, said gate interval having a predetermined time duration not exceeding the said delay interval so that signals indicative of bottom echoes resulting from the said



second transmitted pulse cannot occur during the said gate interval;

means for selectively detecting echo events which occur during the said gate interval from among the said received echo signals; and

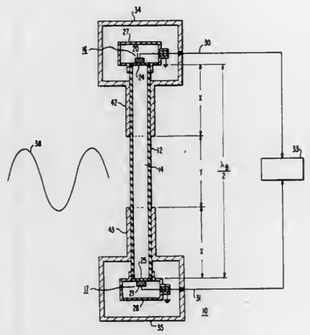
means for activating a sensible signal in response to said detected echo events to indicate the presence of fish within the aforementioned predetermined zone relative to the bottom.

4,188,609

LOW FREQUENCY HYDROPHONE

Gerald Mott, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 10, 1978, Ser. No. 904,697
Int. Cl.[2] H04B *13/00*
U.S. Cl. 367—152 **16 Claims**



1. a low frequency hydrophone comprising:

(a) an elongated, compliant, fluid-filled tube member;

(b) transducer means coupled to said tube member at at least one end thereof;

(c) said tube member being for immersion in the ambient water to be exposed to acoustic waves of frequency f and wavelength λ_A;

(d) the impingement of said acoustic waves on said tube member causing a corresponding pressure wave of frequency f and wavelength λ_B in said fluid in said tube member, where $\lambda_B < \lambda_A$;

(e) said transducer means providing an output signal in response to said pressure wave in said fluid in said tube member;

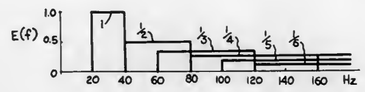
(f) the length of said tube member from said transducer means to the other end thereof being in the order of (n $\lambda_B/2$) where n is an odd integer.

4,188,610

METHOD OF AND APPARATUS FOR THE GENERATION AND TRANSMISSION OF SIGNALS FOR ECHOLOCATION AND OTHER SIGNALLING PURPOSES, SUCH AS IN GEOPHYSICAL EXPLORATION

David E. Nelson, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,698
Int. Cl.[2] G01V *1/14, 1/28*
U.S. Cl. 367—14 **87 Claims**



66. For use in echolation systems for seismic exploration, the method of generating from signals having broad bandwidth which extend over a frequency range used in such systems, a transmission having an autocorrelation function in which side lobes are substantially suppressed, said method comprising

deriving said signals from a plurality of sources operating in harmonically locked relationship with each other, each source transmitting a slowly varying, quasi-repetitive train of signals,

sweeping the repetition frequency of said signals from said sources over N frequency bands within said range, said bands not exceeding one octave and N being an integer including one, and

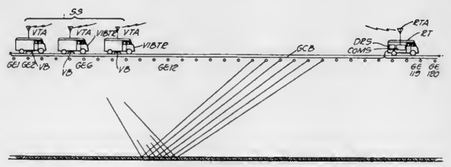
timing the transmissions from said sources to be in such phase relationship that harmonics of the signals from any of said sources which are produced more than once are suppressed.

4,188,611

SEISMIC PROSPECTING SYSTEM

Charles M. Edwards, and William C. Walter, both of Pasadena, Calif., assignors to United Geophysical Corporation, Pasadena, Calif.

Continuation of Ser. No. 304,476, Nov. 7, 1972, abandoned. This application Jan. 9, 1978, Ser. No. 867,967
Int. Cl.[2] G01V *1/36*
U.S. Cl. 367—41 **4 Claims**



1. In a method of seismic surveying, the method of generating, receiving, and processing seismic wave signals that comprises:

a. storing a seismic source wave signal of variable frequency in the form of a series of digital signals in integer-mode format;

b. exciting the earth in accordance with said source signal to cause seismic wave signals of corresponding variable frequency to be generated in the earth over an extended period of time whereby such seismic waves travel downwardly into the earth and are deflected by subsurface formations;

c. receiving seismic waves deflected by such subsurface formations at a spread of geophone stations;

d. converting the seismic waves received at the respective geophone stations into a series of digital signals multiplexed in accordance with a second, or data receiver, floating-point format;

e. converting said series of received digital signals into a set of series of digital signals multiplexed in a third, or compositing, floating-point format;

f. repeating steps (b) to (e) for successive trains of received seismic waves that travel over approximately the same paths, thereby producing corresponding sets of digital signals multiplexed in said third, or compositing, floating-point format;

g. compositing said sets of digital signals to produce a final set of composited signals multiplexed in said third, or compositing, format;

h. reformatting said sets of multiplexed composite signals to produce a final set of said multiplexed signals in said second, or data receiver, floating-point format;

i. also reformatting said set of multiplexed composite signals to store them in said first, or source signal, integer-mode format;

j. cross-correlating said series of seismic source wave digital signals that were recorded in said first, or source signal, format with said set of composite signals after they have been reformatted in said first, or source signal, format while both said series of seismic source wave digital signals and said set of composited signals are in integer mode, to produce a set of cross-correlated signals; and

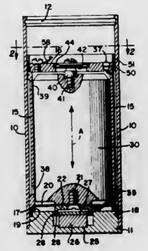
k. reformatting said set of cross-correlated signals to produce a final set of multiplexed correlated signals in said second, or data receiver, floating-point format.

4,188,612

PIEZOELECTRIC SEISMOMETER

James D. Kerr, Allen, Tex., assignor to Teledyne Industries Inc. (Geotech Division), Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,680
Int. Cl.[2] G01V *1/16*
U.S. Cl. 367—160 **6 Claims**



1. A seismometer for delivering signals representing vibrational displacements along an axis of sensitivity, comprising:

a frame extending about said axis;

a rigid vibratory mass in the frame disposed along said axis and having first and second axially spaced ends;

means for restoring the position of the mass in the frame consisting essentially of one spring disc assembly having a disc of spring metal disposed opposite said first end of the mass and fixed at its center thereto to support said first end and yieldably to oppose displacements of the mass in both directions along said axis, and said restoring means further including a piezoelectric disc having one face conductively bonded to a face of the metal disc, and having an electrode bonded to the other face of the piezoelectric disc and operative to deliver said signals, the composite of the metal disc and piezoelectric disc providing the stiffness of the spring disc assembly;

mounting means supported on the frame and tightly clamping the edge of the metal disc all the way around its periphery to hold said edge in a plane normal to the axis, whereby when the mass displaces the central portion of the metal disc from said plane the central portion will flex in one direction and an annular portion of the metal disc nearer its periphery will flex in the opposite direction, the piezoelectric disc overlying said central portion of the metal disc and the ratio of the diameter of the piezoelectric disc to the diameter of the metal disc being about 0.68; and

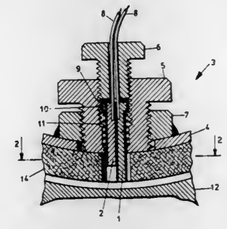
constraining means coupled to the second end of the mass and attached to the frame and operative to constrain the mass to displacements in the direction of the axis.

4,188,613

SAFETY INDICATOR FOR AUTOMOBILE BRAKING SYSTEM

Chieh-Pang Yang, No. 28, Chang Cheng Rd., and Chia-Hsiang Wong, No. 314, Chang Cheng Rd., both of Kuong Fu Hsiang, Hualien Hsien, Taiwan

Filed May 31, 1978, Ser. No. 911,067
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 A **1 Claim**



1. An indicator for a braking system which utilizes a lining affixed to a support shoe comprising: a first conductor bar embedded within the lining and supported by the shoe, said first conductor bar has a terminal portion flush with the brake lining, insulation means electrically isolating said conductor bar from the shoe, a conductor wire leading from said conductor bar to a bulb, a source of power connected to said bulb and connected to a ground, and a ground on a surface against which the lining acts while applying a braking force whereby when said conductor bar touches said surface, the bulb will be illuminated, a second conductor bar shorter than said first conductor bar and fastened thereto such that said first conductor bar will provide a first indication, a second conductor wire connected to said second conductor and to a second bulb which is connected to said source of power whereby said first indication shows that the brakes do work, and the second conductor bar shows lining wear said first and second conductor bars are carried in said lining by means of a base member surrounding said bars defined by a body fastened to said shoe, an adjusting screw threadedly disposed within said body, an insulative washer below said adjusting screw, said bar members are below said washer and are provided with a flange which abuts against said washer whereby the adjusting screw orients said conducting bars.

4,188,614

REMOTE CYCLE ALARM SYSTEM

Fred G. Habib, Jr., 6231 W. Newport, Chicago, Ill. 60634

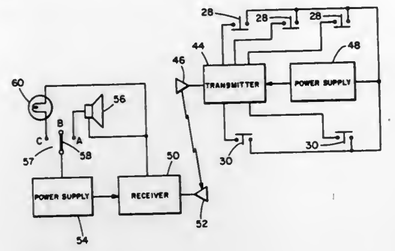
Filed Oct. 6, 1977, Ser. No. 839,985
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—63 **8 Claims**

1. A remote cycle alarm system for preventing theft of vehicles comprising:

housing means being positioned on a support surface for co-operative engagement with a wheel of a vehicle;

actuating means being disposed on said housing means for generating contact closures;

transmitter means disposed on said housing means and being responsive to said acutating means upon a contract closure;



receiving means for receiving the transmitted signals by the transmitting means at a remote distance away from said transmitting means; and

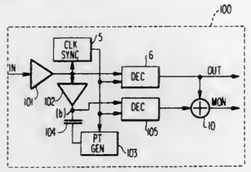
said housing means comprises a base which is provided with an adjustable means for accommodating various size wheels of the vehicles to maintain the wheel in a central portion of the base and over the actuating means.

4,188,615

BIT ERROR DETECTING CIRCUIT FOR USE IN A DIGITAL SIGNAL TRANSMISSION LINE

Yoichi Tan, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 933,924
Claims priority, application Japan, Aug. 15, 1977, 52-97048
Int. Cl.[2] G08C *25/00*
U.S. Cl. 340—146.1 R **4 Claims**



1. A bit error detecting circuit comprising:

clock signal recovery means responsive to an input digital signal transmitted through a transmission line for reproducing a clock signal from said input digital signal;

a first decision circuit for deciding a binary code of said input digital signal in accordance with a first reference level and for producing a decision output in response to said clock signal;

a pattern generating circuit responsive to said clock signal for generating a predetermined binary code pattern;

an adder circuit for adding said binary code pattern to said input digital signal;

a second decision circuit for deciding a binary code of the output from said adder circuit in accordance with a second reference level and for producing a decision output in response to said clock signal; and

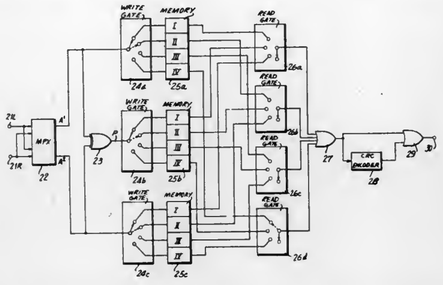
an Exclusive-OR circuit having an Exclusive-OR function of the outputs of said first and second decision circuits, whereby a fault on said transmission line is detected before said first decision circuit produces a bit error.

4,188,616

METHOD AND SYSTEM FOR TRANSMITTING AND RECEIVING BLOCKS OF ENCODED DATA WORDS TO MINIMIZE ERROR DISTORTION IN THE RECOVERY OF SAID DATA WORDS

Shin-Ichi Kazami, Tokyo, and Toshitada Doi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 15, 1978, Ser. No. 905,894
Claims priority, application Japan, May 16, 1977, 52-56142
Int. Cl.[2] G06F *11/10, 11/12*
U.S. Cl. 340—146.1 AL **42 Claims**



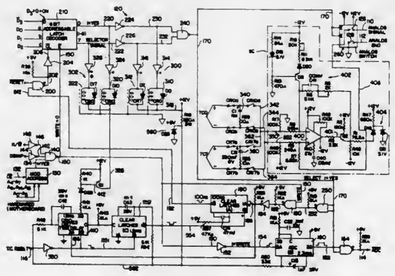
1. A method of transmitting encoded data words, each data word being formed of a multiple of bits, said method comprising the steps of generating a plurality of data blocks and a row of parity bits included in each data block, each data block including a plurality of rows of information bits, and a given parity bit being associated with corresponding ones of information bits in said rows of information bits in said block; generating respective error correcting codes associated with respective rows in each block; and serially transmitting each data block by transmitting said rows of information bits and associated error correcting codes and said row of parity bits and associated error correcting code such that said row of parity bits and associated error correcting code is preceded by a row of information bits and its associated error correcting code and is followed by a row of information bits and its associated error correcting code.

4,188,617

SYSTEM FOR CONVERTING ANALOG SIGNALS TO MULTIPLEXED DIGITAL DATA

Jess F. Fauchier; William H. Seipp, both of Bettendorf, and Stephen E. Whiteside, Davenport, all of Iowa, assignors to Gulf & Western Industries, Inc., New York, N.Y.

Continuation of Ser. No. 727,792, Sep. 29, 1976, abandoned. This application Jun. 16, 1978, Ser. No. 916,287
Int. Cl.[2] G08C *15/06*
U.S. Cl. 340—183 **4 Claims**



1. A module for use in a programmable controller having a control processing unit with output address lines, a selected

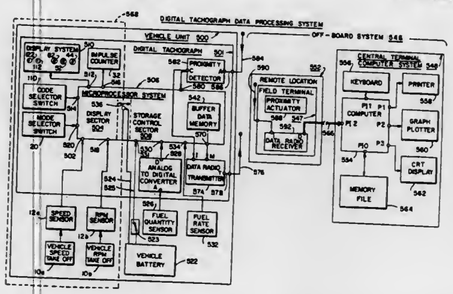
number of input/output bi-directional data lines, means for creating a write signal in a write line and means responsive to said write signal for writing data from said data lines into selected addressed locations, said module comprising: means for receiving at least two analog voltage signals; a signal converting circuit for converting an analog voltage signal at a circuit input to an output analog signal at a circuit output, said output analog signal being capable of conversion into digital data by an external analog to digital conversion circuit; means for selectively activating said module by a given coded address in said address lines of said central processing unit; a signal selecting means for selecting one of said analog voltage signals in response to the simultaneous appearance of a write signal in said write line, said given address in said address lines and a signal selecting code in said data lines, said signal selecting code corresponding to the particular analog voltage signal to be selected; means for applying only said selected analog voltage signal to said circuit input of said signal converting circuit; means for creating a select signal only when one of said analog voltages has been selected; said module having output lines directed to said external conversion circuit and a single switching means for connecting said circuit output of said signal converting circuit to said output lines when said switching means is in a first condition and for electrically isolating said output lines of said module from said circuit output of said signal converting circuit on said module when said switching means is in a second condition; means for shifting said switching means into the first condition only when said select signal is in existence and means for shifting said switching means into the second condition when said select signal is not present.

4,188,618

DIGITAL TACHOGRAPH SYSTEM WITH DIGITAL MEMORY SYSTEM

Emanuel S. Weisbart, 99-60 63rd Rd., Forest Hills, N.Y. 11374

Continuation-in-part of Ser. No. 449,708, Mar. 11, 1974, Pat. No. 3,950,700, which is a continuation-in-part of Ser. No. 157,964, Jun. 29, 1971, Pat. No. 3,835,382. This application Apr. 8, 1976, Ser. No. 674,851
Int. Cl.[2] G08G *17/00*
U.S. Cl. 340—201 R **36 Claims**



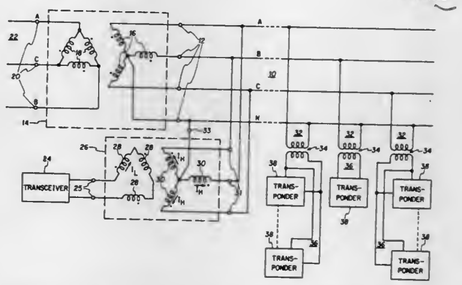
1. A digital tachograph system for recording performance of a vehicle comprising detection means adapted for location entirely on-board said vehicle and operative to continuously detect the dynamic vehicle performance characteristics thereof including vehicular velocity thereof as a function of time and to produce a continuous stream of vehicle characteristic versus time data signals corresponding to said detected characteristics; digital display means operative to selectively display the instantaneous value of said vehicle performance characteristics; data memory means adapted for location on-board said vehicle and operative to continuously receive and record said vehicle characteristic data signals representing said vehicle characteristic data; fixed base computer terminal means including central terminal computer means, and data transmission means operative to selectively transmit said vehicle characteristic data from said vehicle data memory means to said central terminal computer means; said central terminal computer means being operative upon receipt thereof via said data transmission means to selectively read out said vehicle characteristic data.

4,188,619

TRANSFORMER ARRANGEMENT FOR COUPLING A COMMUNICATION SIGNAL TO A THREE-PHASE POWER LINE

William C. Perkins, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1978, Ser. No. 934,449
Int. Cl.[2] H04B *3/54, 3/56*
U.S. Cl. 340—310 R **3 Claims**



1. A transformer arrangement for simultaneously coupling a signal to all three phase conductors of a three-phase power line having a neutral conductor comprising:

a low voltage set of three like windings serially connected, with one end of each of two of said windings being disconnected;

a high voltage set of three like windings connected in a neutral wye configuration to the power line;

means for magnetically coupling each winding of one set with a different winding of the other set so that a current through said low voltage set of windings causes currents to flow through the windings of said high voltage set in the same direction with respect to the neutral connection, and

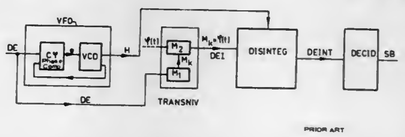
means for applying the signal to be coupled to the power line across the disconnected ends of the two windings of the first set.

4,188,620

PHASE DECODER

Jean-Claude Lamare, Ezanville, and Christian Maury, Velizy, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France

Filed Nov. 9, 1978, Ser. No. 959,097
Claims priority, application France, Nov. 14, 1977, 77 34162
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**



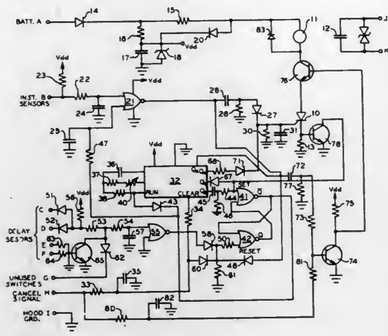
1. Apparatus for integrating a series of bi-level electric bits, comprising at least one integrator containing a capacitive integrating member, a device for controlling the integrator responsive to the series of bits for controlling the duration and direction of charging current flowing in the capacitive member as a function of the direction and duration of each individual bit in the series, a circuit for resetting the integrator to zero at

the end of each integrating operation of each bit, a generator responsive to the repetition rate of the bits for supplying the capacitive integrating member with a charging current proportional to the nominal frequency F_O of the bilevel bits.

4,188,621
ALARM SYSTEM

James D. Heckelman, Norwalk, and Robert A. Ziemke, Sandusky, both of Ohio, assignors to Dan-Mar Co. Inc., Huron, Ohio

Filed Jan. 18, 1978, Ser. No. 870,337
Int. Cl.[2] B60R *25/00*; G08B *13/22*
U.S. Cl. 340—528 **16 Claims**

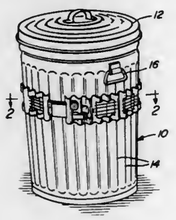


1. A control circuit comprising: a pulse generator providing first and second output signals at spaced apart time intervals, said pulse generator having a clearing terminal and a pause terminal, switch means having start and stop inputs and an output connected to said pause terminal of said pulse generator, said switch means starting said pulse generator when said start input is energize and stopping sadi pulse generator after a first predetermined time period when said stop input is energized, said stop input being actuated by said first pulse generator output signal, and a controlled device actuated by said second output signal after a second predetermined time period when said pause terminal is not actuated by said stop input.

4,188,622
GARBAGE CAN ALARM

Larence G. Miller, 1499 Ringe La., Las Vegas, Nev. 89110, and Rowland B. Purmal, 39 Lowery, Henderson, Nev. 89015

Filed Jan. 27, 1978, Ser. No. 873,411
Int. Cl.[2] G08B *13/12*
U.S. Cl. 340—571 **8 Claims**

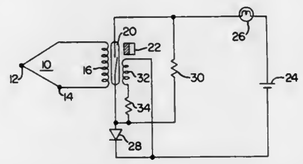


1. In combination, an elongated stiff but bendable strap assembly constructed of shape retentive but deformable and resilient dielectric material and including first and second sides and longitudinally spaced transversely extending corrugations and being adapted to encircle an upright trash can constructed of conductive material with said first side opposing the outer surface of said trash can, said corrugations including ridges spaced along said first side for abutting engagement with said can and said assembly including longitudinally spaced openings formed therethrough, said strap assembly including anchor means for releasably securing said strap assemby in position extending about said can, a conductor member threaded through selected corrugations and spaning said openings, and battery and electrically actuatable signal means supported from said strap assembly, open circuit means serially connecting said battery, signal means and said conductor member and including contact means disposed outwardly of said one side of said assembly for electrical contact with said can, said conductor member being adapted to engage said can and close said circuit means.

4,188,623
TEMPERATURE RESPONSIVE APPARATUS EMPLOYING A THERMOCOUPLE

Seiko Suzuki; Masahiro Takasaka; Toru Sugawara, and Toru Takahasi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1977, Ser. No. 819,993
Claims priority, application Japan, Jul. 28, 1976, 51/89198; Aug. 27, 1976, 51/101614
Int. Cl.[2] G08B *17/06*
U.S. Cl. 340—595 **22 Claims**



1. A temperature responsive apparatus comprising a voltage source, a thermocouple producing a thermoelectric e.m.f. depending on the temperature difference between the temperature to be detected and the circumferential temperature, a first winding supplied with current from the thermocouple to generate a first magnetic field, a second winding generating a second magnetic field in the opposite direction to that generated by said first winding, and a reed switch positioned in the total magnetic field generated by said first and second windings and responding to the intensity of the total magnetic field to make and break its contacts, and at least one diode connected to said voltage source for providing a voltage drop thereacross which varies in dependence on changes in the circumferential temperature, said second winding being connected in parallel to said diode so as to be excited in accordance with variations in said voltage drop across said diode.

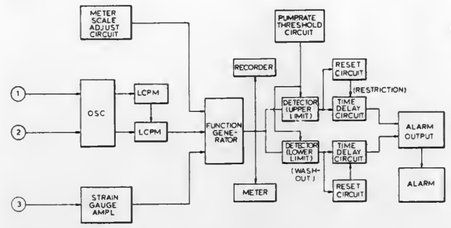
4,188,624
METHOD AND APPARATUS FOR MONITORING FLUID FLOW THROUGH A DRILL STRING

Dennis H. Hochsprung, Houston; Alan C. Wright, Bellaire; Robert I. Annas, Spring, and Pat W. Purcell, Houston, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,100
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—606 **26 Claims**

1. An apparatus for monitoring fluid flow through a drilling string comprising:
- first input producing means for producing a first input signal having a magnitude and proportional to a rate of pumping fluid through a drilling string;
- second input producing means for producing a second input signal having a magnitude and proportional to a pressure of fluid being pumped;
- a function generator responsive to said first and said second

input signals for generating a fluid flow indication signal; and

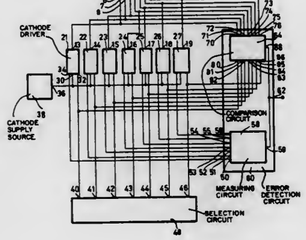


alarm signal generating means responsive to the fluid flow indication signal, for generating an alarm signal when the fluid flow indication signal is outside a predetermined range.

4,188,625
GAS DISCHARGE DISPLAY ARRANGEMENT

Andreas M. L. Hodemaekers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,732
Claims priority, application Netherlands, Feb. 18, 1977, 7701799
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—642 **13 Claims**

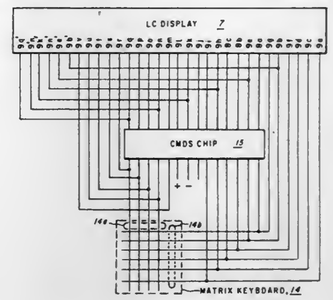


1. A gas discharge display arrangement comprising a plurality of symbol display elements each having a plurality of display segments, said display segments having a common anode and separate cathodes, a plurality of cathode drivers which couple the cathodes to a terminal for connection to a cathode supply source, a selection circuit having a plurality of selection signal outputs respectively coupled to individual inputs of said cathode drivers, an error detection circuit including an error signal output for an electric error signal, a measuring circuit having a plurality of energizing signal outputs for electric energizing signals and a measuring signal output for an electric measuring signal, and means coupling each energizing signal output of the measuring circuit to an energizing signal input of a corresponding cathode driver and the measuring signal output to the error signal output of the error detection circuit, the amplitude of an output signal of the measuring circuit being a measure of the sum of the amplitudes of the electric energizing signals applied by the measuring circuit to the cathode drivers, the amplitude of an energizing signal at a selected display segment being a function of the amplitude of the current through this display segment.

4,188,626
METHOD FOR SCANNING A KEYBOARD AND FOR ACTUATING A DISPLAY DEVICE VIA COMMON CONDUCTORS

Gene A. Frantz, Irving, and George L. Brantingham, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 23, 1977, Ser. No. 799,807
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—711 **6 Claims**

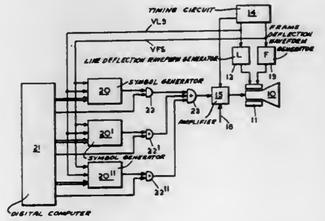


1. A method for actuating a display device and simultaneously scanning a keyboard, said method comprising the steps of:
- (a) communicating A.C. voltages to the segments of a segmented display device via a set of display conductors, the A.C. voltages being of a greater RMS value for those segments which are being actuated than for those segments which are not being actuated;
- (b) communicating a series of keyboard scanning pulses on a first subset of said display conductors, each of said first subset of said display conductors being coupled to a respective one of the switches of said keyboard; and
- (c) sensing the occurrence of said keyboard scanning pulses on a second subset of said display conductors, each of said second subset of said display conductors being also coupled to a respective one of the switches of said keyboard.

4,188,627
DISPLAY APPARATUS

Alfred J. Alexander; David J. Jibb, and Graham Hollaway, all c/o Century Works, Lewisham, London, SE. 13, England, assignors to Elliott Brothers (London) Limited, Essex, England

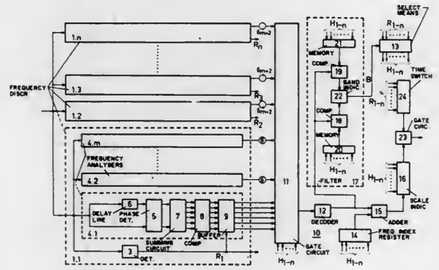
Continuation-in-part of Ser. No. 37,201, May 14, 1970, abandoned. This application Mar. 28, 1972, Ser. No. 238,962
Claims priority, application United Kingdom, May 14, 1969, 24653/69; Dec. 24, 1969, 62816/69
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—747 **9 Claims**



1. Apparatus for displaying line symbols on a screen of a cathode ray comprising:

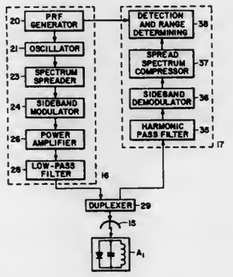
line and frame deflection waveform generators for scanning the cathode ray tube screen in a raster of lines forming a frame;
a video circuit for the application to the cathode ray tube of signals to control the brightness of the cathode ray tube display;
means for producing control signals defining the position and orientation on the screen of a line symbol required to be displayed;
symbol generating means for producing, under the control of said control signals, a succession of pulses which occur during successive raster lines, each pulse occuring at a time during the corresponding raster line determined by the required position and orientation of the line symbol on the screen (as defined by said control signals) and each pulse having a duration which varies inversely with the required angle of the line symbol with respect to the raster lines; and
means for feeding said pulses to the video circuit.

4,188,628
FREQUENCY MEASURING CIRCUIT IN A PASSIVE RADAR RECEIVER
Huibert B. Langeraar, Hengelo, and Gerrit Van Rooijen, Haaksbergen, both of Netherlands, assignors to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands
Filed Apr. 20, 1978, Ser. No. 898,460
Claims priority, application Netherlands, Apr. 26, 1977, 7704526
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 SA **13 Claims**



1. Frequency measuring circuit in a passive radar receiver for producing a digital code representing the frequency of an r.f. signal received by the radar receiver, wherein the frequency measuring circuit comprises:
a. a number (N) of frequency discriminators, each having an ambiguous discriminator characteristic, which discriminators are tuned to different r.f. frequency ranges, partly overlapping each other if they are tuned to adjoining frequency operating ranges, and which discriminators incorporate a plurality of frequency analysers for the phase detection of the applied r.f. signals in two trigonometric components, said r.f. signals being passed via delay lines of different lengths for each of the analysers, and for the binary coding of the polarity of the signals thus obtained by detection;
b. a decoder which can be connected to each of the frequency discriminators via a gate circuit and which converts the composite of binary coded polarities of the analysers pertaining to the connected discriminator into a digital code representing a frequency which may be ambiguous within the frequency range of said discriminator;
c. a digital filter being tunable to each of the discriminators and having a passband corresponding with the unambiguous part of the relevant discriminator characteristic, which digital filter delivers a signal on the application of the digital code from the decoder to indicate whether the binary representation of the frequency value within the frequency operating range of said discriminator is ambiguous or not, which digital filter, after receiving a digital code being an ambiguous representation of the frequency opens said gate circuit for the connection of the decoder to a frequency discriminator tuned to an adjoining frequency operating range;
d. a combination circuit for producing a digital code being an unambiguous representation of the measured frequency and consisting of the digital code from said decoder and the digital code representing the frequency band of the then connected frequency discriminator.

4,188,629
PASSIVE NAVIGATION SYSTEM WITH FREQUENCY CODING
Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 19, 1976, Ser. No. 706,659
Int. Cl.[2] G01S *9/233, 9/56*
U.S. Cl. 343—6.5 R **6 Claims**

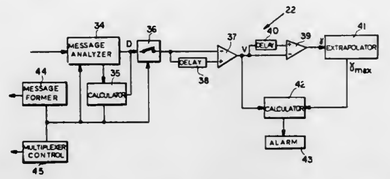


1. A passive marker navigation system with frequency coding comprising:
(a) transmitting means mounted on a vehicle to be navigated for radiating a signal having a plurality of frequencies said transmitting means including apparatus for modulating the signal on and off in pulses at a predetermined repetition rate and further apparatus for spreading the spectrum of the radiated signal during each of the pulses;
(b) a plurality of passive position markers each having a non-linear electrical response characteristic and tuned to reradiate a harmonic of a different one of the plurality of frequencies when the radiated signal from said transmitting means impinges thereon;
(c) said markers being fixedly mounted at predetermined positions relative to a desired course to be traveled by the vehicle; and
(d) receiving means mounted on the vehicle for receiving the reradiated spread spectrum harmonics, compressing and detecting the reradiated spread spectrum harmonics, discriminating between said markers, and determining the range from the vehicle of each of said reradiating markers.

4,188,630
METHOD OF AND SYSTEM FOR AVOIDING COLLISIONS BETWEEN AIRCRAFT
Ljubimko Milosevic, Paris, France, assignor to Thomson-CSF, Paris, France
Continuation-in-part of Ser. No. 939,228, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 694,245, Jun. 9, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,099
Claims priority, application France, Jun. 10, 1975, 75 18059
Int. Cl.[2] G01S *9/44*
U.S. Cl. 343—9 R **6 Claims**

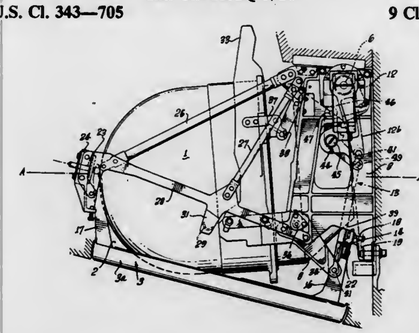
1. A method of avoiding collision between aircraft carrying

navigational equipment for the periodic transmission, during a recurrent time slot individually allotted to each aircraft in a given area, of data relating to altitude, course and speed of the respective aircraft and for plotting from received data the flight paths of nearby aircraft, comprising the steps of:
monitoring aboard a given aircraft the flight paths of other aircraft communicating with said given aircraft;
upon detecting aboard said given aircraft a presumed flight path of another aircraft crossing that of said given aircraft with a minimum closing time less than a predetermined



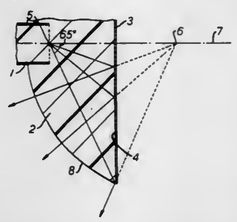
safety threshold, initiating a direct exchange of messages at an accelerated rate between said given aircraft and said other aircraft;
determining aboard said given aircraft, from said direct exchange, the distance D of said aircraft from said given aircraft and the variation ΔD of said distance D from one exchange cycle to the next;
calculating aboard said given aircraft a passing distance s from the parameters D and ΔD; and
taking collision-avoiding measures upon said passing distance s having less than a predetermined magnitude.

4,188,631
LINKAGE APPARATUS FOR SYNCHRONIZING AIRCRAFT DOOR MOVEMENTS WITH THE DEPLOYMENT OF A DOOR-ENCLOSED ANTENNA
Richard H. Dougherty, Tarzana, and Thomas E. Fealy, Burbank, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 13, 1978, Ser. No. 915,345
Int. Cl.[2] H01Q *1/28*
U.S. Cl. 343—705 **9 Claims**



1. Apparatus for opening and closing a door member and for synchronously extending and retracting a deployable object normally carried in a door-enclosed storage area of a support structure comprising:
an elongate drive shaft,
means for rotatably driving said shaft in opposite directions,
a crank shaft carried by said shaft,
a first and second pair of lever arms rigidly carried by and having different lengths extending radially outwardly of said crank shaft for pivotal movement therewith,
separate and independent first and second linkage systems,
a first means pivotally coupling said first linkage system to the outer end of said first lever arm, and
a second means pivotally coupling said second linkage system to the outer end of said second lever arm,
said first linkage system engaging said door member for swingably opening and closing it responsively to said bi-directional rotational movements of said drive shaft and said second linkage system engaging said normally stored object for swingably extending and retracting it responsively to said same bi-directional rotational movements,
said first and second coupling means each being pivotally driven by said crank shaft into an overcenter disposition when rotated in one direction but not the other; said first coupling means moving said first linkage system to an overcenter disposition when the door member is opened and the second coupling means to an overcenter disposition when the object is retracted,
said overcenter disposition of the second linkage system delaying any extension movement of the object until said door member is partially open and the overcenter disposition of the first linkage system delaying any closing movement of the door member until the object is partially retracted.

4,188,632
REAR FEED ASSEMBLIES FOR AERIALS
Dennis M. Knox, Felixstowe, England, assignor to Post Office, London, England
Continuation of Ser. No. 649,975, Jan. 19, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,139
Claims priority, application United Kingdom, Jan. 21, 1975, 2580/75
Int. Cl.[2] H01Q *19/08, 19/18*
U.S. Cl. 343—753 **7 Claims**



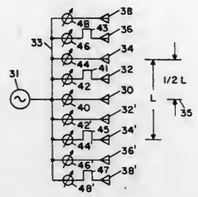
1. A splash plate feed assembly for a microwave aerial comprising a support member of a dielectric material, the member having a convex front face facing the aerial and a rear face facing away from the aerial, an energy reflecting planar surface positioned against said rear face, waveguide means coupled to said support member, the waveguide means having a circular aperture at one end, the centre of the aperture forming the phase centre of the assembly and the distance between said phase centre and said reflecting surface being not less than $8a^2/\lambda_e$ where
a is the radius of the waveguide aperture and
λ_e is the wavelength of microwave radiation in the support member
a plurality of radiation paths extending from said phase centre to said energy reflecting surface and back through said convex face, said support member being so shaped that the electrical lengths of said paths from said phase centre to a spherical wavefront centred on the image phase centre are equal and the dimensions of said energy reflecting surface being at least 8 times the diameter of said waveguide means to ensure that all radiation emitted by the waveguide means within 65° of the axis thereof is reflected by said surface.

4,188,633

PHASED ARRAY ANTENNA WITH REDUCED PHASE QUANTIZATION ERRORS

Richard F. Frazita, Deer Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,525
Int. Cl.² H01Q 1/50; H04B 7/00
U.S. Cl. 343—854 **12 Claims**



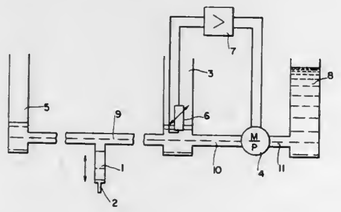
1. A phased array antenna system, comprising:
an aperture having a plurality of antenna element pairs, the elements of each pair being oppositely located with respect to a plane passing through said aperture;
and coupling means for supplying wave energy signals to said elements, said coupling means including digital phase shifters for varying the phase of said wave energy signals in discrete phase steps, the phase length of said coupling means being selected so that wave energy signals supplied to the elements in each pair have a phase-difference which is always approximately an odd-integral multiple of one-half the smallest phase step of said phase shifters.

4,188,634

METHOD FOR REGULATING INK FLOW IN DRAFTING PENS

Gerold Anderka, Ellerbek, and Walter Jozat, Bad Bramdstedt, both of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed May 19, 1978, Ser. No. 907,536
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741311
Int. Cl.² G01D 18/00
U.S. Cl. 346—1.1 **8 Claims**



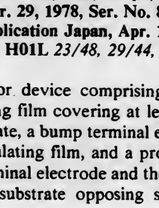
1. Method for regulating ink flow in drafting pens of the type having a tubular writing pen which is communicant with an open ended main reservoir, at one end, and communicant with the tip of a capillary writing tube at its other end, comprising the steps of:
A. Pumping ink from said reservoir into the tubular pen and towards the writing tip of said tube;
B. Buffering ink flow from said reservoir into said tubular pen by defining an open-ended ink buffer chamber which is in ink communication with the reservoir and the writing tip;
C. Gauging the level of ink intermediate said main reservoir and said writing tip by monitoring the ink level in an open-ended intermediate reservoir which is between said writing tip and said main reservoir; and
D. Modifying pumping as the gauged, actual level of ink within said intermediate reservoir deviates from a desired level.

4,188,635

INK JET PRINTING HEAD

Francis P. Giordano, Brooklyn; Lawrence Kuhn, Mount Kisco; Ramon Lane, Crompond, all of N.Y.; Chen-Hsiung Lee, and Gene O. Zierdt, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,093
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 **10 Claims**



1. A multi-nozzle ink jet head comprising:
a head body comprising a member having opposed faces separated by a predetermined distance, said head body having an ink inlet passage and at least one ink slot communicating with said inlet passage and extending to only one of the faces of the head body;
a nozzle plate having a plurality of orifices therein; said nozzle plate being fixed to said one face of said head body with its orifices in alignment with said ink slot so that a row of ink jet streams is formed when pressurized ink is introduced into said ink inlet passage;
an electromechanical transducer fixed to the opposed face of said head body from said one face; said electromechanical transducer having a thickness small with respect to said predetermined distance; and
means for continuously energizing said electromechanical transducer to vibrate said head to cause the ink jet streams to break up into uniform equally spaced drops at a fixed distance from the nozzle plate.

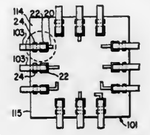
4,188,636

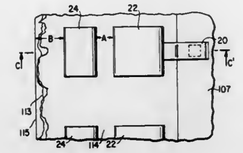
SEMICONDUCTOR DEVICE HAVING BUMP TERMINAL ELECTRODES

Susumu Sato, and Hiroshi Shiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,182
Claims priority, application Japan, Apr. 1, 1977, 52-36996
Int. Cl.² H01L 23/48, 29/44, 29/52
U.S. Cl. 357—71 **17 Claims**

1. A semiconductor device comprising; a semiconductor substrate, an insulating film covering at least a portion of the surface of said substrate, a bump terminal electrode formed on a portion of said insulating film, and a protrusion formed between said bump terminal electrode and the peripheral edge of said semiconductor substrate opposing said bump terminal electrode, said protrusion being separated from said bump terminal electrode by a predetermined distance, and a lower surface of said protrusion being directly attached to said insulating film.



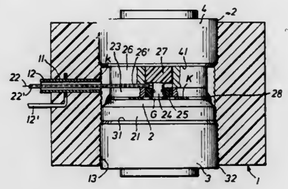


4,188,637

DISC-SHAPED SEMICONDUCTOR DEVICE HAVING AN ANNULAR HOUSING OF ELASTOMER MATERIAL

Heinrich Gerstenköper, and Heinz Juchmann, both of Warstein, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1977, Ser. No. 813,409
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630320
Int. Cl.² H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 **6 Claims**



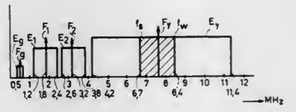
1. In a disc-shaped semiconductor arrangement composed of an annular housing of elastomer material having a hollow cylindrical interior, two contacting discs of cylindrical shape, and a disc-shaped semiconductor body defining a thyristor, having two opposed major surfaces, one major surface having a gate electrode centered therein and an annular cathode electrode surrounding the gate electrode, and the other major surface providing an anode electrode, and the semiconductor body having a cylindrical shape with a diameter no greater than that of either contacting disc, the semiconductor body being clamped, via its major surfaces, between respective axial end faces of the contacting discs, and being hermetically sealed in the housing, the improvement wherein: the hollow interior of said housing has the form of a circular cylinder; the diameter of the interior of said housing, when said housing is unstressed, is smaller than the diameter of each of said contacting discs; said contacting discs, with said semiconductor body clamped therebetween, are press fitted into the interior of said housing; the elastomer material of said housing has physical properties such that said housing acts on said contacting discs in a manner to maintain pressure contact between said contacting discs and the major surfaces of said semiconductor body and to establish a hermetic seal in the space defined between said contacting discs; and said arrangement further comprises means defining a gate electrode connector in the form of a silver disc contacting said gate electrode; a molded body of elastomer material disposed in said housing interior for establishing a pressure contact between said connector and said gate electrode, via the contacting discs, an annular silver ring aligned with, and contacting said cathode electrode, a conductive lead connected to said silver disc and extending radially through said housing, a Teflon sleeve enclosing said lead, a centering ring of insulating material disposed between said silver disc and said silver ring, and a copper ring aligned with, and contacting, said silver ring and having an outer diameter substantially corresponding to that of said silver ring and an inner diameter greater than that of said silver ring, said copper ring being further provided with a radially extending slit for passage of said sleeve and said lead, and wherein said molded body of elastomer material is press fitted into the interior of said copper ring for pressing said silver disc against said gate electrode, and said silver ring, said silver disc, said sleeve, said copper ring and said molded body are all interposed between said one major surface of said semiconductor body and an associated one of said contacting discs.

4,188,638

COLOR TELEVISION SIGNAL HAVING COLOR-DIFFERENCE SIGNALS ALTERNATING BETWEEN TWO CARRIERS

Maarten R. de Haan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 585,387, Jun. 9, 1975, abandoned. This application Aug. 4, 1978, Ser. No. 930,906
Claims priority, application Netherlands, Apr. 22, 1975, 7504733
Int. Cl.² H04N 9/38, 5/76
U.S. Cl. 358—4 **12 Claims**



Ln	1	2	3	4	5	
E_1	R-Y	B-Y	R-Y	B-Y	R-Y	
E_2	B-Y	R-Y	B-Y	R-Y	B-Y	

1. A transmission apparatus for a color television signal, said apparatus comprising an output terminal, means for applying to said terminal a first signal component having the luminance information of said color television signal, first and second modulator means for respectively applying second and third color signal components having first and second color carrier frequencies respectively to said terminal, said second and third components occupying separate frequency bands, and means for line sequentially interchangeably applying to said modulators first and second color signals of said color television signal.

4,188,639

VIDEO SYNCHRONOUS DETECTOR APPARATUS

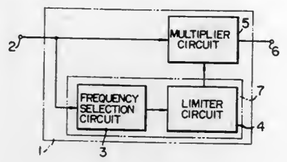
Toshio Murakami, Yokohama; Masaru Noda, Fujisawa; Hiroaki Nabeyama, Kamakura, and Takeshi Murakami, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1977, Ser. No. 862,622
Claims priority, application Japan, Jan. 7, 1977, 52-347
Int. Cl.² H04N 9/50
U.S. Cl. 358—25 **5 Claims**

1. A video synchronous detector apparatus comprising:
a first terminal for receiving a video intermediate frequency signal;
a multiplier circuit having two inputs and an output, one of said two inputs being connected to said first terminal; and

a picture-carrier intermediate frequency extraction circuit connected between said first terminal and the other of said two inputs;

said picture-carrier intermediate frequency extraction circuit comprising a limiter circuit and a frequency selection circuit having a trap circuit, a resonance frequency of said



trap circuit being equal to a differential frequency between a picture-carrier intermediate frequency and a differential frequency between a sound-carrier intermediate frequency and a color subcarrier intermediate frequency to reduce disturbances caused by a beat between the sound-carrier intermediate frequency and a side band component of the video intermediate frequency signal.

4,188,640

APPARATUS FOR MAKING LAMINAR RADIOGRAMS

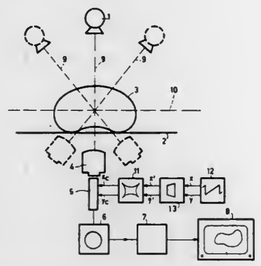
Jürgen Dittrich, Marschacht; Jürgen Heinzerling; Dietrich E. Meijer, both of Hamburg; Ralf Möllendorf, Ahrensburg, and Friedrich Wolf, Marschacht, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,689

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658331

Int. Cl.² H04N *5/32*

U.S. Cl. 358—111 **6 Claims**



1. An apparatus for producing laminar radiograms, including an X-ray radiator and an image recording device mounted to image a subject at different positions with the optical axis of the image recording device maintained parallel to the central ray of the X-ray radiator, the image recording device including an image intensifier and a television camera for recording images of said image intensifier, and further including a superposition device coupled to the television camera for forming laminar radiograms corresponding to images in a laminar plane by superposing individual images which have been shifted by determined amounts with respect to one another; the improvement comprising a correction means coupled to reduce distortion resulting from the structure of aid image recording device, and further comprising deflection signal modifying means for modifying deflection signals in said apparatus as a function of the laminar angle α and the orbit angle φ to correct for geometric distortion resulting from the slope between the input screen of the image intensifier and the laminar plane, the orbit angle φ being the angle between the projection of the central ray on the laminar plane and the X-axis, and the laminar angle α being the angle between the central ray and the normal to the laminar plane.

4,188,641

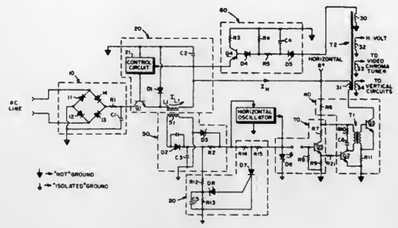
STARTUP CIRCUIT FOR A TELEVISION RECEIVER

Scott H. Baker, Brockport, and David E. Manners, Alexander, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,670

Int. Cl.² H04N *5/44*

U.S. Cl. 358—190 **18 Claims**



1. A television receiver comprising:

an input voltage supply for developing an input voltage, the supply being derived from and electrically coupled to the AC line and returned to a Hot ground;

a switching voltage regulator coupled to the input supply and returned to the Hot ground for providing a regulated output voltage to a load circuit, the regulator comprising an inductive element across which appears a voltage alternating at a predetermined frequency and through which flows a current varying at that frequency;

and an isolated startup voltage supply electrically isolated from the AC line, from the input voltage supply and from the switching voltage regulator, said isolated supply returned to an Isolated ground and comprising a winding magnetically coupled to the inductive element of the switching regulator so that the voltage across the winding varies at substantially the predetermined frequency.

4,188,642

CCD IMAGER OPERABLE IN SINGLE FRAME AND REPETITIVE FRAME MODES

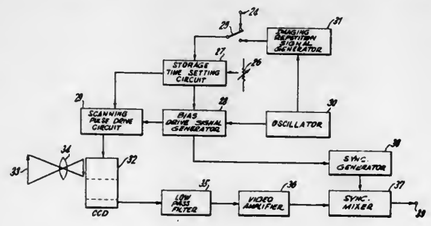
Masanobu Morishita; Hidehiko Inoue; Takao Ando, and Mitsuru Kawasaki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 597,990, Jul. 22, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 792,012

Claims priority, application Japan, Jun. 23, 1974, 49-84490

Int. Cl.² H04N *3/14*

U.S. Cl. 358—213 **4 Claims**



1. A solid-state imaging apparatus comprising means for accumulating charges corresponding to incident light rays during periods determined by a bias signal and having charge storage means for storing and transferring said accumulated charges in response to a first transfer drive signal, and readout register means for transferring said charges in response to a second transfer drive signal;

means coupled to said charge-coupled device for producing said bias signal and for applying said bias signal to said converting means of said charge-coupled device;

means coupled to said bias signal producing means for establishing a predetermined period of said bias signal to determine said period for which said charges are accumulated;

means for producing said first and second transfer drive signals to be applied to said charge storage means and said readout register means, respectively;

means for selecting between a single image mode and a repetitive image mode;

means responsive to said selecting means for changing the repetition frequencies of said first and second transfer drive signals; and

read-out means for obtaining the video signal from said charge-coupled device.

4,188,643

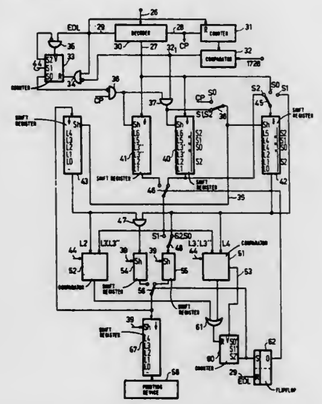
METHOD AND ARRANGEMENT FOR CORRECTING ERRORS IN FACSIMILE TRANSMISSION

Raymond G. Schayes, Brussels, Belgium; Pieter Homan, Hilversum, Netherlands, and Ulf Rothgordt, Norderstedt, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,503

Int. Cl.² H04N *1/38*

U.S. Cl. 358—280 **16 Claims**



1. A method for correcting errors in line by line facsimile transmission, said errors creating a disturbed picture line having undisturbed remaining portions, said method comprising comparing the number of picture elements in a line with a predetermined number, shifting said line relative to a correctly received line upon determining that said number of elements is not equal to said predetermined number so that the beginning and end of said disturbed line are separately and individually aligned with correctly received lines, comparing by correlating said shifted line with respect to at least one adjacent line and comparing the resulting correlation value with respect to a threshold value to determine said remaining portions, and correctly reproducing said disturbed line using said remaining portions and replaced portions taken from at least one adjacent line so that said reproduced line comprises the predetermined number of picture elements.

4,188,644

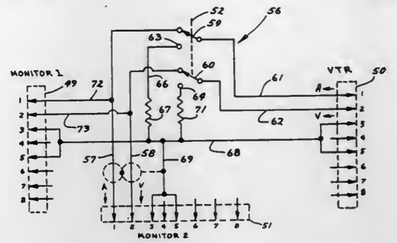
APPARATUS FOR CONTROLLING VIDEO TAPE PRESENTATION

Richard B. Thiewes, 132 S. Dakota Ave., Sioux Falls, S. Dak. 57101, and Donald W. Nelson, 8114 Portland Ave. S., Bloomington, Minn. 55420

Continuation of Ser. No. 753,834, Dec. 23, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,445

Int. Cl.² G11B *27/02*

U.S. Cl. 360—14 **16 Claims**



1. An apparatus for presenting a video tape deposition having audio and visual information to a court and jury comprising: a video tape unit adapted to be connected to a power supply, a jury monitor, a court monitor, each of said monitors having a viewing screen and means for audibly transmitting audio information, and means electrically coupling said monitors to the video tape unit whereby the audio and visual information on the video tape is simultaneously displayed on the jury and court monitors, said means electrically coupling said monitors to the video tape unit having an electrical audio circuit connecting the video tape unit with the court and jury monitors, an electrical video circuit connecting the video tape unit with the court and jury monitors, a first resistor interposed in the audio circuit, a second resistor interposed in the video circuit, and a two position switch means having a first position to couple the first and second resistors to the court and jury monitors to withhold the audio and visual information from the monitors while maintaining a power supply to the monitors, said first and second resistors providing impedance loads substantially the same as that of said monitors when said switch means is in the first position, whereby the monitors are in an operable power on condition when the switch means is in the first position, said switch means having a second position by-passing said first and second resistors whereby the electrical audio and video circuits function to simultaneously present audio and visual information on both monitors from said video tape unit to the court and jury.

4,188,645

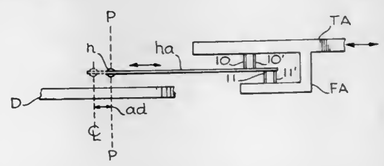
PIEZOELECTRIC SERVO FOR DISK DRIVE

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1978, Ser. No. 957,169

Int. Cl.² G11B *21/02*

U.S. Cl. 360—75 **12 Claims**



1. In a recording transducer head supported upon a pre-

scribed mounting arm and adapted for relatively linear translation and fine-positioning of the head by servo translation means across a locus of medium-confrontation, the combination therewith of:

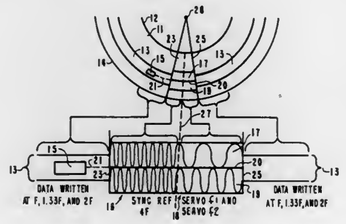
multi-part piezo-flexure means arranged to mount this arm for such translation and adapted to provide one pair of bi-part piezo-flexure strips arrayed in line and coupled directly to said arm pivotingly, as a pair of restraining cantilevers for assuring such linear translation upon electrical energization, each said strip comprising a piezo-flexure beam comprised of a pair of piezo crystal slabs bonded together and affixed about an intermediate electrode segment which contacts the elongate spaces thereof, with a like flanking electrode plate bonded on the respective outer face of each slab, opposite said intermediate electrodes; so that, upon application of prescribed signal voltages and associated field between said segment and said plates, the beams will be electro-strictively energized and distorted and caused to conjunctively convert said electro-strictive distortion into a prescribed bending and somewhat linear translation of the arm to said translation means.

4,188,646

SECTORIZED DATA PATH FOLLOWING SERVO SYSTEM

Frank J. Sordello, Los Gatos; Edward R. Darrah, San Jose, both of Calif., and James J. Touchton, Boulder, Colo., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,257
Int. Cl.[2] G11B *21/10*
U.S. Cl. 360—77 **22 Claims**



1. In a data-path following servo system wherein fine lateral transducer position control is obtained by balancing two positional signals derived by combining two modulation frequencies with two different, recorded servo frequencies, the improvement comprising,

a data recording medium having a plurality of parallel servo tracks contained in spaced apart sectors interrupting user data path recording areas, said sectors having successive parallel servo tracks whereby a longitudinal boundary between two adjacent servo tracks projected outwardly from a sector defines the center line of a user data path, each of said servo tracks having header and tail regions, one following the other, in each sector, one of said sector regions having sync reference waveforms of a single selected frequency recorded therein in both of said adjacent servo tracks for deriving a sync reference input signal for a phase-locked oscillator means and a second adjacent sector region having recorded servo waveforms of two different servo frequencies in said adjacent tracks recorded therein for deriving two positional signals, and

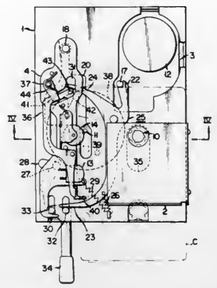
a phase-locked oscillator means connected to receive said signals representing said sync reference waveforms for generating a pair of modulation signals, each having a different modulation frequency whereby said pair of modulations signals are mixed with said two recorded servo frequencies obtaining two positional signals for balancing to correct lateral transducer position.

4,188,647

CASSETTE TYPE TAPE RECORDER

Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,395
Claims priority, application Japan, May 27, 1977, 52-61871
Int. Cl.[2] G11B *15/24; G1B 21/22*
U.S. Cl. 360—105 **1 Claim**



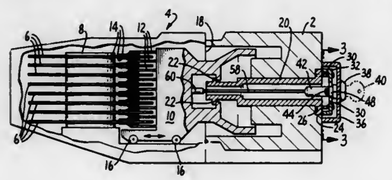
1. A cassette type recorder comprising a base board having a cam hole extending at a specific angle to a tape-running direction; a cassette-receiving section disposed on the base board, into which a cassette is inserted in a direction parallel to the direction in which the tape housed in it is to run; a drive mechanism including reel drive shafts, a capstan drive shaft and a motor for driving the reel and capstan drive shafts; a drive mechanism-carrying board supporting the drive mechanism and disposed below the base board and provided with a support pin protruding upwardly, said drive mechanism-carrying board moving upwardly and forwardly when a 2-reel cassette is inserted into the cassette-receiving section, in the direction in which the cassette moves, thereby inserting the reel and capstan drive shafts into the cassette; and a magnetic head-carrying board supporting a magnetic head and pinch roller and having on one end portion a cam pin inserted in the cam hole of the base board, said magnetic head-carrying board moving in unison with the drive mechanism-carrying board in the direction in which the cassette is inserted into the cassette-receiving section and rotating about said support pin as the cam pin moves in the cam hole, thereby gradually rotating the magnetic head and pinch rollers into contact with the tape in the cassette; as the drive mechanism carrying board is pivoted upwardly and the reel and capstan drive shafts contact the cassette reels and tape, respectively.

4,188,648

DATA SECURITY APPARATUS FOR MAGNETIC RECORDING DISC DRIVE

Albert J. Guerini, Gilroy, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 5, 1978, Ser. No. 939,844
Int. Cl.[2] G11B *5/54*
U.S. Cl. 360—105 **8 Claims**



1. Apparatus for preventing unauthorized access to data recorded upon the magnetic discs of a disc drive which utilizes

at least one rotating magnetic disc and at least one magnetic playback head movable relative to the axis of rotation of the disc to access data recorded on the disc and a motor for moving the head relative to the disc axis, comprising

means selectively engageable and disengageable with said playback head for restraining, when engaged, the movement of said head, said head movement restraining means providing for restraint of said head movement independent of the operation of said head moving motor, and

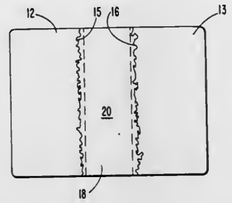
locking means for controlling the engagement and disengagement of said head movement restraining means such that said head movement restraining means can be disengaged only when said locking means is in an unlocked configuration, whereby control of the locking means serves to control access to the recorded data by controlling the movement of the playback head necessary to access the data.

4,188,649

MAGNETIC HEAD HAVING A JAGGED-EDGED GAP, AND METHOD FOR PRODUCING SUCH HEAD

Samuel D. Cheatham, Arvada; Neil L. Robinson, and Edmond W. Smathers, both of Boulder, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,500
Int. Cl.[2] G11B *5/25*
U.S. Cl. 360—118 **8 Claims**



1. A magnetic erase head for erasing magnetic information on a length of magentic media, the magnetic erase head comprising:

a first half core element of magnetic material and having defined thereon a first surface;

a second half core element of magnetic material and having defined thereon a second surface;

the first and second surfaces being positioned in an adjacent but spaced apart relationship to define a gap between the first and second half core members;

the first and second surfaces being irregular and jagged with a surface roughness greater than 0.5 microns at the portions thereof defining the gap; and

a non-magnetic material filling the gap;

whereby an erase head formed of surfaces initially of a relatively smooth configuration and thereafter made irregular and jagged with a surface roughness greater than 0.5 microns is provided to erase magnetic information from an adjacent moving magnetic media.

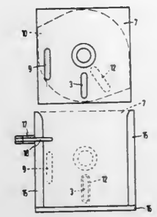
4,188,650

DISKETTE WITH ACCESS COVER MEANS

Wolf-Heider Rein, Pforzheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,597
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709944
Int. Cl.[2] G11B *23/02*
U.S. Cl. 360—133 **4 Claims**

1. A diskette comprising: a housing having approximately parallel side walls, each of said side walls having a first opening therethrough, said first openings being aligned; a pair of parallel auxiliary disks slidable inside said housing against respective ones of said housing side walls; means to hold said auxiliary disks in fixed positions relative to each other, each of said auxiliary disks having a second opening, said second openings always being aligned with each other, said auxiliary disks being slidable back and forth on said respective side walls between first and second positions, said first openings being completely



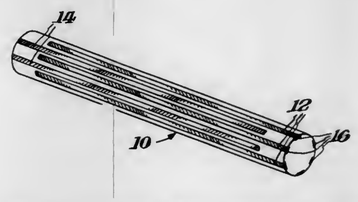
out of registration with said second openings when said auxiliary disks are in said first position, said first openings being at least in partial registration with said second openings when said auxiliary disks are in said second position; and a memory disk rotatable in between said auxiliary disks in frictional engagement therewith, the frictional force between said memory disk and said auxiliary disks being greater than that between said auxiliary disks and said housing sidewalls.

4,188,651

CERAMIC CAPACITOR WITH SURFACE ELECTRODES

John E. Dornfeld, and Bobby L. Joyner, both of Mequon, Wis., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 27, 1978, Ser. No. 890,343
Int. Cl.[2] H01G *1/005, 4/08*
U.S. Cl. 361—322 **7 Claims**



1. A capacitor comprising a semiconductive cylindrical body of reduced ceramic material, a plurality of closely-spaced, substantially parallel, interdigitated metal electrodes disposed on the cylindrical surface of said body, said body having a thin dielectric layer of an oxidized state of said ceramic material immediately beneath each of said electrodes, and a terminal disposed over each end of said cylindrical body, each said terminal in contact with at least one alternate of said interdigitated electrodes.

4,188,652

ELECTRONIC DEVICE

Gennady G. Smolko, 103482 korpus 501, kv. 19, Moscow, U.S.S.R.

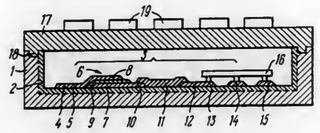
Filed Jan. 17, 1978, Ser. No. 870,174
Int. Cl.[2] H01L *19/00*
U.S. Cl. 361—402 **9 Claims**

1. An electronic device comprising:

a boxlike case made of a metal of the valve group and having an inner surface with a surface layer of the same metal;

a texturized anode oxide film formed in said surface of said

metal of said inner surface and obtained from said metal of said case; and



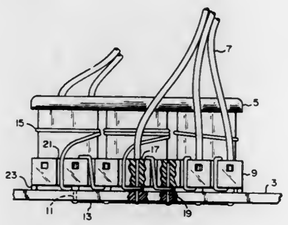
a film integrated microcircuit formed on said texturized anode oxide film.

4,188,653

ELECTRICAL COMPONENT MOUNTING PACKAGE

Charles A. Goepel, Muncy, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 17, 1978, Ser. No. 934,435
Int. Cl.[2] H05K *7/02*
U.S. Cl. 361—405 **5 Claims**



1. In a mounting package including electrical wires and an electrical component with connecting wires and also including a printed circuit board having a plurality of spaced holes and an electrically conductive pattern and solder on one side of said board and an insulating frame member on the other side of said board with slots and selectively positioned apertures and connector pins aligned with said spaced holes of said printed circuit board, the improvement wherein said electrical wires pass through and extend from said apertures of said insulating frame member, said connecting wires of said electrical component pass through said slots and are affixed to said connector pins, and said electrical wires extending from said apertures and said connector pins pass through said spaced holes and are affixed to said electrically conductive pattern of said printed circuit board by said solder.

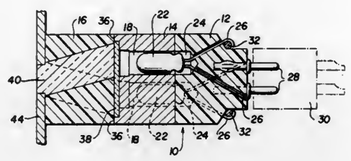
4,188,654

INCANDESCENT LAMPS/FIBER OPTIC COUPLED VERTICAL AND SCALE OR DISPLAY

Zygmund Relch, Burlington, and Raymond W. Sargent, Vergennes, both of Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jul. 19, 1977, Ser. No. 817,460
Int. Cl.[2] G01K *1/06*
U.S. Cl. 362—32 **5 Claims**

1. A display comprising;
an elongated insulating member,
an elongated heat sink member connected to said insulating member and having apertures in two parallel vertically extending rows therein with the apertures in each row in staggered relationship to one another;
incandescent lamps in each of said apertures having conductor means extending into said insulating member and connected to connectors extending from said insulating member;
an elongated module coextensive with said heat sink member and said insulating member;
said module having a plurality of plastic light pipes stacked on one another alternately in V-formation one end of each



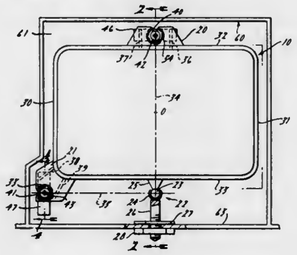
terminating alternatingly at a respective aperture in said two vertically extending rows in said heat sink member at said incandescent lamp and the other terminating in vertically extending lines forming a vertical array of dot positions to form a dot type array.

4,188,655

VEHICLE HEADLAMP AND MOUNTING ASSEMBLY

Thomas G. Tallon, Metamora, and Gerald A. Harris, Fraser, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 2, 1978, Ser. No. 902,125
Int. Cl.[2] B60Q *1/00*
U.S. Cl. 362—80 **20 Claims**



1. A vehicle headlamp unit comprising a reflector and a lens attached to the reflector, said unit having three peripherally spaced mounting means projecting outwardly from its periphery and providing three suspension points from which it may be unyieldably positively secured and adjustably positioned relative to the vehicle from two of the points for independent rotative movement about a coplanar pair of orthogonal and intersecting axes, one of said axes contained in a longitudinal axial plane passing through the geometric center of the unit and the other of said axes displaced from the geometric center thereof,
a first and second one of said mounting means located opposite each other on the said one of said axes and the third mounting means located opposite said second mounting means and contained therewith on the other of said orthogonal axes,
said first and third mounting means adjustably connectable to the vehicle,
said second mounting means comprising one element of a rotary ball joint pivotal connection between the headlamp and the vehicle fixing the headlamp against linear translational movement relative to the vehicle and providing a common pivot rotationally translatable at the intersection of both of said axes for independent limited rotative movement of said lamp unit about the said other of said axes from linear translational adjustment movement of said first mounting means and about the said one of said axes from

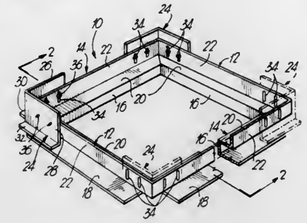
independent linear translational adjustment movement of said third mounting means.

4,188,656

LIGHT FRAME ADAPTER

Norman W. Howard, 3803 Brooklyn Crescent NW., Calgary, Alberta, Canada (T2L 1G9)

Filed Oct. 17, 1978, Ser. No. 952,156
Claims priority, application Canada, Jul. 17, 1978, 307538
Int. Cl.[2] F21S *3/06*
U.S. Cl. 362—365 **14 Claims**



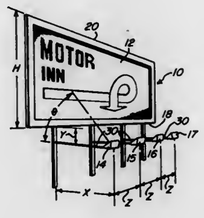
1. An adapter for mounting a light fixture in a ceiling opening, comprising:
a plurality of frame members, one for each edge of said opening, each frame member having a first wall portion, a flange extending outwardly from one longitudinal edge of said first wall portion, a shoulder extending outwardly from the other longitudinal edge of said first wall portion and adapted to support a light fixture, and a second wall portion extending from the outer edge of said shoulder away from said flange;
a plurality of corner members, each having a generally planar wall and a flange extending from a lower edge thereof; and
means connecting a corner member to a frame member adjacent each end thereof for transverse adjustment relative thereto, the adjacent flanges of each corner member and frame member defining a space therebetween for receiving a portion of said ceiling and clampingly engaging said portion.

4,188,657

REFLECTOR AND METHOD OF PRODUCING DIFFERENT, DISTINCTIVE AND PREDICTABLE LIGHT PATTERNS THEREFROM

Robert L. Reibling, Ft. Thomas, Ky., assignor to Whiteway Manufacturing Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 379,107, Jul. 13, 1973, abandoned. This application Dec. 19, 1975, Ser. No. 642,333
Int. Cl.[2] F21V *7/09*
U.S. Cl. 362—348 **19 Claims**



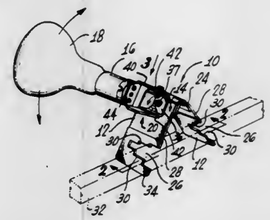
9. An assemblage for forming a plurality of different reflectors each of which produces a distinctive and predictable symmetric or asymmetric reflected light pattern, comprising:
a plurality of elongate, arcuately shaped reflector half-sections, said half-sections being identically shaped;
a plurality of reflecting surface finishes, each of said half-sections having one of said plurality of surface finishes thereon; and
coupling means for coupling a selected pair of said plurality of reflector half-sections together to form an elongate symmetrically shaped reflector having a predetermined combination of surface finishes for producing a light beam having a width determined according to the combination of surface finishes on said coupled half-sections.

4,188,658

ADJUSTABLE SUPPORT FOR PORTABLE LAMP

Daniel I. Aron, Northridge, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.

Filed Jul. 29, 1977, Ser. No. 820,087
Int. Cl.[2] F21V *21/00*; E04G *3/00*
U.S. Cl. 362—396 **4 Claims**



1. A portable lamp adapted for temporary connection to preexisting supporting members of various shapes and dimensions comprising:
a pair of brackets each having a notch with opposing step-shaped edges therein;
hinge means for connecting said brackets having a hinge axis extending generally parallel to the edges of each of said notches;
said step-shaped edges running substantially parallel to said hinge axis and defining a plurality of substantially rectangular adjoining areas having progressively smaller widths in going from the open ends of said notches to the closed ends thereof;
an electrical socket; and
means for connecting said socket to said brackets;
whereby a support member can be received by said notches and the angle between said brackets can be adjusted to cause the edges of a selected one of the rectangular areas of said notches to grip said supporting member.

4,188,659

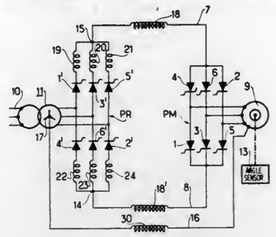
STATIC AC/AC THYRISTOR CONVERTER FOR A SELF-DRIVEN SYNCHRONOUS MOTOR

Michel Cailloux, Belfort, France, assignor to Ogee Alsthom, Levallois-Perret, France

Filed Mar. 22, 1978, Ser. No. 888,901
Claims priority, application France, Mar. 25, 1977, 77 08961
Int. Cl.[2] H02M *5/45*
U.S. Cl. 363—37 **4 Claims**

1. A static AC/AC thyristor converter comprising: a Graetz rectifier "machine" bridge for connection on its AC side to a variable-speed synchronous machine having a star-wound stator, and connected on its DC side via first and second conductors to a static AC/DC "mains" bridge converter for connection to three-phase AC mains, said bridges including respectively means for controlling the firing of their thyristors, said means for controlling the mains bridge converter including means for applying to said first and second conductors voltages whose polarities may be identical to each other or

opposite to each other, said AC/AC converter further including a third connection having a first end connected to the center of the star winding of the stator of the synchronous machine and having a second end connected to an AC point of



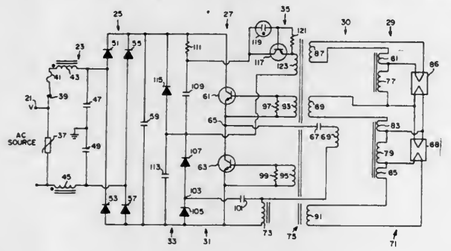
said mains bridge such that the current which flows in one or other of said first and second conductors when the polarities applied thereto in operation, are identical, returns to the three-phase AC mains via third connection.

4,188,660

DIRECT DRIVE BALLAST CIRCUIT

William C. Knoll, Turbotville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 22, 1978, Ser. No. 908,044
Int. Cl.[2] H02M *5/293*
U.S. Cl. 363—49 **19 Claims**



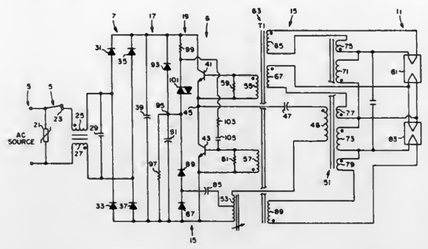
1. A direct drive electronic ballast circuit comprising:
an AC potential source;
rectifier circuit means coupled to said AC potential source for providing a pulsating DC potential;
high frequency inverter circuit means coupled to said rectifier circuit means;
a load circuit coupled to said high frequency inverter circuit;
high frequency inverter drive circuit means coupling said load circuit to said high frequency inverter circuit;
charge storage and isolating circuit means shunting said rectifier circuit means;
feedback rectifier means coupling said high frequency inverter circuit means to said charge storage and isolating circuit means; and
oscillator starting circuit means coupled to said charge storage and isolating circuit means and to said high frequency inverter drive circuit means whereby a potential developed at said charge storage and isolating circuit means activates said oscillator starting circuit which energizes said high frequency inverter circuit means.

4,188,661

DIRECT DRIVE BALLAST WITH STARTING CIRCUIT

Bruce L. Bower, Williamsport, and Raymond H. Kohler, Montoursville, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 23, 1979, Ser. No. 15,530
Int. Cl.[2] H02M *5/458;* **H05B** *41/36*
U.S. Cl. 363—49 **9 Claims**



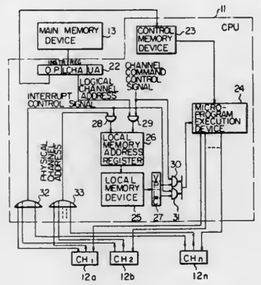
1. In a direct drive ballast circuit coupled to an AC potential source and having a rectifier circuit means providing a pulsating DC potential to a high frequency inverter circuit coupled to a load circuit with a high frequency inverter drive circuit coupling the load circuit to the high frequency inverter and a charge storage and isolating circuit shunting the rectifier circuit means and coupled to a feedback rectifier means connected to the high frequency inverter circuit means, the improvement comprising an oscilator starter circuit means directly coupled to said rectifier circuit means, said feedback rectifier circuit means, and to said charge storage and isolating circuit and AC coupled to said high frequency inverter circuit means.

4,188,662

ADDRESS CONVERTER IN A DATA PROCESSING APPARATUS

Masamichi Ishibashi, Tokyo, Japan, assignor to Fujitsu Limited, Japan

Filed Apr. 14, 1977, Ser. No. 787,493
Claims priority, application Japan, Apr. 27, 1976, 51-48259
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **8 Claims**



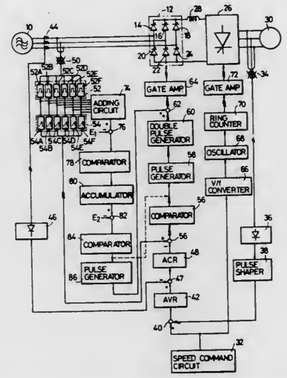
1. In a data processing apparatus which includes first means for generating first control signals indicating needed conversion, to physical address information, of a logical address to be translated, and second means for generating second control signals indicating needed conversion, to logical address information, of a physical address to be translated; a channel and input/output device address converter, comprising:
memory means for storing at least an address conversion table having address positions, each address position indicating a respective logical address to be translated and a respective physical address to be translated, said memory means storing, at said each address position, at least one physical address information corresponding to said respective logical address to be translated indicated by said each address position and at least one logical address information corresponding to said respective physical address to be translated indicated by said each address position,
address gate means responsive to said first control signal and said second control signal, respectively, for enabling access of said address conversion table by said logical address to be translated and said physical address to be translated, respectively, at said address position indicating said logical address to be translated and said physical address to be translated, respectively, so as to cause simultaneous readout, from said address position indicating said logical address to be translated and said physical address to be translated, respectively, of both said physical address information and said logical address information stored at said address position indicating said logical address to be translated and said physical address to be translated, respectively,
said physical address information and said logical address information stored at said address position indicating said logical address to be translated and said physical address to be translated, respectively, thereby not corresponding to each other, but rather said physical address information stored at said address position being a translation of said logical address to be translated, and said logical address information stored at said address position being a translation of said physical address to be translated, and
output gate means responsive to said first and second control signals for selecting, in accordance with said indicated needed conversion, one of said physical address information and said logical address information as simultaneously read out from said memory means.

4,188,663

PROTECTIVE DEVICE OF A CURRENT SOURCE INVERTER

Tadashi Okawa; Mitsuyuki Honbu, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1978, Ser. No. 877,982
Claims priority, application Japan, Feb. 16, 1977, 52-15027
Int. Cl.[2] H02M *7/00, 5/45*
U.S. Cl. 363—51 **16 Claims**



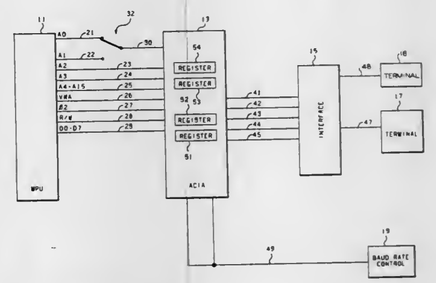
1. A protective device of a current source inverter comprising a converter which changes alternating current into direct current and which is made up of thyristors, an inverter which changes the d.c. output of said converter into alternating current, a reactor which is connected between said converter and said inverter, control circuitry which controls an output voltage of said converter and an output frequency of said inverter, a square wave generator which changes the alternating current into square waves corresponding to respective polarities of respective phases, an adding circuit which adds the square wave outputs of said square wave generator, a decision circuit which provides an output when an output of said adding circuit has become smaller than a predetermined value, and at least one thyristor which is rendered conductive in response to the output of said decision circuit and forms a circulating circuit for releasing energy stored in said reactor.

4,188,664

I/O TERMINAL IDENTIFICATION

Wallace E. DeShon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1977, Ser. No. 851,650
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—200 **9 Claims**



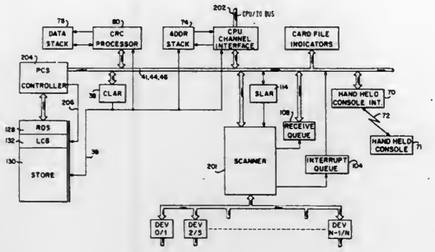
1. Apparatus comprising:
a computer means;
a first input/output (I/O) terminal means which requires a first data format;
a first interface means which interfaces said computer means to said first I/O terminal means;
a register means which is an integral part of said first interface means;
a switch having first and second positions;
means for supplying digital addresses from said computer means to said register means, at least a portion of said digital addresses being supplied from said computer means through said switch to said register means, the presence of said switch preventing at least one digit of the digital addresses supplied by said computer means from reaching said register means, so that a second digital address supplied by said computer means to said register means, as received by said register means, will be equivalent to a first digital address, as received by said register means, if said switch is in said first position and will not be equivalent to said first digital address, as received by said register means, if said switch is in said second position; and
means for supplying digital data from said register means to said computer means when said first digital address is received by said register means or when said second digital address, as received by said register means, is equivalent to said first digital address, said computer means having means for introducing said first data format into said first interface means when said register means is enabled to supply the digital data stored in said register means to said computer means by said second digital address.

4,188,665

PROGRAMMABLE COMMUNICATIONS SUBSYSTEM

Dennis M. Nagel; Douglas O'Neal; Paul W. Petroskey; Jan W. van den Berg, all of Boca Raton; Donald V. Wildes, North Lauderdale, and David C. Wu, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,572
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 3 Claims



1. In a communications multiplexer for transferring data between a central processor and a plurality of communications lines running to remote units, the combination comprising:

a scanner mechanism for selectively and repetitively transmitting data to and receiving data from different ones of the communications lines, each such communications line having a unique line address;

a storage mechanism having a separate data buffer for each communications line and a separate line control block for each communications line, each data buffer being located in its corresponding line control block;

a first-in-first-out transmit interrupt queue mechanism for receiving from the scanner mechanism the line addresses of those communications lines for which a processor-to-scanner data transfer operation is needed;

a line address register for receiving one line address at a time from the transmit queue mechanism and for supplying each such line address to the storage mechanism for addressing the corresponding line control block therein;

a controller mechanism responsive to an output of the transmit queue mechanism for performing during different time intervals the transfer of data between the central processor and any given data buffer and between the given data buffer and the scanner mechanism;

the controller mechanism including an interrupt mechanism responsive to the condition of the transmit queue mechanism when a valid line address appears at the output thereof for interrupting the controller mechanism and causing same to set such queue output line address into the line address register;

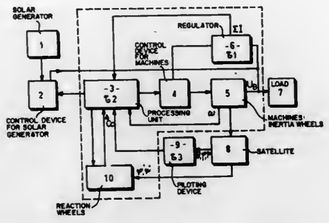
and the controller mechanism further including a first data transfer mechanism for transferring data from the central processor to the addressed line control block data buffer if such data buffer is empty and a second data transfer mechanism for transferring data from the addressed line control block data buffer to the scanner mechanism if such data buffer is not empty.

4,188,666

METHOD AND INTEGRATED SYSTEM FOR THE TORQUE CONTROL AND ENERGY STORAGE FOR A SPACE VEHICLE

Francis Legrand, Rocquencourt, and Bernard Weisser, Verneuil sur Seine, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed May 22, 1978, Ser. No. 908,598
Claims priority, application France, May 31, 1977, 77 16616
Int. Cl.[2] G06F *15/50;* B64G *1/10*
U.S. Cl. 364—434 12 Claims



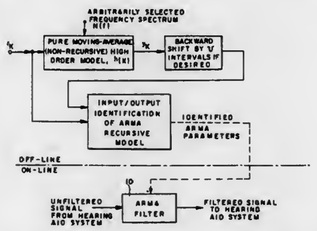
1. Method for the control and storage of energy for a space vehicle, notably for a satellite, having a piloting device, in which a busbar voltage available at a supply busbar is provided by a solar generator, and by a kinetic energy storage device including two momentum wheels in counter-rotation, said wheels serving also to create the torques necessary for piloting the satellite, said method comprising servo-coupling the momentum wheels to the busbar voltage through a first feedback loop including a regulator mounted between the supply busbar and a control device for the momentum wheels, so as to regulate the busbar voltage, servo-coupling the momentum wheels to the speed of the momentum wheels through a second feedback loop comprising a processing unit receiving signals representing said speed and connected to said control device for said wheels, so as to keep at a very low level the disturbing torques produced by the kinetic energy storage device, and servo-coupling the momentum wheels to the piloting device through a third feed-back loop comprising in series the piloting device, the processing unit and the momentum wheel control device, so as to supply the necessary torque for piloting.

4,188,667

ARMA FILTER AND METHOD FOR DESIGNING THE SAME

Daniel Graupe, 2821 Redwing; Aloysius A. Beex, 33-L Aggie Village, both of Fort Collins, Colo. 80521, and G. Donald Causey, 3504 Dunlop, Chevy Chase, Md. 20015

Division of Ser. No. 660,513, Feb. 23, 1976. This application Nov. 18, 1977, Ser. No. 852,917
Int. Cl.[2] G06F *15/34;* H04R *25/00*
U.S. Cl. 364—724 18 Claims



1. A stable digital filter whose amplitude-frequency response approximates an arbitrarily selected frequency spectrum of

amplitude, whose total number of parameters m+n+1 is near-minimum, and whose phase response approximates a substantially linear function of frequency with an arbitrarily selected slope, comprising:

(a) an input terminal and output terminal;

(b) m+1 gain parameters $\beta_0, \beta_1, \ldots \beta_m$ associated with the input terminal;

(c) n gain parameters $\alpha_1, \alpha_2, \ldots \alpha_n$ associated with the output terminal;

(d) means connecting the input and output terminals with the gain parameters such that

$$\frac{y(t)}{u(t)} \quad \frac{\beta_0 + \beta_1 D + \ldots + \beta_m D^m}{1 + \alpha_1 D + \ldots + \alpha_n D^n}$$

where D is a delay operator operating on the filter's output and input signals y(t) and u(t), respectively, such that $Dy(t)=y(t-D)$, etc.;

(e) the gain parameters satisfying the relationship

$$\sum_{i=0}^{n} \alpha_i y_{k-i} = \sum_{j=0}^{m} \beta_j r_{k-j+v}$$

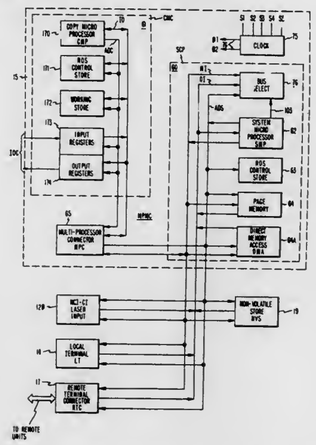
where n=0,1,2, . . . ; m=0,1,2, . . . ; k is an integer; v is an integer determining the slope of the phase shift versus frequency response of the filter; and y_k and r_k are the kth elements of an output sequence and a random sequence, respectively, the output sequence being the sequence obtained by convolving a truncated sequence of coefficients with the random sequence, the truncated sequence being a sequence obtained by truncating the sequence of coefficients resulting from performing an inverse Fourier transform on said arbitrarily selected frequency spectrum.

4,188,668

COMPUTER-CONTROLLED COPIER-PRINTERS

David E. Finlay, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 729,451, Oct. 4, 1976. This application Nov. 16, 1977, Ser. No. 851,903
Int. Cl.[2] G03G *15/00;* G06F *15/16*
U.S. Cl. 364—900 5 Claims



1. A copy production machine having a copy production portion, first and second input means for supplying images to said copy production portion to be imposed on copy sheets, electrical image signal input means for supplying image indicating signals,

comprising, in combination:

first programmable computer means for coupling said electrical image signal input means to said second input means to provide text processing of said image indicating signals prior to their being supplied to said second input means,

second programmable computer means coupled to said copy production portion for controlling the sequence of operations to produce copies of images from either of said first and second input means, and

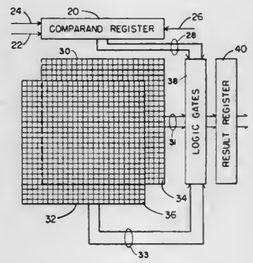
multiprocessor connector means for coupling said first programmable computer means to said second programmable computer means whereby said first programmable computer means can send operating instructions and parameters to said second programmable computer means to modify the control of said copy production portion.

4,188,669

DECODER FOR VARIABLE-LENGTH CODES

Tomlinson G. Rauscher, Wayland, Mass., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1978, Ser. No. 869,961
Int. Cl.[2] G06F *7/02*
U.S. Cl. 364—900 18 Claims



1. Apparatus for decoding an inputted variable-length code word comprising:

a first memory unit having stored therein a plurality of variable-length code words of a coded system, each code word being stored at a predetermined location in said memory unit which location represents the decoded information corresponding to the stored variable-length code word;

a second memory unit having stored therein a length-indicating word for each variable-length word stored in said first memory unit;

first storage means for storing the inputted variable-length code word;

logic means connected to said first storage means and said first and second memory units for comparing the inputted variable-length code word stored in said first storage means with each variable-length code word stored in said first memory unit and for sensing the associated length-indicating word in said second memory unit to output a signal upon finding a coincidence with one of said variable-length code words stored in said first memory unit and the presence of its associated length-indicating word stored in said second memory unit;

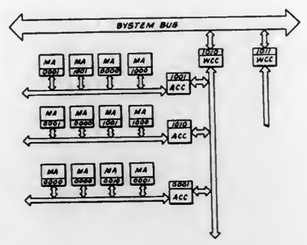
and second storage means connected to said logic means for storing said signal in a location in said second storage means in accordance with the location in said first memory unit of said one of said variable-length code words which location in said second storage means represents the decoded information corresponding to the inputted variable-length code word.

4,188,670

ASSOCIATIVE INTERCONNECTION CIRCUIT

Yukun Hsia, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jan. 11, 1978, Ser. No. 868,667
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—49 10 Claims



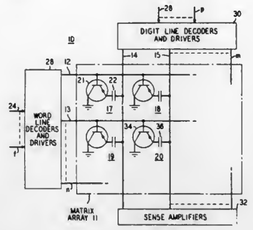
1. An apparatus comprising:
a. a plurality of circuit elements,
b. a bus for carrying signals,
c. means for selectively coupling at least one of said elements to said bus responsive to a specific, including means for storing an address associated with said element, means for comparing said stored address with said specific signal representing an address on said bus, means for generating an enable signal indicative of the result of comparison, and means for enabling said element to communicate with said bus with responsive to said enable signal when the result of said comparison is the identity of said stored address and said address represented by said specific signal, and
d. means for controlling said selective coupling means to respond to a selectable specific signal, including
means for erasing said stored address associated with said element, and
means for initiating storage of another address in said address storing means, whereby said stored address associated with said element may be altered.

4,188,671

SWITCHED-CAPACITOR MEMORY

Dennis J. Lynes, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 761,806, Jan. 24, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 959,207
Int. Cl.[2] G11C *11/24*
U.S. Cl. 365—149 7 Claims



1. In combination in an LSI random-access-memory unit designed to store multiple information words,
means forming multiple spaced-apart word lines,
means orthogonally disposed with respect to said word lines forming multiple spaced-apart digit lines,
multiple identical memory cells respectively connected at the multiple intersections defined by said orthogonally disposed word and digit lines,
each cell at an intersection comprising
a single transistor having base, emitter and collector electrodes,
and a single capacitor,
said base electrode being directly connected to the word line defining said intersection, one of said collector and emitter electrodes being connected to a point of reference potential, and the other one of said collector and emitter electrodes being connected via said capacitor to the digit line defining said intersection,
and means connected to said word and digit lines for selecting a particular one of said memory cells during writing and reading operations,
wherein said first-mentioned means comprises
plural parallel spaced-apart regions of a specified conductivity type ion implanted in the top surface of a substrate of the opposite conductivity type to form said multiple word lines,
at least one high-conductivity region of the specified conductivity type diffused in each of said regions to enhance the conductivity of said word lines,
and channel stop regions of the opposite conductivity type ion implanted in the spaces between said first-mentioned regions.

DESIGN PATENTS

GRANTED FEB. 12, 1980

ERRATA

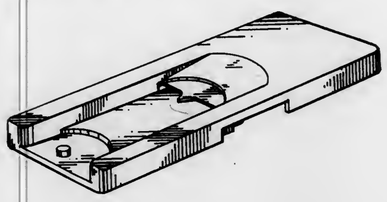
For CLASS	See PATENT NO.
D01-003	254,159
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D02-270	254,176
D02-270	254,177
D02-427	254,179
D03-071	254,157
D04-015	254,162
D06-130	254,158
D06-175	254,164
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D07-110	254,165
D07-076	254,166
D07-132	254,170
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D14-060	254,200
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D18-012	254,195

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D21–225 254,201
D21–027 254,202
D21–237 254,204
D21–185 254,205
D21–212 254,210
D21–234 254,211
D21–234 254,212
D23–146 254,207
D24–038 254,206
D24–064 254,214
D28–065 254,208
D28–049 254,209
D48–023 R 254,215

DESIGNS

FEBRUARY 12, 1980

254,156
VIAL CAP OPENER
Peter Swartz, 33 Pine Ave., Randolph, Mass. 02368, and Ronald J. Sostek, 51 Ansie Rd., Chelmsford, Mass. 01824
Filed Jun. 14, 1978, Ser. No. 916,004
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—40

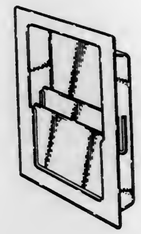


254,157
LUGGAGE
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation
Filed Jun. 20, 1978, Ser. No. 917,434
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71





254,158
RECESSED READING MATERIAL SUPPORT
Virgil R. Caudill, Rte. 2, Indian Lake Camp, Vicksburg, Mich. 49097
Filed Aug. 9, 1978, Ser. No. 932,412
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



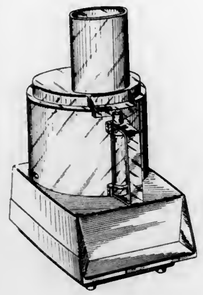
254,159
EDIBLE CONTAINER FOR FOOD
Gordon Daline, 1041 Taylor, Port Townsend, Wash. 98368
Filed Jan. 24, 1977, Ser. No. 755,785
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—3



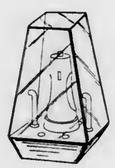
254,160
COMBINED ROPE AND TERMINAL UNIT THEREFOR
Frank D. Bruner, 10012 Emmet St., Omaha, Nebr. 68134
Filed Jan. 31, 1977, Ser. No. 763,784
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349



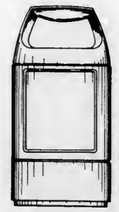
254,161
MACHINE FOR PROCESSING FOOD
Pierre Verdun, Fontsnay-sous-Bois, France, assignor to Robot Coupe, S.A., Rosny sous Bois, France
Filed Jan. 31, 1977, Ser. No. 763,800
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153



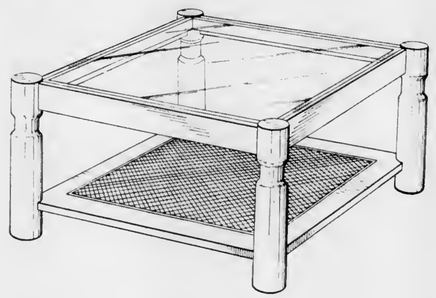
254,162
COMBINED TOOTHBRUSH, DISPLAY AND CHARGING UNIT THEREFOR
Fred J. Barker, 415 N. Hutchinson St., Adel, Ga. 31620
Filed Apr. 18, 1977, Ser. No. 788,680
Term of patent 14 years
Int. Cl. D4—*02;* D24—*03*
U.S. Cl. D4—15

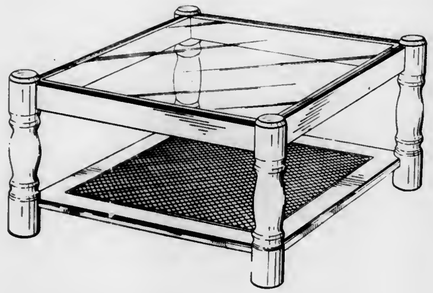


254,163
CONTAINER FOR LIQUIDS OR THE LIKE
William E. Sidor, Jenison, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed May 23, 1977, Ser. No. 799,757
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

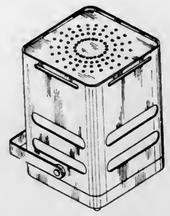


254,164
TABLE
Sidney Gibson, 229 Deloraine Ave., Toronto, Ontario, Canada (M5M 2B2)
Filed Jun. 20, 1977, Ser. No. 808,254
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



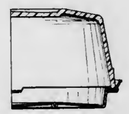


254,165
PORTABLE STOVE
Allen G. Woodward, Rte. 3, Princeton, Minn. 55371
Filed Jul. 18, 1977, Ser. No. 817,002
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110

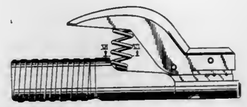


254,166
FOOD STORAGE CONTAINER
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jul. 27, 1977, Ser. No. 819,655
Term of patent 14 years
Int. Cl. D7—*01, 07*
U.S. Cl. D7—76



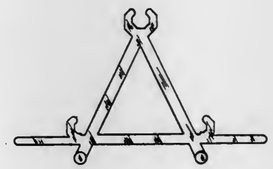


254,167
ARC WELDING ELECTRODE HOLDER
Charles G. Matthews, 1649 Semmes St., Memphis, Tenn. 38114
Filed Jul. 28, 1977, Ser. No. 819,775
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

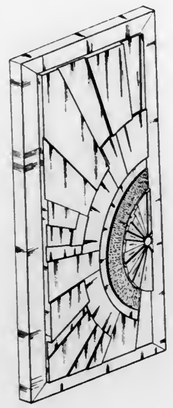




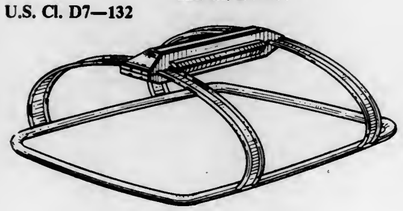
254,168
CATTLE SLAT REINFORCING BAR SUPPORT
Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries Ltd.
Filed Aug. 15, 1977, Ser. No. 824,408
Term of patent 3½ years
Int. Cl. D8—*08*
U.S. Cl. D8—354

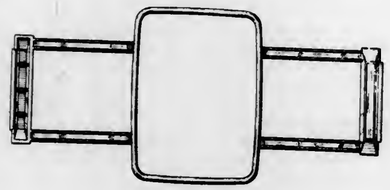


254,169
CABINET DOOR
Glenn Knight, Rochester, N.Y., assignor to Portrait Kitchens, Inc., Rochester, N.Y.
Filed Aug. 22, 1977, Ser. No. 826,882
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

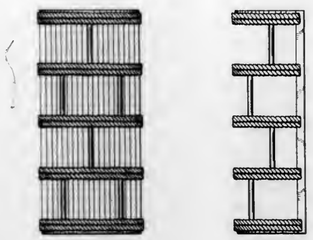


254,170
COMBINED REMOVABLE CARRYING HANDLE AND FRAME FOR A FOOD STORAGE CONTAINER
Jack V. Croyle, Woonsocket, and Robert F. Bateman, Greenville, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 25, 1977, Ser. No. 827,647
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—132





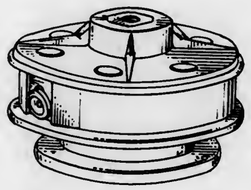
254,171
BOOKCASE OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,552
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



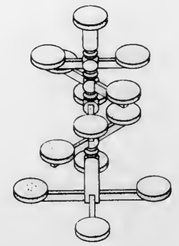
254,172
UPHOLSTERED ROCKING CHAIR OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,555
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



254,173
ROTARY CUTTING HEAD FOR MOWER
Raymond E. Proulx, 5837 Cameo St., Alta Loma, Calif. 91701
Filed Nov. 7, 1977, Ser. No. 849,456
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8



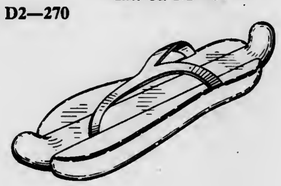
254,174
DISPLAY STAND OR SIMILAR ARTICLE
Henry Horback, 14195 Westmore, Livonia, Mich. 48154
Filed Dec. 5, 1977, Ser. No. 857,874
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—29



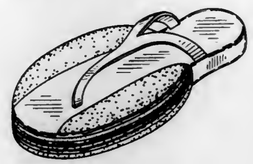
254,175
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,282
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



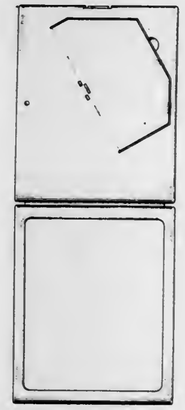
254,176
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,283
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



254,177
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,300
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



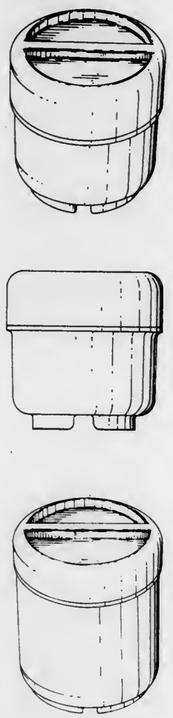
254,178
PICTURE FRAME
Norris B. Levine, Morton Grove, Ill., assignor to Intercraft Industries Corporation, Chicago, Ill.
Filed Feb. 3, 1978, Ser. No. 874,922
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



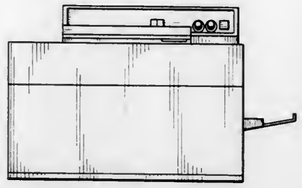
254,179
BELT BUCKLE
Michael Dolas, Santa Barbara, Calif., assignor to Wells Fargo & Company, San Francisco, Calif.
Filed Mar. 31, 1978, Ser. No. 893,162
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—427



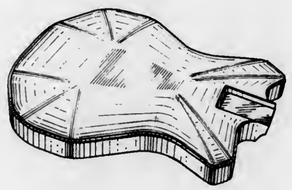
254,180
CANISTER OR THE LIKE
Andre Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,509
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



254,181
COPYING MACHINE
Toshihiko Sakow, Teaneck, N.J.; Isao Katayama, Kobe, and Sadao Ishihara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1976, Ser. No. 736,977
Claims priority, application Japan, Apr. 30, 1976, 51-16338; Apr. 30, 1976, 51-16339; Apr. 30, 1976, 51-16340
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



254,182
GUITAR BODY OR THE LIKE
Emil H. Soika, 2312 E. Grand Ave., Lindenhurst, Ill. 60046, and Robert R. Genc, 117 E. Grove, Mundelein, Ill. 60060
Filed Jun. 20, 1977, Ser. No. 808,232
Term of patent 7 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



254,183
HEAD-PHONE
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 7, 1977, Ser. No. 813,753
Claims priority, application Benelux, Jan. 11, 1977, 5158800
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36



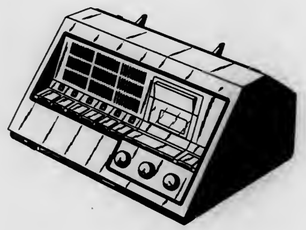
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254,184
BEVERAGE DISPENSING MACHINE
Ernest N. Martin, Escondido, and Michael D. Munson, Jurupa, both of Calif., assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland
Filed Jul. 11, 1977, Ser. No. 814,780
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112



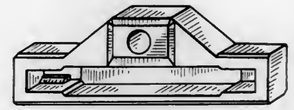


254,185
DICTATING MACHINE
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 26, 1977, Ser. No. 836,683
Claims priority, application Benelux, Mar. 30, 1977, 5177400
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

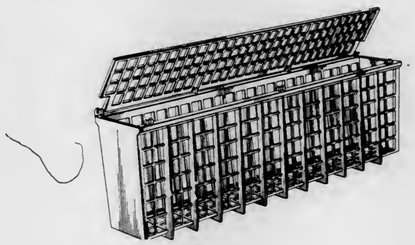


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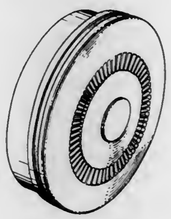
254,186
RESISTOR HOUSING
Anthony Collett, Mendham Township, Morris County, N.J., assignor to The Colber Corporation, Irvington, N.J.
Filed Sep. 29, 1977, Ser. No. 838,114
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—21



254,187
DISHWASHER BASKET
Lillian M. Freese, San Marino, Calif., assignor to Freese Products Corporation, San Marino, Calif.
Filed Nov. 2, 1977, Ser. No. 848,022
Term of patent 14 years
Int. Cl. D15—*05*; D9—*04*
U.S. Cl. D15—36



254,188
COMBUSTION DETECTOR
James A. Odom, 14540 Genesee Ave., Apple Valley, Minn. 55124
Filed Jan. 3, 1978, Ser. No. 866,316
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



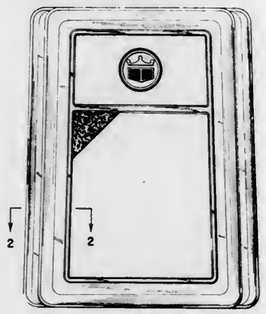
254,189
DIGITAL THERMOMETER
Howard S. Prosky, Denver, Colo., assignor to Electromedics, Inc., Denver, Colo.
Filed Jan. 5, 1978, Ser. No. 867,358
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



254,190
CHRISTMAS ORNAMENT
William B. Campbell, deceased, late of Saint Paul, Minn., by Doris Campbell, executor, West St. Paul, Minn., assignors to Ball Corporation, Muncie, Ind.
Filed Jan. 17, 1978, Ser. No. 870,258
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—127



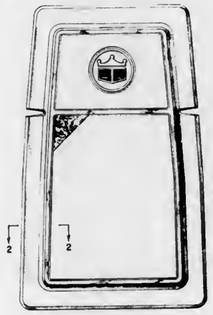
254,191
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Feb. 1, 1978, Ser. No. 874,273
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



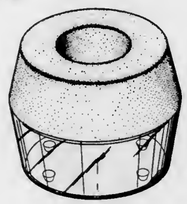
254,192
WHEELCHAIR
Hiroshi Honzyou, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 13, 1978, Ser. No. 877,360
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



254,193
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Mar. 2, 1978, Ser. No. 883,037
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



254,194
PLANT HOLDER
Walton J. Smith, Rte. 4, Grafton, N.H. 03240
Filed Mar. 13, 1978, Ser. No. 886,294
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



254,195
SLIDING HIDEAWAY KEYBOARD
Donald M. Genaro, Haworth; Rembert R. Stokes, Middletown, both of N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 23, 1978, Ser. No. 889,604
Term of patent 14 years
Int. Cl. D18—*01;* D14—*02, 03*
U.S. Cl. D18—12



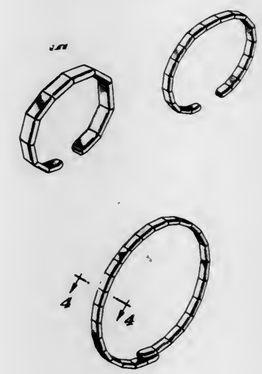
254,196
PORTABLE MANDREL
Michael H. Shulman, 45 Bruce Farm Dr., Willowdale, Ontario, Canada
Filed Apr. 24, 1978, Ser. No. 899,349
Term of patent 3½ years
Int. Cl. D15—*09;* D8—*05*
U.S. Cl. D15—130



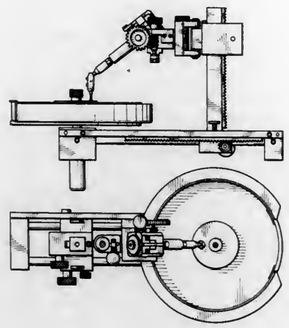
254,197
INTRUSION ALARM HOUSING
Douglas K. Ewald, Greeley, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.
Filed Apr. 28, 1978, Ser. No. 900,928
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



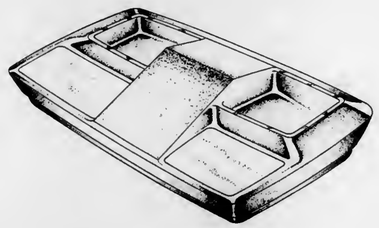
254,198
SEGMENTAL JEWELRY BAND
Gilbert F. Hardy, Huntington Beach, Calif., assignor to Deana W. Wyrwa, Santa Ana, Calif.
Filed Jul. 24, 1978, Ser. No. 927,684
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

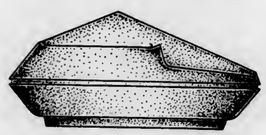


254,199
STONE FACETING MACHINE
Louis M. Beeman, 19120 Nordhoff #46, Northridge, Calif. 91324
Filed Sep. 14, 1978, Ser. No. 944,689
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—125



254,200
TELEPHONE STAND
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 21, 1978, Ser. No. 971,990
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

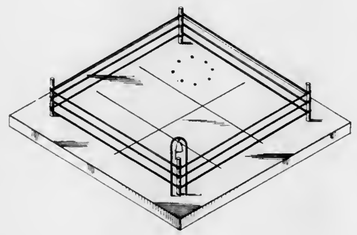




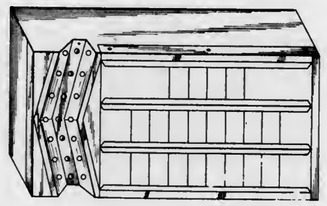
254,201
SKATE
Ian F. Norton, 272 St. Clements Ave., Toronto, Ontario, Canada, and Gerald Beekenkamp, Unit 62, 617 Rathburn Rd., Etobicoke, Ontario, Canada (M9C 3T5)
Filed Jul. 6, 1976, Ser. No. 702,412
Claims priority, application Canada, May 31, 1976, 310576
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225



254,202
BOXING GAME BOARD
Zoltan Kasas, 419 River Dr., Garfield, N.J. 07026, and Akos Nagy, 109 Aycrigg Ave., Passaic, N.J. 07055
Filed Mar. 25, 1977, Ser. No. 781,369
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



254,203
ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Jun. 8, 1977, Ser. No. 804,550
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



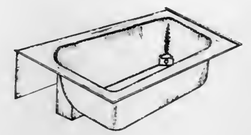
254,204
LIFE PRESERVER
Rolf A. Samsing, 349 Elm St., Braintree, Mass. 02184
Filed Aug. 15, 1977, Ser. No. 824,647
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D21—237



254,205
DOLL OR SIMILAR ARTICLE
Bob Boston, Jr., 2151 Godwin SE., Grand Rapids, Mich. 49503, and Patricia Mills, 4139 Oak Park SE., Kentwood, Mich. 49508
Filed Aug. 22, 1977, Ser. No. 826,340
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—185

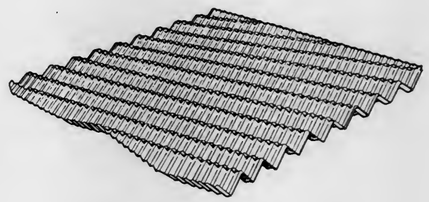


254,206
WHIRLPOOL BATHTUB
Philip I. Ogden, P.O. Box 7671, Boise, Id. 83707
Filed Sep. 12, 1977, Ser. No. 832,544
Term of patent 14 years
Int. Cl. D24—*02*; D23—*02*
U.S. Cl. D24—38

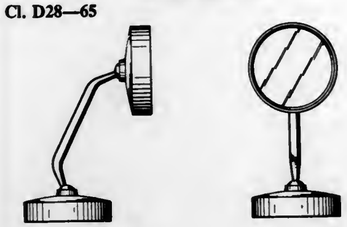




254,207
CORRUGATED METAL SHEET CONTACT BODY FOR HUMIDIFIERS
Roy Holmberg, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Oct. 3, 1977, Ser. No. 838,551
Claims priority, application Sweden, Apr. 1, 1977, 77-0752
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146



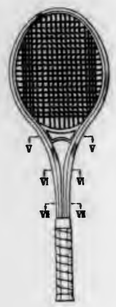
254,208
MAKE-UP MIRROR
David Breslow, 15 W. 26 St., New York, N.Y. 10010
Filed Dec. 9, 1977, Ser. No. 859,654
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—65



254,209
ELECTRIC SHAVER
Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 16, 1978, Ser. No. 869,565
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



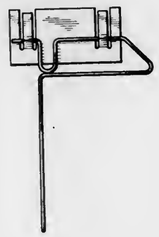
254,210
TENNIS RACKET
Minoru Yoneyama, Koshiji, Japan, assignor to Yonex Sports Kabushiki Kaisha, Koshiju, Japan
Filed Feb. 7, 1978, Ser. No. 875,878
Claims priority, application Japan, Aug. 8, 1977, 52-31230
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



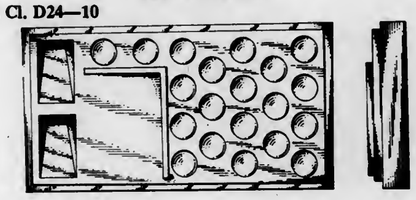
254,211
GOLFER'S TOOL
William L. Gutknecht, 755 Taft, Apt. K, Arlington, Tex. 76011
Filed Apr. 10, 1978, Ser. No. 895,291
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



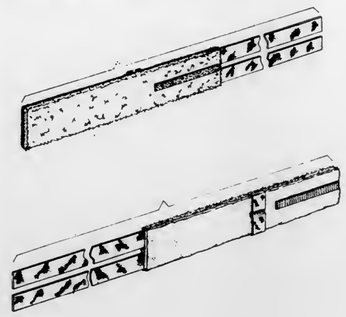
254,212
VISUAL AID FOR GOLF SWING
Benson A. Jones, 6501 Vista Del Mar, Playa del Rey, Calif. 90201
Filed Apr. 10, 1978, Ser. No. 895,292
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



254,213
COMBINED MIXING AND STAINING DENTAL SLAB
Gayland G. Bird, 4810 SW. 6th St., Miami, Fla. 33134
Filed Sep. 18, 1978, Ser. No. 942,980
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



254,214
LIMB AND/OR BODY RESTRAINT
Dennis J. Leary, 3104 Bagley Ave., Los Angeles, Calif. 90034
Filed Dec. 18, 1978, Ser. No. 970,202
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



254,215
LUMINAIRE
Theodor G. Yahraus, and Russell C. Dahl, both of Crawfordsville, Ind., assignors to National Service Industries, Inc.
Filed Dec. 2, 1977, Ser. No. 856,793
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.

A. Menarini S.A.S.: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

A. O. Smith Corporation: *See*—
Wheaton, William H., 4,188,553, Cl. 310-68.00C.

A/S Hoyer-Ellefsen: *See*—
Vigander, Kjell, 4,188,157, Cl. 405-210.000.

Aalbers, Johan G.; and Van Paassen, Nicolaas I., to Chem-Y, Fabriek Van Chemische Produkten B.V. Detergent compositions containing ether sulfates. 4,188,311, Cl. 252-551.000.

AB Svenska Flaktfabriken: *See*—
Fermer, Karl-Erik; and Hulthe, Leif, 4,187,879, Cl. 137-601.000.

Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, to Commissariat a l'Energie Atomique. Composite flexible joint. 4,188,037, Cl. 277-2.000.

Abbey, Harold G. Fuel-air ratio controlled carburetion system. 4,187,805, Cl. 123-28.000.

Abbott Laboratories: *See*—
Bujan, Albert F., 4,187,893, Cl. 150-8.000.
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,188,319, Cl. 260-112.50R.

Abcor, Inc.: *See*—
Nuwayser, Elie S.; and Barrington, James E., 4,187,839, Cl. 128-79.000.

Abelentseva, Galina M.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Abell, Gary E., to Babcock & Wilcox Company, The. Apparatus for aligning an inspection or repair device with a selected tube in a heat exchanger. 4,188,167, Cl. 414-744.000.

Abex Corporation: *See*—
King, Donald A., 4,187,958, Cl. 222-57.000.

Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Tracer head. 4,187,614, Cl. 33-174.00L.

ACF Industries, Incorporated: *See*—
Alvarez, Patricio D., 4,188,014, Cl. 251-196.000.
Kull, George A., 4,187,881, Cl. 137-625.310.
Phelan, Michael B.; and White, Jack M., 4,187,814, Cl. 123-119.0EC.
Whaley, William L., 4,188,016, Cl. 251-328.000.

Achard, Michel, to Automobiles Peugeot. Control of an automatic gearbox in an automobile. 4,187,742, Cl. 74-863.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See*—
Herrig, Klaus; and Wagner, Heinz, 4,188,020, Cl. 256-45.000.

ACR Electronics, Inc.: *See*—
Hahn, James H., 4,188,556, Cl. 310-268.000.

Adachi, Shigeo: *See*—
Takagi, Izumi; and Adachi, Shigeo, 4,187,732, Cl. 74-230.17M.

Adams, Clyde M., Jr. Aluminum production. 4,188,207, Cl. 75-68.00B.

Adams, Paul G.; and Gebler, Kenneth A., to Nalco Chemical Company. Sprayable material for repairing base plates of ingot molds. 4,188,416, Cl. 427-135.000.

Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., to Hooker Chemicals & Plastics Corp. Bipolar electrode with intermediate graphite layer and polymeric layers. 4,188,464, Cl. 429-210.000.

Adrian, Linda S.: *See*—
Dempsey, Leonard H.; and Adrian, Linda S., 4,188,034, Cl. 273-248.000.

AGA Aktiebolag: *See*—
Rudolphi, Kjell, 4,187,868, Cl. 134-184.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Duguet, Jean-Claude, 4,188,131, Cl. 366-301.000.

Agency of Industrial Science & Technology: *See*—
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.

Aisan Industry Co., Ltd.: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material containing diarylhalomethane. 4,188,226, Cl. 430-620.000.

Akashi, Shunji, to Yoshida Kogyo K K. Continuous slide fastener stringers. 4,187,591, Cl. 24-205.00R.

Akkerman, Neil H., to Baker International Corporation. Valve actuator and pilot assembly therefor. 4,187,870, Cl. 137-102.000.

Akkerman, Neil H., to Baker Cac, Inc. Spool valve and pilot interface assembly. 4,188,011, Cl. 251-63.400.

Akopian, Nina E.: *See*—
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.

Akzona Incorporated: *See*—
Bruins, Antonius H. N. M.; and Vollema, Gerlof, 4,188,338, Cl. 260-500.50H.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Hoover, William, 4,188,078, Cl. 308-187.000.

Albert Rolland S.A.: *See*—
Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, 4,188,388, Cl. 424-250.000.

Alcanzare, Eduardo V. Combat and transport vehicle body. 4,188,060, Cl. 296-63.000.

Alchem, Inc.: *See*—
Fless, Donald E., 4,188,205, Cl. 75-42.000.

Aldridge, Lionel D.; and Sprenkle, George J., to Burroughs Corporation. High density solder tail connector assembly for leadless integrated circuit packages. 4,188,085, Cl. 339-176.0MP.

Aldrin, Per O. Universal type machine tool. 4,187,601, Cl. 29-560.000.

Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, to Elliott Brothers (London) Limited. Display apparatus. 4,188,627, Cl. 340-747.000.

Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, to SANAC Societa per Azioni Refrattari Argille e Calolini. Box discharger comprising reloadable refractory plates, with wedge locking. 4,187,965, Cl. 222-600.000.

Allen, Richard G.: *See*—
Meri, Kalju; and Allen, Richard G., 4,188,507, Cl. 179-6.00D.

Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Inc. Floating piston respirating pump. 4,187,836, Cl. 128-2.080.

Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Inc. Respirating pump. 4,187,859, Cl. 128-725.000.

Allen, Robert H., to University Patents, Inc. Quantitative testing for vitamin B_{12}. 4,188,189, Cl. 23-230.300.

Allied Chemical Corporation: *See*—
DeBernard, Lewis M., Jr.; and Mercer, Donald G., 4,188,430, Cl. 428-88.000.

Allington, Robert W., to Instrumentation Specialties Company. AC Detector for DC ground faults and high capacitance in high-voltage DC power supplies. 4,188,574, Cl. 324-51.000.

Allis-Chalmers Corporation: *See*—
Faulkner, Bobby P.; and Moore, Donald C., 4,188,287, Cl. 209-168.000.

Almore International, Inc.: *See*—
Larro, Harold D., 4,188,265, Cl. 435-313.000.

Alomar, Antonio D. Infants cot. 4,187,564, Cl. 5-94.000.

Alps Electric Co., Ltd.: *See*—
Yoshisato, Akiyuki, 4,188,579, Cl. 325-17.000.

Altec Corporation: *See*—
Henricksen, Clifford A.; and Ureda, Mark S., 4,187,926, Cl. 181-192.000.

Altenpohl, Paul J.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,187,945, Cl. 209-592.000.

Altenpohl, William F.; and Altenpohl, Paul J., to W. F. Altenpohl, Inc. Plural path weight sorting system. 4,187,945, Cl. 209-592.000.

Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 1,9-Dihydroxyoctahydrophenanthrenes and intermediates therefor. 4,188,495, Cl. 568-633.000.

Aluminum Company of America: *See*—
Seger, Edward J.; and Haupin, Warren E., 4,188,267, Cl. 204-1.00T.

Alvarez, Patricio D., to ACF Industries, Incorporated. Gate valve with position responsive interlock. 4,188,014, Cl. 251-196.000.

Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., to Dennison Manufacturing Company. Particulate filtering. 4,188,197, Cl. 55-382.000.

Amchem Company Limited: *See—*
Baker, George E., 4,188,522, Cl. 219-69.00M.

American Can Company: *See—*
Rohowetz, Stanley E., 4,188,437, Cl. 428-199.000.

American Cyanamid Company: *See—*
Los, Marinus, 4,188,487, Cl. 548-301.000.

American Home Products Corporation: *See—*
Sejpal, Vasant D., 4,188,412, Cl. 426-609.000.

American Optical Corporation: *See—*
Bartfay-Szabo, Stephen A., 4,188,116, Cl. 356-137.000.
Day, Christopher C.; and McEachern, Robert A., 4,187,858, Cl. 128-710.000.

Anchor/Darling Industries, Inc.: *See—*
Calabrese, Richard A.; and Fandetti, Robert E., 4,187,933, Cl. 188-134.000.

Anchor Hocking Corporation: *See—*
Bogart, Burton S., 4,187,964, Cl. 222-546.000.

Anderka, Gerold; and Jozat, Walter, to Koh-I-Noor Rapidograph, Inc. Method for regulating ink flow in drafting pens. 4,188,634, Cl. 346-1.100.

Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., to Aktieselskabet Nordiske Kabel-OG Traadfabriker. Optical element for use in optical transmission means. 4,188,088, Cl. 350-96.230.

Anderson, Donald R. Treatment of industrial waste water. 4,188,291, Cl. 210-23.00H.

Anderson, Ernest L. Panel constructed building. 4,187,655, Cl. 52-236.600.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,187,911, Cl. 166-312.000.

Anderson, Howard H.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Ando, Takao: *See—*
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.

Ando, Tsuneo: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Annas, Robert I.: *See—*
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.

Anneflod, Weimar A.: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.

Anscher, Bernard. Internally threaded plastic nut. 4,188,178, Cl. 425-469.000.

Aono, Shigeo: *See—*
Hosaka, Akio; and Aono, Shigeo, 4,187,812, Cl. 123-119.0EC.

Appenzeller, Valentin, to Kusters, Eduard. Roll for pressure treating webs of material. 4,187,594, Cl. 29-116.0AD.

Arai, Kunihito: *See—*
Matsuura, Katsuji; and Arai, Kunihito, 4,188,421, Cl. 427-385.00A.

Arakawa, Tatsumi: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.

Aratowerk Walter von Taschitzki: *See—*
von Taschitzki, Rainer, 4,187,804, Cl. 119-72.5RC.

Arcamone, Federico: *See—*
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.

Archer, Duane L.: *See—*
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.

Arcuri, Joseph D., Jr., to Electric Power Research Institute, Inc. Sodium-sulfur battery and method of making a double carbon mat-composite sulfur electrode for use in sodium-sulfur cells. 4,188,463, Cl. 429-104.000.

Aries Electronics, Inc.: *See—*
Sinclair, William Y., 4,187,606, Cl. 29-629.000.

Arima, Yusaku: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.

Aron, Daniel L., to Mole-Richardson Co. Adjustable support for portable lamp. 4,188,658, Cl. 362-396.000.

Artusy, Max T.: *See—*
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.

Arutjunova, Amalia A.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.

Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, to Toyo Kagaku Kabushiki Kaisha. Adhesive tape. 4,188,439, Cl. 428-215.000.

Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, to Toyo Kagaku Kabushiki Kaisha. Adhesive tape. 4,188,442, Cl. 428-216.000.

Asano, Isao, to Babcock-Hitachi Kabushiki Kaisha. Narrow weld-groove welding process. 4,188,526, Cl. 219-137.800.

Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., to Boeing Company, The. Window transmittance tester. 4,188,533, Cl. 250-338.000.

Astero, Ulf J. E., to Asthausbolagen HB Astero & Stockhaus. Manually movable binding apparatus. 4,187,571, Cl. 11-1.0AD.

Asthausbolagen HB Astero & Stockhaus: *See—*
Astero, Ulf J. E., 4,187,571, Cl. 11-1.0AD.

Ateliers et Chantiers de Bretagne-A.C.B.: *See—*
Moreau, Claude; and Schreder, Rene, 4,188,166, Cl. 414-735.000.

Auchinleck, Richard J.: *See—*
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.

Audoux, Guy, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Engine having a variable compression ratio. 4,187,808, Cl. 123-48.0AA.

Auerbach, Robert A., to Lord Corporation. Cold plasma modification of organic and inorganic surfaces. 4,188,426, Cl. 427-40.000.

Autoliv AB: *See—*
Lindblad, Oskar L., 4,187,925, Cl. 180-268.000.

Automecha Ltd.: *See—*
Brown, Frank H., 4,188,252, Cl. 156-361.000.

Automobiles Peugeot: *See—*
Achard, Michel, 4,187,742, Cl. 74-863.000.
Audoux, Guy, 4,187,808, Cl. 123-48.0AA.

Avetisian, Svetlana A.: *See—*
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

Ayerst McKenna & Harrison, Inc.: *See—*
Jirkovsky, Ivo L., 4,188,389, Cl. 424-250.000.

Azarian, Vazgen K.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

B. Braun Melsungen Aktiengesellschaft: *See—*
Brethauer, Ulrich, 4,187,719, Cl. 73-61.400.

B. F. Goodrich Company, The: *See—*
Rajput, Yudh V.; and Skodack, Gary J., 4,188,075, Cl. 303-106.000.
Stricharczuk, Paul T.; and Lawson, Dennis L., 4,188,448, Cl. 428-311.000.

B & J Machinery Company, Inc.: *See—*
Cobble, James T., 4,187,788, Cl. 112-79.00R.

Babbitless: *See—*
Petrini Poli, Denis, 4,187,991, Cl. 241-33.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Asano, Isao, 4,188,526, Cl. 219-137.800.

Babcock & Wilcox Company, The: *See—*
Abell, Gary E., 4,188,167, Cl. 414-744.000.

Backlund, Sture O. E., to SCA Development Aktiebolag. Method of improving the homogeneity of lignocellulose containing material. 4,188,261, Cl. 162-42.000.

Badger Company, The: *See—*
Graham, James J.; and Vernon, Roger J., 4,188,290, Cl. 210-21.000.

Baker Cac, Inc.: *See—*
Akkerman, Neil H., 4,188,011, Cl. 251-63.400.

Baker, George E., to Amchem Company Limited. Method of machining a workpiece to a predetermined depth using a machining process in which machine tool wear occurs. 4,188,522, Cl. 219-69.00M.

Baker International Corporation: *See—*
Akkerman, Neil H., 4,187,870, Cl. 137-102.000.
Kovacs, Jozsef P., 4,187,906, Cl. 166-120.000.

Baker, Keith R., to Deere & Company. Fuel line injection sensor. 4,187,720, Cl. 73-119.00A.

Baker, Scott H.; and Manners, David E., to GTE Sylvania Incorporated. Startup circuit for a television receiver. 4,188,641, Cl. 358-190.000.

Bakumenko, Ljudmila A.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Balzer, David J., to Caterpillar Tractor Co. Brake housing and actuating mechanism. 4,187,931, Cl. 188-72.100.

Balzers Patent-und Beteiligungs-Aktiegesellschaft: *See—*
Lichtenberg, Wolfgang, 4,188,417, Cl. 427-229.000.

Bannat, John W.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.

Bant, John A.; and Raban, Victor J., to Lucas Industries Limited. Lead-acid batteries. 4,188,461, Cl. 429-48.000.

Barbanel, Sidney M.: *See—*
Barton, Steven A.; and Barbanel, Sidney M., 4,187,853, Cl. 128-419.0PT.

Barbieri, Siegfried; and Kapfinger, Wolfgang, to Durst AG Fabrik Fototechnischer Apparate. Apparatus for the determination of the color composition of the printing light in a photographic enlarger. 4,188,125, Cl. 356-404.000.

Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, to Agence Nationale de Valorisation de la Recherche (ANVAR). Polymeric electrical insulators having increased resistance to partial discharges containing metal chelates. 4,188,303, Cl. 252-63.700.

Barnacle, Leslie J. H., to Cosarnia Limited. Lead cropping apparatus. 4,187,751, Cl. 83-458.000.

Baron, Hubertus: *See—*
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.

Baronavski, Andrew P.: *See—*
McDonald, Jimmie R.; and Baronavski, Andrew P., 4,188,120, Cl. 356-318.000.

Barrieres, Elie L.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.

Barrington, James E.: *See—*
Nuwayser, Elie S.; and Barrington, James E., 4,187,839, Cl. 128-79.000.

Bartfay-Szabo, Stephen A., to American Optical Corporation. Abbe refractometer. 4,188,116, Cl. 356-137.000.

Barton, Steven A.; and Barbanel, Sidney M. Electrode implanting apparatus with optimum location probe. 4,187,853, Cl. 128-419.0PT.

Bartrug, Norman G., to PPG Industries, Inc. Lost end rethread clip. 4,188,435, Cl. 428-167.000.

BASF Aktiengesellschaft: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.

Basic Products Development Company, Inc.: *See—*
Turner, Lloyd S., 4,187,953, Cl. 215-301.000.

Baskin, Joseph M., to Boeing Company, The. Rotor blade internal damper. 4,188,171, Cl. 416-226.000.

Bathelt, Heinrich, to Hoechst Aktiengesellschaft. Mixture with low surface tension which consists of fluorinated alkylammonium monoalkyl sulfates and fluoroalkyl-sulfatobetaines. 4,188,307, Cl. 252-355.000.

Battersby, Robert J.; and Dietiker, Paul, to Honeywell Inc. Gas valve seating member. 4,188,013, Cl. 251-175.000.

Bauer, Randy L.; and Krulik, Gerald A. Method of preparing multicomponent chemical compositions. 4,188,227, Cl. 106-1.270.

Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer supported at the vehicle end wall of a self-supporting motor vehicle body. 4,188,059, Cl. 296-188.000.

Baumgarth, Manfred: *See—*
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.

Bausch & Lomb Incorporated: *See—*
Wrue, Richard J., 4,187,574, Cl. 15-104.920.

Baxter Travenol Laboratories, Inc.: *See—*
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.

Bay City Boring: *See—*
Webber, Robert, 4,187,749, Cl. 82-2.700.

Bayer Aktiengesellschaft: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Brandes, Wilhelm; and Daum, Werner, 4,188,401, Cl. 424-304.000.
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.
Fell, Bernard; and Dolkemeyer, Wilfried, 4,188,363, Cl. 423-22.000.
Margotte, Dieter, 4,188,475, Cl. 528-175.000.
Maurer, Fritz; and Hammann, Ingeborg, 4,188,383, Cl. 424-200.000.
Straub, Otto C., 4,188,375, Cl. 424-88.000.
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.

Baysinger, Robert L.: *See—*
Rippelmeyer, Dennis M.; and Baysinger, Robert L., 4,188,181, Cl. 431-66.000.

Beard, Larry D.: *See—*
Coleman, Robert A.; and Beard, Larry D., 4,187,901, Cl. 165-47.000.

Beaty, Loma B. Noise dampened rotary saw blade. 4,187,754, Cl. 83-847.000.

Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, to BASF Aktiengesellschaft. Manufacture of acicular cobalt-modified magnetic iron oxide. 4,188,302, Cl. 252-62.560.

Becker, James J., Jr.; and Beresford, Henry T. Spray dryer. 4,187,617, Cl. 34-57.00R.

Becton, Dickinson and Company: *See—*
Percarpio, Edward P., 4,187,952, Cl. 215-247.000.

Bedocs, Michael F., to Cherry Electrical Prod's. Corp. Keyboard switch actuator and locking assembly. 4,188,136, Cl. 400-276.000.

Beex, Aloysius A.: *See—*
Graupe, Daniel; Beex, Aloysius A.; and Causey, G. Donald, 4,188,667, Cl. 364-724.000.

Beggs, Donald; and Escott, Robert M., to Midrex Corporation. Hot discharge direct reduction furnace. 4,188,022, Cl. 266-195.000.

Behrenberg, Rolf: *See—*
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.

Bell Telephone Laboratories, Incorporated: *See—*
Lynes, Dennis J., 4,188,671, Cl. 365-149.000.
O'Connor, Robert J., 4,188,505, Cl. 179-1.0PC.
Reudink, Douglas O.; and Yeh, Yu S., 4,188,578, Cl. 325-4.000.
Wiese, Larry L., 4,188,601, Cl. 335-51.000.

Bendix Corporation, The: *See—*
Nevitt, James S., 4,187,715, Cl. 73-37.900.

Benton, Marvin E. Locking adapter for trailer towing mirror. 4,187,702, Cl. 70-57.000.

Beresford, Henry T.: *See—*
Becker, James J., Jr.; and Beresford, Henry T., 4,187,617, Cl. 34-57.00R.

Berg, Charles A., to Owens-Illinois, Inc. Solar powered intermittent cycle heat pump. 4,187,688, Cl. 62-2.000.

Berg, Charles A., to Pyreflex Corporation. Process and apparatus for controllably exchanging heat between two bodies. 4,188,519, Cl. 219-10.470.

Bernardi, Luigi: *See—*
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.

Bernstein, Phillip: *See—*
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., 4,187,759, Cl. 89-1.00B.

Bertram, Wolfgang: *See—*
Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, 4,188,419, Cl. 427-287.000.

Besik, Ferdinand. Process for purification of sanitary waters. 4,188,289, Cl. 210-7.000.

Beta Aluminium Products Limited: *See—*
Thompson, Norman, 4,187,641, Cl. 49-403.000.

Betancourt, Jorge; and Hernandez, Jose. Apparatus for automatically kneading and stretching a mixture. 4,188,128, Cl. 366-72.000.

BFG Glassgroup: *See—*
Groth, Rolf, 4,188,452, Cl. 428-336.000.
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.

Bhattacherjee, Parimal: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,188,394, Cl. 424-262.000.

Bhimji, Amir A., to General Foods Corporation. Food extruder pressure indicator. 4,187,727, Cl. 73-706.000.

Bianchini, Claudio: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Range synchronized flash photographic apparatus and method for achieving optimum flash exposure. 4,188,103, Cl. 354-27.000.

Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Nitrile substituted polyimide precursors. 4,188,337, Cl. 260-465.00D.

Binns, Kenneth J., to University of Southampton, The. Alternating current rotating electric machine. 4,188,554, Cl. 310-156.000.

Bio-Rad Laboratories, Inc.: *See—*
Willner, Howard; and Kapteyn, Robert J., 4,188,188, Cl. 23-230.00B.

Birjukov, Sergei B.: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.

Bissi, Rebecca A. Method for producing decorative fabric. 4,187,592, Cl. 28-163.000.

Blachura, Leon, to North Oakland Development Corporation. Home building method and apparatus. 4,187,659, Cl. 52-745.000.

Black Bocs, Ltd.: *See—*
Olmstead, Edward A., 4,187,726, Cl. 73-660.000.

Black, John O. Vertical ascending and descending airplane. 4,187,999, Cl. 244-12.500.

Blasinachim S.p.A.: *See—*
Castelli, Pier P.; and Romano, Bruno, 4,188,322, Cl. 260-239.55R.

Blau, James R. Snow plow. 4,187,624, Cl. 37-42.00R.

Blum, Rainer: *See—*
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.

Blumenaus, Jon M., to World Carpets, Inc. Method of print dyeing textile materials. 4,188,216, Cl. 430-22.000.

Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova,

Nina N. Space structure of a roof covering for a building. 4,187,652, Cl. 52-90.000.

Boehringer Mannheim GmbH: *See—*
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.

Boeing Company, The: *See—*
Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., 4,188,533, Cl. 250-338.000.
Baskin, Joseph M., 4,188,171, Cl. 416-226.000.
Hametner, Albert L.; and Soderberg, Mark S., 4,187,889, Cl. 140-92.100.
Shen, Jan-son, 4,187,682, Cl. 60-413.000.
Soderberg, Mark S., 4,188,041, Cl. 279-75.000.

Bogan, David B. Toilet riser. 4,187,561, Cl. 4-116.000.

Bogart, Burton S., to Anchor Hocking Corporation. Combined closure cap and pour-out fitment. 4,187,964, Cl. 222-546.000.

Bohme, Rolf C.; and Luck, Dieter G., to General Mining and Finance Corporation Limited. Loaders for use in tunnels. 4,188,165, Cl. 414-694.000.

Boisde, Gilbert; and Boissier, Alain, to Commissariat a l'Energie Atomique. Photometer with concave mirrors and field optics. 4,188,126, Cl. 356-440.000.

Boissier, Alain: *See—*
Boisde, Gilbert; and Boissier, Alain, 4,188,126, Cl. 356-440.000.

Bokelman, Gordon H.: *See—*
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.

Boling, Norman L., to Owens-Illinois, Inc. Generation of electrical energy from sunlight, and apparatus. 4,188,238, Cl. 136-89.0FC.

Boling, Norman L., to Owens-Illinois, Inc. Luminescent solar collector structure. 4,188,239, Cl. 136-89.0FC.

Bolton, Joseph A.; and Hoover, William, to Albany International Corp. Bearing lubrication system for bowed rolls. 4,188,078, Cl. 308-187.000.

Bomar, Richard L.; and Duarte, Jesus, to Bourns, Inc. Phaseable impedance device. 4,188,606, Cl. 338-137.000.

Bongianni, Wayne L., to Rockwell International Corporation. Fixed frequency filters using epitaxial ferrite films. 4,188,594, Cl. 332-16.00R.

Bonin, Jean-Claude, to CAV RotoDiesel. Fuel injection pumps for internal combustion engines. 4,188,175, Cl. 417-462.000.

Bonk, Joseph P., to Kendall Company, The. Dispenser with cap and protective member. 4,187,960, Cl. 222-107.000.

Boots Company Limited, The: *See—*
Nicholson, John S.; and Turner, John L., 4,188,491, Cl. 562-492.000.

Borg Textile Corporation: *See—*
Koegel, Ralph A., 4,187,700, Cl. 66-111.000.

Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., to Union Special Corporation. Thread trimmer. 4,187,792, Cl. 112-286.000.

Bosio, Roberto: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.

Bosniack, David S.; and Korbach, Paul F., to Exxon Research & Engineering Co. Conversion of sulfonic acids into a hydrocarbon oil of superior oxidation stability. 4,188,500, Cl. 585-1.000.

Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine derivatives substituted in the 2 position, and their use as medicaments. 4,188,395, Cl. 424-266.000.

Bottino, Aldo: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.

Bourns, Inc.: *See—*
Bomar, Richard L.; and Duarte, Jesus, 4,188,606, Cl. 338-137.000.

Bouyoucos, John V., to Hydroacoustics, Inc. Pile driver. 4,187,917, Cl. 173-131.000.

Bower, Bruce L.; and Kohler, Raymond H., to GTE Sylvania Incorporated. Direct drive ballast with starting circuit. 4,188,661, Cl. 363-49.000.

Bower, David S.; and Smith, Fred J., to Digital Products Corporation. Telephone sequential number dialer with number incrementing. 4,188,510, Cl. 179-90.0BD.

Boyd, Alistair B.: *See—*
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.

Boyer, Harold, to National Cellulose Corporation. Plural component-multi state mixing and encapsulating nozzle. 4,187,983, Cl. 239-9.000.

Boykin, Richard A.; and Hamilton, Gordon A., to Champion International Corporation. Two piece produce box. 4,187,977, Cl. 229-43.000.

Bozon, Alfred: *See—*
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.

Brackbill, Warren H.; and Sadler, Loren G., to Sperry Rand Corporation. Manure spreader paddle attachment. 4,187,988, Cl. 239-662.000.

Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, to Rhone-Poulenc-Textile. Pile textile elements with fused wrapper and base. 4,188,429, Cl. 428-85.000.

Brand, Boris P.: *See—*
Payne, David T.; and Brand, Boris P., 4,188,376, Cl. 424-173.000.

Brandes, Wilhelm; and Daum, Werner, to Bayer Aktiengesellschaft. Combating fungi with 1-(ω-substituted pentyl)-3-(2-cyano-acetyl)-ureas. 4,188,401, Cl. 424-304.000.

Brantingham, George L.: *See—*
Frantz, Gene A.; and Brantingham, George L., 4,188,626, Cl. 340-711.000.

Brault, Albert T.: *See—*
Wilkes, Glenn R.; and Brault, Albert T., 4,188,217, Cl. 430-353.000.

Braun, Joseph M. Fingernail stimulating apparatus. 4,187,837, Cl. 128-32.000.

Bregi, James F., to Ford Motor Company. Iron and/or steel treatment with magnesium and refractory coated composite shot. 4,188,210, Cl. 75-130.00R.

Bremer, Robert C., Jr., to Wallace Murray Corporation. Torsional vibration damper having two part hub. 4,187,597, Cl. 29-281.300.

Brennen, Michael B.: *See—*
Gyugyi, Laszlo; and Brennen, Michael B., 4,188,573, Cl. 323-119.000.

Brescia, Riccardo: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.

Brethauer, Ulrich, to B. Braun Melsungen Aktiengesellschaft. Apparatus to determine the sedimentation rate of red blood cells. 4,187,719, Cl. 73-61.400.

Brimer, Claude M., to Linear International Corporation. Garage door opener including a linear actuator. 4,188,552, Cl. 310-13.000.

Brindle, Patrick A.: *See—*
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.

Brindle, Robert G.: *See—*
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.

British Steel Corporation: *See—*
Pereira, Joseph K.; and White, Martin, 4,187,900, Cl. 165-8.000.

Bro, Per: *See—*
Kang, Hong Y.; and Bro, Per, 4,188,460, Cl. 429-7.000.

Brooks, Robert A.: *See—*
Mhatre, Girish P.; and Brooks, Robert A., 4,188,577, Cl. 324-220.000.

Brower, Harold E.; and Brower, Jeffrey H. Multiple use weight lifting exercising device. 4,188,029, Cl. 272-62.000.

Brower, Jeffrey H.: *See—*
Brower, Harold E.; and Brower, Jeffrey H., 4,188,029, Cl. 272-62.000.

Brown, Frank H., to Automecha Ltd. Label positioning and applying apparatus. 4,188,252, Cl. 156-361.000.

Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., to Motorola, Inc. Automatic signal acquisition means for a phase locked loop with anti-sideband lock protection. 4,188,589, Cl. 331-12.000.

Brown Manufacturing Corporation: *See—*
Harden, Jerrell W.; and Brown, William P., 4,187,916, Cl. 172-146.000.

Brown, Richard E.; and Unangst, Paul C., to Warner-Lambert Company. Indolopyrones having anti-allergic activity. 4,188,326, Cl. 260-326.290.

Brown & Sharpe Manufacturing Company: *See—*
Scott, Ian M., 4,187,612, Cl. 33-172.00E.

Brown, William J.; and Rowley, James R., to PPG Industries, Inc. Bow and spreader bar. 4,188,168, Cl. 414-786.000.

Brown, William L., Jr., to Caterpillar Tractor Co. High swirl inlet port. 4,187,823, Cl. 123-188.00M.

Brown, William P.: *See—*
Harden, Jerrell W.; and Brown, William P., 4,187,916, Cl. 172-146.000.

Browning, Charles W. Line threading and cutting device. 4,188,052, Cl. 289-17.000.

Bruins, Antonius H. N. M.; and Vollema, Gerlof, to Akzona Incorporated. Hydroxamic acids and process for making same. 4,188,338, Cl. 260-500.50H.

Brunner, Eduard: *See—*
Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, 4,188,506, Cl. 179-1.50R.

Brunson, Raymond D. Radiant energy to electrical power conversion system. 4,188,571, Cl. 322-2.00R.

Brunsting, Albert; and Hogg, Walter R., to Coulter Electronics, Inc. Ellipsoid radiation collector apparatus and method. 4,188,543, Cl. 250-458.000.

Brunsting, Albert: *See—*
Hogg, Walter R.; and Brunsting, Albert, 4,188,542, Cl. 250-458.000.

Brunswick Corporation: *See—*
Lanpheer, Richard A.; and Kusche, David W., 4,187,809, Cl. 123-65.0EM.

Brzozowski, Stanley F., to PPG Industries, Inc. Fiber glass making pellets containing fiber glass cullet. 4,188,228, Cl. 106-50.000.

Bucher, Charles A.: *See—*
Wissel, Frank A.; and Bucher, Charles A., 4,188,585, Cl. 325-492.000.

Bucyrus-Erie Company: *See—*
Johnson, Kenneth V., 4,187,681, Cl. 60-395.000.

Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., to United Technologies Corporation. Closed cycle chemical laser. 4,188,592, Cl. 331-94.50G.

Budapesti Muszaki Egyetem: *See—*
Juhasz, Zoltan; and Varju, Gyula, 4,188,233, Cl. 106-97.000.

Budnick, Edward G., to Plains Chemical Development Co. Chelation. 4,188,234, Cl. 106-267.000.

Buehner, Joseph F. Poppet valve stroke adjusting device for, and combination with, an internal combustion valve in head engine. 4,187,810, Cl. 123-90.160.

Bui, Ai: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Bujan, Albert F., to Abbott Laboratories. Combined additive and administration port for a container. 4,187,893, Cl. 150-8.000.

Bull, Michael J., to Shell Oil Company. Furylmethyloxime ethers. 4,188,400, Cl. 424-285.000.

Bullock, Allen R., to Simon Container Machinery Limited. Apparatus for folding box blanks. 4,187,769, Cl. 93-52.000.

Bundy, Gordon L., to Upjohn Company, The. Trans-2,3-didehydro-9-deoxy-9-methylene-PGF,1,11- or 1,15-lactones. 4,188,332, Cl. 260-343.410.

Bunker Ramo Corporation: *See—*
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.

Buresi, Georges; and Grappe, Rene G., to Compagnie Francaise des Petroles. Underwater electrical connectors. 4,188,084, Cl. 339-117.00R.

Burge, Donald G., to Parker-Hannifin Corporation. Tube coupling. 4,188,051, Cl. 285-104.000.

Burnett, Willis R., to Mid-Florida Pools and Repair, Inc. Apparatus for chlorinating and filtering water for swimming pools during filling operation. 4,188,295, Cl. 210-206.000.

Burns, Carmen D., to National Semiconductor Corporation. Antioxidant coating of copper parts for thermal compression gang bonding of semiconductive devices. 4,188,438, Cl. 428-209.000.

Burroughs Corporation: *See—*
Aldridge, Lionel D.; and Sprenkle, George J., 4,188,085, Cl. 339-176.0MP.
Ragle, Herbert U.; and DeMoss, Dean, 4,188,645, Cl. 360-75.000.

Burroughs Wellcome Co.: *See—*
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.

Burtest Products Corp.: *See—*
Cohen, Jerome H., 4,187,627, Cl. 38-66.000.

Burton, Johnny A. Cigarette clipper. 4,187,865, Cl. 131-250.000.

Butler, Calvin J. Method and apparatus for measuring liquid volume to be withdrawn from a container. 4,187,957, Cl. 222-1.000.

Buzby, Nicholas L. Drive and motion synchronizing apparatus for a hydraulic system. 4,187,762, Cl. 91-37.000.

B.V. Neratoom: *See—*
Essebaggers, Jan, 4,187,874, Cl. 137-533.110.

Byrne, James E., to UEC Manufacturing Company. Remotely actuated auxiliary pressurization system. 4,187,927, Cl. 182-2.000.

Cahen, Raymond M. Process for selectively hydrogenating polyenic compounds in oils. 4,188,333, Cl. 260-409.000.

Cailloux, Michel, to Ogee Alsthom. Static AC/AC thyristor converter for a self-driven synchronous motor. 4,188,659, Cl. 363-37.000.

Calabrese, Richard A.; and Fandetti, Robert E., to Anchor/Darling Industries, Inc. Mechanical snubber assembly. 4,187,933, Cl. 188-134.000.

California Cedar Products Company: *See—*
Trinchera, Luigi, 4,188,524, Cl. 219-85.0CM.

California Institute of Technology: *See—*
Perkins, Gerald S., 4,188,174, Cl. 417-432.000.

Calleance, Dave. Water mattress construction. 4,187,569, Cl. 5-451.000.

Cambio, Orlando D., Jr., to Respiratory Care, Inc. Blow molded bottle with diffuser and method for making same. 4,187,951, Cl. 215-6.000.

Cameron Iron Works, Inc.: *See—*
Fisher, Edmund A.; and Schnitzer, Emanuel, 4,188,156, Cl. 405-195.000.
Webster, George R., 4,187,883, Cl. 137-625.680.

Campbell, Graeme R., to Lucas Industries Limited. Control circuit for an electric vehicle traction motor. 4,188,569, Cl. 318-375.000.

Campbell, Simon F., to Pfizer Inc. Antihypertensive 4-amino-2-[4-(1,4-benzodioxan-2-carbonyl) piperazin-1-yl or homopiperazin-1-yl]quinazolines. 4,188,390, Cl. 424-251.000.

Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., to Pfizer Inc. 4-[4-(Substituted)piperidino]quinazoline cardiac stimulants. 4,188,391, Cl. 424-251.000.

Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., to United States of America, Army. Discarding sabot munition. 4,187,783, Cl. 102-93.000.

Canadair Limited: *See—*
Gray, Laurence W., 4,188,149, Cl. 403-271.000.

Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., to Motorola, Inc. Simulcast transmission system having phase-locked remote transmitters. 4,188,582, Cl. 325-58.000.

Cannom, David L.; and Del Rio, Carlos M. Variable impedance device. 4,188,607, Cl. 338-224.000.

Canon Kabushiki Kaisha: *See—*
Momiyama, Kikuo, 4,188,092, Cl. 350-214.000.
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,188,104, Cl. 354-31.000.

Cantrill, James E.: *See—*
Cox, Myron K.; McGrath, William J.; and Cantrill, James E., 4,187,714, Cl. 73-9.000.

Capannelli, Gustavo: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.

Capouillet, Phileas: *See—*
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.

Caprio, Louis W., Jr. Ankle supporter. 4,187,844, Cl. 128-166.000.

Carminucci, Robert N.: *See—*
Lolachi, Houshang; and Carminucci, Robert N., 4,187,846, Cl. 128-214.00R.

Carr, Michael E.: *See—*
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.

Carville, Charles; and Laffitte, Andre, to Compagnie Generale de Radiologie. Rotary anode X-ray tube. 4,188,559, Cl. 313-60.000.

Case, Derek F.: *See—*
Ridgway, Peter C.; and Case, Derek F., 4,188,247, Cl. 156-154.000.

Caspari, Gunter, to Standard Oil Company (Indiana). Oil soluble dithiophosphoric acid derivatives of mercaptothiadiazoles. 4,188,299, Cl. 252-46.400.

Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, to Bayer Aktiengesellschaft. Absorber with suction pump. 4,188,196, Cl. 55-270.000.

Casper, Selma M.: *See—*
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.

Castelli, Pier P.; and Romano, Bruno, to Blasinachim S.p.A. Process for the preparation of 6-halo-pregnanes. 4,188,322, Cl. 260-239.55R.

Castelo, Angel. Jewel mounting structure. 4,187,697, Cl. 63-31.000.

Catalysts & Chemical Industries: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.

Caterpillar Tractor Co.: *See—*
Balzer, David J., 4,187,931, Cl. 188-72.100.
Brown, William L., Jr., 4,187,823, Cl. 123-188.00M.
Cemenska, Richard A.; and Goloff, Alexander, 4,187,807, Cl. 123-41.340.
Davenport, Richard G., 4,187,936, Cl. 192-21.000.
Gladden, John R., 4,188,364, Cl. 423-213.200.
Livesay, Richard E., 4,187,744, Cl. 81-3.00R.

Catte, Raymond: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Causey, G. Donald: *See—*
Graupe, Daniel; Beex, Aloysius A.; and Causey, G. Donald, 4,188,667, Cl. 364-724.000.

CAV RotoDiesel: *See—*
Bonin, Jean-Claude, 4,188,175, Cl. 417-462.000.

Cavalieri D'Oro, Enzo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Cavity resonator having ancillary cylinder for suppressing parasitic mode. 4,188,600, Cl. 333-228.000.

Cawley, John D., to Eastman Kodak Company. Rupturable fluid container and elements containing same. 4,188,219, Cl. 430-208.000.

Cellsystem AG: *See—*
Izatt, James P., 4,188,154, Cl. 405-43.000.

CEM-Compagnie Electro-Mecanique: *See—*
Sterlini, Jacques, 4,187,899, Cl. 165-1.000.

Cemenska, Richard A.; and Goloff, Alexander, to Caterpillar Tractor Co. Cooled engine valve with improved heat transfer. 4,187,807, Cl. 123-41.340.

Century Brass Products, Inc.: *See—*
Northrop, Richard A., Jr.; and Wanat, David J., 4,187,683, Cl. 60-527.000.

Cerny, Jacqueline; and Vivant, Gilbert, to Rhone-Poulenc Industries. Compositions intended for the flameproofing of plastics. 4,188,313, Cl. 260-37.0EP.

Cervato, Giuseppe: *See—*
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.

Chaffee, William H., to Technical Exhibits Corporation. Frame construction. 4,187,649, Cl. 52-36.000.

Champion International Corporation: *See—*
Boykin, Richard A.; and Hamilton, Gordon A., 4,187,977, Cl. 229-43.000.
Cohn, Robert, 4,188,414, Cl. 427-45.100.
Mather, George A., 4,187,976, Cl. 229-41.00B.

Champoux, Louis A., to Industrial Wire & Metal Forming, Inc. Pulling apparatus and method. 4,187,708, Cl. 72-30.000.

Chan, Kai C., to University of Iowa Research Foundation. Dental retention pin and method. 4,187,611, Cl. 433-225.000.

Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of synthesis gas to aromatic hydrocarbons. 4,188,336, Cl. 260-449.00R.

Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., to General Electric Company. Selective open tube aluminum diffusion. 4,188,245, Cl. 148-188.000.

Chang, Wen-Hsuan, to PPG Industries, Inc. Curable lactone derived resins. 4,188,472, Cl. 528-75.000.

Chapelet, Gilbert: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Chapman, Ronald H.: *See—*
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.

Chappelle, Michael C.: *See—*
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.

Chasson, Leon H., to Weyerhaeuser Company. Method and apparatus for automatically processing a workpiece employing calibrated scanning. 4,188,544, Cl. 250-560.000.

Chasteen, Jack W., to University of Dayton. Method for cleaning metal parts with elemental fluorine. 4,188,237, Cl. 134-2.000.

Chatterjee, Arun: *See—*
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.

Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., to International Business Machines Corporation. Magnetic head having a jagged-edged gap, and method for producing such head. 4,188,649, Cl. 360-118.000.

Chem-Y, Fabriek Van Chemische Produkten B.V.: *See—*
Aalbers, Johan G.; and Van Paassen, Nicolaas I., 4,188,311, Cl. 252-551.000.

Chenausky, Peter P.: *See—*
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Cherry Electrical Prod's. Corp.: *See—*
Bedocs, Michael F., 4,188,136, Cl. 400-276.000.

Cheshire, Ernest L., to UOP Inc. Vehicle seat hinge mechanism. 4,188,064, Cl. 297-367.000.

Chesnut, W. Richard, to W. R. Chesnut Engineering, Inc. Rotary die lock structure. 4,187,752, Cl. 83-663.000.

Chevron Research Company: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,187,911, Cl. 166-312.000.
Jensen, Harbo P., 4,188,280, Cl. 208-53.000.
Michlmayr, Manfred J., 4,188,285, Cl. 208-246.000.
Suzuki, Shigeto, 4,188,494, Cl. 562-580.000.

Chicago Bridge & Iron Company: *See—*
Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.

Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, to Fives-Cail Babcock. Thrust bearing for taking up axial thrust of a rotating cylinder. 4,188,077, Cl. 308-135.000.

Chimura, Ippei: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Cho, Nakwon, to United States of America, Energy. Fast-acting valve actuator. 4,187,764, Cl. 91-442.000.

Chromatex, Inc.: *See—*
Hill, Philip R., 4,188,445, Cl. 428-246.000.

Chrysler Corporation: *See—*
Tallon, Thomas G.; and Harris, Gerald A., 4,188,655, Cl. 362-80.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Kamachi, Shinichi; and Ohkura, Yosuke, 4,188,320, Cl. 260-202.000.

Chung, Chan I., to Exxon Research & Engineering Co. Elastomer blend composition of a sulfonated EPDM terpolymer and a polystyrene resin. 4,188,351, Cl. 260-33.6AQ.

Chupp, John P., to Monsanto Company. Ortho-bromination of ortho-alkylated anilines. 4,188,342, Cl. 260-578.000.

Ciba-Geigy Corporation: *See—*
Felder, Louis; and Kirchmayr, Rudolf, 4,188,224, Cl. 204-159.150.
Fischer, Hanspeter, 4,188,341, Cl. 260-573.000.
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.
Hoegerle, Karl, 4,188,483, Cl. 544-302.000.
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.
Wehner, Wolfgang; and Wirth, Hermann O., 4,188,334, Cl. 260-429.700.

Cincinnati Electronics Corporation: *See—*
Wissel, Frank A.; and Bucher, Charles A., 4,188,585, Cl. 325-492.000.

Citizen Watch Co., Ltd.: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Nishimura, Katsuo; and Nanya, Takanori, 4,188,095, Cl. 350-357.000.

Citrin, Paul S., to Indicon Inc. Replaceable tip for a pipette. 4,187,724, Cl. 73-425.40P.

Citron, Paul: *See—*
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.

Clarion Co., Ltd.: *See—*
Kanai, Takao; and Nishikawa, Yashuhisa, 4,187,729, Cl. 74-10.900.

Clark Equipment Company: *See—*
Gaylord, Richard P., 4,187,766, Cl. 92-169.000.

Clark, George W., III: *See—*
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.

Clark, Wallace. Down-hole earth drilling motor capable of free circulation. 4,187,918, Cl. 175-39.000.

Clarke, Angus J.: *See—*
Clarke, Stanley W.; and Clarke, Angus J., 4,188,159, Cl. 405-282.000.

Clarke, David E.; Davies, James F.; and Tune, John B., to Lever Brothers Company. Detergent composition in a water-insoluble bag having a water-sensitive seal. 4,188,304, Cl. 252-93.000.

Clarke, Stanley W.; and Clarke, Angus J. Maintaining the shape of holes. 4,188,159, Cl. 405-282.000.

Clemens, Kurt; and Klein, Hans, deceased (by Frielingsdorf, Maria Klein nee, heir), to L. & C. Steinmuller GmbH. Welded joint. 4,188,140, Cl. 403-13.000.

Clesa S.p.A.: *See—*
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.

Cobble, James T., to B & J Machinery Company, Inc. Tufting machine. 4,187,788, Cl. 112-79.00R.

Cochran, Donald D., to Packaging Systems, Inc. Apparatus for removing pressure sensitive tape from containers. 4,187,662, Cl. 53-381.00A.

Coe, Thomas D.: *See—*
Lavochkin, Ronald B.; and Coe, Thomas D., 4,187,711, Cl. 72-256.000.

Coffield, Harold M. Potato chip cooking apparatus. 4,187,770, Cl. 99-353.000.

Cohen, Jerome H., to Burtest Products Corp. Pads for bucks of garment pressing machines. 4,187,627, Cl. 38-66.000.

Cohen, Leon H. Shoe innersole. 4,187,621, Cl. 36-44.000.

Cohn, Charles C. Treatment of cigarette paper. 4,187,862, Cl. 131-15.00R.

Cohn, Robert, to Champion International Corporation. Method for applying sealing material to envelopes. 4,188,414, Cl. 427-45.100.

Coleman, Robert A.; and Beard, Larry D. Flat plate solar heat collector. 4,187,901, Cl. 165-47.000.

Colgate-Palmolive Company: *See—*
Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, 4,188,306, Cl. 252-121.000.
Gaffar, Abdul, 4,188,372, Cl. 424-54.000.
Temin, Samuel C., 4,188,317, Cl. 260-42.530.

Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, to Montedison S.p.A. Process for polymerizing ethylene in a gaseous phase. 4,188,470, Cl. 526-64.000.

Collins, Robert. Back wash-massage-scrubber. 4,187,575, Cl. 15-222.000.

Collins, Vernon K.: *See—*
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.

Collo GmbH: *See—*
Ehlenz, Peter, 4,188,447, Cl. 428-310.000.

Combustion Engineering, Inc.: *See—*
Ladwig, Richard D., 4,188,186, Cl. 432-43.000.
Lang, Heinrich, 4,187,876, Cl. 137-594.000.

Commercial Shearing Inc.: *See—*
Hodgson, Robert F.; and Petro, John D., 4,187,877, Cl. 137-596.000.

Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.
Boisde, Gilbert; and Boissier, Alain, 4,188,126, Cl. 356-440.000.

Commonwealth Scientific Corporation: *See—*
Monk, Gaines W., 4,187,801, Cl. 118-729.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Mamers, Heikki; and Rowney, John E., 4,188,259, Cl. 162-4.000.
Swingler, Donald L., 4,188,560, Cl. 313-105.00R.

Compagnie Francaise des Petroles: *See—*
Buresi, Georges; and Grappe, Rene G., 4,188,084, Cl. 339-117.00R.
Duval, Jean J., 4,187,625, Cl. 37-71.000.

Compagnie Generale de Radiologie: *See—*
Carville, Charles; and Laffitte, Andre, 4,188,559, Cl. 313-60.000.

Compagnie Internationale pour l'Informatique: *See—*
Delorme, M. Raymond, 4,187,730, Cl. 74-54.000.
Lamare, Jean-Claude; and Maury, Christian, 4,188,620, Cl. 340-347.0DD.

Compen, Johannes M. A. A.: *See—*
Zegers, Antonius P. F.; and Compen, Johannes M. A. A., 4,188,564, Cl. 313-479.000.

Connolly, Joseph C. Electrical fuel cut off switch. 4,187,824, Cl. 123-198.00F.

Conrad, William A.: *See—*
Hansen, Lee A.; and Conrad, William A., 4,187,577, Cl. 15-328.000.

Constantinescu, Spiridon. Vacuum system for swimming pools. 4,187,654, Cl. 52-169.700.

Continental Group, Inc., The: *See—*
Goth, Carl W., 4,187,985, Cl. 239-337.000.
Klootwyk, Ronald I., 4,188,462, Cl. 429-68.000.
Mascia, Carmen T., 4,187,963, Cl. 222-402.130.
Pelton, Peter G., 4,187,959, Cl. 222-94.000.

Cook, George E.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Cook, Stephen O., to Crown Zellerbach Corporation. Flexible packaging films of high density polyethylene capable of forming easily openable heatseals. 4,188,441, Cl. 428-216.000.

Cooper Laboratories, Inc.: *See—*
Krezanoski, Joseph Z., 4,188,373, Cl. 424-78.000.

Copal Company Limited: *See—*
Yamazaki, Masao, 4,188,138, Cl. 400-586.000.

Corbett, Wendell E.; and Sutton, Jay D. Feed residue saver for combines. 4,188,160, Cl. 406-58.000.

Cornelius, Archie J.; and Needham, Riley B., to Phillips Petroleum Company. CO_2 removal from hydrocarbon gas in water bearing underground reservoir. 4,187,910, Cl. 166-305.00R.

Corning Glass Works: *See—*
Weetall, Howard H., 4,188,371, Cl. 424-1.000.

Corrigan, Francis R., to General Electric Company. Direct conversion process for making cubic boron nitride from pyrolytic boron nitride. 4,188,194, Cl. 51-307.000.

Corrugated Development, Inc.: *See—*
Kirkpatrick, Alan D., 4,188,257, Cl. 156-504.000.

Cosarnia Limited: *See—*
Barnacle, Leslie J. H., 4,187,751, Cl. 83-458.000.

Cotton, Frank A.: *See—*
Kaplan, Leonard; and Cotton, Frank A., 4,188,335, Cl. 260-449.00L.

Coulter Electronics, Inc.: *See—*
Brunsting, Albert; and Hogg, Walter R., 4,188,543, Cl. 250-458.000.
Hogg, Walter R.; and Brunsting, Albert, 4,188,542, Cl. 250-458.000.

Cousse, Henri: *See—*
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.

Cox, Myron K.; McGrath, William J.; and Cantrill, James E., to Wright State University. Surface friction tester. 4,187,714, Cl. 73-9.000.

Coyle, Forrest E.: *See—*
Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., 4,188,516, Cl. 200-48.00R.

Cramer, Robert L. Method and apparatus for pumping fluids from bore holes. 4,187,912, Cl. 166-314.000.

Craven, John; and Reilly, Thomas H. M., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,187,822, Cl. 123-179.00L.

Crean, John C.; and Stroppe, Bill, to Fleetwood Enterprises, Inc. Trailer suspension. 4,188,047, Cl. 280-678.000.

Creasey, Leon D. Fireplace insert. 4,187,830, Cl. 126-121.000.

Crofford, Jimmie: *See—*
Holmes, Billy G.; and Crofford, Jimmie, 4,188,068, Cl. 299-5.000.

Crompton & Knowles Corporation: *See—*
Cyvas, Petras, 4,187,887, Cl. 139-196.200.

Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., to Sperry Corporation. Shielded surface wave transmission line. 4,188,595, Cl. 333-113.000.

Cropper, Edwin: *See—*
Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, 4,188,306, Cl. 252-121.000.

Crown Zellerbach Corporation: *See—*
Cook, Stephen O., 4,188,441, Cl. 428-216.000.

Crowther, Curt P. Waterbed. 4,187,567, Cl. 5-451.000.

Crystal Systems, Inc.: *See—*
Schmid, Frederick, 4,187,828, Cl. 125-18.000.

Cue, Berkeley W.: *See—*
Gassman, Paul G.; and Cue, Berkeley W., 4,188,325, Cl. 260-325.00R.

Cuilleron, Jean. Milling cutter with inset cutting blades. 4,188,161, Cl. 407-25.000.

Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., to Baxter Travenol Laboratories, Inc. Method and system for fractionating a quantity of blood into the components thereof. 4,187,979, Cl. 233-14.00R.

Cummins Engine Company, Inc.: *See—*
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.

Curtiss-Wright Corporation: *See—*
Loyd, Robert W., Jr., 4,187,825, Cl. 123-205.000.

Cutter Laboratories, Inc.: *See—*
Dahlen, Burton L.; and Stubstad, James A., 4,187,558, Cl. 3-1.000.

Cyr, Leonide A. Scaffold stabilizer. 4,187,929, Cl. 182-222.000.

Cyvas, Petras, to Crompton & Knowles Corporation. Loom projectile. 4,187,887, Cl. 139-196.200.

Czajkowski, George J.; and Stolfa, Frank, to UOP Inc. Startup method for a moving-bed hydrogenation zone. 4,188,283, Cl. 208-143.000.

D. Swarovski & Co, Glasschleiferei: *See—*
Schwab, Kurt, 4,188,256, Cl. 156-386.000.

Dahlen, Burton L.; and Stubstad, James A., to Cutter Laboratories, Inc. Prosthetic ligament. 4,187,558, Cl. 3-1.000.

Daido Metal Company Ltd.: *See—*
Mori, Sanae, 4,188,079, Cl. 308-237.00R.

Daiichikasei Co., Ltd.: *See—*
Matsuura, Katsuji; and Arai, Kunihito, 4,188,421, Cl. 427-385.00A.

Daikin Kogyo Co., Ltd.: *See—*
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.

Daimler-Benz Aktiengesellschaft: *See—*
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.

DallaPiazza, Dennis G., to General Electric Company. Dental x-ray apparatus. 4,188,536, Cl. 250-402.000.

Dalmasso, Claudio: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.

Dalziel, David G. Air rescue net. 4,188,000, Cl. 244-137.00P.

Dan-Mar Co. Inc.: *See—*
Heckelman, James D.; and Ziemke, Robert A., 4,188,621, Cl. 340-528.000.

Dan River Inc.: *See—*
Norton, Charlie L., 4,187,795, Cl. 112-318.000.

Dana Corporation: *See—*
Ratliff, William K.; and Warman, Charles P., 4,187,940, Cl. 192-88.00A.

Danilewicz, John C.: *See—*
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.

Dannatt, Hugh St. L., to SCM Corporation. Low silhouette keyboard. 4,188,137, Cl. 400-496.000.

Darrah, Edward R.: *See—*
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.

Dassler, Armin A., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe. 4,187,623, Cl. 36-129.000.

Data Recording Instrument Company Limited: *See—*
Ridgway, Peter C.; and Case. Derek F., 4,188,247, Cl. 156-154.000.

Daum, Werner: *See—*
Brandes, Wilhelm; and Daum, Werner, 4,188,401, Cl. 424-304.000.

D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, to Thomson-CSF. Optical fibre positioning ferrule and connector comprising such a ferrule. 4,188,087, Cl. 350-96.200.

Davenport, Richard G., to Caterpillar Tractor Co. Winch assembly with anti-fallback clutch. 4,187,936, Cl. 192-21.000.

Davies, James F.: *See—*
Clarke, David E.; Davies, James F.; and Tune, John B., 4,188,304, Cl. 252-93.000.

Davy International (Oil and Chemicals) Limited: *See—*
Rowden, George A., 4,188,361, Cl. 423-9.000.

Day, Christopher C.; and McEachern, Robert A., to American Optical Corporation. Method and apparatus for orienting the display of information from a recirculating memory. 4,187,858, Cl. 128-710.000.

Dayco Corporation: *See—*
Holden, Homer N.; and Gaster, Ivan, 4,188,081, Cl. 339-15.000.

Dayton-Walther Corporation: *See—*
Walther, William D.; and Phillips, Charles E., 4,187,733, Cl. 74-342.000.

DeBernard, Lewis M., Jr.; and Mercer, Donald G., to Allied Chemical Corporation. Multilevel colorway carpet system. 4,188,430, Cl. 428-88.000.

Deckman, Harry W.; and Halpern, Gerald M., to University of Rochester, The. Method for the non-destructive assaying of laser fusion targets. 4,188,532, Cl. 250-336.000.

Deere & Company: *See—*
Baker, Keith R., 4,187,720, Cl. 73-119.00A.
Stecklein, Gary L., 4,188,146, Cl. 403-158.000.

de Haan, Maarten R., to U.S. Philips Corporation. Color television signal having color-difference signals alternating between two carriers. 4,188,638, Cl. 358-4.000.

Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., to Trico Products Corporation. Wiper blade. 4,187,576, Cl. 15-250.420.

Deissler, Robert J. Method and apparatus for sound production. 4,187,635, Cl. 46-174.000.

Dejean, Pierre: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Delap, Joseph A.: *See—*
Nasser, Benny E., Jr.; and Delap, Joseph A., 4,188,471, Cl. 526-96.000.

DellaBella, Davide: *See—*
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.

Della Torre, Giancarlo: *See—*
Fietta, Emilio; and Della Torre, Giancarlo, 4,187,793, Cl. 112-288.000.

Delorme, M. Raymond, to Compagnie Internationale pour l'Informatique. Lever control arrangement for controlling the movement of an oscillating lever. 4,187,730, Cl. 74-54.000.

Del Rio, Carlos M.: *See—*
Cannom, David L.; and Del Rio, Carlos M., 4,188,607, Cl. 338-224.000.

Del Soldato, Piero: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,188,345, Cl. 568-665.000.

Del Valle, Leon. Device for reconstituting used coffee grounds. 4,187,992, Cl. 241-65.000.

Demole, Edouard: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.

DeMoss, Dean: *See—*
Ragle, Herbert U.; and DeMoss, Dean, 4,188,645, Cl. 360-75.000.

Dempsey, Leonard H.; and Adrian, Linda S. Skill board game. 4,188,034, Cl. 273-248.000.

Dennison Manufacturing Company: *See—*
Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., 4,188,197, Cl. 55-382.000.

Deschamps, Bernard: *See—*
Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, 4,188,077, Cl. 308-135.000.

Deschamps, Joseph P., to International Harvester Company. Rotary mower belt drive. 4,187,924, Cl. 180-53.00R.

DeShon, Wallace E., to Phillips Petroleum Company. I/O Terminal identification. 4,188,664, Cl. 364-200.000.

De Simone, David N., to United States of America, Navy. Ship escape and survival system. 4,187,570, Cl. 9-14.000.

Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, to Licentia Patent-Verwaltungs-G.m.b.H. Method for preventing cracks below seams during plating and welding. 4,188,419, Cl. 427-287.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.

de Villepoix, Raymond: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.

De Vries, James H.: *See—*
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.

Dezawa, Katsumi: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Diamant Boart: *See—*
Lambot, Honore J., 4,187,919, Cl. 175-246.000.

Dickey, Donald F., to Superior Cable Corporation. Telephone wall jack. 4,188,082, Cl. 339-36.000.

Dickey, Fred M.: *See—*
Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., 4,188,533, Cl. 250-338.000.

Dictaphone Corporation: *See—*
Meri, Kalju; and Allen, Richard G., 4,188,507, Cl. 179-6.00D.

Diehl, Pieter S., to Orr Felt Company, The. Papermakers' felt. 4,187,618, Cl. 34-243.00F.

Diehl, Werner K.: *See—*
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,956, Cl. 220-465.000.

Diels, Jean-Claude, to University of Southern California. Efficient particle excitation. 4,188,538, Cl. 250-423.00P.

Dietiker, Paul: *See—*
Battersby, Robert J.; and Dietiker, Paul, 4,188,013, Cl. 251-175.000.

Di'Giorgio, Anthony D.: *See—*
Pagano, Carmine N.; and Di'Giorgio, Anthony D., 4,188,503, Cl. 178-88.000.

Digital Products Corporation: *See—*
Bower, David S.; and Smith, Fred J., 4,188,510, Cl. 179-90.0BD.

Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., to U.S. Philips Corporation. Record carrier in disk form having cover layers. 4,188,433, Cl. 428-64.000.

Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, to Colgate-Palmolive Company. Pumpable soap. 4,188,306, Cl. 252-121.000.

Dills, Raymond L., to General Electric Company. Effective concurrent microwave heating and electrical resistance heating in a countertop microwave oven. 4,188,520, Cl. 219-10.55B.

DiLoreto, Lohret J. Meatball machine. 4,187,582, Cl. 17-32.000.

Dingler, Gerhard. Tensioning device for frame pieces. 4,188,017, Cl. 254-51.000.

Dingwall, Andrew G. F., to RCA Corporation. Circuitry with unbalanced long-tailed-pair connections of FET's. 4,188,588, Cl. 330-253.000.

Distillers Company (Yeast) Limited, The: *See—*
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.

Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, to U.S. Philips Corporation. Apparatus for making laminar radiograms. 4,188,640, Cl. 358-111.000.

Dr. Ing. h.c. F. Porsche Aktiengesellschaft: *See—*
Zebli, Roland-Detlev, 4,187,821, Cl. 123-179.00G.

Doerer, Richard P., to Van Dresser Corporation. Self-supporting automotive liner panel. 4,188,440, Cl. 428-215.000.

Doi, Toshitada: *See—*
Kazami, Shin-Ichi; and Doi, Toshitada, 4,188,616, Cl. 340-146.1AL.

Dolkemeyer, Wilfried: *See—*
Fell, Bernard; and Dolkemeyer, Wilfried, 4,188,363, Cl. 423-22.000.

Donan, David C., Jr.; and Donan, David M., to Waiamea Company, Inc. Mine roof bolt hole seal. 4,188,158, Cl. 405-259.000.

Donan, David M.: *See—*
Donan, David C., Jr.; and Donan, David M., 4,188,158, Cl. 405-259.000.

Dorais, Mark V., to Federal Screw Works. Acoustically responsive sensor switch. 4,188,549, Cl. 307-308.000.

Dorling, Rolf, to L. & C. Steinmuller GmbH. Armored pipe connected to a steel lining of a prestressed cast pressure tank. 4,187,955, Cl. 220-435.000.

Dornfeld, John E.; and Joyner, Bobby L., to Sprague Electric Company. Ceramic capacitor with surface electrodes. 4,188,651, Cl. 361-322.000.

Dorsey, Evelyn E.: *See—*
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.

Dougherty, Richard H.; and Fealy, Thomas E., to United States of America, Navy. Linkage apparatus for synchronizing aircraft door movements with the deployment of a door-enclosed antenna. 4,188,631, Cl. 343-705.000.

Dow Chemical Company, The: *See—*
Giacobbe, Thomas J.; and White, Halbert C., 4,188,330, Cl. 260-343.30R.
Hickner, Richard A.; and Farber, Hugh A., 4,188,340, Cl. 260-567.60P.
Larsen, Eric R.; and McCarty, Leslie P., 4,188,405, Cl. 424-342.000.
Markley, Lowell D., 4,188,346, Cl. 260-651.00F.
Nelson, Donald L., 4,188,473, Cl. 528-86.000.

Dowker, Raymond A. Mailbox protective apparatus. 4,187,978, Cl. 232-39.000.

Dragerwerk Aktiengesellschaft: *See—*
Warncke, Ernst; and Pasternack, Adalbert, 4,187,843, Cl. 128-202.260.

Dragunevicius, Algirdas J.: *See—*
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., 4,188,513, Cl. 179-111.00E.

Draiswerke GmbH: *See—*
Engels, Kaspar, 4,188,130, Cl. 366-228.000.

Dresser Industries, Inc.: *See—*
Fertl, Walter H.; and Vaello, Donald B., 4,187,908, Cl. 166-254.000.
Phelps, Francis E., 4,187,922, Cl. 175-374.000.

Dror, Leon L. Apparatus for feeding anesthetic and/or life sustaining gases during a surgical procedure. 4,187,845, Cl. 128-205.130.

Duarte, Jesus: *See—*
Bomar, Richard L.; and Duarte, Jesus, 4,188,606, Cl. 338-137.000.

Dubrowski, John. Ear clip for flattening of protruding ears. 4,187,838, Cl. 128-76.00R.

Dubs, Paul; and Kuntzel, Heiner, to Givaudan Corporation. Odorant and/or flavoring disulphides, compositions containing same and process for making same. 4,188,488, Cl. 548-337.000.

Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, to Philagro. Fungicides hydrazinium phosphites. 4,188,381, Cl. 424-199.000.

Dudinyak, Ronald S., to Du Pont de Nemours, E. I., and Company. Process and composition for polymerizing and curing methyl methacrylate monomer-polymer syrups in the presence of metal salts of hemi-peresters of maleic acid. 4,188,315, Cl. 260-40.00R.

Duguet, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Self-scraping mixers. 4,188,131, Cl. 366-301.000.

Dunlop Limited: *See—*
Finney, Geoffrey L., 4,187,835, Cl. 126-360.00R.

Dunn, Robert J.; and Martinez, Sigifred. Combination musical instrument stand. 4,187,947, Cl. 211-13.000.

Du Pont de Nemours, E. I., and Company: *See—*
Dudinyak, Ronald S., 4,188,315, Cl. 260-40.00R.
Fang, James C., 4,188,469, Cl. 526-18.000.
Irwin, Robert S., 4,188,476, Cl. 528-190.000.
Lyons, Thomas B., 4,187,994, Cl. 242-35.50R.

Durango Systems, Inc.: *See—*
Waibel, Helmut K., 4,188,148, Cl. 403-258.000.

Durst AG Fabrik Fototechnischer Apparate: *See—*
Barbieri, Siegfried; and Kapfinger, Wolfgang, 4,188,125, Cl. 356-404.000.

Dusart, Etienne R. Hammock chair with back supporting means. 4,188,063, Cl. 297-273.000.

du Temple de Rougemont, Christian, to Isostat. Miniature electrical push button contactor. 4,188,518, Cl. 200-159.00R.

Duval, Jean J., to Compagnie Francaise des Petroles. System for excavation at sea through horizontal guiding by means of cables. 4,187,625, Cl. 37-71.000.

Dymo Industries, Inc.: *See—*
Holland-Letz, Gunter, 4,187,778, Cl. 101-291.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased, 4,188,263, Cl. 439-179.000.

E.T.I. Corporation: *See—*
Murphy, Wesley T., 4,188,147, Cl. 403-230.000.

Eagan, Joseph A., Sr. Farm pump mounting bracket. 4,188,008, Cl. 248-544.000.

Eakins, Kenneth E.; and Bhattacherjee, Parimal, to Nelson Research & Development Company. Ophthalmic composition and method of use. 4,188,394, Cl. 424-262.000.

Eastman Kodak Company: *See—*
Cawley, John D., 4,188,219, Cl. 430-208.000.
Gusfafson, Gary B.; and Staub, Martin L., 4,188,025, Cl. 271-314.000.
Gysling, Henry J., 4,188,218, Cl. 430-495.000.
Harvey, Donald M., 4,188,106, Cl. 354-330.000.
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.
Moring, James M., 4,188,272, Cl. 204-149.000.
Wilkes, Glenn R.; and Brault, Albert T., 4,188,217, Cl. 430-353.000.

Eaton Corporation: *See—*
Smith, Charles R., 4,187,684, Cl. 60-531.000.

Ebauches Electroniques S.A.: *See—*
Fatton, Jean-Claude, 4,187,671, Cl. 58-152.00B.

Echlin Manufacturing Company, The: *See—*
Sinko, Michael J.; and Velinsky, Milton, 4,187,981, Cl. 235-488.000.

Eckel, Hans-Joachim: *See—*
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.

Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., to Rohco, Inc. Alkaline zinc electroplating baths and additive compositions therefor. 4,188,271, Cl. 204-55.00R.

Edelman, Alfred E. Submerged functional implant and method. 4,187,609, Cl. 433-176.000.

Edwards, Charles M.; and Walter, William C., to United Geophysical Corporation. Seismic prospecting system. 4,188,611, Cl. 367-41.000.

Edwards, Gerald L.: *See—*
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., 4,188,511, Cl. 179-99.00A.

Edwards, John A., to Syntex (U.S.A.) Inc. Thioetianic acid derivatives. 4,188,385, Cl. 424-241.000.

Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., to National Institute for Metallurgy. Process for the treatment of platinum group metals and gold. 4,188,362, Cl. 423-22.000.

Edwin Cooper and Company Limited: *See—*
Jayne, Gerald J. J.; and Woods, David R., 4,188,297, Cl. 252-45.000.

Egami, Tsuneyuki, to Nippon Soken, Inc. Demodulator circuit for chopper amplifier. 4,188,586, Cl. 329-192.000.

Ehlenz, Peter, to Collo GmbH. Polymeric foam cleaning product. 4,188,447, Cl. 428-310.000.

Ehrlich, Sol. Hanging plant elevator. 4,187,996, Cl. 242-107.40R.

Eisenberg, Sylvan, to Microtracers Inc. Protected iron tracer composition and method of making. 4,188,408, Cl. 426-74.000.

Electric Power Research Institute, Inc.: *See—*
Arcuri, Joseph D., Jr., 4,188,463, Cl. 429-104.000.

Elliott Brothers (London) Limited: *See—*
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.
Ellis, Stafford M., 4,188,090, Cl. 350-174.000.

Ellis, Peter M.; and Selwood, Alan, to Imperial Chemical Industries Limited. Non woven fabrics with pattern of discrete fused areas. 4,188,436, Cl. 428-198.000.

Ellis, Stafford M., to Elliott Brothers (London) Limited. Retractable head-up displays. 4,188,090, Cl. 350-174.000.

Elmer, Steven A. Knock-down chair. 4,188,067, Cl. 297-442.000.

Emerson Electric Co.: *See—*
Rippelmeyer, Dennis M.; and Baysinger, Robert L., 4,188,181, Cl. 431-66.000.

EMI Limited: *See—*
Hounsfield, Godfrey N., 4,188,541, Cl. 250-445.00T.

Endo, Yoshihiro: *See—*
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.

Engelhardt, Achim: *See—*
Grell, Helmut; and Engelhardt, Achim, 4,187,559, Cl. 3-1.910.

Engels, Kaspar, to Draiswerke GmbH. Device for continuously mixing wood chips with binder. 4,188,130, Cl. 366-228.000.

Engl, Robert; and Richter, Hans, to Meggle Milchindustrie GmbH & Co. KG. Compositions containing thiocyanic acid and hexamethylene-tetramine, production process and administration thereof as bactericide and mycocide. 4,188,386, Cl. 424-249.000.

Ensign-Bickford Company: *See—*
Petruccelli, Guy S., 4,187,780, Cl. 102-28.00R.

Enterprise Machine and Development Corporation: *See—*
Price, Samuel T., 4,187,593, Cl. 28-254.000.

Erbstoesser, Steven R., to Exxon Production Research Company. Method and apparatus for placing buoyant ball sealers. 4,187,909, Cl. 166-284.000.

Erco Envirotech Ltd.: *See—*
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.

Erco Industries Limited: *See—*
McGilvery, James D., 4,188,367, Cl. 423-322.000.

Eriksson, Lars A.: *See—*
Johnsson, Mans K. O.; and Eriksson, Lars A., 4,188,206, Cl. 75-60.000.

Erlichman, Irving, to Polaroid Corporation. Battery containing film cassette wherein removal of last sheet insulates contacts. 4,188,105, Cl. 354-202.000.

Ernst Leitz Wetzlar GmbH: *See—*
Schaefer, Klaus-Dieter, 4,188,102, Cl. 354-25.000.
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.

ESCO Corporation: *See—*
Greer, Donald J.; and MacEwan, John D., Jr., 4,187,626, Cl. 37-141.00R.

Escott, Robert M.: *See—*
Beggs, Donald; and Escott, Robert M., 4,188,022, Cl. 266-195.000.

Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Electrode binder composition. 4,188,235, Cl. 106-278.000.

Ess, John O., to United States of America, Navy. Specific gravity equalizer system. 4,187,796, Cl. 114-312.000.

Essebaggers, Jan, to B.V. Neratoom. Fluid diode. 4,187,874, Cl. 137-533.110.

Etablissement Dentaire Ivoclar: *See—*
Hugelshofer, Max, 4,187,984, Cl. 239-13.000.

Ethyl Corporation: *See—*
Walter, Thomas J., 4,188,493, Cl. 562-580.000.
Walter, Thomas J.; and Laurent, Sebastian M., 4,188,499, Cl. 568-914.000.

Etoh, Kuniomi: *See—*
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.

Eubank, Marcus P. Self contained solar heating supplemental unit. 4,187,831, Cl. 126-419.000.

Evans, Richard F. Automatic machine tool. 4,187,748, Cl. 82-2.500.

Ex-Cell-O Corporation: *See—*
Fitzpatrick, Paul, 4,187,644, Cl. 51-34.00D.

Exxon Production Research Company: *See—*
Erbstoesser, Steven R., 4,187,909, Cl. 166-284.000.

Exxon Research & Engineering Co.: *See—*
Bosniack, David S.; and Korbach, Paul F., 4,188,500, Cl. 585-1.000.
Chung, Chan I., 4,188,351, Cl. 260-33.6AQ.
Oswald, Alexis A., 4,188,380, Cl. 424-198.000.

Eysn, Manfred: *See—*
Patuzzi, Alexander; and Eysn, Manfred, 4,188,021, Cl. 266-88.000.

Ezra C. Lundahl, Inc: *See—*
Lundahl, Ezra C.; and Wiser, J. Gordon, 4,187,990, Cl. 241-30.000.

Facet Enterprises, Inc.: *See—*
Miller, Donald L., 4,187,938, Cl. 192-54.000.

Fachini, Robert M.: *See—*
McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., 4,187,923, Cl. 180-215.000.

Falconbridge Nickel Mines Limited: *See—*
Norman, James L.; and Mayhall, Donald J., 4,188,204, Cl. 75-11.000.

Falomo, Lodovico. Device for clipping strips of photographic paper to developers comprising a flat conveyor belt. 4,188,108, Cl. 354-345.000.

Fandetti, Robert E.: *See—*
Calabrese, Richard A.; and Fandetti, Robert E., 4,187,933, Cl. 188-134.000.

Fang, James C., to Du Pont de Nemours, E. I., and Company. Composition of hydrophilic fluoropolymers with fibrous matter and liquid carrier. 4,188,469, Cl. 526-18.000.

Farber, Hugh A.: *See—*
Hickner, Richard A.; and Farber, Hugh A., 4,188,340, Cl. 260-567.60P.

Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, to Philagro. Herbicidal and phytohormonal amidoximes. 4,188,203, Cl. 71-90.000.

Farley, James R.: *See—*
Patel, Jayant M.; and Farley, James R., 4,188,515, Cl. 200-48.00R.

Farmer, Robert F.: *See—*
Sokol, Phillip E.; and Farmer, Robert F., 4,188,431, Cl. 428-29.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.

Fatton, Jean-Claude, to Ebauches Electroniques S.A. Electronic watch with reaction timer. 4,187,671, Cl. 58-152.00B.

Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., to Gulf & Western Industries, Inc. System for converting analog signals to multiplexed digital data. 4,188,617, Cl. 340-183.000.

Faulkner, Bobby P.; and Moore, Donald C., to Allis-Chalmers Corporation. Slow speed wedge bar flotation mixing device. 4,188,287, Cl. 209-168.000.

Fealy, Thomas E.: *See—*
Dougherty, Richard H.; and Fealy, Thomas E., 4,188,631, Cl. 343-705.000.

Federal Screw Works: *See—*
Dorais, Mark V., 4,188,549, Cl. 307-308.000.

Feig, Stephen; and Vincent, William T., to Plascor Incorporated. Interlocking etagere system. 4,187,786, Cl. 108-64.000.

Felbeck, George T., Jr., to University of Rhode Island. Process for producing hydrocarbon gas from organic plant material. 4,188,193, Cl. 48-197.00R.

Felder, Louis; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Photopolymerizable composition containing anthrones. 4,188,224, Cl. 204-159.150.

Fell, Bernard; and Dolkemeyer, Wilfried, to Bayer Aktiengesellschaft. Recovery of rhodium complex catalysts homogeneously dissolved in organic media. 4,188,363, Cl. 423-22.000.

Fellner, Georg. Quick chucking die holder device for forging presses. 4,187,713, Cl. 72-446.000.

Fergason, James L. Liquid crystal display having light indicia on a dark background. 4,188,094, Cl. 350-337.000.

Ferguson, Wilfred J.: *See—*
Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., 4,188,271, Cl. 204-55.00R.

Fermer, Karl-Erik; and Hulthe, Leif, to AB Svenska Flaktfabriken. Flow regulator. 4,187,879, Cl. 137-601.000.

Fernandez, Arthur A.; and Spector, George. Self propelled cable car. 4,187,784, Cl. 104-235.000.

Ferrini, Pier G.: *See—*
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.

Fertl, Walter H.; and Vaello, Donald B., to Dresser Industries, Inc. Method for ascertaining optimum location for well stimulation and/or perforation. 4,187,908, Cl. 166-254.000.

Fichet-Bauche French Body Corporation: *See—*
Guiraud, Francois, 4,187,705, Cl. 70-362.000.

Fields, Ellis K., to Standard Oil Company (Indiana). Process for trifluoromethylation of aromatic and heterocyclic compounds. 4,188,274, Cl. 204-158.0HA.

Fields, Ellis K., to Standard Oil Company (Indiana). Process for preparing beta-phosphosulfoxy alcohols. 4,188,275, Cl. 204-158.00R.

Fietta, Emilio; and Della Torre, Giancarlo, to Rockwell-Rimoldi, S.p.A. Automatic stitch cutting device. 4,187,793, Cl. 112-288.000.

Finlay, David E., to International Business Machines Corporation. Computer-controlled copier-printers. 4,188,668, Cl. 364-900.000.

Finney, Geoffrey L., to Dunlop Limited. Indirect heat transfer apparatus. 4,187,835, Cl. 126-360.00R.

Firmenich SA: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.

Fischdick, Hermann: *See—*
Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, 4,188,419, Cl. 427-287.000.

Fischer, Hanspeter, to Ciba-Geigy Corporation. Process for the production of (substituted) 2,6-dimethylanilines. 4,188,341, Cl. 260-573.000.

Fischer, Klaus: *See—*
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, to BASF Aktiengesellschaft. Production of 4-(m,m'-ditert.-butyl-p-hydroxyphenyl)-butan-2-ones. 4,188,344, Cl. 260-590.00E.

Fisher, Edmund A.; and Schnitzer, Emanuel, to Cameron Iron Works, Inc. Riser. 4,188,156, Cl. 405-195.000.

Fisher, Eugene L.: *See—*
Johnson, Jesse R., 4,188,012, Cl. 251-173.000.

Fisons Limited: *See—*
Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., 4,188,202, Cl. 71-88.000.

Fitzgibbons, William O., to Standard Oil Company. Inexpensive purification of urea waste streams. 4,188,292, Cl. 210-29.000.

Fitzpatrick, Paul, to Ex-Cell-O Corporation. Dual feed apparatus for multiple spindle honing machine. 4,187,644, Cl. 51-34.00D.

Fives-Cail Babcock: *See—*
Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, 4,188,077, Cl. 308-135.000.

Flanagan, Joseph E.; and Lo, George A., to Rockwell International Corporation. Caseless ammunition. 4,187,781, Cl. 102-38.0CC.

Fleckenstein, John. Ski and integral boot plate with toe piece and releasable heel binding. 4,188,046, Cl. 280-618.000.

Fleetwood Enterprises, Inc.: *See—*
Crean, John C.; and Stroppe, Bill, 4,188,047, Cl. 280-678.000.
Kliewer, Aron, Jr., 4,187,653, Cl. 52-98.000.

Flender, Hans F., to Trienekens, Matthias. Method of and device for treating heterogeneous waste. 4,187,775, Cl. 100-39.000.

Fless, Donald E., to Alchem, Inc. Fuel injection in blast furnaces. 4,188,205, Cl. 75-42.000.

Fliege, Werner: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.

Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, to Motorola, Inc. Semiconductor device having a tin metallization system and package containing same. 4,187,599, Cl. 29-588.000.

Flynn, Eugene R., to Manville Manufacturing Corporation. Liquid detergent reservoir. 4,187,875, Cl. 137-576.000.

FMC Corporation: *See—*
Kondo, Kiyoshi; and Matsui, Kiyohide, 4,188,492, Cl. 562-506.000.
Krisak, Edward J.; and Strozak, Stephen, 4,188,039, Cl. 277-95.000.
Lochte, Glen E., 4,188,050, Cl. 285-24.000.

Foley, Kevin M.; and Hill, Homer G., to Owens-Corning Fiberglas Corporation. Organo silane coupling agents overcoated on aluminum silicate coating on glass fibers. 4,188,454, Cl. 428-391.000.

Foley, Thomas P.: *See—*
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,187,997, Cl. 242-182.000.

Follmer, William C., to Ford Motor Company. Automotive electric quick heat system. 4,188,527, Cl. 219-202.000.

Ford Motor Company: *See—*
Bregi, James F., 4,188,210, Cl. 75-130.00R.
Follmer, William C., 4,188,527, Cl. 219-202.000.
Haung, Bernard; and Rivin, Evgeny I., 4,188,048, Cl. 280-688.000.

Forman, Richard A. Method and apparatus for changing the concentration of molecules or atoms. 4,188,266, Cl. 204-1.00R.

Formanek, Gunther: *See—*
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Fornoni, Luigi. Continuous processes and equipment for treatment of solid substances. 4,188,184, Cl. 432-13.000.

Fortunato, Enrico, to Franco Tosi S.p.A. Device for inverting the direction of rotation of a driven shaft. 4,187,679, Cl. 60-331.000.

Fortune, William S. Desoldering system for use with a soldering instrument. 4,187,973, Cl. 228-20.000.

Foster, Leonard W.: *See—*
Olowinski, Edward J.; and Foster, Leonard W., 4,187,668, Cl. 57-130.000.

Fox, Daniel W.; and Rock, John A., to General Electric Company. Shaped article obtained from a carbonate-polyester composition. 4,188,314, Cl. 260-37.0PC.

Fox, David A., to Westinghouse Electric Corp. Multi-mode control logic circuit for solid state relays. 4,188,547, Cl. 307-239.000.

Fox, Robert Z. Multisport practice device. 4,188,031, Cl. 273-26.00A.

Fradin, David W.: *See—*
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Franco Tosi S.p.A.: *See—*
Fortunato, Enrico, 4,187,679, Cl. 60-331.000.

Franke, Kurt, to Siemens Aktiengesellschaft. Dental apparatus for x-ray diagnosis. 4,188,537, Cl. 250-416.0TV.

Frantz, Gene A.; and Brantingham, George L., to Texas Instruments Incorporated. Method for scanning a keyboard and for actuating a display device via common conductors. 4,188,626, Cl. 340-711.000.

Frazita, Richard F., to Hazeltine Corporation. Phased array antenna with reduced phase quantization errors. 4,188,633, Cl. 343-854.000.

Freeman, Murray E.; and Shipper, Harmon E., to Tapco International, Inc. Control valve assembly. 4,187,872, Cl. 137-454.600.

Freiberg, Robert J.: *See—*
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Freilev, Erik. Complete door set. 4,187,640, Cl. 49-380.000.

Frentzel, Kurt H., to Hunter Douglas International, N.V. Tilting connector for venetian blind slat ends. 4,187,897, Cl. 160-177.000.

Frey, Hellmuth: *See—*
Schmidhammer, Ludwig; and Frey, Hellmuth, 4,188,347, Cl. 260-652.00P.

Friedman, Leonard: *See—*
Pringle, William L., 4,187,777, Cl. 100-93.0PB.

Friedman, Norman J., to Johnson & Johnson. Paper having improved strength. 4,188,446, Cl. 428-288.000.

Frielingsdorf, Maria Klein nee, heir: *See—*
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.

Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, to Upat GmbH & Co. Arrangement for mounting an object to a support structure. 4,187,757, Cl. 85-80.000.

Fritz, Heinz P., to Rheinisch-Westfalisches Elektrizitatswerk AG. Method of making electrodes for electrolytic purposes. 4,188,269, Cl. 204-32.00R.

Fritzsche Dodge & Olcott Inc.: *See—*
Willis, Brian J.; and Yurecko, John M., Jr., 4,188,310, Cl. 252-522.00R.

Froning, H. Robert; Owens, William W.; and Archer, Duane L., to Standard Oil Company (Indiana). Waterflood method using surfactants. 4,187,907, Cl. 166-275.000.

Fuji Electric Co., Ltd.: *See—*
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.

Fuji Industry Co., Ltd.: *See—*
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,187,633, Cl. 43-22.000.

Fuji Photo Film Co., Ltd.: *See—*
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.
Kasugai, Tsuneo; and Kitagawa, Keishi, 4,188,220, Cl. 430-536.000.
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,188,214, Cl. 430-494.000.
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.
Sugiyama, Masatoshi, 4,188,489, Cl. 548-360.000.

Fuji Seal Industry Co., Ltd.: *See—*
Fujio, Masaaki, 4,188,249, Cl. 156-165.000.

Fuji Xerox Co., Ltd.: *See—*
Hiraga, Michio, 4,188,113, Cl. 355-51.000.

Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, to Agency of Industrial Science & Technology. Thermochemical method for producing hydrogen from water. 4,188,370, Cl. 423-579.000.

Fujii, Toru, to Olympus Optical Co., Ltd. Cata-dioptric objective lens system. 4,188,091, Cl. 350-201.000.

Fujimura, Toshiaki: *See—*
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.

Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Package including an elastic container protector and a method and machine for fitting the protector. 4,188,249, Cl. 156-165.000.

Fujishima, Hiroki: *See—*
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.

Fujita, Etuo. Fuel combustion and magnetizing apparatus used therefor. 4,188,296, Cl. 210-222.000.

Fujitsu Limited: *See—*
Ishibashi, Masamichi, 4,188,662, Cl. 364-200.000.
Miwa, Hirohide; and Terakawa, Toshiaki, 4,188,566, Cl. 315-169.400.

Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, to Fuji Photo Film Co., Ltd. Electric current conductive composition, image recording element containing the same and process for recording images using the same. 4,188,212, Cl. 430-69.000.

Fukatsu, Shunzo: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.

Fulton, Ronald T.; and Moody, Roy A., to Panduit Corp. Cable tie mount and tie for use therewith. 4,188,004, Cl. 248-74.0PB.

Funderburk, James O., Jr.: *See—*
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.

Furukawa, Yasuyoshi: *See—*
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.

Furutu, Akira, to Japan Bano'k Co., Ltd. Apparatus for attaching tag pin. 4,187,970, Cl. 227-8.000.

Fuse, Shirou: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Fyfe, Edward R.; and Watson, Stewart C., to Watson Bowman Associates, Inc. High load bearing for bridges and similar structures. 4,187,573, Cl. 14-16.100.

G. D. Searle & Co.: *See—*
Kukla, Michael J., 4,188,485, Cl. 546-202.000.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,188,024, Cl. 270-67.000.

Gabzimalian, Vagram G.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,188,372, Cl. 424-54.000.

Gagne, Jean-Guy, to Hydro-Quebec. Spacer-damper. 4,188,502, Cl. 174-42.000.

Galitsina, Valentina V.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Galstian, Albert P.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Garczynski, John S.: *See—*
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.

Garner, Lloyd L., to Smith International, Inc. Rock bit combination to enhance cuttings removal. 4,187,921, Cl. 175-340.000.

Garrido, John A., to Litton Business Systems, Inc. Ribbon cartridge having cam means for moving ribbon sensing and reversing lever. 4,188,134, Cl. 400-208.000.

Garrison, Judd F., to John Thomas Batts, Inc. Swivel hook attachment for article hangers. 4,187,967, Cl. 223-92.000.

Garshelis, Ivan J. Current sensing device. 4,188,572, Cl. 323-9.000.

Gassman, Paul G.; and Cue, Berkeley W., to University of Minnesota, Regents of. Isatin process and products. 4,188,325, Cl. 260-325.00R.

Gaster, Ivan: *See—*
Holden, Homer N.; and Gaster, Ivan, 4,188,081, Cl. 339-15.000.

Gaulliard, Jean-Michel: *See—*
Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, 4,188,381, Cl. 424-199.000.

Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., to Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov. Method for ultrasonic inspection of materials and device for effecting same. 4,187,725, Cl. 73-613.000.

Gaylord, Richard P., to Clark Equipment Company. Fluid device and method for making. 4,187,766, Cl. 92-169.000.

Gebler, Kenneth A.: *See—*
Adams, Paul G.; and Gebler, Kenneth A., 4,188,416, Cl. 427-135.000.

General Electric Company: *See—*
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.
Corrigan, Francis R., 4,188,194, Cl. 51-307.000.
DallaPiazza, Dennis G., 4,188,536, Cl. 250-402.000.
Dills, Raymond L., 4,188,520, Cl. 219-10.55B.
Fox, Daniel W.; and Rock, John A., 4,188,314, Cl. 260-37.0PC.
Greskovich, Charles D., 4,188,450, Cl. 428-329.000.
Humphrey, James S., Jr., 4,188,451, Cl. 428-331.000.
Irwin, John W., 4,187,691, Cl. 62-324.000.
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., 4,188,496, Cl. 568-723.000.
Lupinski, John H.; and Gorowitz, Bernard, 4,188,413, Cl. 427-30.000.
Nopanen, Esko J., 4,187,993, Cl. 241-89.200.
Palmer, Ansell W.; and Stevens, Francis J., 4,188,575, Cl. 324-103.00R.
Poling, Ronald W., 4,188,145, Cl. 403-112.000.

General Foods Corporation: *See—*
Bhimji, Amir A., 4,187,727, Cl. 73-706.000.
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.

General Foundry Products Corporation: *See—*
Reiland, Dennis J., 4,188,010, Cl. 249-197.000.

General Gas Light Company: *See—*
Loveless, Stanley M., 4,187,884, Cl. 137-625.690.

General Mining and Finance Corporation Limited: *See—*
Bohme, Rolf C.; and Luck, Dieter G., 4,188,165, Cl. 414-694.000.

General Motors Corporation: *See—*
Kitchin, Oscar G., 4,187,937, Cl. 192-45.000.

Genkin, Vitaly Y.: *See—*
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L., 4,187,898, Cl. 164-421.000.

Gensicke, Walter, to Keiper Automobiltechnik GmbH & Co KG. Adjustable hinge for motor-vehicle seat. 4,187,579, Cl. 16-139.000.

Gensike, Karl H.; and Sam, Ronald, to Photomatrix Corporation. Microfiche scanner module. 4,188,114, Cl. 355-54.000.

Geodesic Shelters, Inc.: *See—*
Ivers, Robert P.; and Thimsen, Mark J., 4,187,613, Cl. 33-174.00G.

Geomet, Inc.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Gerasimian, Dzhemma A.: *See—*
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

Gerstenkoper, Heinrich; and Juchmann, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Disc-shaped semiconductor device having an annular housing of elastomer material. 4,188,637, Cl. 357-79.000.

Gevorkian, Ogden A.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Gevorkian, Raya G.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Ghelardoni, Mario: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

Giacobbe, Thomas J.; and White, Halbert C., to Dow Chemical Company, The. Substituted phthalide derivatives. 4,188,330, Cl. 260-343.30R.

Gibbs, Don W. Strap fastening means for a sock and shoe combination. 4,187,619, Cl. 36-10.000.

Gilcher, Heinz, to Westinghouse Air Brake Company. Vital power varistor circuit for railroad signaling systems. 4,188,002, Cl. 246-34.00R.

Gillen, John D.: *See—*
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., 4,188,511, Cl. 179-99.00A.

Gillespie, Albert C. Apparatus for molding crayons and the like. 4,188,009, Cl. 249-78.000.

Gillette Company, The: *See—*
Sokol, Phillip E.; and Farmer, Robert F., 4,188,431, Cl. 428-29.000.

Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., to Fisons Limited. Composition. 4,188,202, Cl. 71-88.000.

Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., to Sulphur Development Institute of Canada. Sulphur concretes, mortars and the like. 4,188,230, Cl. 106-70.000.

Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., to International Business Machines Corporation. Ink jet printing head. 4,188,635, Cl. 346-75.000.

Giulie, Joe D.; and Guilie, James E. Picture frame. 4,187,630, Cl. 40-156.000.

Givaudan Corporation: *See—*
Dubs, Paul; and Kuntzel, Heiner, 4,188,488, Cl. 548-337.000.

Gladden, John R., to Caterpillar Tractor Co. Two-stage catalysis of engine exhaust. 4,188,364, Cl. 423-213.200.

Gliemeroth, Georg; and Meckel, Lothar, to Jenaer Glaswerk Schott & Gen. Optical fibers having high infrared transmittancy. 4,188,089, Cl. 350-96.340.

Glushkova, Nina N.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.

Go, Santos W., to Owens-Illinois, Inc. Method of preparing hollow articles from thermoplastic polyesters. 4,188,357, Cl. 264-540.000.

Goebel, Charles V., Jr., to Polymer Corporation, The. Initiators for lactam polymerization having first functional group,intermediate group, second functional group. 4,188,478, Cl. 528-314.000.

Goedicke, Friedrich E., to United States of America, Energy. Seal arrangement for intersecting conduits. 4,188,038, Cl. 277-64.000.

Goepel, Charles A., to GTE Sylvania Incorporated. Electrical component mounting package. 4,188,653, Cl. 361-405.000.

Golden, Stephen P.; and Jennings, Charles T., to United States of America, Army. Liquid nitrogen level indicator. 4,187,723, Cl. 73-295.000.

Goloff, Alexander: *See—*
Cemenska, Richard A.; and Goloff, Alexander, 4,187,807, Cl. 123-41.340.

Golubeva, Tamara N.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.

Goncharuk, Jury M.: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.

Goodyear Aerospace Corporation: *See—*
Zarembka, Robert L., 4,187,932, Cl. 188-73.200.

Goodyear Tire & Rubber Company, The: *See—*
Hunter, Edward E., 4,188,420, Cl. 427-295.000.
Menapace, Henry R., 4,188,348, Cl. 585-274.000.

Gorowitz, Bernard: *See—*
Lupinski, John H.; and Gorowitz, Bernard, 4,188,413, Cl. 427-30.000.

Goth, Carl W., to Continental Group, Inc., The. Aerosol valve for barrier type packages. 4,187,985, Cl. 239-337.000.

Gottardo, Guido, to Tovel S.p.A. Price labelling apparatus. 4,188,255, Cl. 156-384.000.

Gould Inc.: *See—*
Nanda, Vinod K., 4,187,763, Cl. 91-176.000.

Gournier, Andre: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.

Gouw, Lam H.: *See—*
Holden, Geoffrey; and Gouw, Lam H., 4,188,432, Cl. 428-35.000.

Gowans, Neil A.: *See—*
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,187,576, Cl. 15-250.420.

Grace, Fred I., to United States of America, Army. Shaped charge device. 4,187,782, Cl. 102-56.0SC.

Gradowski, Steven: *See—*
Hyner, Jacob; Gradowski, Steven; and Maestrone, Thomas F., 4,188,459, Cl. 428-648.000.

Graham, James J.; and Vernon, Roger J., to Badger Company, The. Pollution control for fatty acid condensation. 4,188,290, Cl. 210-21.000.

Graham, Robert; and Hall, Philip S., to Newalls Insulation Company Limited. Manufacture of fibrous webs. 4,188,355, Cl. 264-26.000.

Grapov, Artur F.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Grappe, Rene G.: *See—*
Buresi, Georges; and Grappe, Rene G., 4,188,084, Cl. 339-117.00R.

Grass, Joseph J., to Monarch Marking Systems, Inc. Method of making a composite web. 4,188,250, Cl. 156-253.000.

Grass, Joseph J.; and Monarch Marking Systems, Inc. Method of dispensing labels. 4,188,251, Cl. 156-248.000.

Grass, Joseph J., to Monarch Marking Systems, Inc. Composite web of pressure sensitive labels. 4,188,427, Cl. 428-41.000.

Graupe, Daniel; Beex, Aloysius A.; and Causey, G. Donald. ARMA filter and method for designing the same. 4,188,667, Cl. 364-724.000.

Grave, Brunhilde Renckhoff nee, heir and legal representative: *See—*
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased, 4,188,263, Cl. 439-179.000.

Gray, Laurence W., to Canadair Limited. Skin welded joint. 4,188,149, Cl. 403-271.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Method of effecting flocculation. 4,188,293, Cl. 210-47.000.

Green, Martin. Disposable shovel tongs. 4,188,055, Cl. 294-1.00R.

Greer, Donald J.; and MacEwan, John D., Jr., to ESCO Corporation. Excavating tool having hard-facing elements. 4,187,626, Cl. 37-141.00R.

Greeson, Richard L.: *See—*
Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, 4,187,599, Cl. 29-588.000.

Greger, Anthony, to United States of America, Air Force. Latch mechanism. 4,188,001, Cl. 244-151.00B.

Grell, Helmut; and Engelhardt, Achim, to Sybron Corporation. Body joint endoprosthesis. 4,187,559, Cl. 3-1.910.

Grenier, Michel, to WABCO Westinghouse. Braking coordination device. 4,188,070, Cl. 303-3.000.

Greskovich, Charles D., to General Electric Company. Shell investment molds embodying a metastable mullite phase in its physical structure. 4,188,450, Cl. 428-329.000.

Gretag Aktiengesellschaft: *See—*
Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, 4,188,506, Cl. 179-1.50R.

Grober, Roland: *See—*
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.

Groth, Rolf, to BFG Glassgroup. Heat-reflecting glass pane. 4,188,452, Cl. 428-336.000.

Gruppo Lepetit S.p.A.: *See—*
Maggi, Nicola; and Sensi, Piero, 4,188,321, Cl. 260-239.30P.

Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, to Distillers Company (Yeast) Limited, The. Processes for producing active dried yeast. 4,188,407, Cl. 426-62.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.
Lord, John M., 4,188,512, Cl. 179-100.00C.

GTE Sylvania Incorporated: *See—*
Baker, Scott H.; and Manners, David E., 4,188,641, Cl. 358-190.000.
Bower, Bruce L.; and Kohler, Raymond H., 4,188,661, Cl. 363-49.000.
Goepel, Charles A., 4,188,653, Cl. 361-405.000.
Knoll, William C., 4,188,660, Cl. 363-49.000.
Manners, David E., 4,188,568, Cl. 315-411.000.
Monroe, Tex K., 4,188,567, Cl. 315-396.000.

Guarino, Richard A., to USV Pharmaceutical Corporation. Treatment of symptoms of aging. 4,188,404, Cl. 424-330.000.

Guay, Wilbur J., to Newmont Exploration Limited. Recovery of gold from carbonaceous gold-bearing ores. 4,188,208, Cl. 75-105.000.

Guerini, Albert J., to Memorex Corporation. Data security apparatus for magnetic recording disc drive. 4,188,648, Cl. 360-105.000.

Guilbot, Andre: *See—*
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, 4,188,466, Cl. 435-18.000.

Guilie, James E.: *See—*
Giulie, Joe D.; and Guilie, James E., 4,187,630, Cl. 40-156.000.

Guillermin, Rene: *See—*
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, 4,188,429, Cl. 428-85.000.

Guiraud, Francois, to Fichet-Bauche French Body Corporation. Improvements in or relating to Bramah locks. 4,187,705, Cl. 70-362.000.

Gulf & Western Industries, Inc.: *See—*
Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., 4,188,617, Cl. 340-183.000.

Gulf & Western Manufacturing Company: *See—*
Lindahl, Herbert S., 4,187,690, Cl. 62-138.000.

Gulton Industries, Inc.: *See—*
Mounteer, Carlyle A.; and Poteet, Ronald L., 4,188,258, Cl. 156-628.000.

Gumb, Beverley W.: *See—*
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., 4,188,513, Cl. 179-111.00E.

Gunther, Siegfried: *See—*
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.

Gusfafson, Gary B.; and Staub, Martin L., to Eastman Kodak Company. Offset sheet stacking apparatus. 4,188,025, Cl. 271-314.000.

Gust, Charles F. Stoma centering apparatus. 4,187,850, Cl. 128-283.000.

Gutmann, Ingeborg: *See—*
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.

Gysling, Henry J., to Eastman Kodak Company. Images formed by decomposition of Te (II) coordination complexes. 4,188,218, Cl. 430-495.000.

Gyugyi, Laszlo; and Brennen, Michael B., to Westinghouse Electric Corp. Static VAR generator with time-related-error minimizer. 4,188,573, Cl. 323-119.000.

Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, to Ciba-Geigy Corporation. New phenylazacycloalkanes. 4,188,396, Cl. 424-267.000.

Habib, Fred G., Jr. Remote cycle alarm system. 4,188,614, Cl. 340-63.000.

Hadden-Deering, Phillip R. Image projection apparatus with sustained image exposure. 4,188,099, Cl. 353-94.000.

Haegele, Gerhard, to Zahnradfabrik Friedrichshafen AG. Rack steering. 4,187,736, Cl. 74-422.000.

Hager, Richard A.: *See—*
Miller, Clarence S., Jr.; and Hager, Richard A., 4,187,902, Cl. 165-76.000.

Hagihara, Tadashi. Rotary filter apparatus. 4,188,294, Cl. 210-160.000.

Hahn, James H., to ACR Electronics, Inc. Electro-mechanical machine. 4,188,556, Cl. 310-268.000.

Hahn, Raymond F. Form for a mortar cap. 4,187,648, Cl. 52-21.000.

Halas, Linda A., to Procter & Gamble Company, The. Surfactant for an automatic dishwasher. 4,188,305, Cl. 252-95.000.

Hall, John R., to Hall, Margaret T.; and Turner, James B., Jr. Manhole extender elements. 4,187,647, Cl. 52-20.000.

Hall, John R., to Hall, Margaret T.; and Turner, James B., Jr. Manhole extension assembly. 4,188,151, Cl. 404-26.000.

Hall, Lawrence G.; and Whistler, Wayne J., to Perkin-Elmer Corporation, The. High-speed transmission of blood stream gases. 4,187,856, Cl. 128-635.000.

Hall, Margaret T.: *See—*
Hall, John R., 4,187,647, Cl. 52-20.000.
Hall, John R., 4,188,151, Cl. 404-26.000.

Hall, Philip S.: *See—*
Graham, Robert; and Hall, Philip S., 4,188,355, Cl. 264-26.000.

Hall, William C.; and Peterson, John M. Mini-aggregate iron ore in cement matrix. 4,188,232, Cl. 106-97.000.

Halpern, Gerald M.: *See—*
Deckman, Harry W.; and Halpern, Gerald M., 4,188,532, Cl. 250-336.000.

Halpine, Joseph C. Ball valve having improved sealing capability. 4,188,015, Cl. 251-315.000.

Ham, Allan L.: *See—*
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.

Hamanaka Kabushiki Kaisha: *See—*
Hamanaka, Rikio, 4,187,669, Cl. 57-235.000.

Hamanaka, Rikio, to Hamanaka Kabushiki Kaisha. Knitting material. 4,187,669, Cl. 57-235.000.

Hamelink, William B., to Honeywell Inc. Fuel burner safe starting system. 4,188,180, Cl. 431-46.000.

Hametner, Albert L.; and Soderberg, Mark S., to Boeing Company, The. Wire pinch mark detector for use in method and apparatus for semiautomatically manufacturing electrical wire harness. 4,187,889, Cl. 140-92.100.

Hamilton, Gordon A.: *See—*
Boykin, Richard A.; and Hamilton, Gordon A., 4,187,977, Cl. 229-43.000.

Hamilton, Michael D. Out-of-frame detector for motion picture film duplicating equipment. 4,188,112, Cl. 355-50.000.

Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, to Zahnradfabrik Friedrichshafen AG. Hydrostatic torque converter having a stepped transmission. 4,187,739, Cl. 74-732.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; and Hammann, Ingeborg, 4,188,383, Cl. 424-200.000.

Hanke, Carl C., Jr.: *See—*
Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.

Hansen, David E.: *See—*
Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., 4,188,197, Cl. 55-382.000.

Hansen, Elwood F.: *See—*
Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., 4,188,197, Cl. 55-382.000.

Hansen, Lee A.; and Conrad, William A. Blower attachment for line trimmer. 4,187,577, Cl. 15-328.000.

Hansen, Loren F., to Outboard Marine Corporation. Tote-trailer with wheel locking device. 4,188,164, Cl. 414-447.000.

Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, to Rohm GmbH. Double-walled shaped plastic articles. 4,188,425, Cl. 428-34.000.

Harbert, Charles A.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.

Harden, Jerrell W.; and Brown, William P., to Brown Manufacturing Corporation. Soil conditioning and seed bed preparing apparatus. 4,187,916, Cl. 172-146.000.

Hardy, James H.; and Roberson, James E. Method and apparatus for applying chemicals to weeds and plants. 4,187,638, Cl. 47-1.500.

Harp, Robert S.; and Russell, Kenneth J., to Hughes Aircraft Company. Conical power combiner. 4,188,590, Cl. 331-56.000.

Harris, Gerald A.: *See—*
Tallon, Thomas G.; and Harris, Gerald A., 4,188,655, Cl. 362-80.000.

Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., to R. D. Bussard & Son, Inc. Elastic fastener. 4,187,590, Cl. 24-73.00P.

Hart, James E., to Westinghouse Air Brake Company. Railway vehicle brake apparatus arranged to accommodate reduced emergency reservoir volume. 4,188,071, Cl. 303-33.000.

Hartman, Wallace R., Jr.: *See—*
Sanson, Henry E., III; and Hartman, Wallace R., Jr., 4,188,300, Cl. 252-48.600.

Harvey, Donald M., to Eastman Kodak Company. Apparatus and method for processing film. 4,188,106, Cl. 354-330.000.

Harvey Hubbell, Incorporated: *See—*
Senften, John W., 4,187,934, Cl. 191-39.000.

Hashiba, Isao: *See—*
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, 4,188,343, Cl. 260-571.000.

Hashimoto, Yoshio: *See—*
Watanabe, Kunio; and Hashimoto, Yoshio, 4,188,241, Cl. 148-12.00F.

Haung, Bernard; and Rivin, Evgeny I., to Ford Motor Company. Wheel suspension. 4,188,048, Cl. 280-688.000.

Haupin, Warren E.: *See—*
Seger, Edward J.; and Haupin, Warren E., 4,188,267, Cl. 204-1.00T.

Hauser, Thomas M., to Mentor Corporation. Sheath arrangement for male urinal device and method of forming the same. 4,187,851, Cl. 128-295.000.

Hayashi, Yoshio: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.

Haynes, Harold G.: *See—*
Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., 4,188,202, Cl. 71-88.000.

Hazeltine Corporation: *See—*
Frazita, Richard F., 4,188,633, Cl. 343-854.000.

Hch. Bertrams Aktiengesellschaft: *See—*
Kuhnlein, Hans, 4,187,904, Cl. 165-104.000.

Heberlein Hispano SA: *See—*
Vignon, Louis, 4,187,587, Cl. 19-272.000.

Heckelman, James D.; and Ziemke, Robert A., to Dan-Mar Co. Inc. Alarm system. 4,188,621, Cl. 340-528.000.

Heffernan, Bart T. Blood sample handling apparatus and method. 4,187,861, Cl. 128-764.000.

Hein, Lehmann AG: *See—*
Wehner, Albert, deceased, 4,188,288, Cl. 209-310.000.

Heinrich, Kurt: *See—*
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.

Heinzerling, Jurgen: *See—*
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.

Heise, Arend: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Heise, Richard L.: *See—*
Webster, Sherwood F.; and Heise, Richard L., 4,187,820, Cl. 123-141.000.

Helene Curtis Industries, Inc.: *See—*
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.

Hemperly, Lyle D., Jr., to Seal Incorporated. Vacuum press. 4,188,254, Cl. 156-382.000.

Hendrickson, Richard C., to United States of America, Navy. Pressure-biased shuttle valve. 4,187,871, Cl. 137-112.000.

Henricksen, Clifford A.; and Ureda, Mark S., to Altec Corporation. Loudspeaker horn. 4,187,926, Cl. 181-192.000.

Henry, Elbert C., to Henry Enterprises, Inc. Fuel service tank with self-retracting hose reel. 4,187,962, Cl. 222-173.000.

Henry Enterprises, Inc.: *See—*
Henry, Elbert C., 4,187,962, Cl. 222-173.000.

Hensel, Jorg: *See—*
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.

Hensley, Albert L., Jr.: *See—*
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,188,284, Cl. 208-216.0PP.

Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, to Medtronic, Inc. Implantable demand pacemaker and monitor. 4,187,854, Cl. 128-419.0PG.

Herbert Morris Ltd.: *See—*
Ward, Frederick G., 4,187,942, Cl. 198-345.000.

Hercofina: *See—*
Miller, Clarence S., Jr.; and Hager, Richard A., 4,187,902, Cl. 165-76.000.

Herenius, Frederik J., to Perkins Engines Limited. Marine engine manifold. 4,187,678, Cl. 60-321.000.

Hermann Finckh Maschinenfabrik: *See—*
Holz, Emil, 4,188,286, Cl. 209-273.000.

Hernandez, Jose: *See—*
Betancourt, Jorge; and Hernandez, Jose, 4,188,128, Cl. 366-72.000.

Herrig, Klaus; and Wagner, Heinz, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Knotted wire fencing. 4,188,020, Cl. 256-45.000.

Hickner, Richard A.; and Farber, Hugh A., to Dow Chemical Company, The. Polyethers having aminothioether side chains. 4,188,340, Cl. 260-567.60P.

Hill, David T., to SmithKline Corporation. 2,2-Alkyldiylbis(thio)bis-(imidazoles). 4,188,397, Cl. 424-273.00R.

Hill, Homer G.: *See—*
Foley, Kevin M.; and Hill, Homer G., 4,188,454, Cl. 428-391.000.

Hill, John C. Antitheft guard for ignition switch. 4,187,706, Cl. 70-428.000.

Hill, Philip R., to Chromatex, Inc. Laminated fabric of polypropylene. 4,188,445, Cl. 428-246.000.

Hinnenkamp, James A.; and Scheben, John A., to National Distillers and Chemical Corporation. Catalytic oxidation of ethylene to mixtures of acetic acid and vinyl acetate. 4,188,490, Cl. 560-245.000.

Hintner, Josef; and Stauble, Georg, to Knorr-Bremse GmbH. Brake accelerator device for an air brake system of a railway vehicle. 4,188,072, Cl. 303-69.000.

Hiraga, Michio, to Fuji Xerox Co., Ltd. Copying device with facsimile function. 4,188,113, Cl. 355-51.000.

Hirai, Tosihisa: *See—*
Suzuki, Yasuo; and Hirai, Tosihisa, 4,188,555, Cl. 310-162.000.

Hirata, Kenichi: *See—*
Takahashi, Nobuhiro; and Hirata, Kenichi, 4,188,243, Cl. 148-155.000.

Hirleman, Edwin D., Jr.; and Wittig, Sigmar L. K. Multiple ratio single particle counter. 4,188,121, Cl. 356-336.000.

Hisano, Katsukuni: *See—*
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Hitachi Chemical Company, Ltd.: *See—*
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.

Hitachi, Ltd.: *See—*
Iwasaki, Takashiroh; and Mameda, Jun-ichi, 4,188,551, Cl. 307-311.000.
Miura, Michiyori, 4,188,596, Cl. 333-151.000.
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.
Ohninata, Ichiro, 4,188,548, Cl. 307-252.00C.
Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, 4,188,663, Cl. 363-51.000.
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., to NL Industries, Inc. Method and apparatus for monitoring fluid flow through a drill string. 4,188,624, Cl. 340-606.000.

Hodemaekers, Andreas M. L., to U.S. Philips Corporation. Gas discharge display arrangement. 4,188,625, Cl. 340-642.000.

Hodgson, Robert F.; and Petro, John D., to Commercial Shearing Inc. Compensated work port fluid valves. 4,187,877, Cl. 137-596.000.

Hoechst Aktiengesellschaft: *See—*
Bathelt, Heinrich, 4,188,307, Cl. 252-355.000.
Semjonow, Valentin, 4,187,586, Cl. 19-161.100.
Strecker, Helmut, 4,188,539, Cl. 250-432.0PD.

Hoegerle, Karl, to Ciba-Geigy Corporation. 5-Alkylsulphonyl- and 5-alkenylsulphonylbarbituric acids and derivatives thereof. 4,188,483, Cl. 544-302.000.

Hoffman, David S.: *See—*
Rogers, Walter C., Jr.; and Hoffman, David S., 4,188,062, Cl. 297-61.000.

Hogan, Clarence V.: *See—*
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.

Hogg, Walter R.; and Brunsting, Albert, to Coulter Electronics, Inc. Mirror image ellipsoid radiation collector and method. 4,188,542, Cl. 250-458.000.

Hogg, Walter R.: *See—*
Brunsting, Albert; and Hogg, Walter R., 4,188,543, Cl. 250-458.000.

Hoinski, Walter W., to Power Systems Development Corporation. Threshold plate door alarm. 4,187,797, Cl. 116-87.000.
Hoinski, Walter W., to Power Systems Development Corporation. Solar heating system. 4,187,834, Cl. 126-425.000.
Holden, Geoffrey; and Gouw, Lam H., to Shell Oil Company. Articles resistant to attack by fatty substances, made from polystyrene blends, and compositions. 4,188,432, Cl. 428-35.000.
Holden, Homer N.; and Gaster, Ivan, to Dayco Corporation. Vacuum cleaner hose assembly and method of making same. 4,188,081, Cl. 339-15.000.
Holladay, Jack T. Method of and apparatus for testing visual integrity. 4,188,097, Cl. 351-36.000.
Holland-Letz, Gunter, to Dymo Industries, Inc. Apparatus for printing and dispensing labels. 4,187,778, Cl. 101-291.000.
Hollaway, Graham: *See—*
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.
Hollenbeck, Paul R. Hand operated flexible stamp carrier. 4,187,772, Cl. 101-379.000.
Holly, Sandor: *See—*
Massie, Norbert A.; and Holly, Sandor, 4,188,122, Cl. 356-349.000.
Hollymatic Corporation: *See—*
Wagner, Richard C., 4,187,581, Cl. 17-32.000.
Holmes, Billy G.; and Crofford, Jimmie, to Mobil Oil Corporation. Apparatus for mixing gas and liquid at a downhole location. 4,188,068, Cl. 299-5.000.
Holmes, Neil C.: *See—*
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.
Holt, Lloyd J., to United States of America, Navy. Inflight, stores, forces and moments measuring device. 4,187,760, Cl. 89-1.50E.
Holt, Lloyd J.; and Panlaqui, Clayton E., to United States of America, Navy. Variable force control system for weapon ejection mechanisms. 4,187,761, Cl. 89-1.50R.
Holz, Emil, to Hermann Finckh Maschinenfabrik. Screening apparatus for fiber suspensions. 4,188,286, Cl. 209-273.000.
Homan, Pieter: *See—*
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.
Homma, Jun-ichi: *See—*
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.
Honbu, Mitsuyuki: *See—*
Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, 4,188,663, Cl. 363-51.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sakurai, Yoshitoshi, 4,187,677, Cl. 60-282.000.
Honeywell Inc.: *See—*
Battersby, Robert J.; and Dietiker, Paul, 4,188,013, Cl. 251-175.000.
Hamelink, William B., 4,188,180, Cl. 431-46.000.
Hoogstraate, Hendrik, to N. V. Hollandse Signaalapparaten. Mixer. 4,188,584, Cl. 325-446.000.
Hooker Chemicals & Plastics Corp.: *See—*
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Hooper, Lindsay A., to Repco Limited. Cycle exerciser. 4,188,030, Cl. 272-73.000.
Hoover, William: *See—*
Bolton, Joseph A.; and Hoover, William, 4,188,078, Cl. 308-187.000.
Horkey, Edward J. Drag chain links. 4,187,943, Cl. 198-730.000.
Horn, Hannes S. Method and apparatus for production of plate glass. 4,188,200, Cl. 65-90.000.
Hosaka, Akio; and Aono, Shigeo, to Nissan Motor Company, Limited. Closed loop fuel control with sample-hold operative in response to sensed engine operating parameters. 4,187,812, Cl. 123-119.0EC.
Hotta, Tetsuya: *See—*
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.
Houghtaling, Samuel V., to Societe de Prayon. Manufacture of phosphoric acid. 4,188,366, Cl. 423-320.000.
Hounsfield, Godfrey N., to EMI Limited. Apparatus for examining a body by radiation such as X or gamma radiation. 4,188,541, Cl. 250-445.00T.
Howard, Dennis D., to Lord Corporation. Actinic radiation-curable formulations containing at least one unsaturated polyether-esterurethane oligomer. 4,188,455, Cl. 428-423.100.
Howard, Norman W. Light frame adapter. 4,188,656, Cl. 362-365.000.
Howell, Stephen L.: *See—*
Robinson, John W.; and Howell, Stephen L., 4,187,756, Cl. 84-1.240.
Hsia, Yukun, to McDonnell Douglas Corporation. Associative interconnection circuit. 4,188,670, Cl. 365-49.000.
Hufford, Charles D., to University of Mississippi, The. Antimicrobial compositions. 4,188,392, Cl. 424-258.000.
Hugelshofer, Max, to Etablissement Dentaire Ivoclar. Metallizing gun for applying sprayed metal. 4,187,984, Cl. 239-13.000.
Hughart, Robert P.: *See—*
Wilson, Peter C.; and Hughart, Robert P., 4,188,535, Cl. 250-359.000.
Hughes Aircraft Company: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,188,337, Cl. 260-465.00D.
Harp, Robert S.; and Russell, Kenneth J., 4,188,590, Cl. 331-56.000.
Hughes Tool Company: *See—*
Scales, Stanley R., 4,188,242, Cl. 148-15.500.
Hughey, John E., to Zurn Industries, Inc. Valve having internally pressurized sealing elements. 4,187,878, Cl. 137-601.000.
Hugosson, Evald; and Kullendorf, Anders, to Stal-Laval Turbin AB. Protective coating on a steel surface. 4,188,458, Cl. 428-556.000.
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., to Shell Oil Company. Purification of 3,5-xylenol. 4,188,497, Cl. 568-799.000.
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased (by Grave, Brunhilde Renckhoff nee, heir and legal representative), to Dynamit Nobel Aktiengesellschaft. Carrier-bound acylases. 4,188,263, Cl. 439-179.000.
Hulthe, Leif: *See—*
Fermer, Karl-Erik; and Hulthe, Leif, 4,187,879, Cl. 137-601.000.
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, to ITT Industries, Incorporated. Single-handle mixing valve. 4,187,880, Cl. 137-625.170.
Humphrey, James S., Jr., to General Electric Company. Polycarbonate article coated with an adherent, durable, silica filled organopolysiloxane coating and process for producing same. 4,188,451, Cl. 428-331.000.
Hunt, Morris C. Electrical filter. 4,188,598, Cl. 333-207.000.
Hunter Douglas International, N.V.: *See—*
Frentzel, Kurt H., 4,187,897, Cl. 160-177.000.
Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Method for coating wire on a spool. 4,188,420, Cl. 427-295.000.
Huraux, Claude: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Hurni, William M.: *See—*
McAleer, William J.; and Hurni, William M., 4,187,989, Cl. 241-2.000.
Husain, Matloob: *See—*
Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.
Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Slant hole foam cleanout. 4,187,911, Cl. 166-312.000.
Hydro-Quebec: *See—*
Gagne, Jean-Guy, 4,188,502, Cl. 174-42.000.
Hydroacoustics, Inc.: *See—*
Bouyoucos, John V., 4,187,917, Cl. 173-131.000.
Nelson, David E., 4,188,610, Cl. 367-14.000.
Hyner, Jacob; Gradowski, Steven; and Maestrone, Thomas F., to Whyco Chromium Company, Inc. Corrosion resistant plating and method utilizing alloys having micro-throwing power. 4,188,459, Cl. 428-648.000.
I.N.R.A.: *See—*
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, 4,188,466, Cl. 435-18.000.
Ichioka, Athushi: *See—*
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
ICI Americas Inc.: *See—*
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,188,349, Cl. 525-366.000.
Ideal Toy Corporation: *See—*
Nielsen, Edwin A., 4,187,637, Cl. 46-262.000.
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, to Ricoh Company, Ltd. Fixing apparatus for electrophotography. 4,188,109, Cl. 355-3.0FU.
Igarashi, Yoshiaki: *See—*
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.
Ikeda, Hisao: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Ikeda, Sadaharu: *See—*
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.
Ikeda, Tomoaki: *See—*
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,188,214, Cl. 430-494.000.
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.
Illinois Tool Works Inc.: *See—*
Reinwall, Ernest W., Jr., 4,187,658, Cl. 52-489.000.
Imamura, Yoshiaki: *See—*
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.
Imperial Chemical Industries Limited: *See—*
Ellis, Peter M.; and Selwood, Alan, 4,188,436, Cl. 428-198.000.
McClean, Arthur J.; and Montgomery, Kenneth F., 4,188,545, Cl. 250-561.000.
Payne, David T.; and Brand, Boris P., 4,188,376, Cl. 424-173.000.
Indicon Inc.: *See—*
Citrin, Paul S., 4,187,724, Cl. 73-425.40P.
Industrial Blast Coil Corporation: *See—*
Stikeleather, Allan, 4,187,710, Cl. 72-204.000.
Industrial Wire & Metal Forming, Inc.: *See—*
Champoux, Louis A., 4,187,708, Cl. 72-30.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.
Ingenthron, Walter W., Jr.: *See—*
Wasley, William L.; and Ingenthron, Walter W., Jr., 4,188,422, Cl. 28-167.000.

Inoue, Hidehiko: *See—*
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.
Inoue, Morio: *See—*
Itoh, Kunio; and Inoue, Morio, 4,188,244, Cl. 148-174.000.
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, to Bunker Ramo Corporation. Connector for terminating flexible parallel conductors. 4,188,086, Cl. 339-176.0MF.
Institut fur Biomedizinische Technik: *See—*
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.
Institut Organicheskoi Khimii Akademii Nauk Armyanskoi: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.
Instrumentation Specialties Company: *See—*
Allington, Robert W., 4,188,574, Cl. 324-51.000.
International Business Machines Corporation: *See—*
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.
Finlay, David E., 4,188,668, Cl. 364-900.000.
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Jaerisch, Walter; and Makosch, Guenter, 4,188,124, Cl. 356-356.000.
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
International Harvester Company: *See—*
Deschamps, Joseph P., 4,187,924, Cl. 180-53.00R.
McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., 4,187,923, Cl. 180-215.000.
International Standard Electric Corporation: *See—*
Munchow, Peter; and Kaiser, Walter, 4,188,509, Cl. 179-18.0AD.
Rein, Wolf-Heider, 4,188,650, Cl. 360-133.000.
International Telephone and Telegraph Corporation: *See—*
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.
Intertecnica S.p.A.: *See—*
La Marca, Giuseppe, 4,188,054, Cl. 292-226.000.
Invicta Plastics Limited: *See—*
Jones-Fenleigh, Edward J., 4,188,036, Cl. 273-265.000.
Ippoliti, Ralph J.; and Nelson, John J., to Product Dynamics, Ltd. Container of the combination-locked envelope type. 4,187,703, Cl. 70-63.000.
Irwin, John W., to General Electric Company. Heat pump bypass valve arrangement. 4,187,691, Cl. 62-324.000.
Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Aromatic polyester consisting essentially of p-oxybenzoyl units, terephthaloyl units, 2,6-dioxynaphthalene or 2,6-dioxyanthraquinone units and m-oxybenzoyl or 1,3-dioxyphenylene units. 4,188,476, Cl. 528-190.000.
Isaka, Kinichi: *See—*
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Isdale, Charles E., Sr.: *See—*
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.
Isenberg, Raymond C. Attachable pipe radiator. 4,187,905, Cl. 165-181.000.
Ishibashi, Masamichi, to Fujitsu Limited. Address converter in a data processing apparatus. 4,188,662, Cl. 364-200.000.
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-vibration apparatus for a vehicle brake system. 4,188,073, Cl. 303-87.000.
Ishizawa, Hidenori: *See—*
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.
Ishizuka, Naoyasu: *See—*
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Isostat: *See—*
du Temple de Rougemont, Christian, 4,188,518, Cl. 200-159.00R.
Itaya, Shikiho: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.
Ito, Jinichi, to Yamada Yuki Seizo Co., Ltd. Diaphragm pump. 4,188,170, Cl. 417-387.000.
Ito, Keiso: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Ito, Kenichiro; and Schischkoff, Kurt, to Yoshida Kogyo K K. Machine for automatically cutting an elongate material into lengths. 4,187,750, Cl. 83-67.000.
Ito, Masanori: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Ito, Sadayoshi: *See—*
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.
Itoh, Kunio; and Inoue, Morio, to Matsushita Electric Industrial Co., Ltd. Method of making a semiconductor light-emitting device utilizing low-temperature vapor-phase deposition. 4,188,244, Cl. 148-174.000.
ITT Industries, Incorporated: *See—*
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.
Ivers, Robert P.; and Thimsen, Mark J., to Geodesic Shelters, Inc. Jig for precise measurement of panels for geodesic. 4,187,613, Cl. 33-174.00G.
Iwahara, Makoto: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, to Seikagaku Kogyo Co. Ltd. Process for determining bacterial endotoxin and reagents used therefor. 4,188,264, Cl. 23-230.00B.
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, to Fuji Photo Film Co., Ltd. Electrostatic print marking apparatus. 4,187,774, Cl. 101-1.000.
Iwasaki, Takashiroh; and Mameda, Jun-ichi, to Hitachi, Ltd. Amplifier circuit having photoelectric converter. 4,188,551, Cl. 307-311.000.
Iwata Co., Ltd.: *See—*
Iwata, Takuzo, 4,187,615, Cl. 34-1.000.
Iwata, Takuzo, to Iwata Co., Ltd. Process for treating feathers and cyclone used for carrying out the process. 4,187,615, Cl. 34-1.000.
Izatt, James P., to Cellsystem AG. Apparatus for watering and draining soil. 4,188,154, Cl. 405-43.000.
Jablin, Richard. Treatment of waste liquor. 4,188,195, Cl. 55-89.000.
Jacobs, Paul L., to United States of America, Army. Angular rate sensor. 4,188,576, Cl. 324-163.000.
Jacques, Andre: *See—*
D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, 4,188,087, Cl. 350-96.200.
Jaeckh, Christof: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Jaerisch, Walter; and Makosch, Guenter, to International Business Machines Corporation. Interferometric measuring system. 4,188,124, Cl. 356-356.000.
Jagenberg Werke Aktiengesellschaft: *See—*
Walde, Peter, 4,187,753, Cl. 83-674.000.
Jameel, Khaja M.: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.
James, Gordon E., to TRW Inc., Systems & Energy. Dispensing method and system for lubricating oil and other liquids. 4,187,930, Cl. 184-1.00R.
James, Robert G. Variable speed traction transmission. 4,187,731, Cl. 74-198.000.
Janko, Bozidar, to Tektronix, Inc. Cathode ray tube having an electron lens system including a meshless scan expansion post deflection acceleration lens. 4,188,563, Cl. 313-460.000.
Janome Sewing Machine Co. Ltd.: *See—*
Takenoya, Hideaki; and Makabe, Machiro, 4,187,789, Cl. 112-158.00E.
Japan Bano'k Co., Ltd.: *See—*
Furutu, Akira, 4,187,970, Cl. 227-8.000.
Japan Medical Supply Co., Ltd.: *See—*
Kurata, Motoji, 4,188,360, Cl. 422-46.000.
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., to General Electric Company. Process for preparing 2,2-bis(4-hydroxy-phenyl) propane from distillation by-products thereof. 4,188,496, Cl. 568-723.000.
Jayne, Gerald J. J.; and Woods, David R., to Edwin Cooper and Company Limited. Lubricant additive. 4,188,297, Cl. 252-45.000.
Jenaer Glaswerk Schott & Gen.: *See—*
Gliemeroth, Georg; and Meckel, Lothar, 4,188,089, Cl. 350-96.340.
Jennings, Charles T.: *See—*
Golden, Stephen P.; and Jennings, Charles T., 4,187,723, Cl. 73-295.000.
Jensen, Harbo P., to Chevron Research Company. Method for removing arsenic from shale oil. 4,188,280, Cl. 208-53.000.
Jensen, Knud B.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.
Jewry, Ian C.: *See—*
Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., 4,188,202, Cl. 71-88.000.
Jibb, David J.: *See—*
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.
Jirkovsky, Ivo L., to Ayerst McKenna & Harrison, Inc. 1,2,3,4-Tetrahydropyrrolo(1,2-A)pyrazines. 4,188,389, Cl. 424-250.000.
Jobe, William T., II. Slotting fastener driving device. 4,187,589, Cl. 227-66.000.
John D. Hollingsworth on Wheels, Inc.: *See—*
Lowe, Jerry B., 4,187,585, Cl. 19-98.000.
John Thomas Batts, Inc.: *See—*
Garrison, Judd F., 4,187,967, Cl. 223-92.000.
John Zink Company: *See—*
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.
Johnson, Bruce K.: *See—*
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., 4,188,103, Cl. 354-27.000.
Johnson, Gary R., to Tri-State Oil Tool Industries, Inc. Enlarged bore hole drilling method and apparatus. 4,187,920, Cl. 175-267.000.

Johnson, Jesse R., to Knowles, Coyle E., a part interest to each; and Fisher, Eugene L., a part interest to each. Butterfly valve construction. 4,188,012, Cl. 251-173.000.
Johnson & Johnson: *See—*
Friedman, Norman J., 4,188,446, Cl. 428-288.000.
Johnson, Kenneth V., to Bucyrus-Erie Company. Hydrostatic winch. 4,187,681, Cl. 60-395.000.
Johnson, Michael R.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.
Johnson, Robert H., to Motorola, Inc. Passive navigation system with frequency coding. 4,188,629, Cl. 343-6.50R.
Johnsson, Mans K. O.; and Eriksson, Lars A., to Uddeholms Aktiebolag. Metallurgical process. 4,188,206, Cl. 75-60.000.
Jones-Fenleigh, Edward J., to Invicta Plastics Limited. Board game with letter shaped playing pieces. 4,188,036, Cl. 273-265.000.
Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., to United States of America, Navy. Marine mine. 4,187,779, Cl. 102-18.00M.
Jones, Richard B.: *See—*
Jones, Robert H., Jr.; and Jones, Richard B., 4,187,767, Cl. 92-171.000.
Jones, Robert H., Jr.; and Jones, Richard B. Diesel cylinder head and liner. 4,187,767, Cl. 92-171.000.
Jordaan, Ian J.: *See—*
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.
Joslyn Mfg. and Supply Co.: *See—*
Pranke, Walter T.; and Wilms, Manfred W., 4,188,561, Cl. 313-325.000.
Joyner, Bobby L.: *See—*
Dornfeld, John E.; and Joyner, Bobby L., 4,188,651, Cl. 361-322.000.
Jozat, Walter: *See—*
Anderka, Gerold; and Jozat, Walter, 4,188,634, Cl. 346-1.100.
Juchmann, Heinz: *See—*
Gerstenkoper, Heinrich; and Juchmann, Heinz, 4,188,637, Cl. 357-79.000.
Judson, Philip N. Condensers. 4,187,903, Cl. 165-76.000.
Juh, Yang R. Portable table. 4,187,785, Cl. 108-36.000.
Juhasz, Zoltan; and Varju, Gyula, to Budapesti Muszaki Egyetem. Process for preparing hydraulic binding materials of high bonding capacity from glassy pyrogenic rocks. 4,188,233, Cl. 106-97.000.
Junak, Edward M., to Teletronics Co., Inc. of Clifton. Method and apparatus for igniting and reigniting combustible fuel. 4,188,182, Cl. 431-80.000.
Jung, Lothar. Apparatus for forming an ingot in a rotating housing. 4,188,201, Cl. 65-302.000.
Juskevic, John. Key duplicating machine. 4,188,163, Cl. 409-82.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Mori, Ikuo; and Yoshida, Kenichi, 4,187,737, Cl. 74-471.0XY.
Kagaya, Hajime: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Kahler, Richard W. Three-point, plug type sealing means for a hollow, cylindrical container, particularly a liquid-filtered smoking device. 4,187,885, Cl. 138-89.000.
Kaiser, Walter: *See—*
Munchow, Peter; and Kaiser, Walter, 4,188,509, Cl. 179-18.0AD.
Kalamazoo Manufacturing Company: *See—*
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.
Kamachi, Shinichi; and Ohkura, Yosuke, to Chugai Seiyaku Kabushiki Kaisha. Ester of higher fatty acid and reagent for determination of activity of lipase. 4,188,320, Cl. 260-202.000.
Kanai, Takao; and Nishikawa, Yashuhisa, to Clarion Co., Ltd. Pushbutton tuner. 4,187,729, Cl. 74-10.900.
Kanebo, Ltd.: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Kaneko, Yoshiyuki: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.
Kang, Hong Y.; and Bro, Per, to P. R. Mallory & Co., Inc. Internal battery fuse. 4,188,460, Cl. 429-7.000.
Kankaanpaa, Matti, to Valmet. Method for dewatering paper in a paper machine press section. 4,188,262, Cl. 162-205.000.
Kansai Paint Co., Ltd.: *See—*
Nezu, Tuguo; and Miyata, Nobuyoshi, 4,188,222, Cl. 96-115.00P.
Kapfinger, Wolfgang: *See—*
Barbieri, Siegfried; and Kapfinger, Wolfgang, 4,188,125, Cl. 356-404.000.
Kaplan, Leonard; and Cotton, Frank A., to Union Carbide Corporation. Novel solvents for the catalytic process for producing polyhydric alcohols. 4,188,335, Cl. 260-449.00L.
Kaplan, Leonard A., to RCA Corporation. RC Oscillator. 4,188,593, Cl. 331-108.00D.
Kapteyn, Robert J.: *See—*
Willner, Howard; and Kapteyn, Robert J., 4,188,188, Cl. 23-230.00B.
Karl Lautenschlager KG Mobelbeschlagfabrik: *See—*
Lautenschlager, Karl, Jr., 4,187,580, Cl. 16-145.000.
Karlin, Robert. Steadying rest to aid in steadying an artist's hand. 4,188,006, Cl. 248-118.300.
Kasho, Yoshihiro: *See—*
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, to Victor Company of Japan, Limited. Signal processing circuit for binaural signals. 4,188,504, Cl. 179-1.0GP.
Kasugai, Tsuneo; and Kitagawa, Keishi, to Fuji Photo Film Co., Ltd. Supports for photographic paper and photographic light-sensitive material. 4,188,220, Cl. 430-536.000.
Kasuya, Takahiko: *See—*
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.
Katagiri, Masaaki: *See—*
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.
Kataoka, Akiyoshi. Process for electrolytically forming glossy film on articles of aluminum or alloy thereof. 4,188,270, Cl. 204-42.000.
Kato, Hisashi: *See—*
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.
Katoh, Kenji; and Ogita, Tamotu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system of an internal combustion engine. 4,187,811, Cl. 123-119.00A.
Kautzky, Norbert. Connecting arrangement for the detachable mounting of a binding on skis. 4,188,044, Cl. 280-611.000.
Kawaguchi, Masashi: *See—*
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, to Nippon Electric Co., Ltd.; and Fuji Industry Co., Ltd. Roll electrode for use in a seam welding machine. 4,188,523, Cl. 219-83.000.
Kawai, Syuji: *See—*
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Komatsu, Tadaomi, 4,187,949, Cl. 212-58.00R.
Komatsu, Tadaomi, 4,187,949, Cl. 212-58.00R.
Takagi, Izumi; and Adachi, Shigeo, 4,187,732, Cl. 74-230.17M.
Kawasaki, Mitsuru: *See—*
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.
Kay, Charles. Beverage product and process. 4,188,409, Cl. 426-78.000.
Kazami, Shin-Ichi; and Doi, Toshitada, to Sony Corporation. Method and system for transmitting and receiving blocks of encoded data words to minimize error distortion in the recovery of said data words. 4,188,616, Cl. 340-146.1AL.
Kazda, Stanislav: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Keiper Automobiltechnik GmbH & Co KG: *See—*
Gensicke, Walter, 4,187,579, Cl. 16-139.000.
Keller, Richard L.: *See—*
Westover, Jack D.; and Keller, Richard L., 4,187,771, Cl. 99-404.000.
Kelly, Michael: *See—*
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, to BASF Aktiengesellschaft. Surface-coating binders and their use for cathodic electrocoating. 4,188,312, Cl. 260-19.0EP.
Kendall Company, The: *See—*
Bonk, Joseph P., 4,187,960, Cl. 222-107.000.
Layton, Terry N., 4,187,722, Cl. 73-229.000.
Taylor, Glenn N., 4,187,848, Cl. 128-247.000.
Villari, Frank K., 4,187,860, Cl. 128-763.000.
Kennedy, Richard W.: *See—*
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.
Kerr, James D., to Teledyne Industries Inc. (Geotech Division). Piezoelectric seismometer. 4,188,612, Cl. 367-160.000.
Kewanee Industries, Inc.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.
Khudoian, Korjun L.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Recording material. 4,188,214, Cl. 430-494.000.
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., to Texas Instruments Incorporated. System for fabrication of semiconductor bodies. 4,188,177, Cl. 425-5.000.
Killian, Gerald I. Folding limb compound archery bow. 4,187,826, Cl. 124-24.00R.
Kim, Young J.: *See—*
Lyons, Bernard J.; and Kim, Young J., 4,188,276, Cl. 204-159.170.

Kimball International, Inc.: *See—*
Robinson, John W.; and Howell, Stephen L., 4,187,756, Cl. 84-1.240.
Kimbro, Robert M. Adjustable stabilizer for motor vehicles and the like. 4,188,049, Cl. 280-766.000.
Kimura, Takeo: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.
Kinetics, Inc.: *See—*
Zahora, Edward P.; and Zahora, Edward, Jr., 4,187,833, Cl. 126-312.000.
King, Donald A., to Abex Corporation. Flow proportional conveyor drive system. 4,187,958, Cl. 222-57.000.
Kintz, Glenn W. Animal trap for capturing burrowing animals. 4,187,634, Cl. 43-61.000.
Kirchmayr, Rudolf: *See—*
Felder, Louis; and Kirchmayr, Rudolf, 4,188,224, Cl. 204-159.150.
Kirkpatrick, Alan D., to Corrugated Development, Inc. Web handling apparatus. 4,188,257, Cl. 156-504.000.
Kirkpatrick, David B.: *See—*
Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., 4,187,779, Cl. 102-18.00M.
Kirmaier, N.: *See—*
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.
Kishishita, Hiroshi: *See—*
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Kissich, Arnulf; and Sussenbacher, Florian, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Mining machine having walk-on platform on cutter arm. 4,188,069, Cl. 299-73.000.
Kitagawa, Keishi: *See—*
Kasugai, Tsuneo; and Kitagawa, Keishi, 4,188,220, Cl. 430-536.000.
Kitazume, Keisuke: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.
Kitchin, Oscar G., to General Motors Corporation. Unit handled roller clutch subassembly. 4,187,937, Cl. 192-45.000.
Kitt, Edward A. Gravel spreader. 4,188,152, Cl. 404-110.000.
Klausing, Thomas A.: *See—*
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., 4,188,172, Cl. 417-53.000.
Klein, Hans, deceased: *See—*
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.
Kleinknecht, Hans P., to RCA Corporation. Optically measuring the carrier concentration in a semiconductor. 4,188,123, Cl. 356-354.000.
Klie, Wolfgang: *See—*
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.
Kliewer, Aron, Jr., to Fleetwood Enterprises, Inc. Structural members and joints between such members. 4,187,653, Cl. 52-98.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Raue, Reimund, 4,187,987, Cl. 239-585.000.
Klootwyk, Ronald I., to Continental Group, Inc., The. Power module assembly with monopolar cells. 4,188,462, Cl. 429-68.000.
Knauer, Karl, to Siemens Aktiengesellschaft. Process for the operation of a transversal filter. 4,188,597, Cl. 333-165.000.
Knetsch, Manfred: *See—*
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.
Knight, Charles E., Jr.; and Pollard, Roy E., to United States of America, Energy. Rim for rotary inertial energy storage device and method. 4,187,738, Cl. 74-572.000.
Knoll, William C., to GTE Sylvania Incorporated. Direct drive ballast circuit. 4,188,660, Cl. 363-49.000.
Knopf, Robert J.: *See—*
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Knorr-Bremse GmbH: *See—*
Hintner, Josef; and Stauble, Georg, 4,188,072, Cl. 303-69.000.
Knowles, Coyle E.: *See—*
Johnson, Jesse R., 4,188,012, Cl. 251-173.000.
Knowles, Robert G., to Litton Systems, Inc. Flat cable connector with strain relief and two-position latch. 4,188,083, Cl. 339-99.00R.
Knox, Dennis M., to Post Office. Rear feed assemblies for aerials. 4,188,632, Cl. 343-753.000.
Knudsen, Poul U.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.
Knutson, Richard A. Bone compression or distraction device. 4,187,841, Cl. 128-92.00E.
Kobayashi, Hidehiko: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.
Kobayashi, Toshihiko; and Oonishi, Toshinari, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake fuel mixture heating system for internal combustion engine. 4,187,815, Cl. 123-122.00H.
Koberstein, Edgar: *See—*
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.
Koegel, Ralph A., to Borg Textile Corporation. Latch guard and deep pile fabric circular knitting machine fitted therewith. 4,187,700, Cl. 66-111.000.
Koernig, Wolfgang: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.
Koester, Eberhard: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Koh-I-Noor Rapidograph, Inc.: *See—*
Anderka, Gerold; and Jozat, Walter, 4,188,634, Cl. 346-1.100.
Kohler, Raymond H.: *See—*
Bower, Bruce L.; and Kohler, Raymond H., 4,188,661, Cl. 363-49.000.
Kohler, William J.: *See—*
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.
Kohmoto, Osamu: *See—*
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.
Kohno, Kazuo: *See—*
Yamaguchi, Yasumasa; and Kohno, Kazuo, 4,188,339, Cl. 260-561.00N.
Kohno, Toshihiko: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Koizumi, Michio: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Koleske, Joseph V.: *See—*
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Komatsu, Tadaomi, to Kawasaki Jukogyo Kabushiki Kaisha; and Kawasaki Jukogyo Kabushiki Kaisha. Derrick crane with wide horizontal swinging range of boom. 4,187,949, Cl. 212-58.00R.
Kondo, Kiyoshi; and Matsui, Kiyohide, to FMC Corporation. Process for converting 2,2-dichlorovinylcyclopropanes to dibromovinyl analogs. 4,188,492, Cl. 562-506.000.
Kondo, Wakichi: *See—*
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.
Koniger, Rudolf: *See—*
Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, 4,187,757, Cl. 85-80.000.
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, to GTE Automatic Electric Laboratories Incorporated. Tool and method for installing flexible tubing in a multi-capsule reed relay switching assembly. 4,187,604, Cl. 29-622.000.
Korbach, Paul F.: *See—*
Bosniack, David S.; and Korbach, Paul F., 4,188,500, Cl. 585-1.000.
Koren, Paul P.: *See—*
Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., 4,188,514, Cl. 200-48.00R.
Kossler, Erich. Hydraulic turbine with vertical axis. 4,188,546, Cl. 290-52.000.
Kouda, Hajime: *See—*
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.
Kovacs, Jozsef P., to Baker International Corporation. Well bore apparatus with annulus pressure releasable tubing seal unit. 4,187,906, Cl. 166-120.000.
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased (by Stoll, Suzanne, executrix), to Firmenich SA. Cycloaliphatic unsaturated ketones as odor and taste modifying agents in tobacco products. 4,187,863, Cl. 131-17.00R.
Krall, Harry J.: *See—*
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.
Kraus, Bernd: *See—*
Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, 4,187,806, Cl. 123-32.0EE.
Kreonite, Inc.: *See—*
Marvin, Roger L., 4,188,111, Cl. 355-37.000.
Marvin, Roger L., 4,188,115, Cl. 355-75.000.
Kreuter, Walter: *See—*
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.
Krezanoski, Joseph Z., to Cooper Laboratories, Inc. Clear, water-miscible, liquid pharmaceutical vehicles and compositions which gel at body temperature for drug delivery to mucous membranes. 4,188,373, Cl. 424-78.000.
Krisak, Edward J.; and Strozak, Stephen, to FMC Corporation. Bulkhead shaft seal. 4,188,039, Cl. 277-95.000.
Kroeger, Edward R., to Warner Electric Brake & Clutch Company. Method of making an electrically released electromagnetic friction brake. 4,187,603, Cl. 29-602.00R.
Krulik, Gerald A.: *See—*
Bauer, Randy L.; and Krulik, Gerald A., 4,188,227, Cl. 106-1.270.
Kruske, Gerhard, to Metallgesellschaft Aktiengesellschaft. Nickel-base alloy. 4,188,209, Cl. 75-122.000.
Kubicek, Donald H., to Phillips Petroleum Company. Sulfolene hydrogenation. 4,188,327, Cl. 549-87.000.

Kubik, Charles K.: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.
Kubota, Ltd.: *See—*
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,187,616, Cl. 34-13.000.
Kudo, Yoshio: *See—*
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.
Kuhn, Lawrence: *See—*
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Kuhn, Ralph F., Jr., to United States of America, Air Force. Method of fabricating nozzle blades for lasers. 4,187,595, Cl. 29-157.00C.
Kuhnlein, Hans, to Hch. Bertrams Aktiengesellschaft. Heat transfer installation having storage reservoir containing a salt as a heat carrier. 4,187,904, Cl. 165-104.000.
Kuipers, Arie; and Schroder, Karl, to Meggle Milchindustrie GmbH & Co. KG. Method of preparing a protein-enriched unripened cheese composition. 4,188,411, Cl. 426-582.000.
Kukla, Michael J., to G. D. Searle & Co. 1-[(10,11-Dihydro-5H-dibenzo[a,d]-cycloheptен-5-yl)methyl]-4-substituted piperidines and related compounds. 4,188,485, Cl. 546-202.000.
Kull, George A., to ACF Industries, Incorporated. Cone valve assembly. 4,187,881, Cl. 137-625.310.
Kullendorf, Anders: *See—*
Hugosson, Evald; and Kullendorf, Anders, 4,188,458, Cl. 428-556.000.
Kumagai, Toshiya: *See—*
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.
Kumita, Norio: *See—*
Narita, Seiichi; and Kumita, Norio, 4,188,517, Cl. 200-61.45R.
Kuntzel, Heiner: *See—*
Dubs, Paul; and Kuntzel, Heiner, 4,188,488, Cl. 548-337.000.
Kuntzi, David M.: *See—*
Resa, Richard N.; and Kuntzi, David M., 4,188,058, Cl. 296-208.000.
Kunze, Hans J.: *See—*
Wolf, Franz-Josef; and Kunze, Hans J., 4,188,040, Cl. 277-207.00R.
Kuraray Co., Ltd.: *See—*
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.
Kurata, Motoji, to Japan Medical Supply Co., Ltd. Artificial lung with a built-in heat exchanger. 4,188,360, Cl. 422-46.000.
Kurath, Paul: *See—*
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,188,319, Cl. 260-112.50R.
Kurihara, Toshio: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Kusche, David W.: *See—*
Lanpheer, Richard A.; and Kusche, David W., 4,187,809, Cl. 123-65.0EM.
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Appenzeller, Valentin, 4,187,594, Cl. 29-116.0AD.
L. & C. Steinmuller GmbH: *See—*
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.
Dorling, Rolf, 4,187,955, Cl. 220-435.000.
LaCroix, Gene, Jr. Saddle girth. 4,187,663, Cl. 54-23.000.
Ladwig, Richard D., to Combustion Engineering, Inc. Automatic calcining kettle. 4,188,186, Cl. 432-43.000.
Laffitte, Andre: *See—*
Carville, Charles; and Laffitte, Andre, 4,188,559, Cl. 313-60.000.
Laing, Ingeborg: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,187,982, Cl. 237-2.00B.
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Apparatus for increasing the transmission capacity of remote heating grids. 4,187,982, Cl. 237-2.00B.
Laing, Oliver: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,187,982, Cl. 237-2.00B.
La Marca, Giuseppe, to Intertecnica S.p.A. Closure, particularly for industrial freezer doors. 4,188,054, Cl. 292-226.000.
Lamare, Jean-Claude; and Maury, Christian, to Compagnie Internationale pour l'Informatique. Phase decoder. 4,188,620, Cl. 340-347.0DD.
Lambert, Roger T., to Omnetics, Inc. Wire stripper. 4,187,745, Cl. 81-9.510.
Lambot, Honore J., to Diamant Boart. Cable-type core barrel. 4,187,919, Cl. 175-246.000.
Landau, Manfred, to Pilkington Brothers Limited. Method of coating glass and glass coated thereby. 4,188,444, Cl. 428-428.000.
Landis, Abraham L.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,188,337, Cl. 260-465.00D.
Lane, Ramon: *See—*
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Lang, Heinrich, to Combustion Engineering, Inc. Sub-surface gate valve. 4,187,876, Cl. 137-594.000.
Lang, William H.: *See—*
Chang, Clarence D.; and Lang, William H., 4,188,336, Cl. 260-449.00R.
Langeraar, Huibert B.; and Van Rooijen, Gerrit, to N.V. Hollandse Signaalapparaten. Frequency measuring circuit in a passive radar receiver. 4,188,628, Cl. 343-5.0SA.
Langermann, P. Hillel. Containment boom. 4,188,155, Cl. 405-63.000.
Lanpheer, Richard A.; and Kusche, David W., to Brunswick Corporation. Exhaust system for multiple cylinder two-stroke engines. 4,187,809, Cl. 123-65.0EM.
Larro, Harold D., to Almore International, Inc. Portable incubator. 4,188,265, Cl. 435-313.000.
Larsen, Eric R.; and McCarty, Leslie P., to Dow Chemical Company, The. Deuterated 1,1-difluoro-2,2-dihaloethyl difluoromethyl esters. 4,188,405, Cl. 424-342.000.
Larson, Clayton E., to White Metal Rolling & Stamping Corp. Stepladders. 4,187,928, Cl. 182-124.000.
Laurent, Sebastian M.: *See—*
Walter, Thomas J.; and Laurent, Sebastian M., 4,188,499, Cl. 568-914.000.
Lautenschlager, Karl, Jr., to Karl Lautenschlager KG Mobelbeschlagfabrik. Over-center hinge. 4,187,580, Cl. 16-145.000.
Lavochkin, Ronald B.; and Coe, Thomas D., to Wakefield Engineering, Inc. Method and apparatus for producing a high fin density extruded heat dissipator. 4,187,711, Cl. 72-256.000.
Lawson, Dennis L.: *See—*
Stricharczuk, Paul T.; and Lawson, Dennis L., 4,188,448, Cl. 428-311.000.
Layton, Terry N., to Kendall Company, The. Device for measuring the velocity of a urine discharge. 4,187,722, Cl. 73-229.000.
Leboul, Jean: *See—*
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.
Leclercq, Robert: *See—*
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.
Lee, Chen-Hsiung: *See—*
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Lee, Chun C. Bag support frame. 4,188,005, Cl. 248-97.000.
Legate, Roland A.; and Strickland, Kevin, to Strickland, Kevin. Explosive forming. 4,187,709, Cl. 72-56.000.
Le Goff, Yves: *See—*
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.
Legrand, Francis; and Weisser, Bernard, to Societe Nationale Industrielle et Aerospatiale. Method and integrated system for the torque control and energy storage for a space vehicle. 4,188,666, Cl. 364-434.000.
Lehman, Richard F., to Xerox Corporation. Color corrected printing system. 4,188,213, Cl. 430-43.000.
Len, George: *See—*
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, to BASF Aktiengesellschaft. Spiral stirrer unsupported at one end. 4,188,132, Cl. 366-314.000.
Lester, William D.: *See—*
McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., 4,187,923, Cl. 180-215.000.
Levenson, Michael K.: *See—*
Levenson, Sol J.; and Levenson, Michael K., 4,188,192, Cl. 44-39.000.
Levenson, Sol J.; and Levenson, Michael K. Fire igniting method and apparatus. 4,188,192, Cl. 44-39.000.
Lever Brothers Company: *See—*
Clarke, David E.; Davies, James F.; and Tune, John B., 4,188,304, Cl. 252-93.000.
Livingston, Robert M., 4,188,418, Cl. 427-245.000.
Liberman, Anatoly L.: *See—*
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L., 4,187,898, Cl. 164-421.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, 4,188,419, Cl. 427-287.000.
Gerstenkoper, Heinrich; and Juchmann, Heinz, 4,188,637, Cl. 357-79.000.
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.
Lichtenberg, Wolfgang, to Balzers Patent-und Beteiligungs-Aktiegesellschaft. Method of applying a dielectric layer to a substrate and a mask-forming coating for the application of a dielectric layer. 4,188,417, Cl. 427-229.000.
Lin, Tung-Yen; and Yang, Yue-Chyou, to T. Y. Lin International. Method of constructing cooling tower employing precast reinforced concrete panels. 4,187,660, Cl. 52-747.000.
Lind, Fred W., to Timesavers, Inc. Reactive system for accommodating belt stretch and tracking. 4,187,645, Cl. 51-135.0BT.
Lindahl, Herbert S., to Gulf & Western Manufacturing Company. Ice-maker heat pump. 4,187,690, Cl. 62-138.000.
Lindberg, Ulf W.: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.
Lindblad, Oskar L., to Autoliv AB. Device for stretching a band forming part of a safety belt for vehicles. 4,187,925, Cl. 180-268.000.
Linde Aktiengesellschaft: *See—*
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.

Lindsay, Malcolm, to United States of America, Energy. Vertical pump with free floating check valve. 4,188,173, Cl. 417-424.000.
Linear International Corporation: *See—*
Brimer, Claude M., 4,188,552, Cl. 310-13.000.
Linss, Gerhard; and Ossberger, Karl, to Ossberger Turbinenfabrik. Apparatus for manufacturing a blown synthetic hollow body with a closed bottom portion. 4,188,179, Cl. 425-531.000.
L'Instituto Farmaceutico S.p.A.: *See—*
Scolastico, Carlo; and Tronconi, Giovanni, 4,188,484, Cl. 544-317.000.
Lippits, Gerardus J. M.: *See—*
Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., 4,188,433, Cl. 428-64.000.
Lipshaw, Julius. Microscope slide and method for making same. 4,188,246, Cl. 156-57.000.
Lissner, Reinhard: *See—*
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.
Litovits, Theodore Aaron: *See—*
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.
Little, Carl H., to Weber-Knapp Company. Caster bracket and method of forming same. 4,187,578, Cl. 16-29.000.
Litton Business Systems, Inc.: *See—*
Garrido, John A., 4,188,134, Cl. 400-208.000.
Litton Industrial Products, Inc.: *See—*
Pawlow, Roy E., 4,187,747, Cl. 81-177.00G.
Litton Systems, Inc.: *See—*
Knowles, Robert G., 4,188,083, Cl. 339-99.00R.
Liu, Hua-Kuang, to Lumin, Inc. Halftone screen with cell matrix. 4,188,225, Cl. 430-7.000.
Livesay, Richard E., to Caterpillar Tractor Co. Apparatus for rotating track chain bushing. 4,187,744, Cl. 81-3.00R.
Livingston, Robert M., to Lever Brothers Company. Separation process. 4,188,418, Cl. 427-245.000.
Lo, George A.: *See—*
Flanagan, Joseph E.; and Lo, George A., 4,187,781, Cl. 102-38.0CC.
Lochte, Glen E., to FMC Corporation. Remote-controlled flowline connector. 4,188,050, Cl. 285-24.000.
Loeser, Edward A. Airless intravenous fluid system. 4,187,847, Cl. 128-214.00F.
Loeser, Werner: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
LoFurno, Henry J.: *See—*
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.
Lolachi, Houshang; and Carminucci, Robert N., to Union Carbide Corporation. Sterile connectors. 4,187,846, Cl. 128-214.00R.
London Concrete Machinery Co.: *See—*
Pawley, Jess W., 4,188,127, Cl. 366-44.000.
Longanbach, James R.; and Robinson, Leon, to Occidental Petroleum Corporation. Process for reducing the sulfur content of coal and coal char and the ignition temperature of coal char. 4,188,191, Cl. 44-1.00F.
Longobardi, Roberto. Frusto-conical, spiral fuel economization and pollution reduction device for use with carburetors of internal combustion engines. 4,187,819, Cl. 123-141.000.
Loo, Joe P.: *See—*
Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., 4,188,362, Cl. 423-22.000.
Loov, Robert E.: *See—*
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.
Loran, Thomas J., to Storage Technology Corporation. Lubricant for a magnetic member. 4,188,434, Cl. 428-65.000.
Lord Corporation: *See—*
Auerbach, Robert A., 4,188,426, Cl. 427-40.000.
Howard, Dennis D., 4,188,455, Cl. 428-423.100.
Olowinski, Edward J.; and Foster, Leonard W., 4,187,668, Cl. 57-130.000.
Lord, John M., to GTE Automatic Electric Laboratories Incorporated. Telephone hookswitch actuator and handset support assembly. 4,188,512, Cl. 179-100.00C.
Los, Marinus, to American Cyanamid Company. Imidazolinyl benzoic acids, esters and salts and their use as herbicidal agents. 4,188,487, Cl. 548-301.000.
Loveless, Stanley M., to General Gas Light Company. Four-way valve employing fluid spring. 4,187,884, Cl. 137-625.690.
Lowe, Jerry B., to John D. Hollingsworth on Wheels, Inc. Carding machine driving apparatus. 4,187,585, Cl. 19-98.000.
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Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, 4,188,306, Cl. 252-121.000.
Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Pilot fuel ignited stratified charge rotary combustion engine and fuel injector therefor. 4,187,825, Cl. 123-205.000.
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., to Eastman Kodak Company. Phosphorescent screens. 4,188,449, Cl. 428-314.000.
Lucas Industries Limited: *See—*
Bant, John A.; and Raban, Victor J., 4,188,461, Cl. 429-48.000.
Campbell, Graeme R., 4,188,569, Cl. 318-375.000.
Craven, John; and Reilly, Thomas H. M., 4,187,822, Cl. 123-179.00L.
Phillips, Ronald, 4,187,818, Cl. 123-140.00R.
Smith, Trevor S., 4,187,673, Cl. 60-39.28R.
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Bohme, Rolf C.; and Luck, Dieter G., 4,188,165, Cl. 414-694.000.
Lum, Jackson, to Medfare, Inc. Photodetector circuit. 4,188,550, Cl. 307-311.000.
Lumin, Inc.: *See—*
Liu, Hua-Kuang, 4,188,225, Cl. 430-7.000.
Lundahl, Ezra C.; and Wiser, J. Gordon, to Ezra C. Lundahl, Inc. Metering stack feeder and methods. 4,187,990, Cl. 241-30.000.
Lupinski, John H.; and Gorowitz, Bernard, to General Electric Company. Electrostatic-fluidized bed coating of wire. 4,188,413, Cl. 427-30.000.
Lutz, Hermann. Tacking strip or rail. 4,187,656, Cl. 52-273.000.
Lynch, Thomas A.: *See—*
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Lynes, Dennis J., to Bell Telephone Laboratories, Incorporated. Switched-capacitor memory. 4,188,671, Cl. 365-149.000.
Lyons, Bernard J.; and Kim, Young J., to Raychem Corporation. Voltage stable positive temperature coefficient of resistance cross-linked compositions. 4,188,276, Cl. 204-159.170.
Lyons, Thomas B., to Du Pont de Nemours, E. I., and Company. Yarn winding apparatus. 4,187,994, Cl. 242-35.50R.
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, to Macedo, Pedro Buarque de; and Litovits, Theodore Aaron. Joint doping of porous glasses to produce materials with high modifier concentrations. 4,188,198, Cl. 65-3.00A.
Macedo, Pedro Buarque de: *See—*
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.
MacEwan, John D., Jr.: *See—*
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Maeno, Kunio: *See—*
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Magnetic Analysis Corporation: *See—*
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Mailian, Shaen M.: *See—*
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Maisenbacher, Jurgen: *See—*
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Makabe, Machiro: *See—*
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Makosch, Guenter: *See—*
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Malsot, Christian: *See—*
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Mameda, Jun-ichi: *See—*
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Mamers, Heikki; and Rowney, John E., to Commonwealth Scientific and Industrial Research Organization. Recovery of fibre from laminated carton boards. 4,188,259, Cl. 162-4.000.
Mann, Arnold, to VDO Adolf Schindling AG. Electric regulating device. 4,187,734, Cl. 74-405.000.
Manners, David E., to GTE Sylvania Incorporated. Power saving circuit. 4,188,568, Cl. 315-411.000.
Manners, David E.: *See—*
Baker, Scott H.; and Manners, David E., 4,188,641, Cl. 358-190.000.
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L. Mandrel for use in continuous casting of hollow ingots. 4,187,898, Cl. 164-421.000.
Mansmann, Manfred: *See—*
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Manville Manufacturing Corporation: *See—*
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Marca, Gianfranco: *See—*
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Marchal, Gerard: *See—*
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Marchetti, Pasquale F. Orthopedic device. 4,187,869, Cl. 135-67.000.

Margotte, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of flame-retardant polycarbonates. 4,188,475, Cl. 528-175.000.

Marker, Hannes. Safety ski binding. 4,188,045, Cl. 280-614.000.

Markiewitz, Kenneth H.; and Restaino, Alfred J., to ICI Americas Inc. Process for curing unsaturated polyesters utilizing novel initiators. 4,188,349, Cl. 525-366.000.

Markley, Lowell D., to Dow Chemical Company, The. Dehydrohalogenation of (polyhaloalkyl)benzenes. 4,188,346, Cl. 260-651.00F.

Martin, David G., to Upjohn Company, The. Purification of AT-125. 4,188,324, Cl. 548-240.000.

Martin, E. Joel, to Sperry Rand Corporation. Bale restrictive flap. 4,187,941, Cl. 193-5.000.

Martin, Fred L.: *See—*
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Martin, Jerry R.: *See—*
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Martin, Robert B., to Petrolite Corporation. Process for desalting petroleum oils. 4,188,277, Cl. 204-190.000.

Martinez, Sigifred: *See—*
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Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Marvin, Roger L., to Kreonite, Inc. Additive tri-color lamphouse for a photographic printer. 4,188,111, Cl. 355-37.000.

Marvin, Roger L., to Kreonite, Inc. Magnetic film carrier. 4,188,115, Cl. 355-75.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See—*
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.

Mascia, Carmen T., to Continental Group, Inc., The. Adapter ring for dispensing overcap. 4,187,963, Cl. 222-402.130.

Mashimo, Yukio: *See—*
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Masi, Paolo: *See—*
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Massachusetts Institute of Technology: *See—*
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Massie, Norbert A.; and Holly, Sandor, to Rockwell International Corporation. Interferometer. 4,188,122, Cl. 356-349.000.

Mast, Aquila D., to Sperry Rand Corporation. Collection and recycling apparatus for crop particles in a roll forming machine. 4,187,667, Cl. 56-341.000.

Masters, Blake W.; and Moran, Robert D., to United States of America, Navy. Gimbal angle rate feedback by cage coil demodulation. 4,188,570, Cl. 318-616.000.

Masuda, Hironori. Rotatable slide holder. 4,188,101, Cl. 353-95.000.

Masuda, Michio: *See—*
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Mather, George A., to Champion International Corporation. Collapsible container with reinforcing members. 4,187,976, Cl. 229-41.00B.

Matsoian, Stepan G.: *See—*
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Matsuda, Yasuo: *See—*
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Matsui, Hirotoshi, to Sharp Kabushiki Kaisha. Dot matrix impact printer employing magnetic dot elements. 4,188,133, Cl. 400-121.000.

Matsui, Kiyohide: *See—*
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Matsumoto, Yukio: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsushita Electric Works, Ltd.: *See—*
Suzuki, Yasuo; and Hirai, Tosihisa, 4,188,555, Cl. 310-162.000.

Matsuura, Katsuji; and Arai, Kunihito, to Daiichikasei Co., Ltd. Process for treating the surface of glass fibre to impart resistance to alkalis. 4,188,421, Cl. 427-385.00A.

Matsuura, Norio. Device for retaining scaffold member. 4,188,143, Cl. 403-49.000.

Mattoon, Roland W. Apparatus for pumping fluid from a well. 4,187,765, Cl. 92-13.100.

Mattuschka, Werner, to Siemens Aktiengesellschaft. Piezoelectric overtone resonator with at least a convex surface and specific thickness and diameter or diagonal. 4,188,557, Cl. 310-368.000.

Maurer, Fritz; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating arthropods with O-alkyl-O-(6-dialkyl-carbamoyloxy-pyrimidin-4-yl)-(thiono)(thiol)-phosphoric (phosphonic) acid esters and ester-amides. 4,188,383, Cl. 424-200.000.

Maury, Christian: *See—*
Lamare, Jean-Claude; and Maury, Christian, 4,188,620, Cl. 340-347.0DD.

Maybee, Richard C., to Polygauge Industries Ltd. Thermostat regulator. 4,188,604, Cl. 337-377.000.

Mayco Oil and Chemical Company, Inc.: *See—*
Sanson, Henry E., III; and Hartman, Wallace R., Jr., 4,188,300, Cl. 252-48.600.

Mayer, Rudi: *See—*
Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, 4,187,806, Cl. 123-32.0EE.

Mayhall, Donald J.: *See—*
Norman, James L.; and Mayhall, Donald J., 4,188,204, Cl. 75-11.000.

Mayoux, Christian: *See—*
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Mazzorana, Alfred, to Societe de Paris et du Rhone. Unidirectional drive systems. 4,187,728, Cl. 74-6.000.

McAleer, William J.; and Hurni, William M., to Merck & Co., Inc. Method for recovering embryos from embryonated eggs. 4,187,989, Cl. 241-2.000.

McCarty, Leslie P.: *See—*
Larsen, Eric R.; and McCarty, Leslie P., 4,188,405, Cl. 424-342.000.

McClean, Arthur J.; and Montgomery, Kenneth F., to Imperial Chemical Industries Limited. Yarn processing, method and apparatus. 4,188,545, Cl. 250-561.000.

McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., to International Harvester Company. Guide wheel position indicating apparatus. 4,187,923, Cl. 180-215.000.

McCurdy, Robert J., to RCA Corporation. Sampling method and apparatuses. 4,188,583, Cl. 325-163.000.

McDonald, Jimmie R.; and Baronavski, Andrew P., to United States of America, Navy. Radioiodine detector based on laser induced fluorescence. 4,188,120, Cl. 356-318.000.

McDonnell Douglas Corporation: *See—*
Hsia, Yukun, 4,188,670, Cl. 365-49.000.

McEachern, Robert A.: *See—*
Day, Christopher C.; and McEachern, Robert A., 4,187,858, Cl. 128-710.000.

McElroy, David J., to Texas Instruments Incorporated. Static memory cell using field implanted resistance. 4,187,602, Cl. 29-571.000.

McGilvery, James D., to Erco Industries Limited. Manufacture of red phosphorus. 4,188,367, Cl. 423-322.000.

McGrath, William J.: *See—*
Cox, Myron K.; McGrath, William J.; and Cantrill, James E., 4,187,714, Cl. 73-9.000.

McIlwain, Irwin D., to Sperry Rand Corporation. baler pickup counter balancing means. 4,187,666, Cl. 56-341.000.

McKee, William R.: *See—*
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.

McLane, Fredrick G.: *See—*
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.

McMullan, James P.; and Stevens, Albert. Water bed transducer. 4,187,568, Cl. 5-451.000.

Mead Corporation, The: *See—*
Wood, Prentice J., 4,187,944, Cl. 206-187.000.

Meckel, Lothar: *See—*
Gliemeroth, Georg; and Meckel, Lothar, 4,188,089, Cl. 350-96.340.

Medfare, Inc.: *See—*
Lum, Jackson, 4,188,550, Cl. 307-311.000.

Media Arts Workshop Inc.: *See—*
Prichett, Harry W., 4,188,100, Cl. 353-95.000.

Medtronic, Inc.: *See—*
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.

Meek, Nigel W.; and Ramsay, Jeffrey S., to Sperry Rand Corporation. Agricultural machine structure. 4,187,664, Cl. 56-13.600.

Meeker, Marlene F. Combination harness and coverlet for infant seats. 4,188,065, Cl. 297-485.000.

Meggle Milchindustrie GmbH & Co. KG: *See—*
Engl, Robert; and Richter, Hans, 4,188,386, Cl. 424-249.000.
Kuipers, Arie; and Schroder, Karl, 4,188,411, Cl. 426-582.000.

Mehoudar, Raphael. Pressure regulators. 4,187,873, Cl. 137-505.130.

Meijer, Dietrich E.: *See—*
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.

Meiji Seika Kaisha, Ltd.: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.

Meissner, Bernd: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.

Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., to A. H. Robins Company, Incorporated. Process for tempering tissue for heparin production. 4,188,467, Cl. 435-274.000.

Meli, Alberto: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., to Vsesojuzny Nauchno, et al. Thiazolinyl (thiazolyl) phosphonamidates and phosphoramidates pesticidal and herbicidal compositions based thereon. 4,188,382, Cl. 424-200.000.

Melvin, Lawrence S., Jr.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.

Memorex Corporation: *See—*
Guerini, Albert J., 4,188,648, Cl. 360-105.000.

Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Hydrogenation of cyclopentadiene to form cyclopentene. 4,188,348, Cl. 585-274.000.

Mentor Corporation: *See—*
Hauser, Thomas M., 4,187,851, Cl. 128-295.000.

Mercer, Donald G.: *See—*
DeBernard, Lewis M., Jr.; and Mercer, Donald G., 4,188,430, Cl. 428-88.000.

Mercier-Greenwood, Christiane: *See—*
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, 4,188,466, Cl. 435-18.000.

Merck & Co., Inc.: *See—*
McAleer, William J.; and Hurni, William M., 4,187,989, Cl. 241-2.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.

Meredith, Harold F., to Meredith Manufacturing Co. Limited. Fencing construction. 4,188,019, Cl. 256-24.000.

Meredith Manufacturing Co. Limited: *See—*
Meredith, Harold F., 4,188,019, Cl. 256-24.000.

Meri, Kalju; and Allen, Richard G., to Dictaphone Corporation. Remotely controlled telephone answering apparatus. 4,188,507, Cl. 179-6.00D.

Merianos, John J.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.

Mermi, Kurt: *See—*
Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, 4,187,757, Cl. 85-80.000.

Merrick, George J.; Cook, George E.; and Modglin, Donald D., to Merrick Welding International. Welding torch oscillation apparatus. 4,188,525, Cl. 219-125.120.

Merrick Welding International: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Messer Griesheim GmbH: *See—*
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,956, Cl. 220-465.000.

Metal Box Limited: *See—*
Throp, Arnold M., 4,188,457, Cl. 428-542.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Kruske, Gerhard, 4,188,209, Cl. 75-122.000.

Metzler, Robert A., Jr. Chess word game. 4,188,035, Cl. 273-260.000.

Meyer, Horst: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Meyer, Thomas N.: *See—*
United States of America, National Aeronautics and Space Administration; Wolf, Charles B.; and Meyer, Thomas N., 4,188,368, Cl. 423-350.000.

Mhatre, Girish P.; and Brooks, Robert A., to Magnetic Analysis Corporation. Pulse eddy current testing apparatus for magnetic materials, particularly tubes. 4,188,577, Cl. 324-220.000.

Michlmayr, Manfred J., to Chevron Research Company. Selective process for removal of thiophenes from gasoline using a silver-exchanged faujasite-type zeolite. 4,188,285, Cl. 208-246.000.

Miciukiewicz, Joseph F., to Pitney Bowes Inc. Document handling apparatus and drive control. 4,188,028, Cl. 271-265.000.

Microtracers Inc.: *See—*
Eisenberg, Sylvan, 4,188,408, Cl. 426-74.000.

Mid-Florida Pools and Repair, Inc.: *See—*
Burnett, Willis R., 4,188,295, Cl. 210-206.000.

Midland-Ross Corporation: *See—*
Wilhelm, Larry A., 4,187,717, Cl. 73-46.000.

Midolo, Lawrence L. Liquid cooled rotary vane air cycle machine. 4,187,692, Cl. 62-402.000.

Midolo, Lawrence L. Binary working fluid air conditioning system. 4,187,694, Cl. 62-402.000.

Midrex Corporation: *See—*
Beggs, Donald; and Escott, Robert M., 4,188,022, Cl. 266-195.000.

Mignonac, Sylviane S. J., born Mondon: *See—*
Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, 4,188,388, Cl. 424-250.000.

Mikhailov, Gennady G.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.

Miles Laboratories, Inc.: *See—*
Shemer, Michael, 4,188,399, Cl. 426-276.000.

Miller, Bruce H., to Simco Company, Inc., The. Light-shielded extended-range static eliminator. 4,188,530, Cl. 250-324.000.

Miller, Clarence S., Jr.; and Hager, Richard A., to Hercofina. Heat exchange apparatus. 4,187,902, Cl. 165-76.000.

Miller, David L.: *See—*
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.

Miller, Donald L., to Facet Enterprises, Inc. Electromagnetic clutch with anti-jam cam actuation. 4,187,938, Cl. 192-54.000.

Miller, Gary M.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.

Miller, Larence G.; and Purmal, Rowland B. Garbage can alarm. 4,188,622, Cl. 340-571.000.

Miller, Leroy J.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,188,337, Cl. 260-465.00D.

Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, to Orebro Pappersbruks AB. Producing a continuous flexible sheet covering material for wrapping heat, cold and sound insulation. 4,188,248, Cl. 156-164.000.

Milosevic, Ljubimko, to Thomson-CSF. Method of and system for avoiding collisions between aircraft. 4,188,630, Cl. 343-9.00R.

Minoura, Mikio: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Mioduski, Victoria F. Personal urinal device for females. 4,187,562, Cl. 4-144.300.

Mislin, Roland; and Steiner, Karl-Ulrich, to Sandoz Ltd. Dyeing of polyamide textiles and anthraquinone dyestuffs therefor. 4,188,187, Cl. 8-39.00B.

Mitchell, Lawrence C.: *See—*
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., 4,188,496, Cl. 568-723.000.

Mitchell, Robert W. Photographic print processing system. 4,188,107, Cl. 354-328.000.

Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., to Abbott Laboratories. Intermediates for the preparation of prostaglandins and prostaglandin analogs from a mold metabolite. 4,188,329, Cl. 260-343.30P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.

Mitsui Petrochemical Industries, Ltd.: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.

Miura, Michiyori, to Hitachi, Ltd. Elastic surface wave device. 4,188,596, Cl. 333-151.000.

Miwa, Hirohide; and Terakawa, Toshiaki, to Fujitsu Limited. Method for detecting coordinates of gas discharge panels and apparatus for carrying out the same. 4,188,566, Cl. 315-169.400.

Miyata, Nobuyoshi: *See—*
Nezu, Tuguo; and Miyata, Nobuyoshi, 4,188,222, Cl. 96-115.00P.

Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, to Sharp Kabushiki Kaisha. Oxygen atom containing film for a thin-film electroluminescent element. 4,188,565, Cl. 313-509.000.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.

Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, to Citizen Watch Co., Ltd. Multiple inked ribbon color changeover mechanism for printing machine. 4,188,135, Cl. 400-214.000.

Mkrtchian, Foerbakh V.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A. Method for treating epilepsy. 4,188,398, Cl. 424-274.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Lang, William H., 4,188,336, Cl. 260-449.00R.
Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 4,188,235, Cl. 106-278.000.
Holmes, Billy G.; and Crofford, Jimmie, 4,188,068, Cl. 299-5.000.
Yan, Tsoung-Yuan, 4,188,279, Cl. 204-294.000.

Mobile Oil Corporation: *See—*
Tabak, Samuel A.; and Morrison, Roger A., 4,188,282, Cl. 208-134.000.

Modglin, Donald D.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Moench, Theodor P.: *See—*
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.
Moertel, George B., to Textron Inc. Method of manufacturing slide fastener stringers. 4,187,791, Cl. 112-265.200.
Mole-Richardson Co.: *See—*
Aron, Daniel L., 4,188,658, Cl. 362-396.000.
Mollendorf, Ralf: *See—*
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.
Mollering, Hans: *See—*
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Retrofocus type wide-angle objective lens. 4,188,092, Cl. 350-214.000.
Monarch Marking Systems, Inc.: *See—*
Grass, Joseph J., 4,188,250, Cl. 156-253.000.
Grass, Joseph J.; and Monarch Marking Systems, Inc., 4,188,251, Cl. 156-248.000.
Grass, Joseph J., 4,188,427, Cl. 428-41.000.
Moncur, Marlowe V.: *See—*
Woodbrey, James C.; and Moncur, Marlowe V., 4,188,223, Cl. 430-270.000.
Monk, Gaines W., to Commonwealth Scientific Corporation. Method and apparatus for transporting workpieces. 4,187,801, Cl. 118-729.000.
Mono-Med, Inc.: *See—*
Stach, Paul E.; and Sherrin, Thomas P., 4,187,890, Cl. 141-27.000.
Monroe, Tex K., to GTE Sylvania Incorporated. Constant-current vertical amplifier. 4,188,567, Cl. 315-396.000.
Monsanto Company: *See—*
Chupp, John P., 4,188,342, Cl. 260-578.000.
Woodbrey, James C.; and Moncur, Marlowe V., 4,188,223, Cl. 430-270.000.
Montedison S.p.A.: *See—*
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Montgomery, John A., to United States of America, Health, Education and Welfare. Anticancer and antiviral activity of 9-β-D-arabinofuranosyl-2-fluoroadenine. 4,188,378, Cl. 424-180.000.
Montgomery, Kenneth F.: *See—*
McClean, Arthur J.; and Montgomery, Kenneth F., 4,188,545, Cl. 250-561.000.
Moody, Roy A.: *See—*
Fulton, Ronald T.; and Moody, Roy A., 4,188,004, Cl. 248-74.0PB.
Moore, Donald C.: *See—*
Faulkner, Bobby P.; and Moore, Donald C., 4,188,287, Cl. 209-168.000.
Moran, Robert D.: *See—*
Masters, Blake W.; and Moran, Robert D., 4,188,570, Cl. 318-616.000.
Moreau, Claude; and Schreder, Rene, to Ateliers et Chantiers de Bretagne-A.C.B. Small size telemanipulator. 4,188,166, Cl. 414-735.000.
Mori, Ikuo; and Yoshida, Kenichi, to Kabushiki Kaisha Komatsu Seisakusho. Control mechanism for hydraulic system. 4,187,737, Cl. 74-471.0XY.
Mori, Sanae, to Daido Metal Company Ltd. Multiple-layer metal bearing for use in a large-size engine. 4,188,079, Cl. 308-237.00R.
Mori, Toshinori: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Morinaga, Teruhiko; and Nishikawa, Ikuo, to Toyo Kogyo Co., Ltd. Weather-tight seal structures for automobile windows. 4,187,642, Cl. 49-406.000.
Moring, James M., to Eastman Kodak Company. Electrical chemical process for the removal of hexavalent chromium from aqueous medium. 4,188,272, Cl. 204-149.000.
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, to Nippon Electric Co., Ltd. CCD Imager operable in single frame and repetitive frame modes. 4,188,642, Cl. 358-213.000.
Morita, Takashi: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Moritz, Alfred: *See—*
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, 4,187,827, Cl. 125-16.00R.
Moritz, Frederick G.: *See—*
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,187,997, Cl. 242-182.000.
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., to Northern Telecom Limited. Electret microphone with simplified electrical connections by printed circuit board mounting. 4,188,513, Cl. 179-111.00E.
Morrison, Roger A.: *See—*
Tabak, Samuel A.; and Morrison, Roger A., 4,188,282, Cl. 208-134.000.
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G. Vacuum control system for magnetic tape handler. 4,187,997, Cl. 242-182.000.
Moshofsky, Jerome F.: *See—*
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.
Moss, Philip H.: *See—*
Waddill, Harold G.; and Moss, Philip H., 4,188,474, Cl. 528-111.000.
Motorola, Inc.: *See—*
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.
Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, 4,187,599, Cl. 29-588.000.
Johnson, Robert H., 4,188,629, Cl. 343-6.50R.
Palmer, James R., 4,188,587, Cl. 330-136.000.
Motosugi, Katsuhiko: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Mott, Gerald, to Westinghouse Electric Corp. Low frequency hydrophone. 4,188,609, Cl. 367-152.000.
Mounteer, Carlyle A.; and Poteet, Ronald L., to Gulton Industries, Inc. Process for fabricating strain gage transducer. 4,188,258, Cl. 156-628.000.
Mouzin, Gilbert: *See—*
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.
Mowill, Jan. Impeller element or radial inflow gas turbine wheel. 4,188,169, Cl. 416-185.000.
Moyer, Rudolph H.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., to W. R. Grace & Co. Multi-layer polyester/-polyolefin shrink film. 4,188,443, Cl. 428-216.000.
Mukai, Yositaka: *See—*
Saruwatari, Teturo; and Mukai, Yositaka, 4,187,895, Cl. 157-1.550.
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, to Tecneco S.p.A. Method for the preparation of asymmetrical membranes. 4,188,354, Cl. 264-22.000.
Munchow, Peter; and Kaiser, Walter, to International Standard Electric Corporation. Tone signalling arrangement for a telecommunications exchange. 4,188,509, Cl. 179-18.0AD.
Muntean, George L.: *See—*
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.
Murakami, Takeshi: *See—*
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, to Hitachi, Ltd. Video synchronous detector apparatus. 4,188,639, Cl. 358-25.000.
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, to Tokyo Shibaura Electric Co., Ltd.; and Tokyo Shibaura Electric Co. Ltd. Input control method and means for nitrogen oxide removal means. 4,188,190, Cl. 23-232.00R.
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, to Nissan Chemical Industries, Ltd. Process for producing linalool. 4,188,498, Cl. 568-875.000.
Murphy, Wesley T., to E.T.I. Corporation. Quick set clip for partition studs. 4,188,147, Cl. 403-230.000.
N.A.D., Inc.: *See—*
Schreiber, Peter J., 4,187,842, Cl. 128-202.220.
N. V. Hollandse Signaalapparaten: *See—*
Hoogstraate, Hendrik, 4,188,584, Cl. 325-446.000.
Nabeyama, Hiroaki: *See—*
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.
Nagai, Kazumasa, to Ryobi, Ltd. Paper sheet feeding device. 4,188,026, Cl. 271-148.000.
Nagano, Kazuo: *See—*
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, 4,188,343, Cl. 260-571.000.
Nagatanien Honpo Co., Ltd.: *See—*
Yoshimura, Tetsuya, 4,187,798, Cl. 116-206.000.
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., to International Business Machines Corporation. Programmable communications subsystem. 4,188,665, Cl. 364-200.000.
Naito, Hiroyuki: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Nakabayashi, Satoru: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.
Nakajima, Takao: *See—*
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.
Nakamoto, Hiromasa: *See—*
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Nakamura, Shin: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Nakamura, Shozo: *See—*
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, to Meiji Seika Kaisha, Ltd. Process for the production of a 9,3″-di-acyl derivative of a macrolide antibiotic. 4,188,480, Cl. 536-17.000.
Nakao, Kiyoshi: *See—*
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.
Nakao, Yoshiaki: *See—*
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.
Nakatsu, Daniel T. Rope-suspended shelving unit. 4,187,787, Cl. 108-96.000.
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, to Olympus Optical Co., Ltd. Device for manufacturing photosensitive screen. 4,187,800, Cl. 118-724.000.
Nalco Chemical Company: *See—*
Adams, Paul G.; and Gebler, Kenneth A., 4,188,416, Cl. 427-135.000.
Reven, Frederick V., 4,188,229, Cl. 106-68.000.
Nanda, Vinod K., to Gould Inc. Overload relief valve. 4,187,763, Cl. 91-176.000.
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, to Toyo Boseki Kabushiki Kaisha. Photosensitive polyamide resin composition useful for making relief printing plate. 4,188,221, Cl. 430-288.000.
Nanya, Takanori: *See—*
Nishimura, Katsuo; and Nanya, Takanori, 4,188,095, Cl. 350-357.000.
Napoli, Joseph L., Jr.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.
Narita, Seiichi; and Kumita, Norio, to Nippondenso Co., Ltd. Collision detecting inertia switch. 4,188,517, Cl. 200-61.45R.
Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, to Victor Company of Japan, Limited. Magnetic recording composition. 4,188,301, Cl. 252-62.540.
Nasser, Benny E., Jr.; and Delap, Joseph A., to Phillips Petroleum Company. Organochromium on titanium-impregnated base as olefin polymerization catalyst. 4,188,471, Cl. 526-96.000.
National Cellulose Corporation: *See—*
Boyer, Harold, 4,187,983, Cl. 239-9.000.
National Distillers and Chemical Corporation: *See—*
Hinnenkamp, James A.; and Scheben, John A., 4,188,490, Cl. 560-245.000.
National Institute for Metallurgy: *See—*
Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., 4,188,362, Cl. 423-22.000.
National Semiconductor Corporation: *See—*
Burns, Carmen D., 4,188,438, Cl. 428-209.000.
Naumann, Reinhard. Apparatus for laterally positioning sheets in printing machines or the like. 4,188,027, Cl. 271-241.000.
NCR Corporation: *See—*
Patel, Rashmikant R., 4,188,456, Cl. 428-530.000.
Rauscher, Tomlinson G., 4,188,669, Cl. 364-900.000.
Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer: *See—*
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.
Nedila, Walter. Device for use in picking berries. 4,187,665, Cl. 56-330.000.
Needham, Riley B.: *See—*
Cornelius, Archie J.; and Needham, Riley B., 4,187,910, Cl. 166-305.00R.
Neefe, Charles W. Method of making aspheric lenses. 4,188,353, Cl. 264-1.000.
Nelson, David E., to Hydroacoustics, Inc. Method of and apparatus for the generation and transmission of signals for echolocation and other signalling purposes, such as in geophysical exploration. 4,188,610, Cl. 367-14.000.
Nelson, Donald L., to Dow Chemical Company, The. High temperature polymers. 4,188,473, Cl. 528-86.000.
Nelson, Donald W.: *See—*
Thiewes, Richard B.; and Nelson, Donald W., 4,188,644, Cl. 360-14.000.
Nelson, John J.: *See—*
Ippoliti, Ralph J.; and Nelson, John J., 4,187,703, Cl. 70-63.000.
Nelson, Norman A., to Upjohn Company, The. Phenyl-substituted 5,6-dihydro-prostacyclin analogs. 4,188,468, Cl. 542-429.000.
Nelson Research & Development Company: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,188,394, Cl. 424-262.000.
Netzer, Henry A. Large sailboat visibility improvements. 4,188,093, Cl. 350-303.000.
Neumann, Peter, to Sandoz Ltd. Treating spastic conditions or relaxing muscles. 4,188,393, Cl. 424-258.000.
Neumann, Robert A.: *See—*
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.
Nevins, Robert L. Method and apparatus for manufacturing a solar energy collector. 4,187,596, Cl. 29-157.30C.
Nevitt, James S., to Bendix Corporation, The. Method and apparatus for dimensional gaging with fluid pressure. 4,187,715, Cl. 73-37.900.
Newalls Insulation Company Limited: *See—*
Graham, Robert; and Hall, Philip S., 4,188,355, Cl. 264-26.000.
Newmont Exploration Limited: *See—*
Guay, Wilbur J., 4,188,208, Cl. 75-105.000.
Newton, Paul P.: *See—*
Silvestrini, Richard L.; and Newton, Paul P., 4,187,939, Cl. 192-84.00C.
Nezu, Tuguo; and Miyata, Nobuyoshi, to Kansai Paint Co., Ltd. Photocurable composition containing an N-nitrosodiarylamine. 4,188,222, Cl. 96-115.00P.
Nicholson, John S.; and Turner, John L., to Boots Company Limited, The. Preparation of therapeutic compounds. 4,188,491, Cl. 562-492.000.
Nicolai, Carl R.; Raike, William M.; and Miller, David L., to Telesync Corporation. Secure communication system. 4,188,580, Cl. 325-32.000.
Nielsen, Edwin A., to Ideal Toy Corporation. Toy vehicle. 4,187,637, Cl. 46-262.000.
Nihon Dixie Company, Limited: *See—*
Suzuki, Shoichi, 4,187,768, Cl. 93-39.10R.
Nikolaeva, Tatyana A.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Nippon Electric Co., Ltd.: *See—*
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.
Okano, Yasunobu, 4,187,670, Cl. 58-23.00R.
Sato, Susumu; and Shiba, Hiroshi, 4,188,636, Cl. 357-71.000.
Tan, Yoichi, 4,188,615, Cl. 340-146.10R.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Sawada, Shuichi, 4,188,316, Cl. 260-40.00R.
Nippon Kokan Kabushiki Kaisha: *See—*
Takahashi, Nobuhiro; and Hirata, Kenichi, 4,188,243, Cl. 148-155.000.
Nippon Soken, Inc.: *See—*
Egami, Tsuneyuki, 4,188,586, Cl. 329-192.000.
Nippon Steel Corporation: *See—*
Watanabe, Kunio; and Hashimoto, Yoshio, 4,188,241, Cl. 148-12.00F.
Nippondenso Co., Ltd.: *See—*
Narita, Seiichi; and Kumita, Norio, 4,188,517, Cl. 200-61.45R.
Nirasawa, Mitsuharu: *See—*
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.
Nishikawa, Ikuo: *See—*
Morinaga, Teruhiko; and Nishikawa, Ikuo, 4,187,642, Cl. 49-406.000.
Nishikawa, Masaji: *See—*
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.
Nishikawa, Yashuhisa: *See—*
Kanai, Takao; and Nishikawa, Yashuhisa, 4,187,729, Cl. 74-10.900.
Nishimura, Katsuo; and Nanya, Takanori, to Citizen Watch Co., Ltd. Liquid type display cells and method of manufacturing the same. 4,188,095, Cl. 350-357.000.
Nissan Chemical Industries, Ltd.: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, 4,188,343, Cl. 260-571.000.
Nissan Motor Company, Limited: *See—*
Hosaka, Akio; and Aono, Shigeo, 4,187,812, Cl. 123-119.0EC.
Yama, Toshio; and Shimizu, Kazuaki, 4,188,074, Cl. 303-92.000.
Nissel, Gunthard: *See—*
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.
Nitto Chemical Industry Co., Ltd.: *See—*
Yamaguchi, Yasumasa; and Kohno, Kazuo, 4,188,339, Cl. 260-561.00N.
Niwa, Makoto: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
NL Industries, Inc.: *See—*
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.
Noda, Masaru: *See—*
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.
Nopanen, Esko J., to General Electric Company. Food grinder. 4,187,993, Cl. 241-89.200.
Norman, James L.; and Mayhall, Donald J., to Falconbridge Nickel Mines Limited. Metallurgical process using liquid fuels. 4,188,204, Cl. 75-11.000.
North Oakland Development Corporation: *See—*
Blachura, Leon, 4,187,659, Cl. 52-745.000.
Northern Telecom Limited: *See—*
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., 4,188,513, Cl. 179-111.00E.
Northrop, Richard A., Jr.; and Wanat, David J., to Century Brass Products, Inc. Thermal power element with safety lockup. 4,187,683, Cl. 60-527.000.
Norton, Charlie L., to Dan River Inc. Drive mechanism for a sewing machine puller wheel. 4,187,795, Cl. 112-318.000.

Nose, Takashi: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Noshi, Yoshibumi: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.

NTN Toyo Bearing Co. Ltd.: *See—*
Tsukumo, Zenzaburo, 4,187,588, Cl. 19-281.000.

Nusser, Hermann: *See—*
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.

Nuwayser, Elie S.; and Barrington, James E., to Abcor, Inc. Implantable penile prosthesis. 4,187,839, Cl. 128-79.000.

N.V. Hollandse Signaalapparaten: *See—*
Langeraar, Huibert B.; and Van Rooijen, Gerrit, 4,188,628, Cl. 343-5.0SA.

NYA AB Nyhems Mekaniska Verkstad: *See—*
Rex, Gert I., 4,187,995, Cl. 242-107.40A.

Nyce, Andrew C. Implantable teeth and method of making. 4,187,608, Cl. 433-201.000.

Nyman, Bengt E. Power regenerative transmission. 4,187,741, Cl. 74-751.000.

Occidental Petroleum Corporation: *See—*
Longanbach, James R.; and Robinson, Leon, 4,188,191, Cl. 44-1.00F.

O'Connor, Robert J., to Bell Telephone Laboratories, Incorporated. Modular jack converter. 4,188,505, Cl. 179-1.0PC.

Ogee Alsthom: *See—*
Cailloux, Michel, 4,188,659, Cl. 363-37.000.

Ogita, Tamotu: *See—*
Katoh, Kenji; and Ogita, Tamotu, 4,187,811, Cl. 123-119.00A.

Ohashi, Yoshio: *See—*
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.

O'Hern, Thomas R. Brake operated shift lock. 4,187,935, Cl. 192-4.00A.

Ohkura, Yosuke: *See—*
Kamachi, Shinichi; and Ohkura, Yosuke, 4,188,320, Cl. 260-202.000.

Ohlinger, Manfred: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.

Ohloff, Gunther: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.

Ohlson, John F. Coupling for misaligned shafts. 4,187,698, Cl. 64-9.00R.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Reel seat for fishing rods. 4,187,633, Cl. 43-22.000.

Ohninata, Ichiro, to Hitachi, Ltd. Semiconductor switching circuit. 4,188,548, Cl. 307-252.00C.

Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, to Toyoda Gosei Co., Ltd. Metal carrier for trim. 4,188,424, Cl. 428-572.000.

Ohno, Yukihiro: *See—*
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.

Ohtsuki, Tomonari: *See—*
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.

Ohya, Kazuo: *See—*
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.

Oil-Dri Corporation of America: *See—*
Valenta, Rudolph C., 4,187,803, Cl. 119-1.000.

Okamoto, Kouji: *See—*
Urry, Dan W.; and Okamoto, Kouji, 4,187,852, Cl. 128-334.00R.

Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Company, Limited. Tape cassette. 4,187,998, Cl. 242-199.000.

Okano, Yasunobu, to Nippon Electric Co., Ltd. Time signal generator circuit for use in an electronic timepiece. 4,187,670, Cl. 58-23.00R.

Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, to Hitachi, Ltd. Protective device of a current source inverter. 4,188,663, Cl. 363-51.000.

Okawara, Yasuo: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.

Oliver, Leland W.: *See—*
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.

Olmstead, Edward A., to Black Bocs, Ltd. Computer performance measurement device and process. 4,187,726, Cl. 73-660.000.

Olowinski, Edward J.; and Foster, Leonard W., to Lord Corporation. Adjustable support system. 4,187,668, Cl. 57-130.000.

Olsson, Hans O. Lockable swivel coupling. 4,188,142, Cl. 403-31.000.

Olympus Optical Co., Ltd.: *See—*
Fujii, Toru, 4,188,091, Cl. 350-201.000.
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.

Omnetics, Inc.: *See—*
Lambert, Roger T., 4,187,745, Cl. 81-9.510.

Omura, Yoshio: *See—*
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.

O'Neal, Douglas: *See—*
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.

O'Neil, Scott M.; and Payne, Howard H., to United States of America, Navy. Bi-metallic thermal compensator for mounting a solid propellant grain. 4,187,676, Cl. 60-255.000.

Onisko, Bruce L.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.

Ono, Tomoyuki. Molding process for a natural fruit of a fruit-tree or vegetable, a molding frame therefor and molded above fruit. 4,187,639, Cl. 47-58.000.

Oonishi, Toshinari: *See—*
Kobayashi, Toshihiko; and Oonishi, Toshinari, 4,187,815, Cl. 123-122.00H.

Oranje, Pieter J. D.: *See—*
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.

Orebro Pappersbruks AB: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.

Orr Felt Company, The: *See—*
Diehl, Pieter S., 4,187,618, Cl. 34-243.00F.

Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclopentan-1-amines. 4,188,403, Cl. 424-330.000.

Ortho Pharmaceutical Corporation: *See—*
Wachter, Michael P., 4,188,328, Cl. 260-340.90R.

Osmers, Herman R.: *See—*
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.

Ossberger, Karl: *See—*
Linss, Gerhard; and Ossberger, Karl, 4,188,179, Cl. 425-531.000.

Ossberger Turbinenfabrik: *See—*
Linss, Gerhard; and Ossberger, Karl, 4,188,179, Cl. 425-531.000.

Ossin, David I.: *See—*
Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., 4,188,362, Cl. 423-22.000.

Oswald, Alexis A., to Exxon Research & Engineering Co. Surface active quaternary higher dialkyl phosphonium salt biocides and intermediates. 4,188,380, Cl. 424-198.000.

Ott, Anton: *See—*
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.

Outboard Marine Corporation: *See—*
Hansen, Loren F., 4,188,164, Cl. 414-447.000.

Ovsepian, Lavrenty A.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Owens-Corning Fiberglas Corporation: *See—*
Foley, Kevin M.; and Hill, Homer G., 4,188,454, Cl. 428-391.000.

Owens-Illinois, Inc.: *See—*
Berg, Charles A., 4,187,688, Cl. 62-2.000.
Boling, Norman L., 4,188,238, Cl. 136-89.0FC.
Boling, Norman L., 4,188,239, Cl. 136-89.0FC.
Go, Santos W., 4,188,357, Cl. 264-540.000.

Owens, William W.: *See—*
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.

P. R. Mallory & Co., Inc.: *See—*
Kang, Hong Y.; and Bro, Per, 4,188,460, Cl. 429-7.000.

Pace Incorporated: *See—*
Vella, Alexander J., 4,187,972, Cl. 228-20.000.

Packaging Systems, Inc.: *See—*
Cochran, Donald D., 4,187,662, Cl. 53-381.00A.

Pagano, Carmine N.; and Di'Giorgio, Anthony D., to United States of America, Army. Digital data communications system. 4,188,503, Cl. 178-88.000.

Palau, Joseph, to S.A. des Etablissements Staubli. Dobby for the formation of the shed on looms. 4,187,886, Cl. 139-68.000.

Palmer, Ansell W.; and Stevens, Francis J., to General Electric Company. Key operated meter access lock and reset mechanism. 4,188,575, Cl. 324-103.00R.

Palmer, James R., to Motorola, Inc. Linear gain control apparatus utilizing feed forward level control. 4,188,587, Cl. 330-136.000.

Panduit Corp.: *See—*
Fulton, Ronald T.; and Moody, Roy A., 4,188,004, Cl. 248-74.0PB.

Panlaqui, Clayton E.: *See—*
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,187,761, Cl. 89-1.50R.

Papa, Franco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Inductance coil for telecommunication system and method of making same. 4,188,599, Cl. 333-219.000.

Parker-Hannifin Corporation: *See—*
Burge, Donald G., 4,188,051, Cl. 285-104.000.

Pasanen, Pertti. Means for accelerating the speed on a ski jump. 4,188,018, Cl. 254-175.300.

Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, to Ing. C. Olivetti & C., S.p.A. Method and apparatus for correctably printing characters with sublimable ink. 4,188,139, Cl. 400-696.000.

Pasternack, Adalbert: *See—*
Warncke, Ernst; and Pasternack, Adalbert, 4,187,843, Cl. 128-202.260.

Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., to Westinghouse Electric Corp. Telescoping disconnect switch with gasketed covered access port. 4,188,514, Cl. 200-48.00R.

Patel, Jayant M.; and Farley, James R., to Westinghouse Electric Corp. Telescoping disconnect switch with low resistance center conductor. 4,188,515, Cl. 200-48.00R.

Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., to Westinghouse Electric Corp. Telescoping disconnect switch with high current contact system. 4,188,516, Cl. 200-48.00R.

Patel, Rashmikant R., to NCR Corporation. Pressure-sensitive recording sheet. 4,188,456, Cl. 428-530.000.

Patuzzi, Alexander; and Eysn, Manfred, to Voest-Alpine Aktiengesellschaft. Metallurgical vessel cooling and safety system. 4,188,021, Cl. 266-88.000.

Pauley, Eugene E. Fireplace heat exchanger assembly. 4,187,829, Cl. 126-121.000.

Pauli, Harry P. Retractable patio assembly for recreational vehicle. 4,188,057, Cl. 296-162.000.

Paulus, Cornelia A.; and Paulus, Nancy E. Garment for use after breast surgery. 4,187,855, Cl. 128-427.000.

Paulus, Nancy E.: *See—*
Paulus, Cornelia A.; and Paulus, Nancy E., 4,187,855, Cl. 128-427.000.

Pauly, Ronald R., to Tonka Corporation. Camping trailer. 4,187,636, Cl. 46-201.000.

Pawley, Jess W., to London Concrete Machinery Co. Mixing blades of concrete mixing drums. 4,188,127, Cl. 366-44.000.

Pawlow, Roy E., to Litton Industrial Products, Inc. Quick release mechanism for socket wrench. 4,187,747, Cl. 81-177.00G.

Payne, David T.; and Brand, Boris P., to Imperial Chemical Industries Limited. Stable liquid compositions containing salts of 1,2-benzisothiazolin-3-one. 4,188,376, Cl. 424-173.000.

Payne, Howard H.: *See—*
O'Neil, Scott M.; and Payne, Howard H., 4,187,676, Cl. 60-255.000.

Pederson, Brian L.; and Pederson, Stephen F. Log trailer assembly. 4,188,042, Cl. 280-404.000.

Pederson, Stephen F.: *See—*
Pederson, Brian L.; and Pederson, Stephen F., 4,188,042, Cl. 280-404.000.

Peet, Gale P. Gas can transporter. 4,187,950, Cl. 414-421.000.

Pegel, Karl H., to Roecar Holdings (Netherlands Antilles) N.V. Sterolins and their use. 4,188,379, Cl. 424-182.000.

Pelton, Peter G., to Continental Group, Inc., The. Propellantless aerosol dispensing system. 4,187,959, Cl. 222-94.000.

Pennella, Filippo: *See—*
Rycheck, Mark R.; and Pennella, Filippo, 4,188,501, Cl. 585-643.000.

Percarpio, Edward P., to Becton, Dickinson and Company. Cannula pierceable, self-sealing closure. 4,187,952, Cl. 215-247.000.

Pereira, Joseph K.; and White, Martin, to British Steel Corporation. Regenerators. 4,187,900, Cl. 165-8.000.

Peripheral Dynamics, Inc.: *See—*
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.

Perkin-Elmer Corporation, The: *See—*
Hall, Lawrence G.; and Whistler, Wayne J., 4,187,856, Cl. 128-635.000.

Perkins Engines Limited: *See—*
Herenius, Frederik J., 4,187,678, Cl. 60-321.000.

Perkins, Gerald S., to California Institute of Technology. Wear resistant valve. 4,188,174, Cl. 417-432.000.

Perkins, William C., to Rockwell International Corporation. Transformer arrangement for coupling a communication signal to a three-phase power line. 4,188,619, Cl. 340-310.00R.

Permacor, Inc.: *See—*
Tsoutsas, Peter A., 4,188,603, Cl. 336-75.000.

Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, to Abbott Laboratories. Prostaglandin derivatives. 4,188,331, Cl. 260-343.600.

Perrella, Emilio. Pill-box display stand. 4,187,948, Cl. 211-71.000.

Persoons, Cornelis J.: *See—*
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.

Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, to A. Menarini S.A.S. Derivatives of 2-oxazolydone and methods for preparing the same. 4,188,323, Cl. 548-229.000.

Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, to Robert Bosch GmbH. Mechanism for holding and guiding a pivoting member. 4,188,144, Cl. 403-104.000.

Peterson, John M.: *See—*
Hall, William C.; and Peterson, John M., 4,188,232, Cl. 106-97.000.

Peterson, Ted S. Tire traction device. 4,187,894, Cl. 152-222.000.

Peterson, Warren E., to Wilshire Bedding Co., Inc. Water mattress construction. 4,187,566, Cl. 5-451.000.

Petrini Poli, Denis, to Babbitless. Unloading. 4,187,991, Cl. 241-33.000.

Petro, John D.: *See—*
Hodgson, Robert F.; and Petro, John D., 4,187,877, Cl. 137-596.000.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.

Petrolite Corporation: *See—*
Martin, Robert B., 4,188,277, Cl. 204-190.000.
Quinlan, Patrick M., 4,188,359, Cl. 422-12.000.

Petroskey, Paul W.: *See—*
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.

Petrovic, John E., to Teledyne Industries, Inc. Sprayer. 4,187,986, Cl. 239-449.000.

Petruccelli, Guy S., to Ensign-Bickford Company. Detonating cord and blasting cap connector block. 4,187,780, Cl. 102-28.00R.

Petty, Jon, to United States of America, Army. Bomb container with gravity-closed internal door. 4,187,758, Cl. 86-1.00B.

Pfizer Inc.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.
Campbell, Simon F., 4,188,390, Cl. 424-251.000.
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.
Sciavolino, Frank C., 4,188,479, Cl. 536-9.000.

Phelan, Michael B.; and White, Jack M., to ACF Industries, Incorporated. Altitude compensation apparatus. 4,187,814, Cl. 123-119.0EC.

Phelps, Francis E., to Dresser Industries, Inc. Varied pitch rotary rock bit. 4,187,922, Cl. 175-374.000.

Philagro: *See—*
Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, 4,188,381, Cl. 424-199.000.
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.

Phillips, Charles E.: *See—*
Walther, William D.; and Phillips, Charles E., 4,187,733, Cl. 74-342.000.

Phillips Petroleum Company: *See—*
Cornelius, Archie J.; and Needham, Riley B., 4,187,910, Cl. 166-305.00R.
DeShon, Wallace E., 4,188,664, Cl. 364-200.000.
Kubicek, Donald H., 4,188,327, Cl. 549-87.000.
Nasser, Benny E., Jr.; and Delap, Joseph A., 4,188,471, Cl. 526-96.000.
Rycheck, Mark R.; and Pennella, Filippo, 4,188,501, Cl. 585-643.000.

Phillips, Ronald, to Lucas Industries Limited. Fuel injection pumping apparatus for internal combustion engines including manifold pressure device. 4,187,818, Cl. 123-140.00R.

Phillips Screw Company: *See—*
Simmons, Frederick A., 4,187,892, Cl. 145-50.00A.

Photomatrix Corporation: *See—*
Gensike, Karl H.; and Sam, Ronald, 4,188,114, Cl. 355-54.000.

Picciotti, Michael F.: *See—*
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.

Pierre Fabre S.A.: *See—*
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.

Pilkington Brothers Limited: *See—*
Landau, Manfred, 4,188,444, Cl. 428-428.000.

Pillsbury Company, The: *See—*
Westover, Jack D.; and Keller, Richard L., 4,187,771, Cl. 99-404.000.

Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, to Pierre Fabre S.A. Amino-aryl 1,24-triazines useful in the treatment of diverse pain. 4,188,387, Cl. 424-249.000.

Pitney Bowes Inc.: *See—*
Miciukiewicz, Joseph F., 4,188,028, Cl. 271-265.000.

Pittinger, Charles B., Jr. Filament wound perforate plate system. 4,187,598, Cl. 29-513.000.

Plains Chemical Development Co.: *See—*
Budnick, Edward G., 4,188,234, Cl. 106-267.000.

Plantsch, Josef: *See—*
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.

Plascor Incorporated: *See—*
Feig, Stephen; and Vincent, William T., 4,187,786, Cl. 108-64.000.

Pohjola, Jorma. Endless belt and roll assembly for vehicles or conveyers. 4,188,076, Cl. 305-29.000.

Poiget, Gilbert: *See—*
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.

Poiry, William R. Building siding removal and reinstallation system. 4,187,661, Cl. 52-748.000.

Polaroid Corporation: *See—*
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., 4,188,103, Cl. 354-27.000.
Erlichman, Irving, 4,188,105, Cl. 354-202.000.
Powers, Sheldon D., 4,188,098, Cl. 352-130.000.

Poling, Ronald W., to General Electric Company. Assembly and method of assembling. 4,188,145, Cl. 403-112.000.

Pollard, Roy E.: *See—*
Knight, Charles E., Jr.; and Pollard, Roy E., 4,187,738, Cl. 74-572.000.

Polygauge Industries Ltd.: *See—*
Maybee, Richard C., 4,188,604, Cl. 337-377.000.

Polymer Corporation, The: *See—*
Goebel, Charles V., Jr., 4,188,478, Cl. 528-314.000.
Pommier, Lorenzo A. Power generator utilizing elevation-temperature differential. 4,187,686, Cl. 60-647.000.
Poplin, James E. Construction unit. 4,187,650, Cl. 52-57.000.
Popov, Petr V.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Popova, Ljudmila A.: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, to Clesa S.p.A. Derivatives of the D-threo-1-phenyl-2-trifluoroacetamido-1,3-propandediol. 4,188,402, Cl. 424-324.000.
Porter, Wilbur A.: *See—*
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.
Post Office: *See—*
Knox, Dennis M., 4,188,632, Cl. 343-753.000.
Poteet, Ronald L.: *See—*
Mounteer, Carlyle A.; and Poteet, Ronald L., 4,188,258, Cl. 156-628.000.
Pouli, Dirk: *See—*
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Power Systems Development Corporation: *See—*
Hoinski, Walter W., 4,187,797, Cl. 116-87.000.
Hoinski, Walter W., 4,187,834, Cl. 126-425.000.
Powers, Sheldon D., to Polaroid Corporation. Photographic film cassette having bowed spring with device preventing overstressing of spring. 4,188,098, Cl. 352-130.000.
PPG Industries, Inc.: *See—*
Bartrug, Norman G., 4,188,435, Cl. 428-167.000.
Brown, William J.; and Rowley, James R., 4,188,168, Cl. 414-786.000.
Brzozowski, Stanley F., 4,188,228, Cl. 106-50.000.
Chang, Wen-Hsuan, 4,188,472, Cl. 528-75.000.
Pranke, Walter T.; and Wilms, Manfred W., to Joslyn Mfg. and Supply Co. Station protector spark gap applique. 4,188,561, Cl. 313-325.000.
Prew, Raymond A., Jr., to Textron Inc. Stapler for an improved flexible pusher retracting member. 4,187,971, Cl. 227-125.000.
Price, Samuel T., to Enterprise Machine and Development Corporation. Yarn texturing air jet with cylindrical and planar baffles. 4,187,593, Cl. 28-254.000.
Prichett, Harry W., to Media Arts Workshop Inc. Rotary slide carrier system. 4,188,100, Cl. 353-95.000.
Pringle, William L., to Friedman, Leonard. Apparatus for bonding brake linings. 4,187,777, Cl. 100-93.0PB.
Procter & Gamble Company, The: *See—*
Halas, Linda A., 4,188,305, Cl. 252-95.000.
Product Dynamics, Ltd.: *See—*
Ippoliti, Ralph J.; and Nelson, John J., 4,187,703, Cl. 70-63.000.
Propper Manufacturing Co., Inc.: *See—*
Zwarun, Andrew A., 4,187,799, Cl. 116-217.000.
Pujol, Yves A., to S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques. Machine for automatically tying the ends of sausages and the like. 4,188,053, Cl. 289-18.100.
PUMA-Sportschuhfabriken Rudolf Dassler KG: *See—*
Dassler, Armin A., 4,187,623, Cl. 36-129.000.
Purcell, Pat W.: *See—*
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.
Purmal, Rowland B.: *See—*
Miller, Larence G.; and Purmal, Rowland B., 4,188,622, Cl. 340-571.000.
Pusch, Gunter. Apparatus for scanning an air space for detecting low-flying airplanes and flying bodies. 4,188,531, Cl. 250-334.000.
Pyreflex Corporation: *See—*
Berg, Charles A., 4,188,519, Cl. 219-10.470.
Quehen, Andre, to SECIM. Thickness control method and apparatus for a rolling mill. 4,187,707, Cl. 72-8.000.
Quick, Leonard M.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for the hydrotreating of heavy hydrocarbon streams. 4,188,284, Cl. 208-216.0PP.
Quinlan, Patrick M., to Petrolite Corporation. Thioether containing quartenary ammonium derivatives of 1,4-thiazines. 4,188,359, Cl. 422-12.000.
R. D. Bussard & Son, Inc.: *See—*
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.
Raban, Victor J.: *See—*
Bant, John A.; and Raban, Victor J., 4,188,461, Cl. 429-48.000.
Radunz, Hans-Eckart: *See—*
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.
Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Piezoelectric servo for disk drive. 4,188,645, Cl. 360-75.000.
Raike, William M.: *See—*
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.
Rajput, Yudh V.; and Skodack, Gary J., to B. F. Goodrich Company, The. Adaptive acceleration system for vehicle skid control systems. 4,188,075, Cl. 303-106.000.
Ramsay, Jeffrey S.: *See—*
Meek, Nigel W.; and Ramsay, Jeffrey S., 4,187,664, Cl. 56-13.600.
Ramsey, Charles W. Strain relief bushing. 4,188,003, Cl. 248-56.000.
Rao, Basrur R.: *See—*
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Rapson, W. Howard: *See—*
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.
Rasor Associates, Inc.: *See—*
Rasor, Ned S., 4,187,672, Cl. 60-39.120.
Rasor, Ned S., to Rasor Associates, Inc. Apparatus for converting carbonaceous material into fuel gases and the recovery of energy therefrom. 4,187,672, Cl. 60-39.120.
Ratliff, William K.; and Warman, Charles P., to Dana Corporation. Free floating, self-aligning shaft coupling device. 4,187,940, Cl. 192-88.00A.
Rau, Wolfgang: *See—*
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.
Raue, Reimund, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injector. 4,187,987, Cl. 239-585.000.
Rauscher, Tomlinson G., to NCR Corporation. Decoder for variable-length codes. 4,188,669, Cl. 364-900.000.
Rautavuori, Jorma K.; and Tormala, Pertti. Method of manufacturing vitreous carbon. 4,188,369, Cl. 423-449.000.
Raychem Corporation: *See—*
Lyons, Bernard J.; and Kim, Young J., 4,188,276, Cl. 204-159.170.
Razvodovskaya, Ljudmila V.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
RCA Corporation: *See—*
Dingwall, Andrew G. F., 4,188,588, Cl. 330-253.000.
Kaplan, Leonard A., 4,188,593, Cl. 331-108.00D.
Kleinknecht, Hans P., 4,188,123, Cl. 356-354.000.
McCurdy, Robert J., 4,188,583, Cl. 325-163.000.
Reed, Robert D.: *See—*
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.
Reeve, Douglas W.: *See—*
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, to Wacker-Chemitronic fur Elektronic Grundstoffe mbH. Process for multiple lap cutting of solid materials. 4,187,827, Cl. 125-16.00R.
Reibling, Robert L., to Whiteway Manufacturing Co., Inc. Reflector and method of producing different, distinctive and predictable light patterns therefrom. 4,188,657, Cl. 362-348.000.
Reich, Zygmund; and Sargent, Raymond W., to Simmonds Precision Products, Inc. Incandescent lamps/fiber optic coupled vertical and scale or display. 4,188,654, Cl. 362-32.000.
Reiland, Dennis J., to General Foundry Products Corporation. Casting risers. 4,188,010, Cl. 249-197.000.
Reilly, Thomas H. M.: *See—*
Craven, John; and Reilly, Thomas H. M., 4,187,822, Cl. 123-179.00L.
Rein, Wolf-Heider, to International Standard Electric Corporation. Diskette with access cover means. 4,188,650, Cl. 360-133.000.
Reinart, Joseph: *See—*
Whaley, Kent; and Reinart, Joseph, 4,188,023, Cl. 269-228.000.
Reinhard, Russell R.; and Yaffe, Roberta, to Texaco Inc. Synthetic aircraft turbine oil. 4,188,298, Cl. 252-46.600.
Reiniger, Friedrich, to U.S. Philips Corporation. X-ray apparatus comprising a weight compensation device. 4,188,540, Cl. 250-439.00R.
Reinwall, Ernest W., Jr., to Illinois Tool Works Inc. Panel clamp. 4,187,658, Cl. 52-489.000.
Reis, A.; Kirmaier, N.; and Schoberl, M., to Institut fur Biomedizinische Technik. Apparatus for degerminating fluids. 4,188,278, Cl. 204-268.000.
Renckhoff, Gustav, deceased: *See—*
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased, 4,188,263, Cl. 439-179.000.
Rennie, Stanley D.: *See—*
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.
Repco Limited: *See—*
Hooper, Lindsay A., 4,188,030, Cl. 272-73.000.
Reppisch-Werke Aktiengesellschaft: *See—*
Ubezio, Lorenzo, 4,188,007, Cl. 248-411.000.
Resa, Richard N.; and Kuntzi, David M. Self draining truck bed floorings. 4,188,058, Cl. 296-208.000.
Respiratory Care, Inc.: *See—*
Cambio, Orlando D., Jr., 4,187,951, Cl. 215-6.000.
Restaino, Alfred J.: *See—*
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,188,349, Cl. 525-366.000.
Reudink, Douglas O.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Satellite communication system which concurrently transmits a scanning spot beam and a plurality of fixed spot beams. 4,188,578, Cl. 325-4.000.
Reven, Frederick V., to Nalco Chemical Company. High temperature refractory caulking composition. 4,188,229, Cl. 106-68.000.
Rex, Gert I., to NYA AB Nyhems Mekaniska Verkstad. Emergency locking mechanism for seat belts. 4,187,995, Cl. 242-107.40A.
Rheinisch-Westfalisches Elektrizitatswerk AG: *See—*
Fritz, Heinz P., 4,188,269, Cl. 204-32.00R.
Rhone-Poulenc Industries: *See—*
Cerny, Jacqueline; and Vivant, Gilbert, 4,188,313, Cl. 260-37.0EP.
Rhone-Poulenc-Textile: *See—*
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, 4,188,429, Cl. 428-85.000.
Ricci, Roberto: *See—*
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.
Rice, V. Louise: *See—*
Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, 4,187,599, Cl. 29-588.000.
Richard, Joseph D. Fish detection apparatus. 4,188,608, Cl. 367-93.000.
Richardson, John P., to Rolls-Royce Limited. Combustion equipment for gas turbine engines. 4,187,674, Cl. 60-39.360.
Richter, Hans: *See—*
Engl, Robert; and Richter, Hans, 4,188,386, Cl. 424-249.000.
Ricoh Company, Ltd.: *See—*
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.
Ridgley, Dana H.: *See—*
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Ridgway, Peter C.; and Case, Derek F., to Data Recording Instrument Company Limited. Manufacture of magnetic transducing heads. 4,188,247, Cl. 156-154.000.
Riester, William C.: *See—*
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,187,576, Cl. 15-250.420.
Ringelstein, Hans M.: *See—*
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,956, Cl. 220-465.000.
Rippelmeyer, Dennis M.; and Baysinger, Robert L., to Emerson Electric Co. Gas burner control system. 4,188,181, Cl. 431-66.000.
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., to General Foods Corporation. Foam frying. 4,188,410, Cl. 426-296.000.
Ristic-Petrovic, Spasoje. Hydraulic locking system. 4,187,704, Cl. 70-263.000.
Ritter, Fridolin J.: *See—*
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.
Rivin, Evgeny I.: *See—*
Haung, Bernard; and Rivin, Evgeny I., 4,188,048, Cl. 280-688.000.
Roberson, James E.: *See—*
Hardy, James H.; and Roberson, James E., 4,187,638, Cl. 47-1.500.
Robert Bosch GmbH: *See—*
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.
Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, 4,187,806, Cl. 123-32.0EE.
Stumpp, Gerhard, 4,187,813, Cl. 123-136.000.
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., to Ciba-Geigy Corporation. Process for the production of a pigment composition. 4,188,236, Cl. 106-308.00Q.
Robinson, John W.; and Howell, Stephen L., to Kimball International, Inc. Automatic arpeggiator. 4,187,756, Cl. 84-1.240.
Robinson, Leon: *See—*
Longanbach, James R.; and Robinson, Leon, 4,188,191, Cl. 44-1.00F.
Robinson, Neil L.: *See—*
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.
Rock, John A.: *See—*
Fox, Daniel W.; and Rock, John A., 4,188,314, Cl. 260-37.0PC.
Rockwell International Corporation: *See—*
Bongianni, Wayne L., 4,188,594, Cl. 332-16.00R.
Flanagan, Joseph E.; and Lo, George A., 4,187,781, Cl. 102-38.0CC.
Massie, Norbert A.; and Holly, Sandor, 4,188,122, Cl. 356-349.000.
Perkins, William C., 4,188,619, Cl. 340-310.00R.
Rockwell-Rimoldi, S.p.A.: *See—*
Fietta, Emilio; and Della Torre, Giancarlo, 4,187,793, Cl. 112-288.000.
Roder, Albert: *See—*
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.
Roecar Holdings (Netherlands Antilles) N.V.: *See—*
Pegel, Karl H., 4,188,379, Cl. 424-182.000.
Roesch, Alfred: *See—*
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A. Telephone call restricting apparatus. 4,188,508, Cl. 179-18.0DA.
Rogers, Morris A.: *See—*
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.
Rogers, Walter C., Jr.; and Hoffman, David S., to Royal Development Company, Inc. Handle-operated wall-avoiding recliner chair with headrest. 4,188,062, Cl. 297-61.000.
Rohco, Inc.: *See—*
Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., 4,188,271, Cl. 204-55.00R.
Rohm GmbH: *See—*
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.
Rohowetz, Stanley E., to American Can Company. Thermotropic adhesive tape. 4,188,437, Cl. 428-199.000.
Rolls-Royce Limited: *See—*
Richardson, John P., 4,187,674, Cl. 60-39.360.
Romano, Bruno: *See—*
Castelli, Pier P.; and Romano, Bruno, 4,188,322, Cl. 260-239.55R.
Rook, Charles W.: *See—*
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.
Rooney, Robert L.: *See—*
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.
Rosati, Francesco: *See—*
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Ross, Gerald F.: *See—*
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Ross, Roger J.; and Tullman, Edward J., to Singer Company, The. Sewing machine work feeding mechanism. 4,187,794, Cl. 112-308.000.
Rossi, Alberto: *See—*
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.
Rothgordt, Ulf: *See—*
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.
Rouaud, Christian: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.
Rowden, George A., to Davy International (Oil and Chemicals) Limited. Recovery of uranium values. 4,188,361, Cl. 423-9.000.
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, to Erco Envirotech Ltd. Low effluent pulp mill, bleach plant operation. 4,188,260, Cl. 162-16.000.
Rowley, James R.: *See—*
Brown, William J.; and Rowley, James R., 4,188,168, Cl. 414-786.000.
Rowney, John E.: *See—*
Mamers, Heikki; and Rowney, John E., 4,188,259, Cl. 162-4.000.
Royal Development Company, Inc.: *See—*
Rogers, Walter C., Jr.; and Hoffman, David S., 4,188,062, Cl. 297-61.000.
Rozanski, Walter J., Jr.: *See—*
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.
Rudolphi, Kjell, to AGA Aktiebolag. Method and device for cleaning a sloping or vertical surface on an optical element. 4,187,868, Cl. 134-184.000.
Russell, Kenneth J.: *See—*
Harp, Robert S.; and Russell, Kenneth J., 4,188,590, Cl. 331-56.000.
Ruti-te Strake B.V.: *See—*
van Mullekom, Hubert P., 4,187,888, Cl. 139-435.000.
Rycheck, Mark R.; and Pennella, Filippo, to Phillips Petroleum Company. Purification of monoolefin-containing hydrocarbon stream. 4,188,501, Cl. 585-643.000.
Rydstrom, Hans F. Remote controlled image display device. 4,187,632, Cl. 40-446.000.
Ryobi, Ltd.: *See—*
Nagai, Kazumasa, 4,188,026, Cl. 271-148.000.
S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques: *See—*
Pujol, Yves A., 4,188,053, Cl. 289-18.100.
S & F Associates: *See—*
Smith, James E., 4,187,721, Cl. 73-194.00B.
Sada, Hidetaka: *See—*
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.
Sadler, Loren G.: *See—*
Brackbill, Warren H.; and Sadler, Loren G., 4,187,988, Cl. 239-662.000.
Sakai, Akira: *See—*
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, to Nissan Chemical Industries, Ltd. Process for preparing anthranylaldehyde derivatives. 4,188,343, Cl. 260-571.000.
Sakurai, Yoshitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust port liner support for internal combustion engine. 4,187,677, Cl. 60-282.000.
Sam, Ronald: *See—*
Gensike, Karl H.; and Sam, Ronald, 4,188,114, Cl. 355-54.000.
Samanta, Mrinmay: *See—*
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.
Sampson, Jacob. Bundle tying machine. 4,187,773, Cl. 100-4.000.

Samuels, Peter B.; and Wood, Ernest C. Hemostatic clip applicator. 4,187,712, Cl. 72-410.000.

SANAC Societa per Azioni Refrattari Argille e Calolini: *See—*
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.

Sandoz Ltd.: *See—*
Mislin, Roland; and Steiner, Karl-Ulrich, 4,188,187, Cl. 8-39.00B.
Neumann, Peter, 4,188,393, Cl. 424-258.000.

Sanford, George A. Oil well pump drive. 4,187,680, Cl. 60-369.000.

Sangalli, Sylvio: *See—*
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, 4,188,429, Cl. 428-85.000.

Sano, Takezo; and Sasaki, Masao, to Sumitomo Chemical Company, Limited. Process for preparing novel thin films. 4,188,273, Cl. 204-158.0HE.

Sanson, Henry E., III; and Hartman, Wallace R., Jr., to Mayco Oil and Chemical Company, Inc. Cosulfurized olefin and lard oil. 4,188,300, Cl. 252-48.600.

Sargent, Raymond W.: *See—*
Reich, Zygmund; and Sargent, Raymond W., 4,188,654, Cl. 362-32.000.

Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., to Institut Organicheskoi Khimii Akademii Nauk Armyanskoi. Polymeric binder for chewing gum, method for preparing same and chewing gum based on said polymeric binder. 4,188,406, Cl. 426-3.000.

Saruwatari, Teturo; and Mukai, Yositaka. Method and apparatus for automatically assembling spoked wheels. 4,187,895, Cl. 157-1.550.

Sasaki, Masao: *See—*
Sano, Takezo; and Sasaki, Masao, 4,188,273, Cl. 204-158.0HE.

Sasaki, Yasushi: *See—*
Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, 4,188,301, Cl. 252-62.540.

Sato, Eiichi: *See—*
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.

Sato, Masaaki: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.

Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Photosensitive printing plate, method of preparing same, and method of processing same. 4,188,215, Cl. 430-156.000.

Sato, Shigeru, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave diagnostic apparatus to concurrently display an echo signal and a reference signal. 4,187,857, Cl. 128-660.000.

Sato, Susumu; and Shiba, Hiroshi, to Nippon Electric Co., Ltd. Semiconductor device having bump terminal electrodes. 4,188,636, Cl. 357-71.000.

Savage, Harry A. System for utilizing solar energy and ambient air in air conditioners during the heating mode. 4,187,687, Cl. 62-2.000.

Savich, Peter P., to Smyth Manufacturing Company, The. Method for making integrated book lining. 4,187,572, Cl. 11-2.000.

Savitsky, Alexandr V.: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.

Sawada, Shuichi, to Nippon Gakki Seizo Kabushiki Kaisha. Process for producing shaped articles with patterns. 4,188,316, Cl. 260-40.00R.

Sawada, Takashi: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.

SCA Development Aktiebolag: *See—*
Backlund, Sture O. E., 4,188,261, Cl. 162-42.000.

Scales, Stanley R., to Hughes Tool Company. Combination carburizing and boronizing methods. 4,188,242, Cl. 148-15.500.

Schabel, Karl-Heinz: *See—*
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.

Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Mirror reflex camera with electronic rangefinder. 4,188,102, Cl. 354-25.000.

Schafer, Hermann: *See—*
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.

Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, to U.S. Philips Corporation. Method and arrangement for correcting errors in facsimile transmission. 4,188,643, Cl. 358-280.000.

Scheben, John A.: *See—*
Hinnenkamp, James A.; and Scheben, John A., 4,188,490, Cl. 560-245.000.

Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, to Ernst Leitz Wetzlar GmbH. Two-coordinate length measuring device for microscopic instruments. 4,188,119, Cl. 356-252.000.

Scherr, Norman J., Jr.: *See—*
Smith, David L.; and Scherr, Norman J., Jr., 4,187,646, Cl. 51-165.770.

Scheumann, Leonhard: *See—*
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Schier, Oswald: *See—*
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.

Schirmer, Henry G.: *See—*
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.

Schischkoff, Kurt: *See—*
Ito, Kenichiro; and Schischkoff, Kurt, 4,187,750, Cl. 83-67.000.

Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., to Peripheral Dynamics, Inc. Badge reader with reliable data clocking means. 4,187,980, Cl. 235-474.000.

Schlossmann, Klaus: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Schmid, Frederick, to Crystal Systems, Inc. Cutting. 4,187,828, Cl. 125-18.000.

Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, to Gretag Aktiengesellschaft. Method and installation for masked speech transmission over a telephone channel. 4,188,506, Cl. 179-1.50R.

Schmidhammer, Ludwig; and Frey, Hellmuth, to Wacker-Chemie GmbH. Process for treating unreacted 1,2-dichloroethane from 1,2-dichloroethane cracking. 4,188,347, Cl. 260-652.00P.

Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, to Boehringer Mannheim GmbH. Stabilized urease composition. 4,188,465, Cl. 435-12.000.

Schnitzer, Emanuel: *See—*
Fisher, Edmund A.; and Schnitzer, Emanuel, 4,188,156, Cl. 405-195.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.

Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, to Robert Bosch GmbH. Fuel-air mixture control apparatus. 4,187,806, Cl. 123-32.0EE.

Schoberl, M.: *See—*
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.

Schochat, Nathaniel E.; and Martin, Fred L. Electronic CB twenty meter. 4,188,529, Cl. 235-92.0DN.

Schoenberg, Julian H.: *See—*
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.

Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., to Messer Griesheim GmbH. Safety insert for storage vessels of low-boiling liquified gases. 4,187,956, Cl. 220-465.000.

Schreder, Rene: *See—*
Moreau, Claude; and Schreder, Rene, 4,188,166, Cl. 414-735.000.

Schreiber, Peter J., to N.A.D., Inc. Pressure monitor for breathing system. 4,187,842, Cl. 128-202.220.

Schreyer, Gunter: *See—*
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.

Schroder, Karl: *See—*
Kuipers, Arie; and Schroder, Karl, 4,188,411, Cl. 426-582.000.

Schroder, Rolf, to Wagener & Co. Belt press. 4,187,776, Cl. 100-93.00P.

Schumacher, Ernest W., to Virginia Chemicals Inc. Air-conditioning system having recirculating and flow-control means. 4,187,695, Cl. 62-503.000.

Schupp, Eberhard: *See—*
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.

Schuster, Erich: *See—*
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.

Schwab, Kurt, to D. Swarovski & Co, Glasschleiferei. Apparatus for manufacturing identification plates having indented retroreflective characters. 4,188,256, Cl. 156-386.000.

Schwartz, Martin L.: *See—*
Zinnes, Harold; and Schwartz, Martin L., 4,188,482, Cl. 544-32.000.

Schwartz, Robert E.: *See—*
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.

Schwarz, Gunter, to S.A. Etablissement Francois Salomon & Fils. Ski brake apparatus. 4,188,043, Cl. 280-605.000.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C_8 modifications. 4,188,479, Cl. 536-9.000.

SCM Corporation: *See—*
Dannatt, Hugh St. L., 4,188,137, Cl. 400-496.000.

Scolastico, Carlo; and Tronconi, Giovanni, to L'Instituto Farmaceutico S.p.A. (2-Pyrimidinyl-thio)-alkanoic acid amides and their preparation. 4,188,484, Cl. 544-317.000.

Sconzo, Thomas. Window and door frame assembly adapted to facilitate installation and removal of window panes. 4,187,643, Cl. 49-455.000.

Scott, Ian M., to Brown & Sharpe Manufacturing Company. Height gage. 4,187,612, Cl. 33-172.00E.

Seal Incorporated: *See—*
Hemperly, Lyle D., Jr., 4,188,254, Cl. 156-382.000.

SECIM: *See—*
Quehen, Andre, 4,187,707, Cl. 72-8.000.

Sedykh, Aelita S.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Seger, Edward J.; and Haupin, Warren E., to Aluminum Company of America. Method and apparatus for measuring the integrity of an electrolytic cell lining. 4,188,267, Cl. 204-1.00T.

Seikagaku Kogyo Co. Ltd.: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.

Seipp, William H.: *See—*
Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., 4,188,617, Cl. 340-183.000.

Sejpal, Vasant D., to American Home Products Corporation. Non-foaming, clear, aerosol vegetable oil compositions containing lecithin, ethyl alcohol and hydrocarbon propellents. 4,188,412, Cl. 426-609.000.

Seki, Kohji: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.

Seki, Shigeo: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.

Sekiya, Setsuro: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., to Chicago Bridge & Iron Company. Apparatus for reliquefying boil-off natural gas from a storage tank. 4,187,689, Cl. 62-54.000.

Selner, Allen J. Biomechanical shoe. 4,187,620, Cl. 36-28.000.

Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., to International Telephone and Telegraph Corporation. Method of making electrical connector assembly. 4,187,605, Cl. 29-629.000.

Selwood, Alan: *See—*
Ellis, Peter M.; and Selwood, Alan, 4,188,436, Cl. 428-198.000.

Semjonow, Valentin, to Hoechst Aktiengesellschaft. Process for the manufacture of non-woven structures. 4,187,586, Cl. 19-161.100.

Semke, Victor. Flushing device. 4,187,563, Cl. 4-256.000.

Senften, John W., to Harvey Hubbell, Incorporated. Section insulator for catenary systems. 4,187,934, Cl. 191-39.000.

Sensi, Piero: *See—*
Maggi, Nicola; and Sensi, Piero, 4,188,321, Cl. 260-239.30P.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for folding sheet material into hinged lid packets. 4,188,024, Cl. 270-67.000.

Shah, Jagdish K.: *See—*
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.

Shajenko, Peter, to United States of America, Navy. Acousto-optical transducer. 4,188,096, Cl. 350-358.000.

Shanbrom, Edward. Simplified method for preparation of high yield, high purity Factor VIII concentrate. 4,188,318, Cl. 260-112.00B.

Shapovalova, Galina K.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Sharp Kabushiki Kaisha: *See—*
Matsui, Hirotoshi, 4,188,133, Cl. 400-121.000.
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.

Shehi, Lyle E. Automobile trunk lid holder. 4,188,061, Cl. 296-76.000.

Shell Oil Company: *See—*
Bull, Michael J., 4,188,400, Cl. 424-285.000.
Holden, Geoffrey; and Gouw, Lam H., 4,188,432, Cl. 428-35.000.
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.

Shemer, Michael, to Miles Laboratories, Inc. Process for preparing a heat coagulable viscous protein. 4,188,399, Cl. 426-276.000.

Shen, Jan-son, to Boeing Company, The. Constant pressure hydraulic accumulator. 4,187,682, Cl. 60-413.000.

Shepherd, Charles J., to W. J. Bradford Paper Company. Combination slotted partition spacer. 4,187,975, Cl. 229-15.000.

Sherman, Charles J., to Western Electric Company, Inc. Fluid bearing. 4,187,867, Cl. 134-64.00P.

Sherrin, Thomas P.: *See—*
Stach, Paul E.; and Sherrin, Thomas P., 4,187,890, Cl. 141-27.000.

Shiba, Haruo: *See—*
Okamura, Masatoshi; and Shiba, Haruo, 4,187,998, Cl. 242-199.000.

Shiba, Hiroshi: *See—*
Sato, Susumu; and Shiba, Hiroshi, 4,188,636, Cl. 357-71.000.

Shibasaki, Kyuichi, to Toyo Seikan Kaisha, Ltd. Method and apparatus for inspecting an internal pressure of hermetically sealed container. 4,187,718, Cl. 73-52.000.

Shibata, Tsugio. Power wrench having ratchet means at both surfaces of socket thereof. 4,187,746, Cl. 81-57.390.

Shibatani, Juichi: *See—*
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.

Shimizu, Kazuaki: *See—*
Yama, Toshio; and Shimizu, Kazuaki, 4,188,074, Cl. 303-92.000.

Shipper, Harmon E.: *See—*
Freeman, Murray E.; and Shipper, Harmon E., 4,187,872, Cl. 137-454.600.

Shirai, Kazuya. Apparatus for cutting sheet glass. 4,187,755, Cl. 83-882.000.

Shore, Ronald H. Self-inflating solar curtain. 4,187,896, Cl. 160-121.00R.

Shrive, Nigel G.: *See—*
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.

Shroyer, Cecil E. Relay repair apparatus. 4,188,602, Cl. 335-132.000.

Shultz, David E.: *See—*
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.

Sibbett, Donald J.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Siegel, Walter P.: *See—*
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.

Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., to United States of America, Air Force. RF excited mercury laser lamp. 4,188,591, Cl. 331-94.50P.

Siemens Aktiengesellschaft: *See—*
Franke, Kurt, 4,188,537, Cl. 250-416.0TV.
Knauer, Karl, 4,188,597, Cl. 333-165.000.
Mattuschka, Werner, 4,188,557, Cl. 310-368.000.
Streble, Bernd, 4,188,080, Cl. 339-14.00R.

Siemer, Klaus: *See—*
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.

Siforova, Tamara A.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Sih, John C., to Upjohn Company, The. Pyran analogs of 2,3,4,5-tetradehydro-PGI$_1$ compounds. 4,188,481, Cl. 542-426.000.

Silvestri, Giovanni J. Epicyclic gear train planet carrier system. 4,187,740, Cl. 74-750.00R.

Silvestrini, Richard L.; and Newton, Paul P., to Warner Electric Brake & Clutch Company. Armature assembly for electromagnetic coupling. 4,187,939, Cl. 192-84.00C.

Simco Company, Inc., The: *See—*
Miller, Bruce H., 4,188,530, Cl. 250-324.000.

Simmonds Precision Products, Inc.: *See—*
Reich, Zygmund; and Sargent, Raymond W., 4,188,654, Cl. 362-32.000.

Simmons, Frederick A., to Phillips Screw Company. Recessed screw heads and drivers. 4,187,892, Cl. 145-50.00A.

Simmons, Joseph H.: *See—*
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.

Simon Container Machinery Limited: *See—*
Bullock, Allen R., 4,187,769, Cl. 93-52.000.

Simpson, Robert. Condenser leak searching plugs. 4,187,716, Cl. 73-40.000.

Sims, Rex J.: *See—*
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.

Simuro, Ernest G.; Turk, Abraham A.; and Turk, Nathan M. Horseman's pocket knife. 4,187,607, Cl. 30-152.000.

Sinclair, Norman: *See—*
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.

Sinclair, William Y., to Aries Electronics, Inc. Flexible electrical jumper and method of making same. 4,187,606, Cl. 29-629.000.

Singer Company, The: *See—*
Ross, Roger J.; and Tullman, Edward J., 4,187,794, Cl. 112-308.000.
Vogel, John D., 4,187,790, Cl. 112-158.00E.

Sinko, Michael J.; and Velinsky, Milton, to Echlin Manufacturing Company, The. Coded module for use in a magnetic pulse generator and method of manufacture. 4,187,981, Cl. 235-488.000.

Sitnov, Anatoly G.: *See—*
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L., 4,187,898, Cl. 164-421.000.

Sitrl, Erhard: *See—*
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, 4,187,827, Cl. 125-16.00R.

Skodack, Gary J.: *See—*
Rajput, Yudh V.; and Skodack, Gary J., 4,188,075, Cl. 303-106.000.

Skoupi, Dieter: *See—*
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.

Smathers, Edmond W.: *See—*
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.

Smith, Charles R., to Eaton Corporation. Thermally responsive power elements with multiple vapor/gas filled capsules and hydraulic fluid transmissions. 4,187,684, Cl. 60-531.000.

Smith, David L.; and Scherr, Norman J., Jr., to Valeron Corporation, The. Apparatus for grinding. 4,187,646, Cl. 51-165.770.

Smith, David W.: *See—*
Townsend, Ray T.; and Smith, David W., 4,187,583, Cl. 17-49.000.

Smith, Franklin G.: *See—*
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.

Smith, Fred J.: *See—*
Bower, David S.; and Smith, Fred J., 4,188,510, Cl. 179-90.0BD.
Smith International, Inc.: *See—*
Garner, Lloyd L., 4,187,921, Cl. 175-340.000.
Thomas, Robert D., 4,187,743, Cl. 76-108.00A.
Smith, James E., to S & F Associates. Method and structure for flow measurement. 4,187,721, Cl. 73-194.00B.
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., to Tone Commander Systems, Inc. Multi-link telephone intercom system. 4,188,511, Cl. 179-99.00A.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Isocyanate derivatives of ester diol alkoxylates and compositions thereof. 4,188,477, Cl. 528-288.000.
Smith, Trevor S., to Lucas Industries Limited. Fuel control system for a gas turbine engine. 4,187,673, Cl. 60-39.28R.
SmithKline Corporation: *See—*
Hill, David T., 4,188,397, Cl. 424-273.00R.
Smolinski, Ronald E. Closed chamber rotary vane gas cycle cooling system. 4,187,693, Cl. 62-402.000.
Smolko, Gennady G. Electronic device. 4,188,652, Cl. 361-402.000.
Smyth Manufacturing Company, The: *See—*
Savich, Peter P., 4,187,572, Cl. 11-2.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Cavalieri D'Oro, Enzo, 4,188,600, Cl. 333-228.000.
Papa, Franco, 4,188,599, Cl. 333-219.000.
Societe Anonyme Automobiles Citroen: *See—*
Audoux, Guy, 4,187,808, Cl. 123-48.0AA.
S.A. des Etablissements Staubli: *See—*
Palau, Joseph, 4,187,886, Cl. 139-68.000.
S.A. Etablissement Francois Salomon & Fils: *See—*
Schwarz, Gunter, 4,188,043, Cl. 280-605.000.
Societe de Paris et du Rhone: *See—*
Mazzorana, Alfred, 4,187,728, Cl. 74-6.000.
Societe de Prayon: *See—*
Houghtaling, Samuel V., 4,188,366, Cl. 423-320.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Legrand, Francis; and Weisser, Bernard, 4,188,666, Cl. 364-434.000.
Soderberg, Mark S., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion. 4,188,041, Cl. 279-75.000.
Soderberg, Mark S.: *See—*
Hametner, Albert L.; and Soderberg, Mark S., 4,187,889, Cl. 140-92.100.
Sokol, Phillip E.; and Farmer, Robert F., to Gillette Company, The. Latent image printing and development. 4,188,431, Cl. 428-29.000.
Soloviev, Gennady I.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.
Sony Corporation: *See—*
Kazami, Shin-Ichi; and Doi, Toshitada, 4,188,616, Cl. 340-146.1AL.
Yoshio, Akira, 4,188,240, Cl. 148-6.14R.
Zandelin, Ernst E., 4,187,631, Cl. 40-381.000.
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., to Sperry Rand Corporation. Sectorized data path following servo system. 4,188,646, Cl. 360-77.000.
Soverini, Arrigo: *See—*
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Spector, George: *See—*
Fernandez, Arthur A.; and Spector, George, 4,187,784, Cl. 104-235.000.
Spehrley, Charles W., Jr., to Xerox Corporation. Fixed stapler head. 4,187,969, Cl. 227-2.000.
Sperry Corporation: *See—*
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Sperry Rand Corporation: *See—*
Brackbill, Warren H.; and Sadler, Loren G., 4,187,988, Cl. 239-662.000.
Martin, E. Joel, 4,187,941, Cl. 193-5.000.
Mast, Aquila D., 4,187,667, Cl. 56-341.000.
McIlwain, Irwin D., 4,187,666, Cl. 56-341.000.
Meek, Nigel W.; and Ramsay, Jeffrey S., 4,187,664, Cl. 56-13.600.
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.
Sprague Electric Company: *See—*
Dornfeld, John E.; and Joyner, Bobby L., 4,188,651, Cl. 361-322.000.
Sprengers, Johannes: *See—*
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Sprenkle, George J.: *See—*
Aldridge, Lionel D.; and Sprenkle, George J., 4,188,085, Cl. 339-176.0MP.
Sroka, Edward A. Highway lane marker. 4,188,150, Cl. 404-11.000.
Stach, Paul E.; and Sherrin, Thomas P., to Mono-Med, Inc. Filling apparatus for pharmaceuticals. 4,187,890, Cl. 141-27.000.
Stal-Laval Turbin AB: *See—*
Hugosson, Evald; and Kullendorf, Anders, 4,188,458, Cl. 428-556.000.
Standard Oil Company: *See—*
Fitzgibbons, William O., 4,188,292, Cl. 210-29.000.
Standard Oil Company (Indiana): *See—*
Caspari, Gunter, 4,188,299, Cl. 252-46.400.
Fields, Ellis K., 4,188,274, Cl. 204-158.0HA.
Fields, Ellis K., 4,188,275, Cl. 204-158.00R.
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,188,284, Cl. 208-216.0PP.
Swartz, Henry D., 4,188,253, Cl. 156-361.000.
Stange, Klaus K., to Xerox Corporation. Photoconductive belt supporting apparatus. 4,188,110, Cl. 355-3.0BE.
Staub, Martin L.: *See—*
Gusfafson, Gary B.; and Staub, Martin L., 4,188,025, Cl. 271-314.000.
Stauble, Georg: *See—*
Hintner, Josef; and Stauble, Georg, 4,188,072, Cl. 303-69.000.
Steck, Werner: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in a preselected compressed state. 4,188,146, Cl. 403-158.000.
Steiner, Edwin G.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.
Steiner, Karl-Ulrich: *See—*
Mislin, Roland; and Steiner, Karl-Ulrich, 4,188,187, Cl. 8-39.00B.
Stenger, Antoine: *See—*
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.
Stephens, Donald E.: *See—*
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Sterlini, Jacques, to CEM-Compagnie Electro-Mecanique. Method and apparatus for exchanging heat between fluids. 4,187,899, Cl. 165-1.000.
Stevens, Albert: *See—*
McMullan, James P.; and Stevens, Albert, 4,187,568, Cl. 5-451.000.
Stevens, Francis J.: *See—*
Palmer, Ansell W.; and Stevens, Francis J., 4,188,575, Cl. 324-103.00R.
Stevenson, Roy A. Signalling system. 4,188,581, Cl. 325-38.00R.
Stevenson, Walter A. Worm harvester. 4,187,946, Cl. 209-674.000.
Stikeleather, Allan, to Industrial Blast Coil Corporation. Method and apparatus for simultaneously rolling and slitting metal strip. 4,187,710, Cl. 72-204.000.
Stim, Edward M. Suction curettage device with valve control and support means for differing diameter tubes. 4,187,849, Cl. 128-278.000.
Stockl, Herbert: *See—*
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.
Stoepel, Kurt: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Stofer, Walter: *See—*
Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, 4,188,506, Cl. 179-1.50R.
Stolfa, Frank: *See—*
Czajkowski, George J.; and Stolfa, Frank, 4,188,283, Cl. 208-143.000.
Stoll, Max, deceased: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Stoll, Suzanne, executrix: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Stonov, Leonid D.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Stoot, Robert C. Butt hook for a logging choker line. 4,188,141, Cl. 403-24.000.
Storage Technology Corporation: *See—*
Loran, Thomas J., 4,188,434, Cl. 428-65.000.
Stout, Glenn M. Encapsulated Hall effect device. 4,188,605, Cl. 338-32.00H.
Straub, Otto C., to Bayer Aktiengesellschaft. Process for the preparation of vaccines. 4,188,375, Cl. 424-88.000.
Streble, Bernd, to Siemens Aktiengesellschaft. Cable for transmitting low-level signals. 4,188,080, Cl. 339-14.00R.
Strecker, Helmut, to Hoechst Aktiengesellschaft. Nuclide generator for preparing radio-nuclides. 4,188,539, Cl. 250-432.0PD.
Stricharczuk, Paul T.; and Lawson, Dennis L., to B. F. Goodrich Company, The. Stereo reticulated polymeric lace-like structure and process for making the same. 4,188,448, Cl. 428-311.000.
Strickland, Kevin: *See—*
Legate, Roland A.; and Strickland, Kevin, 4,187,709, Cl. 72-56.000.
Striggow, Lewis J. Beverage container lid. 4,187,954, Cl. 220-90.400.
Stroppe, Bill: *See—*
Crean, John C.; and Stroppe, Bill, 4,188,047, Cl. 280-678.000.
Strozak, Stephen: *See—*
Krisak, Edward J.; and Strozak, Stephen, 4,188,039, Cl. 277-95.000.

Stubbs, John K.: *See—*
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.
Stubstad, James A.: *See—*
Dahlen, Burton L.; and Stubstad, James A., 4,187,558, Cl. 3-1.000.
Stumpp, Gerhard, to Robert Bosch GmbH. Fuel supply device. 4,187,813, Cl. 123-136.000.
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Carminomycin derivatives, their preparation and use. 4,188,377, Cl. 424-180.000.
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for an electrode for a lead battery. 4,188,268, Cl. 204-2.100.
Sugawara, Toru: *See—*
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Sugiyama, Masatoshi, to Fuji Photo Film Co., Ltd. Process for the production of 3-substituted amino-5-pyrazolones. 4,188,489, Cl. 548-360.000.
Suh, Nam P.; and Malguarnera, Salvatore C., to Massachusetts Institute of Technology. Method and apparatus for the treatment of particulate materials. 4,188,185, Cl. 432-27.000.
Sukolics, Ronald D., to Swiss Aluminium Ltd. Thermal windows. 4,187,657, Cl. 52-397.000.
Sulphur Development Institute of Canada: *See—*
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.
Sumitomo Chemical Company, Limited: *See—*
Sano, Takezo; and Sasaki, Masao, 4,188,273, Cl. 204-158.0HE.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Air-fuel ratio controlling system for an internal combustion engine. 4,187,816, Cl. 123-139.0AW.
Sung, Fong G. Inner sole for a shoe. 4,187,622, Cl. 36-44.000.
Superior Cable Corporation: *See—*
Dickey, Donald F., 4,188,082, Cl. 339-36.000.
Sussenbacher, Florian: *See—*
Kissich, Arnulf; and Sussenbacher, Florian, 4,188,069, Cl. 299-73.000.
Sutton, Jay D.: *See—*
Corbett, Wendell E.; and Sutton, Jay D., 4,188,160, Cl. 406-58.000.
Suzuki, Hideo: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, to Hitachi, Ltd. Temperature responsive apparatus employing a thermocouple. 4,188,623, Cl. 340-595.000.
Suzuki, Shigeto, to Chevron Research Company. Hydrogen fluoride removal from glycolic acid. 4,188,494, Cl. 562-580.000.
Suzuki, Shoichi, to Nihon Dixie Company, Limited. Method for the manufacture of a paper container. 4,187,768, Cl. 93-39.10R.
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, to Daikin Kogyo Co., Ltd. Elastomeric composition comprising fluoroelastomer and epicholorohydrin elastomer. 4,188,352, Cl. 525-187.000.
Suzuki, Yasuo; and Hirai, Tosihisa, to Matsushita Electric Works, Ltd. Stator of uni-directional self starting synchronous motor. 4,188,555, Cl. 310-162.000.
Swartz, Henry D., to Standard Oil Company (Indiana). Machine for the fabrication of plasticboard. 4,188,253, Cl. 156-361.000.
Swift, Joseph A., to Xerox Corporation. Solvent extracted heat fuser member. 4,188,423, Cl. 427-444.000.
Swingler, Donald L., to Commonwealth Scientific and Industrial Research Organization. Flanged cylindrical electron multipliers. 4,188,560, Cl. 313-105.00R.
Swiss Aluminium Ltd.: *See—*
Sukolics, Ronald D., 4,187,657, Cl. 52-397.000.
Sybron Corporation: *See—*
Grell, Helmut; and Engelhardt, Achim, 4,187,559, Cl. 3-1.910.
Syntex (U.S.A.) Inc.: *See—*
Edwards, John A., 4,188,385, Cl. 424-241.000.
T. Y. Lin International: *See—*
Lin, Tung-Yen; and Yang, Yue-Chyou, 4,187,660, Cl. 52-747.000.
Tabak, Samuel A.; and Morrison, Roger A., to Mobile Oil Corporation. Manufacture of benzene, toluene and xylene. 4,188,282, Cl. 208-134.000.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-Acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,188,319, Cl. 260-112.50R.
Taddeo, Michael. Cigarette holder for ash receptacles. 4,187,864, Cl. 131-242.000.
Taguchi, Masahiro: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Taguchi, Tetsuya: *See—*
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,188,104, Cl. 354-31.000.
Takagi, Izumi; and Adachi, Shigeo, to Kawasaki Jukogyo Kabushiki Kaisha. Sheave assembly for V-belt type infinitely variable transmissions. 4,187,732, Cl. 74-230.17M.
Takahashi, Akira: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, to Hitachi Chemical Company, Ltd. Baseboard for printed circuit board and method of producing the same. 4,188,415, Cl. 427-97.000.
Takahashi, Kenji: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Takahashi, Nobuaki: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Takahashi, Nobuhiro; and Hirata, Kenichi, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for heat-treating metallic material. 4,188,243, Cl. 148-155.000.
Takahasi, Toru: *See—*
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Takaki, Noboru: *See—*
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,187,616, Cl. 34-13.000.
Takasaka, Masahiro: *See—*
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Takeda, Keiji: *See—*
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.
Takemura, Shinichiro: *See—*
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Takenoya, Hideaki; and Makabe, Machiro, to Janome Sewing Machine Co. Ltd. Sewing machine with an electronic pattern stitch control system. 4,187,789, Cl. 112-158.00E.
Takeuchi, Yuzo: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., to United States of America, Navy. Method and means for injecting hot liquid when pumping cold liquid. 4,188,172, Cl. 417-53.000.
Tallon, Thomas G.; and Harris, Gerald A., to Chrysler Corporation. Vehicle headlamp and mounting assembly. 4,188,655, Cl. 362-80.000.
Tan, Yoichi, to Nippon Electric Co., Ltd. Bit error detecting circuit for use in a digital signal transmission line. 4,188,615, Cl. 340-146.10R.
Tanaka, Hirokazu: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.
Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Cassette type tape recorder. 4,188,647, Cl. 360-105.000.
Tanaka, Taku: *See—*
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.
Tanashin Denki Co., Ltd.: *See—*
Tanaka, Shinsaku, 4,188,647, Cl. 360-105.000.
Tanzawa, Misao: *See—*
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.
Tapco International, Inc.: *See—*
Freeman, Murray E.; and Shipper, Harmon E., 4,187,872, Cl. 137-454.600.
Taylor, Glenn N., to Kendall Company, The. Adapter assembly. 4,187,848, Cl. 128-247.000.
Taylor, John E. Formation of barriers. 4,188,153, Cl. 405-34.000.
TDK Electronics Company, Limited: *See—*
Okamura, Masatoshi; and Shiba, Haruo, 4,187,998, Cl. 242-199.000.
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.
Technical Exhibits Corporation: *See—*
Chaffee, William H., 4,187,649, Cl. 52-36.000.
Tecneco S.p.A.: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Tektronix, Inc.: *See—*
Janko, Bozidar, 4,188,563, Cl. 313-460.000.
Teledyne Industries, Inc.: *See—*
Petrovic, John E., 4,187,986, Cl. 239-449.000.
Teledyne Industries Inc. (Geotech Division): *See—*
Kerr, James D., 4,188,612, Cl. 367-160.000.
Telesync Corporation: *See—*
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.
Teletronics Co., Inc. of Clifton: *See—*
Junak, Edward M., 4,188,182, Cl. 431-80.000.
Temin, Samuel C., to Colgate-Palmolive Company. Dental restorative compositions containing titanium silicate. 4,188,317, Cl. 260-42.530.
te Raa, Gerhardus A.: *See—*
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Terakawa, Toshiaki: *See—*
Miwa, Hirohide; and Terakawa, Toshiaki, 4,188,566, Cl. 315-169.400.
Ter-Davtian, Zorik S.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden

A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.
Terenzoni, Amerigo. Furniture construction. 4,188,066, Cl. 297-440.000.
Terlecky, Boris S.: *See*—
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.
Terry, Clegia L. Helical drive trains which eliminate the need for thrust bearings. 4,187,735, Cl. 74-410.000.
Texaco Development Corporation: *See*—
Waddill, Harold G.; and Moss, Philip H., 4,188,474, Cl. 528-111.000.
Texaco Inc.: *See*—
Reinhard, Russell R.; and Yaffe, Roberta, 4,188,298, Cl. 252-46.600.
Texas Instruments Incorporated: *See*—
Frantz, Gene A.; and Brantingham, George L., 4,188,626, Cl. 340-711.000.
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.
McElroy, David J., 4,187,602, Cl. 29-571.000.
Textron Inc.: *See*—
Moertel, George B., 4,187,791, Cl. 112-265.200.
Prew, Raymond A., Jr., 4,187,971, Cl. 227-125.000.
Thiewes, Richard B.; and Nelson, Donald W. Apparatus for controlling video tape presentation. 4,188,644, Cl. 360-14.000.
Thimm, Max. Device for applying flowing masses to the surface of a workpiece. 4,187,802, Cl. 118-708.000.
Thimsen, Mark J.: *See*—
Ivers, Robert P.; and Thimsen, Mark J., 4,187,613, Cl. 33-174.00G.
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, to I.N.R.A. Automatic method for the determination of starch. 4,188,466, Cl. 435-18.000.
Thomas, Robert D., to Smith International, Inc. Rock bit and method of manufacture. 4,187,743, Cl. 76-108.00A.
Thompson, Howard J. Identification device. 4,187,628, Cl. 40-10.00D.
Thompson, Norman, to Beta Aluminium Products Limited. Louvre windows. 4,187,641, Cl. 49-403.000.
Thompson, Roy F. Device for obtaining lateral and vibrational movement within rotatable receptacles. 4,188,129, Cl. 366-108.000.
Thomson-CSF: *See*—
D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, 4,188,087, Cl. 350-96.200.
Milosevic, Ljubimko, 4,188,630, Cl. 343-9.00R.
Throp, Arnold M., to Metal Box Limited. Closures of liquid product containers. 4,188,457, Cl. 428-542.000.
Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, to Albert Rolland S.A. Phenoxy pyridazinones and anorexigenic use thereof. 4,188,388, Cl. 424-250.000.
Timesavers, Inc.: *See*—
Lind, Fred W., 4,187,645, Cl. 51-135.0BT.
Timossi, Giovanni: *See*—
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.
Tokyo Shibaura Electric Co. Ltd.: *See*—
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Sato, Shigeru, 4,187,857, Cl. 128-660.000.
Yamamura, Toshio, 4,188,558, Cl. 313-55.000.
Tolsma, Auke. Method for manufacturing thermally insulated buildings, construction elements suitable for application in this method and a method of manufacturing the building construction elements. 4,187,651, Cl. 52-79.100.
Tombari, Aldo L. Athletic glove. 4,187,557, Cl. 2-19.000.
Tomoda, Masayasu: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.
Tone Commander Systems, Inc.: *See*—
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., 4,188,511, Cl. 179-99.00A.
Tonka Corporation: *See*—
Pauly, Ronald R., 4,187,636, Cl. 46-201.000.
Tormala, Pertti: *See*—
Rautavuori, Jorma K.; and Tormala, Pertti, 4,188,369, Cl. 423-449.000.
Touchton, James J.: *See*—
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.
Tovel S.p.A.: *See*—
Gottardo, Guido, 4,188,255, Cl. 156-384.000.
Towart, Robertson: *See*—
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Townsend Engineering Company: *See*—
Townsend, Ray T.; and Smith, David W., 4,187,583, Cl. 17-49.000.
Townsend, Ray T.; and Smith, David W., to Townsend Engineering Company. Method and means for encasing sausage or the like. 4,187,583, Cl. 17-49.000.
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., to United States of America, Navy. Separation nut system. 4,187,759, Cl. 89-1.00B.
Toyo Boseki Kabushiki Kaisha: *See*—
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.
Toyo Kagaku Kabushiki Kaisha: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.
Toyo Kogyo Co., Ltd.: *See*—
Morinaga, Teruhiko; and Nishikawa, Ikuo, 4,187,642, Cl. 49-406.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Shibasaki, Kyuichi, 4,187,718, Cl. 73-52.000.
Toyoda Gosei Co., Ltd.: *See*—
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.
Katoh, Kenji; and Ogita, Tamotu, 4,187,811, Cl. 123-119.00A.
Kobayashi, Toshihiko; and Oonishi, Toshinari, 4,187,815, Cl. 123-122.00H.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Trailer Train Company: *See*—
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.
Traut, Earl W. Variable displacement rotary fluid energy converter. 4,188,176, Cl. 418-24.000.
Tregoning, Robert H. Cosmic and solar ray hot water heater. 4,187,832, Cl. 126-443.000.
Tri-State Oil Tool Industries, Inc.: *See*—
Johnson, Gary R., 4,187,920, Cl. 175-267.000.
Trico Products Corporation: *See*—
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,187,576, Cl. 15-250.420.
Trienekens, Matthias: *See*—
Flender, Hans F., 4,187,775, Cl. 100-39.000.
Trinchera, Luigi, to California Cedar Products Company. Method of brazing tips on circular saw teeth. 4,188,524, Cl. 219-85.0CM.
Tronconi, Giovanni: *See*—
Scolastico, Carlo; and Tronconi, Giovanni, 4,188,484, Cl. 544-317.000.
Trost, Werner: *See*—
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.
Trutzschler GmbH & Co. KG: *See*—
Trutzschler, Hermann, 4,187,584, Cl. 19-81.000.
Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Method and apparatus for opening textile fiber bales. 4,187,584, Cl. 19-81.000.
TRW Inc., Systems & Energy: *See*—
James, Gordon E., 4,187,930, Cl. 184-1.00R.
Tsoutsas, Peter A., to Permacor, Inc. Inductor with conducting core of sintered powdered metal. 4,188,603, Cl. 336-75.000.
Tsuchiya, Shuji: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, to Hitachi, Ltd. Method and system for effecting control governing of a steam turbine. 4,187,685, Cl. 60-660.000.
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, to Kanebo, Ltd. 2-Substituted benzimidazole compounds. 4,188,486, Cl. 546-271.000.
Tsukumo, Zenzaburo, to NTN Toyo Bearing Co. Ltd.; and Tsukumo, Zenzaburo. Construction of pendulum arm type high sensitivity self-aligning weighting arm. 4,187,588, Cl. 19-281.000.
Tuchida, Hisashi: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Tullman, Edward J.: *See*—
Ross, Roger J.; and Tullman, Edward J., 4,187,794, Cl. 112-308.000.
Tune, John B.: *See*—
Clarke, David E.; Davies, James F.; and Tune, John B., 4,188,304, Cl. 252-93.000.
Turk, Abraham A.: *See*—
Simuro, Ernest G.; Turk, Abraham A.; and Turk, Nathan M., 4,187,607, Cl. 30-152.000.
Turk, Nathan M.: *See*—
Simuro, Ernest G.; Turk, Abraham A.; and Turk, Nathan M., 4,187,607, Cl. 30-152.000.
Turner, James B., Jr.: *See*—
Hall, John R., 4,187,647, Cl. 52-20.000.
Hall, John R., 4,188,151, Cl. 404-26.000.
Turner, John L.: *See*—
Nicholson, John S.; and Turner, John L., 4,188,491, Cl. 562-492.000.
Turner, Lloyd S., to Basic Products Development Company, Inc. Security container and closure apparatus. 4,187,953, Cl. 215-301.000.
Ubezio, Lorenzo, to Reppisch-Werke Aktiengesellschaft. Drafting board base. 4,188,007, Cl. 248-411.000.

Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Automatic control device for electronic flash. 4,188,104, Cl. 354-31.000.
Uddeholms Aktiebolag: *See*—
Johnsson, Mans K. O.; and Eriksson, Lars A., 4,188,206, Cl. 75-60.000.
UEC Manufacturing Company: *See*—
Byrne, James E., 4,187,927, Cl. 182-2.000.
Ueno, Akio: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.
Ueta, Yutaka: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.
Uliana, Claudio: *See*—
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Unangst, Paul C.: *See*—
Brown, Richard E.; and Unangst, Paul C., 4,188,326, Cl. 260-326.290.
Union Carbide Corporation: *See*—
Kaplan, Leonard; and Cotton, Frank A., 4,188,335, Cl. 260-449.00L.
Lolachi, Houshang; and Carminucci, Robert N., 4,187,846, Cl. 128-214.00R.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.
Union Special Corporation: *See*—
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.
United Geophysical Corporation: *See*—
Edwards, Charles M.; and Walter, William C., 4,188,611, Cl. 367-41.000.
United States of America
Agriculture: *See*—
Wasley, William L.; and Ingenthron, Walter W., Jr., 4,188,422, Cl. 28-167.000.
Air Force: *See*—
Greger, Anthony, 4,188,001, Cl. 244-151.00B.
Kuhn, Ralph F., Jr., 4,187,595, Cl. 29-157.00C.
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.
Wakeman, Thomas G., 4,187,675, Cl. 60-39.750.
Army: *See*—
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.
Golden, Stephen P.; and Jennings, Charles T., 4,187,723, Cl. 73-295.000.
Grace, Fred I., 4,187,782, Cl. 102-56.0SC.
Jacobs, Paul L., 4,188,576, Cl. 324-163.000.
Pagano, Carmine N.; and Di'Giorgio, Anthony D., 4,188,503, Cl. 178-88.000.
Petty, Jon, 4,187,758, Cl. 86-1.00B.
Energy: *See*—
Cho, Nakwon, 4,187,764, Cl. 91-442.000.
Goedicke, Friedrich E., 4,188,038, Cl. 277-64.000.
Knight, Charles E., Jr.; and Pollard, Roy E., 4,187,738, Cl. 74-572.000.
Lindsay, Malcolm, 4,188,173, Cl. 417-424.000.
Weinstein, Berthold W.; and Willenborg, David L., 4,188,118, Cl. 356-244.000.
Health, Education and Welfare: *See*—
Montgomery, John A., 4,188,378, Cl. 424-180.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wolf, Charles B.; and Meyer, Thomas N. Method of producing silicon. 4,188,368, Cl. 423-350.000.
Navy: *See*—
De Simone, David N., 4,187,570, Cl. 9-14.000.
Dougherty, Richard H.; and Fealy, Thomas E., 4,188,631, Cl. 343-705.000.
Ess, John O., 4,187,796, Cl. 114-312.000.
Hendrickson, Richard C., 4,187,871, Cl. 137-112.000.
Holt, Lloyd J., 4,187,760, Cl. 89-1.50E.
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,187,761, Cl. 89-1.50R.
Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., 4,187,779, Cl. 102-18.00M.
Masters, Blake W.; and Moran, Robert D., 4,188,570, Cl. 318-616.000.
McDonald, Jimmie R.; and Baronavski, Andrew P., 4,188,120, Cl. 356-318.000.
O'Neil, Scott M.; and Payne, Howard H., 4,187,676, Cl. 60-255.000.
Shajenko, Peter, 4,188,096, Cl. 350-358.000.
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., 4,188,172, Cl. 417-53.000.
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., 4,187,759, Cl. 89-1.00B.
U.S. Philips Corporation: *See*—
de Haan, Maarten R., 4,188,638, Cl. 358-4.000.
Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., 4,188,433, Cl. 428-64.000.
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.
Hodemaekers, Andreas M. L., 4,188,625, Cl. 340-642.000.
Reiniger, Friedrich, 4,188,540, Cl. 250-439.00R.
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.
Van Oostrum, Karel J., 4,188,562, Cl. 313-402.000.
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Zegers, Antonius P. F.; and Compen, Johannes M. A. A., 4,188,564, Cl. 313-479.000.
United Technologies Corporation: *See*—
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.
University of Alabama, The: *See*—
Urry, Dan W.; and Okamoto, Kouji, 4,187,852, Cl. 128-334.00R.
University of Dayton: *See*—
Chasteen, Jack W., 4,188,237, Cl. 134-2.000.
University of Iowa Research Foundation: *See*—
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University of Minnesota, Regents of: *See*—
Gassman, Paul G.; and Cue, Berkeley W., 4,188,325, Cl. 260-325.00R.
University of Mississippi, The: *See*—
Hufford, Charles D., 4,188,392, Cl. 424-258.000.
University of Rhode Island: *See*—
Felbeck, George T., Jr., 4,188,193, Cl. 48-197.00R.
University of Rochester, The: *See*—
Deckman, Harry W.; and Halpern, Gerald M., 4,188,532, Cl. 250-336.000.
University of Southampton, The: *See*—
Binns, Kenneth J., 4,188,554, Cl. 310-156.000.
University of Southern California: *See*—
Diels, Jean-Claude, 4,188,538, Cl. 250-423.00P.
University Patents, Inc.: *See*—
Allen, Robert H., 4,188,189, Cl. 23-230.300.
Uno, Masahiro: *See*—
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.
UOP Inc.: *See*—
Cheshire, Ernest L., 4,188,064, Cl. 297-367.000.
Czajkowski, George J.; and Stolfa, Frank, 4,188,283, Cl. 208-143.000.
Uozumi, Junzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Upat GmbH & Co: *See*—
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Upjohn Company, The: *See*—
Bundy, Gordon L., 4,188,332, Cl. 260-343.410.
Martin, David G., 4,188,324, Cl. 548-240.000.
Nelson, Norman A., 4,188,468, Cl. 542-429.000.
Sih, John C., 4,188,481, Cl. 542-426.000.
Ureda, Mark S.: *See*—
Henricksen, Clifford A.; and Ureda, Mark S., 4,187,926, Cl. 181-192.000.
Urry, Dan W.; and Okamoto, Kouji, to University of Alabama, The. Synthetic elastomeric insoluble cross-linked polypentapeptide. 4,187,852, Cl. 128-334.00R.
USV Pharmaceutical Corporation: *See*—
Guarino, Richard A., 4,188,404, Cl. 424-330.000.
Vaello, Donald B.: *See*—
Fertl, Walter H.; and Vaello, Donald B., 4,187,908, Cl. 166-254.000.
Valenta, Rudolph C., to Oil-Dri Corporation of America. Process for pelletizing sorptive mineral fines. 4,187,803, Cl. 119-1.000.
Valeron Corporation, The: *See*—
Smith, David L.; and Scherr, Norman J., Jr., 4,187,645, Cl. 51-165.770.
Zweekly, Raymond T., 4,188,162, Cl. 408-199.000.
Valmet: *See*—
Kankaanpaa, Matti, 4,188,262, Cl. 162-205.000.
Valore, Rudolph C. Methods of preparing iron oxide mortars or cements with admixtures and the resulting products. 4,188,231, Cl. 106-90.000.
Van Dresser Corporation: *See*—
Doerer, Richard P., 4,188,440, Cl. 428-215.000.
van Bergen, Johannes A. W. P. Ear ornament clips. 4,187,696, Cl. 63-14.00C.
Van Cauter, Albert: *See*—
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.
van den Berg, Jan W.: *See*—
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
van den Broek, Arnoldus J. M.: *See*—
Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., 4,188,433, Cl. 428-64.000.
van der Lely, Cornelis. Soil cultivating implements. 4,187,914, Cl. 172-53.000.

van der Lely, Cornelis. Soil cultivating implements. 4,187,915, Cl. 172-59.000.
Van der Zwaan, Johan C.: *See—*
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., 4,187,759, Cl. 89-1.00B.
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, to BFG Glassgroup. Metal compound coating on a face of a continuously longitudinally moving glass ribbon and apparatus for use in forming such coating. 4,188,199, Cl. 65-60.00C.
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., to Kalamazoo Manufacturing Company. Metal dispensing valve assembly for battery grid casting machine. 4,187,966, Cl. 222-601.000.
Van Linder, Ronald C.: *See—*
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.
van Mullekom, Hubert P., to Ruti-te Strake B.V. Supply system for a pneumatic weaving machine. 4,187,888, Cl. 139-435.000.
Van Namen, Dirk J.: *See—*
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.
Van Oostrum, Karel J., to U.S. Philips Corporation. Color display tube and method of manufacturing such a color display tube. 4,188,562, Cl. 313-402.000.
Van Paassen, Nicolaas I.: *See—*
Aalbers, Johan G.; and Van Paassen, Nicolaas I., 4,188,311, Cl. 252-551.000.
Van Rooijen, Gerrit: *See—*
Langeraar, Huibert B.; and Van Rooijen, Gerrit, 4,188,628, Cl. 343-5.0SA.
Varen Technology: *See—*
Vaughan, Ronald J., 4,188,308, Cl. 252-413.000.
Varju, Gyula: *See—*
Juhasz, Zoltan; and Varju, Gyula, 4,188,233, Cl. 106-97.000.
Vater, Wulf: *See—*
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Vaughan, Ronald J., to Varen Technology. Conversion of pendant sulfonate groups to sulfonic acid groups on perfluorvinylether-tetrafluoroethylene copolymer catalysts. 4,188,308, Cl. 252-413.000.
VDO Adolf Schindling AG: *See—*
Mann, Arnold, 4,187,734, Cl. 74-405.000.
Velinsky, Milton: *See—*
Sinko, Michael J.; and Velinsky, Milton, 4,187,981, Cl. 235-488.000.
Vella, Alexander J., to Pace Incorporated. Apparatus including general purpose desolderer and means for converting the general purpose desolderer to either a soldering iron or a special purpose desolderer. 4,187,972, Cl. 228-20.000.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Kissich, Arnulf; and Sussenbacher, Florian, 4,188,069, Cl. 299-73.000.
Vernon, Roger J.: *See—*
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Vetter, Werner: *See—*
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.
Vial, Jean: *See—*
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Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., to Union Carbide Corporation. Olefin polymer blends and films therefrom. 4,188,350, Cl. 525-232.000.
Victor Company of Japan, Limited: *See—*
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Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, 4,188,301, Cl. 252-62.540.
Vigander, Kjell, to A/S Hoyer-Ellefsen. Marine structure. 4,188,157, Cl. 405-210.000.
Vignon, Louis, to Heberlein Hispano SA. Textile machine having hydraulically controlled drafting rollers. 4,187,587, Cl. 19-272.000.
Vigo, Fernando: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Villari, Frank K., to Kendall Company, The. Arterial blood collection device. 4,187,860, Cl. 128-763.000.
Vincent, William T.: *See—*
Feig, Stephen; and Vincent, William T., 4,187,786, Cl. 108-64.000.
Virginia Chemicals Inc.: *See—*
Schumacher, Ernest W., 4,187,695, Cl. 62-503.000.
Vivant, Gilbert: *See—*
Cerny, Jacqueline; and Vivant, Gilbert, 4,188,313, Cl. 260-37.0EP.
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer. Attractant for the potato moth and the preparation of the former. 4,188,374, Cl. 424-84.000.
Voest-Alpine Aktiengesellschaft: *See—*
Patuzzi, Alexander; and Eysn, Manfred, 4,188,021, Cl. 266-88.000.
Vogel, John D., to Singer Company, The. Stepper disk adder for pattern stitch sewing machines. 4,187,790, Cl. 112-158.00E.
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Shaped catalyst and process for its production. 4,188,309, Cl. 252-466.00J.
Vollema, Gerlof: *See—*
Bruins, Antonius H. N. M.; and Vollema, Gerlof, 4,188,338, Cl. 260-500.50H.
Voller, Ronald L. Dye metering system. 4,187,961, Cl. 222-133.000.
Volterra, Giovanna: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.
von Taschitzki, Rainer, to Aratowerk Walter von Taschitzki. Water dispenser for livestock. 4,187,804, Cl. 119-72.5RC.
Vsesojuzny Nauchno, et al.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.
W. F. Altenpohl, Inc.: *See—*
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W. R. Chesnut Engineering, Inc.: *See—*
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W. R. Grace & Co.: *See—*
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.
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Wachter, Michael P., to Ortho Pharmaceutical Corporation. Chemical intermediates in the preparation of oxepane compounds. 4,188,328, Cl. 260-340.90R.
Wacker-Chemie GmbH: *See—*
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Wacker-Chemitronic fur Elektronic Grundstoffe mbH: *See—*
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, 4,187,827, Cl. 125-16.00R.
Waddill, Harold G.; and Moss, Philip H., to Texaco Development Corporation. Epoxy curing accelerator. 4,188,474, Cl. 528-111.000.
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Wagner, Heinz: *See—*
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Wagner, Richard C., to Hollymatic Corporation. Molding device. 4,187,581, Cl. 17-32.000.
Waiamea Company, Inc.: *See—*
Donan, David C., Jr.; and Donan, David M., 4,188,158, Cl. 405-259.000.
Waibel, Helmut K., to Durango Systems, Inc. Fastener assembly. 4,188,148, Cl. 403-258.000.
Waitman, Reuben H., Sr.: *See—*
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.
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Lavochkin, Ronald B.; and Coe, Thomas D., 4,187,711, Cl. 72-256.000.
Wakeman, Thomas G., to United States of America, Air Force. Compact air-to-air heat exchanger for jet engine application. 4,187,675, Cl. 60-39.750.
Walde, Peter, to Jagenberg Werke Aktiengesellschaft. Knife drum for cross cutting machines. 4,187,753, Cl. 83-674.000.
Wallace Murray Corporation: *See—*
Bremer, Robert C., Jr., 4,187,597, Cl. 29-281.300.
Walter, Thomas J., to Ethyl Corporation. Process for recovering CMOS. 4,188,493, Cl. 562-580.000.
Walter, Thomas J.; and Laurent, Sebastian M., to Ethyl Corporation. Purification of alcohol. 4,188,499, Cl. 568-914.000.
Walter, William C.: *See—*
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Walther, William D.; and Phillips, Charles E., to Dayton-Walther Corporation. Speed reduction mechanism for semi-trailer landing gear. 4,187,733, Cl. 74-342.000.
Wanat, David J.: *See—*
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Ward, Frederick G., to Herbert Morris Ltd. Transfer beam conveyor. 4,187,942, Cl. 198-345.000.
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Warncke, Ernst; and Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Respirator having an oxygen-releasing chemical cartridge and means for attaching an additional cartridge. 4,187,843, Cl. 128-202.260.
Warner Electric Brake & Clutch Company: *See—*
Kroeger, Edward R., 4,187,603, Cl. 29-602.00R.
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Warner-Lambert Company: *See—*
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Zinnes, Harold; and Schwartz, Martin L., 4,188,482, Cl. 544-32.000.
Wasley, William L.; and Ingenthron, Walter W., Jr., to United States of America, Agriculture. Shrink-resistant textiles containing polypropylene proteinous fiber blend produced by immersing textile in an inert liquid at high temperature. 4,188,422, Cl. 28-167.000.
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, to Fuji Electric Co., Ltd. Infrared gas analyzer. 4,188,534, Cl. 250-345.000.
Watanabe, Kunio; and Hashimoto, Yoshio, to Nippon Steel Corporation. Method for producing high tensile strength, high ductility, low yield ratio hot rolled steel sheet. 4,188,241, Cl. 148-12.00F.
Watanabe, Masahiro: *See—*
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Watanabe, Robert S. Bone plate clamp. 4,187,840, Cl. 128-92.0EA.
Watanabe, Saburo: *See—*
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.
Watson, Allan: *See—*
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Watson Bowman Associates, Inc.: *See—*
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Watson, Charles L. Combination boat and camper trailer. 4,188,056, Cl. 296-157.000.
Watson, John D. Diverter-valve apparatus. 4,187,882, Cl. 137-625.470.
Watson, Stewart C.: *See—*
Fyfe, Edward R.; and Watson, Stewart C., 4,187,573, Cl. 14-16.100.
Webber, Robert, to Bay City Boring. Method and apparatus for loading and unloading workpieces. 4,187,749, Cl. 82-2.700.
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, to Bayer Aktiengesellschaft. Method and an apparatus for the production of a foam-forming reaction mixture or homogeneous material-forming reaction mixture and for the subsequent introduction thereof into a cavity. 4,188,356, Cl. 264-40.100.
Weber, Horst: *See—*
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.
Weber-Knapp Company: *See—*
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Webster, George R., to Cameron Iron Works, Inc. Multiple position valve. 4,187,883, Cl. 137-625.680.
Webster, Sherwood F.; and Heise, Richard L. Intake manifold variable atomizing valve. 4,187,820, Cl. 123-141.000.
Weetall, Howard H., to Corning Glass Works. Immunological detection of Neisseria bacteria via labelled antibodies. 4,188,371, Cl. 424-1.000.
Wehinger, Egbert: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Wehner, Albert, deceased (by Wehner, Elfriede, legal representative), to Hein, Lehmann AG. Screen with tubular frame systems coupled for rectilinear motion. 4,188,288, Cl. 209-310.000.
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Wehner, Albert, deceased, 4,188,288, Cl. 209-310.000.
Wehner, Wolfgang; and Wirth, Hermann O., to Ciba-Geigy Corporation. Organotin compounds. 4,188,334, Cl. 260-429.700.
Weible, Warren W., to Zeller Corporation, The. Universal joint for connecting shafts. 4,187,699, Cl. 64-12.000.
Weill, Theodore C. Wear part. 4,187,891, Cl. 144-162.00R.
Weinberg, Alan S.: *See—*
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.
Weinstein, Berthold W.; and Willenborg, David L., to United States of America, Energy. Manipulator for rotating and examining small spheres. 4,188,118, Cl. 356-244.000.
Weisbart, Emanuel S. Digital tachograph system with digital memory system. 4,188,618, Cl. 340-201.00R.
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Wells, John L., to Zimm-Zamm Aktiengesellschaft. Tethered ball game with helix support. 4,188,033, Cl. 273-413.000.
Wendel, Ion L., to WenLo Corporation. Laundry hot water supply system and apparatus. 4,187,701, Cl. 68-20.000.
WenLo Corporation: *See—*
Wendel, Ion L., 4,187,701, Cl. 68-20.000.
Werner, Nils H.: *See—*
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Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, to Linde Aktiengesellschaft; and Bayer Aktiengesellschaft. Two-stage production of olefins utilizing a faujasite structure zeolite in hydrogenation stage. 4,188,281, Cl. 208-57.000.
Western Electric Company, Inc.: *See—*
Mahajan, Roop L., 4,187,974, Cl. 228-242.000.
Sherman, Charles J., 4,187,867, Cl. 134-64.00P.
Westinghouse Air Brake Company: *See—*
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Gyugyi, Laszlo; and Brennen, Michael B., 4,188,573, Cl. 323-119.000.
Mott, Gerald, 4,188,609, Cl. 367-152.000.
Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., 4,188,514, Cl. 200-48.00R.
Patel, Jayant M.; and Farley, James R., 4,188,515, Cl. 200-48.00R.
Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., 4,188,516, Cl. 200-48.00R.
Yeo, Denis, 4,188,521, Cl. 219-60.00A.
Westover, Jack D.; and Keller, Richard L., to Pillsbury Company, The. Frying apparatus. 4,187,771, Cl. 99-404.000.
Weyerhaeuser Company: *See—*
Chasson, Leon H., 4,188,544, Cl. 250-560.000.
Whaley, Kent; and Reinart, Joseph, to Whaley, Kent. Clamping device. 4,188,023, Cl. 269-228.000.
Whaley, William L., to ACF Industries, Incorporated. Spacer carriers for floating seats in gate valves. 4,188,016, Cl. 251-328.000.
Wheaton, William H., to A. O. Smith Corporation. Pocket receptacle for securing a sensing element within electrical windings. 4,188,553, Cl. 310-68.00C.
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White Metal Rolling & Stamping Corp.: *See—*
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Whiteside, George D.: *See—*
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Whiteside, Stephen E.: *See—*
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Whiteway Manufacturing Co., Inc.: *See—*
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Whyco Chromium Company, Inc.: *See—*
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Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, to Licentia Patent-Verwaltungs-G.m.b.H. Electronic control device for electric ranges. 4,188,528, Cl. 219-490.000.
Wiese, Larry L., to Bell Telephone Laboratories, Incorporated. Mercury-wetted relay construction. 4,188,601, Cl. 335-51.000.
Wilcox, Dwight E., to Wilcox Silent Nozzle Man, Inc. Firehose-assembly steadying device. 4,187,913, Cl. 169-51.000.
Wilcox Silent Nozzle Man, Inc.: *See—*
Wilcox, Dwight E., 4,187,913, Cl. 169-51.000.
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Wilhelm, Larry A., to Midland-Ross Corporation. Apparatus and method for testing products for leaks. 4,187,717, Cl. 73-46.000.
Wilkes, Glenn R.; and Brault, Albert T., to Eastman Kodak Company. Catalytic activation of cobalt complex imaging by cobalt sulfide. 4,188,217, Cl. 430-353.000.
Willenborg, David L.: *See—*
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Willis, Don: *See—*
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Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.
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Willner, Howard; and Kapteyn, Robert J., to Bio-Rad Laboratories, Inc. High density lipoprotein cholesterol assay. 4,188,188, Cl. 23-230.00B.
Wilms, Manfred W.: *See—*
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Wilson, Harry L.; Shultz, David E.; and Muntean, George L., to Cummins Engine Company, Inc. Apparatus and method for averting the effects of seal failure in an I.C. engine fuel supply system. 4,187,817, Cl. 123-139.0AW.

Wilson, Peter C.; and Hughart, Robert P. Method and apparatus for monitoring density fluctuations in material flowing spirally within a hydrocyclone. 4,188,535, Cl. 250-359.000.
Wilson, Robert G.: *See*—
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Wimelius, Bjorn: *See*—
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Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Apparatus for threading a paper web into the folding mechanism of a rotary printing press. 4,187,968, Cl. 226-92.000.
Wirth, Hermann O.: *See*—
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Wissel, Frank A.; and Bucher, Charles A., to Cincinnati Electronics Corporation. Synchronized receiver power system. 4,188,585, Cl. 325-492.000.
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, to U.S. Philips Corporation. Method of manufacturing a metallized plastic reflector. 4,188,358, Cl. 264-255.000.
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WOCO Franz-Josef Wolf & Co., Firma: *See*—
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Wolf, Charles B.: *See*—
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Wolf, Franz-Josef; and Kunze, Hans J., to WOCO Franz-Josef Wolf & Co., Firma. Sealing ring. 4,188,040, Cl. 277-207.00R.
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Wolf, Peter. Board element. 4,188,428, Cl. 428-71.000.
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Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., 4,188,516, Cl. 200-48.00R.
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Wood, Ernest C.: *See*—
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Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,187,944, Cl. 206-187.000.
Woodbrey, James C.; and Moncur, Marlowe V., to Monsanto Company. Amino-functional photopolymer compositions and photo-oxidation imaging processes employing same. 4,188,223, Cl. 430-270.000.
Woods, David R.: *See*—
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Wrue, Richard J., to Bausch & Lomb Incorporated. Contact lens cleansing apparatus. 4,187,574, Cl. 15-104.920.
Wu, David C.: *See*—
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Stange, Klaus K., 4,188,110, Cl. 355-3.0BE.
Swift, Joseph A., 4,188,423, Cl. 427-444.000.
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Yama, Toshio; and Shimizu, Kazuaki, to Nissan Motor Company, Limited. Hydraulic anti-skid device. 4,188,074, Cl. 303-92.000.
Yamada-Graphics Corp.: *See*—
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Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, to Kubota, Ltd. Method for cooling aged board material. 4,187,616, Cl. 34-13.000.
Yamada, Yoshikazu, to Yamada-Graphics Corp. Perpetual and multi-year calendars. 4,187,629, Cl. 40-109.000.
Yamada Yuki Seizo Co., Ltd.: *See*—
Ito, Jinichi, 4,188,170, Cl. 417-387.000.
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, to TDK Electronics Company, Limited. Thermally stable amorphous magnetic alloy. 4,188,211, Cl. 75-170.000.
Yamaguchi, Yasumasa; and Kohno, Kazuo, to Nitto Chemical Industry Co., Ltd. Process for preparing acrylamide aqueous solution. 4,188,339, Cl. 260-561.00N.
Yamamoto, Stephen K.: *See*—
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Yamamura, Toshio, to Tokyo Shibaura Electric Co., Ltd. X-ray tube. 4,188,558, Cl. 313-55.000.
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, to Kuraray Co., Ltd. Method and apparatus for detecting leaks in hollow fiber membrane modules. 4,188,117, Cl. 356-237.000.
Yamazaki, Masao, to Copal Company Limited. Switch means for journal paper feeding and receipt paper feeding control circuit. 4,188,138, Cl. 400-586.000.
Yan, Tsoung-Yuan, to Mobil Oil Corporation. Shaped carbon articles. 4,188,279, Cl. 204-294.000.
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Yanagioka, Seiichi. Nickel-plated golf club shaft made of fiber-reinforced plastics. 4,188,032, Cl. 273-80.00R.
Yang, Chieh-Pang; and Wong, Chia-Hsiang. Safety indicator for automobile braking system. 4,188,613, Cl. 340-52.00A.
Yang, Yue-Chyou: *See*—
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Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., to Trailer Train Company. Apparatus for machining railroad truck bolsters. 4,187,600, Cl. 29-564.000.
Yeh, Yu S.: *See*—
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Yoshida, Kenichi: *See*—
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Yoshida Kogyo K K: *See*—
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Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, to Burroughs Wellcome Co. Nitrogen-containing polysaccharide for promoting drug-sensitivity of bacteria resistant to antibiotics. 4,188,384, Cl. 424-180.000.
Yoshimura, Tetsuya, to Nagatanien Honpo Co., Ltd. Method of detecting defective portion of sealing. 4,187,798, Cl. 116-206.000.
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Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Yoshio, Akira, to Sony Corporation. Method for producing a metal layer by plating. 4,188,240, Cl. 148-6.14R.
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, to Mitsui Petrochemical Industries, Ltd.; and Catalysts & Chemical Industries. Process for catalytic vapor phase reduction of nitrogen oxides and catalyst composition used therefor. 4,188,365, Cl. 423-239.00A.
Yoshisato, Akiyuki, to Alps Electric Co., Ltd. SSB transceiver. 4,188,579, Cl. 325-17.000.
Yurecko, John M., Jr.: *See*—
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Zahnradfabrik Friedrichshafen AG: *See*—
Haegele, Gerhard, 4,187,736, Cl. 74-422.000.
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Zahora, Edward, Jr.: *See*—
Zahora, Edward P.; and Zahora, Edward, Jr., 4,187,833, Cl. 126-312.000.
Zahora, Edward P.; and Zahora, Edward, Jr., to Kinetics, Inc. Venting system for gas-fired heating plants. 4,187,833, Cl. 126-312.000.
Zakharov, Alexandr V.: *See*—
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.
Zandelin, Ernst E., to Sony Corporation. Card index. 4,187,631, Cl. 40-381.000.
Zarembka, Robert L., to Goodyear Aerospace Corporation. Ribbon-wrapped carbon brake disk. 4,187,932, Cl. 188-73.200.
Zebli, Roland-Detlev, to Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Internal combustion engine with a bypass line skirting the load-control organ of the internal combustion engine. 4,187,821, Cl. 123-179.00G.
Zegers, Antonius P. F.; and Compen, Johannes M. A. A., to U.S. Philips Corporation. Cathode ray tube having low resistance contact area beneath high voltage contact spring. 4,188,564, Cl. 313-479.000.
Zeller Corporation, The: *See*—
Weible, Warren W., 4,187,699, Cl. 64-12.000.
Zeltzer, Lee B. Waterbed construction. 4,187,565, Cl. 5-451.000.
Ziegler, Thomas F. Impacted tooth ligation chain. 4,187,610, Cl. 433-24.000.

Ziemke, Robert A.: *See*—
Heckelman, James D.; and Ziemke, Robert A., 4,188,621, Cl. 340-528.000.
Zierdt, Gene O.: *See*—
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Zimm-Zamm Aktiengesellschaft: *See*—
Wells, John L., 4,188,033, Cl. 273-413.000.
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., to John Zink Company. Better use of gas discharge energy for smoke suppression. 4,188,183, Cl. 431-202.000.
Zinnes, Harold; and Schwartz, Martin L., to Warner-Lambert Company. Thiazino indole compounds. 4,188,482, Cl. 544-32.000.
Zurn Industries, Inc.: *See*—
Hughey, John E., 4,187,878, Cl. 137-601.000.
Zwarun, Andrew A., to Propper Manufacturing Co., Inc. Temperature indicator. 4,187,799, Cl. 116-217.000.
Zweekly, Raymond T., to Valeron Corporation, The. Indexable insert drill. 4,188,162, Cl. 408-199.000.
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, to Helene Curtis Industries, Inc. Comb with rotatable teeth. 4,187,866, Cl. 132-151.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., to United Technologies Corporation. Damped intershaft bearing and stabilizer. Re. 30,210, Cl. 308-26.000.

Cameron, Robert G.; and Neuberger, Dan, to Eastman Kodak Company. Photographic elements containing color-forming couplers having an inhibiting effect upon the reactivity of competing couplers. Re. 30,211, Cl. 430-503.000.

Carder, Charles H., to Union Carbide Corporation. Coating and ink compositions. Re. 30,212, Cl. 106-20.000.

Carlson, Nils G.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Eastman Kodak Company: *See*—
Cameron, Robert G.; and Neuberger, Dan, Re. 30,211, Cl. 430-503.000.

Eaton Corporation: *See*—
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., Re. 30,209, Cl. 303-106.000.

Gagliani, John; and Long, John V., to International Harvester Company. Method of making foamed copolyimides and product obtained therefrom. Re. 30,213, Cl. 521-185.000.

Hibner, David H.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Hopkins, Gary L.: *See*—
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., Re. 30,209, Cl. 303-106.000.

International Harvester Company: *See*—
Gagliani, John; and Long, John V., Re. 30,213, Cl. 521-185.000.

Knorr-Bremse GmbH: *See*—
Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, Re. 30,208, Cl. 188-59.000.

Long, John V.: *See*—
Gagliani, John; and Long, John V., Re. 30,213, Cl. 521-185.000.

McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., to Eaton Corporation. Skid control system. Re. 30,209, Cl. 303-106.000.

Moringiello, Donald C.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Neuberger, Dan: *See*—
Cameron, Robert G.; and Neuberger, Dan, Re. 30,211, Cl. 430-503.000.

Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, to Knorr-Bremse GmbH. Disc brake for railway vehicles. Re. 30,208, Cl. 188-59.000.

Prahl, Franz: *See*—
Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, Re. 30,208, Cl. 188-59.000.

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Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, Re. 30,208, Cl. 188-59.000.

Union Carbide Corporation: *See*—
Carder, Charles H., Re. 30,212, Cl. 106-20.000.

United Technologies Corporation: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Urban, John A.: *See*—
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., Re. 30,209, Cl. 303-106.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Reedley Nursery, Inc. Plum tree. 4,501, 2-12-80, Cl. 38.000.

Dooka, Akira; and Dooka, Michiko. Carnation named Dooka Pink. 4,502, 2-12-80, Cl. 70.000.

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Ball Corporation: *See*—
Campbell, William B., deceased; and Campbell, Doris, executor, 254,190, Cl. D11-127.000.

Barker, Fred J. Combined toothbrush, display and charging unit therefor. 254,162, 2-12-80, Cl. D4-15.000.

Bateman, Robert F.: *See*—
Croyle, Jack V.; and Bateman, Robert F., 254,170, Cl. D7-132.000.

Beekenkamp, Gerald: *See*—
Norton, Ian F.; and Beekenkamp, Gerald, 254,201, Cl. D21-225.000.

Beeman, Louis M. Stone faceting machine. 254,199, 2-12-80, Cl. D15-125.000.

Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald M.; Stokes, Rembert R.; and Sylvester, Gordon E., 254,195, Cl. D18-12.000.

Bird, Gayland G. Combined mixing and staining dental slab. 254,213, 2-12-80, Cl. D24-10.000.

Boston, Bob, Jr.; and Mills, Patricia. Doll or similar article. 254,205, 2-12-80, Cl. D21-185.000.

Breslow, David. Make-up mirror. 254,208, 2-12-80, Cl. D28-65.000.

Bruner, Frank D. Combined rope and terminal unit therefor. 254,160, 2-12-80, Cl. D8-349.000.

Campbell, Doris, executor: *See*—
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Campbell, William B., deceased; and by Campbell, Doris, executor, to Ball Corporation. Christmas ornament. 254,190, 2-12-80, Cl. D11-127.000.

Caudill, Virgil R. Recessed reading material support. 254,158, 2-12-80, Cl. D6-130.000.

Christian, Hubert E., to Dart Industries Inc. Food storage container. 254,166, 2-12-80, Cl. D7-76.000.

Colber Corporation, The: *See*—
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Collett, Anthony, to Colber Corporation, The. Resistor housing. 254,186, 2-12-80, Cl. D13-21.000.

Corcoran, Gary V.; and Reed, John R. Sandal. 254,175, 2-12-80, Cl. D2-270.000.

Corcoran, Gary V.; and Reed, John R. Sandal. 254,176, 2-12-80, Cl. D2-270.000.

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Croyle, Jack V.; and Bateman, Robert F., to Dart Industries Inc. Combined removable carrying handle and frame for a food storage container. 254,170, 2-12-80, Cl. D7-132.000.

Dahl, Russell C.: *See*—
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Daline, Gordon. Edible container for food. 254,159, 2-12-80, Cl. D1-3.000.

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Christian, Hubert E., 254,166, Cl. D7-76.000.
Croyle, Jack V.; and Bateman, Robert F., 254,170, Cl. D7-132.000.

Dolas, Michael, to Wells Fargo & Company. Belt buckle. 254,179, 2-12-80, Cl. D2-427.000.

Doodson, Peter J., to U.S. Philips Corporation. Head-phone. 254,183, 2-12-80, Cl. D14-36.000.

Doodson, Peter J., to U.S. Philips Corporation. Dictating machine. 254,185, 2-12-80, Cl. D14-6.000.

Electromedics, Inc.: *See*—
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Ewald, Douglas K., to Teledyne Industries, Inc. Intrusion alarm housing. 254,197, 2-12-80, Cl. D10-106.000.

Freese, Lillian M., to Freese Products Corporation. Dishwasher basket. 254,187, 2-12-80, Cl. D15-36.000.

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Genaro, Donald M.; Stokes, Rembert R.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Sliding hideaway keyboard. 254,195, 2-12-80, Cl. D18-12.000.

Genc, Robert R.: *See*—
Soika, Emil H.; and Genc, Robert R., 254,182, Cl. D17-20.000.

Gibson, Sidney. Table. 254,164, 2-12-80, Cl. D6-175.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
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Gutknecht, William L. Golfer's tool. 254,211, 2-12-80, Cl. D21-234.000.

Hardy, Gilbert F., to Wyrwa, Deana W. Segmental jewelry band. 254,198, 2-12-80, Cl. D11-4.000.

Holmberg, Roy, to Aktiebolaget Svenska Flaktfabriken. Corrugated metal sheet contact body for humidifiers. 254,207, 2-12-80, Cl. D23-146.000.

Honzyou, Hiroshi, to Sony Corporation. Wheelchair. 254,192, 2-12-80, Cl. D12-131.000.

Horback, Henry. Display stand or similar article. 254,174, 2-12-80, Cl. D6-29.000.

Ilukowicz, Robert J., to Preco Industries Ltd. Cattle slat reinforcing bar support. 254,168, 2-12-80, Cl. D8-354.000.

Intercraft Industries Corporation: *See*—
Levine, Norris B., 254,178, Cl. D6-236.000.

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Janda, George M., to GTE Automatic Electric Laboratories Incorporated. Telephone stand. 254,200, 2-12-80, Cl. D14-60.000.

Jones, Benson A. Visual aid for golf swing. 254,212, 2-12-80, Cl. D21-234.000.

Kasas, Zoltan; and Nagy, Akos. Boxing game board. 254,202, 2-12-80, Cl. D21-27.000.

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Morin, Andre. Canister or the like. 254,180, 2-12-80, Cl. D7-79.000.

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Odom, James A. Combustion detector. 254,188, 2-12-80, Cl. D10-106.000.

Ogden, Philip I. Whirlpool bathtub. 254,206, 2-12-80, Cl. D24-38.000.

Pelavin, Joseph Y., to Lark Luggage Corporation. Luggage. 254,157, 2-12-80, Cl. D3-71.000.

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Samsing, Rolf A. Life preserver. 254,204, 2-12-80, Cl. D21-237.000.

Shulman, Michael H. Portable mandrel. 254,196, 2-12-80, Cl. D15-130.000.

Sidor, William E., to Leigh Products, Inc. Container for liquids or the like. 254,163, 2-12-80, Cl. D9-52.000.

Simmons, Gregory L. Bookcase or the like. 254,171, 2-12-80, Cl. D6-186.000.

Simmons, Gregory L. Upholstered rocking chair or the like. 254,172, 2-12-80, Cl. D6-49.000.

Smith, Walton J. Plant holder. 254,194, 2-12-80, Cl. D11-152.000.

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Yoneyama, Minoru, to Yonex Sports Kabushiki Kaisha. Tennis racket. 254,210, 2-12-80, Cl. D21-212.000.

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61.4 4,187,719
119 A 4,187,720
194 B 4,187,721
229 4,187,722
295 4,187,723
425.4 P 4,187,724
613 4,187,725
660 4,187,726
706 4,187,727

CLASS 74

6 4,187,728
10.9 4,187,729
54 4,187,730
198 4,187,731
230.17 M 4,187,732
342 4,187,733
405 4,187,734
410 4,187,735
422 4,187,736
471 XY 4,187,737
572 4,187,738
732 4,187,739
750 R 4,187,740
751 4,187,741
863 4,187,742

CLASS 75

11 4,188,204
42 4,188,205
60 4,188,206
68 B 4,188,207
105 4,188,208
122 4,188,209
130 R 4,188,210
170 4,188,211

CLASS 76

108 A 4,187,743

CLASS 81

3 R 4,187,744
9.51 4,187,745
57.39 4,187,746
177 G 4,187,747

CLASS 82

2.5 4,187,748
2.7 4,187,749

CLASS 83

67 4,187,750
458 4,187,751
663 4,187,752
674 4,187,753
847 4,187,754
882 4,187,755

CLASS 84

1.24 4,187,756

CLASS 85

80 4,187,757

CLASS 86

1 B 4,187,758

CLASS 89

4,187,759
1.5 E 4,187,760
1.5 R 4,187,761

CLASS 91

37 4,187,762
176 4,187,763
442 4,187,764

CLASS 92

13.1 4,187,765
169 4,187,766
171 4,187,767

CLASS 93

39.1 R 4,187,768
52 4,187,769

CLASS 96

115 P 4,188,222

CLASS 99

353 4,187,770
404 4,187,771

CLASS 100

4 4,187,773
39 4,187,775
93 P 4,187,776
93 PB 4,187,777

CLASS 101

1 4,187,774
291 4,187,778
379 4,187,772

CLASS 102

18 M 4,187,779
28 R 4,187,780
38 CC 4,187,781
56 SC 4,187,782
93 4,187,783

CLASS 104

235 4,187,784

CLASS 106

1.27 4,188,227
20 Re.30,212
50 4,188,228
68 4,188,229
70 4,188,230
90 4,188,231
97 4,188,232
4,188,233
267 4,188,234
278 4,188,235
308 Q 4,188,236

CLASS 108

36 4,187,785
64 4,187,786
96 4,187,787

CLASS 112

79 R 4,187,788
158 E 4,187,789
4,187,790
265.2 4,187,791
286 4,187,792
288 4,187,793
308 4,187,794
318 4,187,795

CLASS 114

312 4,187,796

CLASS 116

87 4,187,797
206 4,187,798
217 4,187,799

CLASS 118

708 4,187,802
724 4,187,800
729 4,187,801

CLASS 119

1 4,187,803
72.5 HRC 4,187,804

CLASS 123

28 4,187,805
32 EE 4,187,806
41.34 4,187,807
48 AA 4,187,808
65 EM 4,187,809
90.16 4,187,810
119 A 4,187,811
119 EC 4,187,812
4,187,814
122 H 4,187,815
136 4,187,813
139 AW 4,187,816
4,187,817
140 R 4,187,818
141 4,187,819
4,187,820
179 G 4,187,821
179 L 4,187,822
188 M 4,187,823
198 F 4,187,824
205 4,187,825

CLASS 124

24 R 4,187,826

CLASS 125

16 R 4,187,827
18 4,187,828

CLASS 126

121 4,187,829
4,187,830
312 4,187,833
360 R 4,187,835
419 4,187,831
425 4,187,834
443 4,187,832

CLASS 128

2.08 4,187,836
32 4,187,837
76 R 4,187,838
79 4,187,839
92 E 4,187,841
92 EA 4,187,840
166 4,187,844
202.22 4,187,842
202.26 4,187,843
205.13 4,187,845
214 F 4,187,847
214 R 4,187,846
247 4,187,848
278 4,187,849
283 4,187,850
295 4,187,851
334 R 4,187,852
419 PG 4,187,854
419 PT 4,187,853
427 4,187,855
635 4,187,856
660 4,187,857
710 4,187,858
725 4,187,859
763 4,187,860
764 4,187,861

CLASS 131

15 R 4,187,862
17 R 4,187,863
242 4,187,864
250 4,187,865

CLASS 132

151 4,187,866

CLASS 134

2 4,188,237
64 P 4,187,867
184 4,187,868

CLASS 135

67 4,187,869

CLASS 136

89 FC 4,188,238
4,188,239

CLASS 137

102 4,187,870
112 4,187,871
454.6 4,187,872
505.13 4,187,873
533.11 4,187,874
576 4,187,875
594 4,187,876
596 4,187,877
601 4,187,878
4,187,879
625.17 4,187,880
625.31 4,187,881
625.47 4,187,882
625.68 4,187,883
625.69 4,187,884

CLASS 138

89 4,187,885

CLASS 139

68 4,187,886
196.2 4,187,887
435 4,187,888

CLASS 140

92.1 4,187,889

CLASS 141

27 4,187,890

CLASS 144

162 R 4,187,891

CLASS 145

50 A 4,187,892

CLASS 148

6.14 R 4,188,240
12 F 4,188,241
15.5 4,188,242
155 4,188,243
174 4,188,244
188 4,188,245

CLASS 150

8 4,187,893

CLASS 152

222 4,187,894

CLASS 156

57 4,188,246
154 4,188,247
164 4,188,248
165 4,188,249
248 4,188,251
253 4,188,250
361 4,188,252
4,188,253
382 4,188,254
384 4,188,255
386 4,188,256
504 4,188,257
628 4,188,258

CLASS 157

1.55 4,187,895

CLASS 160

121 R 4,187,896
177 4,187,897

CLASS 162

4 4,188,259
16 4,188,260
42 4,188,261
205 4,188,262

CLASS 164

421 4,187,898

CLASS 165

1 4,187,899
8 4,187,900
47 4,187,901
76 4,187,902
4,187,903
104 4,187,904
181 4,187,905

CLASS 166

120 4,187,906
254 4,187,908
275 4,187,907
284 4,187,909
305 R 4,187,910
312 4,187,911
314 4,187,912

CLASS 169

51 4,187,913

CLASS 172

53 4,187,914
59 4,187,915
146 4,187,916

CLASS 173

131 4,187,917

CLASS 174

42 4,188,502

CLASS 175

39 4,187,918
246 4,187,919
267 4,187,920
340 4,187,921
374 4,187,922

CLASS 178

88 4,188,503

CLASS 179

1 GP 4,188,504
1 PC 4,188,505
1.5 R 4,188,506
6 D 4,188,507
18 AD 4,188,509
18 DA 4,188,508
90 BD 4,188,510
99 A 4,188,511
100 C 4,188,512
111 E 4,188,513

CLASS 180

53 R 4,187,924
215 4,187,923
268 4,187,925

CLASS 181

192 4,187,926

CLASS 182

2 4,187,927
124 4,187,928
222 4,187,929

CLASS 184

1 R 4,187,930

CLASS 188

59 Re.30,208
72.1 4,187,931
73.2 4,187,932
134 4,187,933

CLASS 191

39 4,187,934

CLASS 192

4 A 4,187,935
21 4,187,936
45 4,187,937
54 4,187,938
84 C 4,187,939
88 A 4,187,940

CLASS 193

5 4,187,941

CLASS 198

345 4,187,942
730 4,187,943

CLASS 200

48 R 4,188,514
4,188,515
4,188,516
61.45 R 4,188,517
159 R 4,188,518

CLASS 204

1 R 4,188,266
1 T 4,188,267
2.1 4,188,268
32 R 4,188,269
42 4,188,270
55 R 4,188,271
149 4,188,272
158 HA 4,188,274
158 HE 4,188,273
158 R 4,188,275
159.15 4,188,224
159.17 4,188,276
190 4,188,277
268 4,188,278
294 4,188,279

CLASS 206

187 4,187,944

CLASS 208

53 4,188,280
57 4,188,281
134 4,188,282
143 4,188,283
216 PP 4,188,284
246 4,188,285

CLASS 209

168 4,188,287
273 4,188,286
310 4,188,288
592 4,187,945
674 4,187,946

CLASS 210

7 4,188,289
21 4,188,290
23 H 4,188,291
29 4,188,292
47 4,188,293
160 4,188,294
206 4,188,295
222 4,188,296

CLASS 211

13 4,187,947
71 4,187,948

CLASS 212

58 R 4,187,949

CLASS 215

6 4,187,951
247 4,187,952
301 4,187,953

CLASS 219

10.47 4,188,519
10.55 B 4,188,520
60 A 4,188,521
69 M 4,188,522
83 4,188,523
85 CM 4,188,524
125.12 4,188,525
137.8 4,188,526
202 4,188,527
490 4,188,528

CLASS 220

90.4 4,187,954
435 4,187,955
465 4,187,956

CLASS 222

1 4,187,957
57 4,187,958
94 4,187,959
107 4,187,960
133 4,187,961
173 4,187,962
402.13 4,187,963
546 4,187,964
600 4,187,965
601 4,187,966

CLASS 223

92 4,187,967

CLASS 226

4,187,968

CLASS 227

2 4,187,969
8 4,187,970
66 4,187,589
125 4,187,971

CLASS 228

20 4,187,972
4,187,973
242 4,187,974

CLASS 229

15 4,187,975
41 B 4,187,976
43 4,187,977

CLASS 232

39 4,187,978

CLASS 233

14 R 4,187,979

CLASS 235

92 DN 4,188,529
474 4,187,980
488 4,187,981

CLASS 237

2 B 4,187,982

CLASS 239

9 4,187,983
13 4,187,984
337 4,187,985
449 4,187,986
585 4,187,987
662 4,187,988

CLASS 241

2 4,187,989
30 4,187,990
33 4,187,991
65 4,187,992
89.2 4,187,993

CLASS 242

35.5 R 4,187,994
107.4 A 4,187,995
107.4 R 4,187,996
182 4,187,997
199 4,187,998

CLASS 244

12.5 4,187,999
137 P 4,188,000
151 B 4,188,001

CLASS 246

34 R 4,188,002

CLASS 248

56 4,188,003
74 PB 4,188,004
97 4,188,005
118.3 4,188,006
411 4,188,007
544 4,188,008

CLASS 249

78 4,188,009
197 4,188,010

CLASS 250

324 4,188,530
334 4,188,531
336 4,188,532
338 4,188,533
345 4,188,534
359 4,188,535
402 4,188,536
416 TV 4,188,537
423 P 4,188,538
432 PD 4,188,539
439 R 4,188,540
445 T 4,188,541
458 4,188,542
4,188,543
560 4,188,544
561 4,188,545

CLASS 251

63.4 4,188,011
173 4,188,012
175 4,188,013
196 4,188,014
315 4,188,015
328 4,188,016

CLASS 252

45 4,188,297
46.4 4,188,299
46.6 4,188,298
48.6 4,188,300
62.54 4,188,301
62.56 4,188,302
63.7 4,188,303
93 4,188,304
95 4,188,305
121 4,188,306
355 4,188,307
413 4,188,308
466 J 4,188,309
522 R 4,188,310
551 4,188,311

CLASS 254

51 4,188,017
175.3 4,188,018

CLASS 256

24 4,188,019
45 4,188,020

CLASS 260

19 EP 4,188,312
33.6 AQ 4,188,351
37 EP 4,188,313
37 PC 4,188,314
40 R 4,188,315
4,188,316
42.53 4,188,317
112 B 4,188,318
112.5 R 4,188,319
202 4,188,320
239.3 P 4,188,321
239.55 R 4,188,322
325 R 4,188,325
326.29 4,188,326
340.9 R 4,188,328
343.3 P 4,188,329
343.3 R 4,188,330
343.41 4,188,332
343.6 4,188,331
409 4,188,333
429.7 4,188,334
449 L 4,188,335
449 R 4,188,336
465 D 4,188,337
500.5 H 4,188,338
561 N 4,188,339
567.6 P 4,188,340
571 4,188,343
573 4,188,341
578 4,188,342
590 E 4,188,344
651 F 4,188,346
652 P 4,188,347

CLASS 264

1 4,188,353
22 4,188,354
26 4,188,355
40.1 4,188,356
255 4,188,358
540 4,188,357

CLASS 266

88 4,188,021
195 4,188,022

CLASS 269

228 4,188,023

CLASS 270

67 4,188,024

CLASS 271

148 4,188,026
241 4,188,027
265 4,188,028
314 4,188,025

CLASS 272

62 4,188,029
73 4,188,030

CLASS 273

26 A 4,188,031
80 R 4,188,032
248 4,188,034
260 4,188,035
265 4,188,036
413 4,188,033

CLASS 277

2 4,188,037
64 4,188,038
95 4,188,039
207 R 4,188,040

CLASS 279

75 4,188,041

CLASS 280

404 4,188,042
605 4,188,043
611 4,188,044
614 4,188,045
618 4,188,046
678 4,188,047
688 4,188,048
766 4,188,049

CLASS 285

24 4,188,050
104 4,188,051

CLASS 289

17 4,188,052
18.1 4,188,053

CLASS 290

52 4,188,546

CLASS 292

226 4,188,054

CLASS 294

1 R 4,188,055

CLASS 296

63 4,188,060
76 4,188,061
157 4,188,056
162 4,188,057
188 4,188,059
208 4,188,058

CLASS 297

61 4,188,062
273 4,188,063
367 4,188,064
440 4,188,066
442 4,188,067
485 4,188,065

CLASS 299

5 4,188,068
73 4,188,069

CLASS 303

3 4,188,070
33 4,188,071
69 4,188,072
87 4,188,073
92 4,188,074
106 Re.30,209
4,188,075

CLASS 305

29 4,188,076

CLASS 307

239 4,188,547
252 C 4,188,548
308 4,188,549
311 4,188,550
4,188,551

CLASS 308

26 Re.30,210
135 4,188,077
187 4,188,078
237 R 4,188,079

CLASS 310

13 4,188,552
68 C 4,188,553
156 4,188,554
162 4,188,555
268 4,188,556
368 4,188,557

CLASS 313

55 4,188,558
60 4,188,559
105 R 4,188,560
325 4,188,561
402 4,188,562
460 4,188,563
479 4,188,564
509 4,188,565

CLASS 315

169.4 4,188,566
396 4,188,567
411 4,188,568

CLASS 318

375 4,188,569
616 4,188,570

CLASS 322

2 R 4,188,571

CLASS 323

9 4,188,572
119 4,188,573

CLASS 324

51 4,188,574
103 R 4,188,575
163 4,188,576
220 4,188,577

CLASS 325

4 4,188,578
17 4,188,579
32 4,188,580
38 R 4,188,581
58 4,188,582
163 4,188,583
446 4,188,584
492 4,188,585

CLASS 329

192 4,188,586

CLASS 330

136 4,188,587
253 4,188,588

CLASS 331

12 4,188,589
56 4,188,590
94.5 G 4,188,592
94.5 P 4,188,591
108 D 4,188,593

CLASS 332

16 R 4,188,594

CLASS 333

113 4,188,595
151 4,188,596
165 4,188,597
207 4,188,598
219 4,188,599
228 4,188,600

CLASS 335

51 4,188,601
132 4,188,602

CLASS 336

75 4,188,603

CLASS 337

377 4,188,604

CLASS 338

32 H 4,188,605
137 4,188,606
224 4,188,607

CLASS 339

14 R 4,188,080
15 4,188,081
36 4,188,082
99 R 4,188,083
117 R 4,188,084
176 MF 4,188,086
176 MP 4,188,085

CLASS 340

52 A 4,188,613
63 4,188,614
146.1 AL 4,188,616
146.1 R 4,188,615
183 4,188,617
201 R 4,188,618
310 R 4,188,619
347 DD 4,188,620
528 4,188,621
571 4,188,622
595 4,188,623
606 4,188,624
642 4,188,625
711 4,188,626
747 4,188,627

CLASS 343

5 SA 4,188,628
6.5 R 4,188,629
9 R 4,188,630
705 4,188,631
753 4,188,632
854 4,188,633

CLASS 346

1.1 4,188,634
75 4,188,635

CLASS 350

96.20 4,188,087
96.23 4,188,088
96.34 4,188,089
174 4,188,090
201 4,188,091
214 4,188,092
303 4,188,093
337 4,188,094
357 4,188,095
358 4,188,096

CLASS 351

36 4,188,097

CLASS 352

130 4,188,098

CLASS 353

94 4,188,099
95 4,188,100
4,188,101

CLASS 354

25 4,188,102
27 4,188,103
31 4,188,104
202 4,188,105
328 4,188,107
330 4,188,106
345 4,188,108

CLASS 355

3 BE 4,188,110
3 FU 4,188,109
37 4,188,111
50 4,188,112
51 4,188,113
54 4,188,114
75 4,188,115

CLASS 356

137 4,188,116
237 4,188,117
244 4,188,118
252 4,188,119
318 4,188,120
336 4,188,121
349 4,188,122
354 4,188,123
356 4,188,124
404 4,188,125
440 4,188,126

CLASS 357

71 4,188,636
79 4,188,637

CLASS 358

4 4,188,638
25 4,188,639
111 4,188,640
190 4,188,641
213 4,188,642
280 4,188,643

CLASS 360

14 4,188,644
75 4,188,645
77 4,188,646
105 4,188,647
4,188,648
118 4,188,649
133 4,188,650

CLASS 361

322 4,188,651
402 4,188,652
405 4,188,653

CLASS 362

32 4,188,654
80 4,188,655
348 4,188,657
365 4,188,656
396 4,188,658

CLASS 363

37 4,188,659
49 4,188,660
51 4,188,661
4,188,663

CLASS 364

200 4,188,662
4,188,664
4,188,665
434 4,188,666
724 4,188,667
900 4,188,668
4,188,669

CLASS 365

49 4,188,670
149 4,188,671

CLASS 366

44 4,188,127
72 4,188,128
108 4,188,129
228 4,188,130
301 4,188,131
314 4,188,132

CLASS 367

14 4,188,610
41 4,188,611
93 4,188,608
152 4,188,609
160 4,188,612

CLASS 400

121 4,188,133
208 4,188,134
214 4,188,135
276 4,188,136
496 4,188,137
586 4,188,138
696 4,188,139

CLASS 403

13 4,188,140
24 4,188,141
31 4,188,142
49 4,188,143
104 4,188,144
112 4,188,145
158 4,188,146
230 4,188,147
258 4,188,148
271 4,188,149

CLASS 404

11 4,188,150
26 4,188,151
110 4,188,152

CLASS 405

34 4,188,153
43 4,188,154
63 4,188,155
195 4,188,156
210 4,188,157
259 4,188,158
282 4,188,159

CLASS 406

58 4,188,160

CLASS 407

25 4,188,161

CLASS 408

199 4,188,162

CLASS 409

82 4,188,163

CLASS 414

421 4,187,950
447 4,188,164
694 4,188,165
735 4,188,166
744 4,188,167
786 4,188,168

CLASS 416

185 4,188,169
226 4,188,171

CLASS 417

53 4,188,172
387 4,188,170
424 4,188,173
432 4,188,174
462 4,188,175

CLASS 418

24 4,188,176

CLASS 422

12 4,188,359
46 4,188,360

CLASS 423

9 4,188,361
22 4,188,362
4,188,363
213.2 4,188,364
239 A 4,188,365
320 4,188,366
322 4,188,367
350 4,188,368
449 4,188,369
579 4,188,370

CLASS 424

1 4,188,371
54 4,188,372
78 4,188,373
84 4,188,374
88 4,188,375
173 4,188,376
180 4,188,377
4,188,378
4,188,384
182 4,188,379
198 4,188,380
199 4,188,381
200 4,188,382
4,188,383
241 4,188,385
249 4,188,386
250 4,188,387
4,188,388
4,188,389
251 4,188,390
4,188,391
258 4,188,392
4,188,393
262 4,188,394
266 4,188,395
267 4,188,396
273 R 4,188,397
274 4,188,398
285 4,188,400
304 4,188,401
324 4,188,402
330 4,188,403
4,188,404
342 4,188,405

CLASS 425

5 4,188,177
469 4,188,178
531 4,188,179

CLASS 426

3 4,188,406
62 4,188,407
74 4,188,408
78 4,188,409
276 4,188,399
296 4,188,410
582 4,188,411
609 4,188,412

CLASS 427

30 4,188,413
40 4,188,426
45.1 4,188,414
97 4,188,415
135 4,188,416
229 4,188,417
245 4,188,418
287 4,188,419
295 4,188,420
385 A 4,188,421
444 4,188,423

CLASS 428

29 4,188,431
34 4,188,425
35 4,188,432
41 4,188,427
64 4,188,433
65 4,188,434
71 4,188,428
85 4,188,429
88 4,188,430
167 4,188,435
198 4,188,436
199 4,188,437
209 4,188,438
215 4,188,439
4,188,440
216 4,188,441
4,188,442
4,188,443
246 4,188,445
288 4,188,446
310 4,188,447
311 4,188,448
314 4,188,449
329 4,188,450
331 4,188,451
336 4,188,452
391 4,188,454
423.1 4,188,455
428 4,188,444
530 4,188,456
542 4,188,457
556 4,188,458
572 4,188,424
648 4,188,459

CLASS 429

7 4,188,460
48 4,188,461
68 4,188,462
104 4,188,463
210 4,188,464

CLASS 430

7 4,188,225
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Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

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SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 28, 1980.

Patent Suits

Notices under 15 U.S.C. 1116; Trademark Act of July 5, 1946

2,859,949, J. Willard, FORWARD DISCHARGING TRANSIT CONCRETE MIXER, **filed** Apr. 4, 1975, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 75–985, *R. W. Sims and R. W. Sims Trust v. Mack Truck Corporation.* Judgment entered in favor of plaintiff on Sept. 18, 1978. **Same, filed** Nov. 5, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–939, *R. W. Sims et al. v. Oshkosh Corporation.*

2,962,176, J. D. Russell, LOW HEIGHT SHUTTLE CAR, **filed** Oct. 28, 1975, D.C, W.D. Pa. (Pittsburgh), Doc. 75–1375, *FMC Corp. v. Joy Manufacturing Co.* Stipulation and order dismissing case filed Nov. 7, 1979.

3,013,953, Craig and Otto, X-RAY APPARATUS; **3,061,729,** James R. Craig, X-RAY TUBE CURRENT METERING CIRCUIT; **3,130,312,** James R. Craig, X-RAY TIMER SYSTEM TO PRODUCE SHORT DURATION RADIATION PULSES; **3,325,643,** Craig and Otto, PIVOTALLY SUPPORTED X-RAY INTENSIFIER DEVICE HAVING A PARKED POSITION ON TOP OF THE SUPPORTING TOWER; **3,488,499,** Craig and Bayer, DIRECT CONTACT X-RAY IMAGE INTENSIFIER HOUSING APPARATUS; **3,532,882,** Craig and Otto, X-RAY TABLE MOUNTED FOR CONSTANT TRANSLATIONAL MOVEMENT AND NONLINEAR ROTATIONAL MOVEMENT; **3,538,331,** James R. Craig, ANODE HEAT CONTENT CALCULATOR FOR X-RAY TUBE; **3,546,461,** James R. Craig, AUTOMATIC CONTROL OF A NONSYNCHRONOUS CINE FLUORORADIOGRAPHIC APPARATUS; **3,518,208,** Joseph Battista, FLUOROSCOPIC INTENSITY CONTROL WHEREIN THE BRIGHTNESS OF THE IMAGE IS MAINTAINED AT A PREDETERMINED LEVEL; **3,622,783,** Roscoe Earl Miller, RETRACTABLE CASSETTE HOLDER FOR AN X-RAY TABLE; **3,644,735,** Cornelius Keith Vendervelden, LEVELING MECHANISM FOR X-RAY MACHINES; **3,702,935,** Carey and Mansour, MOBILE FLUOROSCOPIC UNIT FOR BEDSIDE CATHETER PLACEMENT; **3,740,556,** George W. Otto, Jr., SPOT FILM DEVICE; **3,872,242,** Austin G. Cooley, FACSIMILE FLATBED TRANSCEIVER; **3,887,816,** Austin G. Cooley, OPTICAL SYSTEM FOR X-RAY SCANNING EQUIPMENT; **3,887,889,** Karlov et al. HIGH POWER VARIABLE AUTOTRANSFORMER; **3,909,616,** Redfield et al., METHOD AND APPARATUS FOR CHECKING THE SUPERIMPOSITION OF AN X-RAY FIELD AND A LIGHTFIELD; **3,958,818,** Richard Lewis Mason, FITTING ASSEMBLY FOR FLEXIBLE TUBING; **3,980,852,** Charles L. Redfield, ADJUSTABLE HIGH DENSITY CAM-SWITCH ASSEMBLY; **D. 217,079,** Vandervelden and Prisland, A WALL MOUNTED FOLDABLE SUPPORT FOR AN X-RAY UNIT; **D. 225,473,** Carey and Mansour, MOBILE FLUOROSCOPIC UNIT, **filed** Mar. 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1159, *Litton Industrial Products v. Xonics, Inc.*

3,055,988, Shure Brothers, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** same, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** same, STEREOPHONIC PICKUP CARTRIDGE; **3,463,889,** same, MOVING MAGNET STEREOPHONIC PICKUP, **filed** Mar. 23, 1977, D.C. N.D. Ill. (Chicago), Doc. 77c971, *Shure Brothers v. Fidelitone, Inc. et al.* Defendants are permanently enjoined from infringing, inducing infringement and contributing to the infringement of plaintiff's patents. Filed Oct. 17, 1978.

3,061,729. (See 3,043,953.)

3,063,457, Scholl, Inc., FOOT EXERCISER SANDALS, **filed** Sept. 12, 1978, D.C., N.D. Ill. (Chicago), Doc. 74c2302, *Scholl, Inc. v. S. S. Kresge Company.* Judgment entered in favor of defendant and against plaintiff on Sept. 12, 1978.

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,130,312. (See 3,043,953.)

3,164,655, Howard and Kaplan, METHOD OF MAKING BREAST PADS, CUPS AND FRONTS, **filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79–C–5860, *International Molders Inc. v. Donald Gurry.*

3,203,561, S&S Corrugated Paper Machinery Co., Inc., LIFT CAM FOR STACKING DEVICE, **filed** Oct. 12, 1979, D.C.N.J. (Newark), Doc. 79–2978, *S&S Corrugated Paper Machinery Co., Inc. v. S. A. Martin Groupe and Bobst Champlain Inc.*

3,260,106, Moore Business Forms, Inc., WEB TENSION METER, **filed** Oct. 25, 1979, D.C.N.H. (Concord), Doc. 79–332, *Cleveland Machine Controls, Inc. v. K-Beb Manufacturing Company and Edward C. Bartlett.*

3,274,863, Sandvik Aktiebolag, CHIP CUTTING ROTARY DRILL; **3,751,177,** same, GUIDE PAD MOUNTING ON A DRILL BIT, filed Feb. 9, 1978, D.C., W.D. Pa. (Erie), Doc. C.A. 78–5 Erie, *Sandvik Steel of Colorado, Inc. v. Martin N. Hamilton, doing business as Hamilton Tool Co.* Order approving stipulation for dismissal entered Oct. 30, 1979.

3,291,947, Westinghouse Electric Corporation, INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY, **filed** Mar. 15. 1979, D.C., E.D. Mich. (Detroit), Doc. 79–70708, *Westinghouse Electric Corp. v. BBC Brown, Boveri & Company, Limited and BBC Brown, Boveri Corporation.* **Same, filed** Mar. 28, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–403 CA, *Siemens Aktiengesellschaft v. Westinghouse Electric Corp.*

3,312,590, Glaxo Group Limited, TOPICALLY ACTIVE ANTIINFLAMMATORY 17-MONO- AND 17, 21-DIESTERS OF BETAMETHASONE AND ITS 9-CHLORO-ANALOGS, COMPOSITIONS AND USE THEREOF, **filed** Aug. 28, 1979. D.C.N.J. (Newark), Doc. 79–2607, *Glaxo Group Limited v. Lark S.P.A.*

3,315,929, Keril M. Keiser, PORTABLE COLLAPSIBLE TOWER FOR FLUID TANKS AND THE LIKE, **filed** July 20, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0275S LEW (Kx), *Keril M. Keiser, et al. v. D&W Paving, Inc. et al.*

3,325,643. (See 3,043,953.)

3,325,823, D. J. Boon, MANUFACTURE OF FOAM MATERIAL, **filed** Oct. 26, 1979, D.C. Del. (Wilmington), Doc. 79–506, *Unifoam A. G. v. Tenneco Chemicals, Inc.* **Same, filed** Oct. 26, 1979, D.C., W.D.N.C. (Statesville), Doc. ST–C–79–36, *Unifoam A. G. v. Hickory Springs Manufacturing Co., Inc.*

3,351,118, Mark E. Ward, MEANS FOR SUPPLYING AIR TO A GAS BURNER; **3,391,982,** same, GAS BURNER, **filed** Nov. 14, 1977, D.C., N.D.N.Y. (Utica), Doc. 77–CV–452, *Andro Corporation and Tappan Company v. Dieter E. Grether.* Stipulation of dismissal filed Oct. 25, 1979.

3,359,116, Battelle Development Corp., PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE; **3,378,375,** same, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS; **Re. 27,381,** same, PREPARATION OF IMITATION SOUR CREAM, **filed** Oct. 26, 1979, D.C., S.D. Ind. (Indianapolis), Doc. IP 79–865–C, *Battelle Development Corp. v. Mutual Milk Co., Inc. and Royal Foods Products Co.*

3,365,562, Morris R. Jeppson, APPARATUS AND PROCESS FOR MICROWAVE TREATMENT, **filed** May 14, 1979, D.C., N.D. Calif. (San Francisco), Doc. C–79–1136 WWS, *Microdry Corporation v. Raytheon Company.* Stipulation of dismissal with prejudice filed Aug. 31, 1979.

3,378,375. (See 3,359,116.)

3,391,982. (See 3,351,118.)

3,399,442, Kennametal Inc., CUTTING INSERT, **filed** Oct. 16, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73977, *Kennametal Inc. v. GTE Sylvania Inc.*

3,406,618, Bradshaw Bowman, METHOD OF MANUFACTURING BRICKS, TILES, COBBLESTONES AND THE LIKE DIRECTLY ON THE GROUND TO BE COVERED. **filed** Sept. 12, 1974, D.C., S.D. Calif. (San Diego), Doc. 74–435–S, *Bomanite Corporation v. Stampcrete Inc. and George Fresquez.* Stipulated dismissal filed on Jan. 23, 1976.

3,414,928, Jerome H. Lemelson, COMBINATION SPONGE AND SCOURER, **filed** Oct. 30, 1979, D.C., N.D. Tex. (Dallas), Doc. 3–79–1354–G, *Jerome H. Lemelson v. Minnesota Mining & Manufacturing Co.*

3,416,338, Presto Lock Co., Inc., LATCHING DEVICE AND COMBINATION LOCKING MEANS, **filed** Oct. 9, 1979, D.C., S.D.N.Y., Doc. 79–C–5341 CBM, *Walter Kidde & Company, Inc. v. Domex Trading Corp.*

3,438,031, George H. Fathauer, DOPPLER RADAR HAVING DIGITAL SPEED INDICATOR; **3,689,921,** Fred M. Berry, METHOD AND APPARATUS FOR DIGITALLY DETERMINING THE SPEED OF A MOVING OBJECT; **Re. 29,401,** Aker et al., METHOD AND APPARATUS FOR DIGITALLY MEASURING SPEED, **filed** Aug. 1, 1978, D.C. Kans. (Kansas City), Doc. 78–2178, *Kustom Electronics, Inc. v. MPH Industries, Inc. et al.* Defendants are permanently enjoined from infringing plaintiff's patents. Filed Sept. 11, 1979.

3,463,889. (See 3,055,988.)

3,488,499. (See 3,043,953.)

3,491,248, Robert W. Beckwith, POWER TRANSMISSION LINE SWITCH CONTROL SYSTEM, **filed** May 8, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–586M, *Beckwith Electric Co., Inc. v. G. Granville Sydnor, III and Phoenix Power Systems, Inc.*

3,498,311, Roland J. Hawes, APPARATUS FOR DISPENSING AND DELIVERING FEED ADDITIVES TO LIVESTOCK AND POULTRY; **3,670,923,** Hawes and Daniel; CONTROL SYSTEM FOR MULTIPLE INGREDIENT DISPENSING APPARATUS; **3,822,056,** Hawes and Brewster, METHOD AND MEANS FOR ADDING SMALL MEASURED QUANTITIES OF SELECTED MATERIALS TO A LARGE CAPACITY MATERIAL-MIXING PLANT, **filed** June 29, 1979, D.C., N.D. Tex. (Amarillo), Doc. CA–2–79–108, *Micro Chemical, Inc. v. Great Plains Chemical Company of Kansas.* Order for dismissal without prejudice filed Oct. 9, 1979.

3,532,882. (See 3,043,953.)

3,538,331. (See 3,043,953).

3,546,461. (See 3,043,953.)

3,548,208. (See 3,043,953.)

3,614,740, Digital Equipment Corporation, DATA PROCESSING SYSTEM WITH CIRCUITS FOR TRANSFERRING BETWEEN OPERATING ROUTINES, INTERRUPTION ROUTINES AND SUBROUTINES; **3,614,741,** same, DATA PROCESSING SYSTEM WITH INSTRUCTION ADDRESSES IDENTIFYING ONE OF A PLURALITY OF REGISTERS INCLUDING THE PROGRAM COUNTER; **3,710,324,** same, DATA PROCESSING SYSTEM; **3,815,099,** same, DATA PROCESSING SYSTEM, **filed** June 2, 1977, D.C. Mass. (Boston), Doc. 77–1580–F, *Digital Equipment Corporation v. Electronics Memories & Magnetics Corp.* Case transferred to C.D. Calif. (Los Angeles) on June 23, 1978. **Same, filed** Sept. 28, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–2306–SAW, *National Semiconductor Corp. v. Digital Equipment Corporation.*

3,614,741. (See 3,614,740.)

3,622,783. (See 3,043,953.)

3,644,125, Salvatore & Joseph Lobinado, PROCESS FOR PRODUCING COOKED HAMS, **filed** Nov. 1, 1979, D.C., E.D. Calif. (Sacramento), Doc. Civ. S–79–784 LKK, *Senza-Gel Corporation et al. v. John B. Seiffhart et al.*

3,644,735. (See 3,043,953.)

3,666,284, Deere & Company, HYDRAULIC DEPTH CONTROL FOR DRAWN IMPLEMENT CARRIERS HAVING PIVOTED OUTER FRAMES; **3,700,039,** same, SPRING TRIP SHANK ASSEMBLY, **filed** May 9, 1979, D.C., S.D. Iowa (Des Moines), Doc. 79–214–2, *Deere & Company v. Massey-Ferguson,* Inc. **Same filed** June 15, 1979, D.C. Kans. (Kansas City). Doc. 79–2167, *Deere & Company v. Hesston Corporation.* **Same, filed** July 16, 1979, D.C. Minn. (St. Paul), Doc. 2–79–357, *Deere & Company v. Hiniker Company.*

3,669,499, Steelcase, Inc., CHAIR, **filed** Oct. 31, 1975, D.C. Del. (Wilmington), Doc. 75–359, *Steelcase, Inc. v. Harvard Industries, Inc.* Stipulation and order dismissing action with prejudice filed May 9, 1979.

3,670,923. (See 3,498,331.)

3,677,301, Genova, Inc., PLASTIC PIPE FITTING AND CLOSURE, **filed** Oct. 3, 1979, D.C., W.D. Mich. (Grand Rapids), Doc. K79–586 CA4. *Genova, Inc. v. Permafit Corporation.*

3,689,921. (See 3,438,031.)

3,698,271, Preston Engravers, Inc., ADJUSTABLE AIR EJECT DIE-CUTTING ASSEMBLY, **filed** Oct. 29, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–689, *Preston Engravers, Inc. v. Rotoflex International Limited.*

3,700,039. (See 3,666,284.)

3,702,935. (See 3,043,953.)

3,704,519, Gregers Lystager, METHOD TO PREPARE A DENTAL MODEL; **3,932,939,** Bernard Weissman, PIN ARRANGEMENT FOR PROSTHODONTIC CASTS; **Reg. No. 1,001,824** (PINDEX), Whaledent, Inc., **filed** May 18, 1978, D.C., S.D.N.Y., Doc. 78–C–2310, *Ipco Hospital Supply Corp. v. Healthco, Inc. and Healthco Dental Supply.* Action dismissed with prejudice and with each party bearing its own costs on Oct. 16, 1979.

3,706,414, Herman K. Dupre, APPARATUS FOR MAKING SNOW; **3,822,825,** same, SNOW MAKING APPARATUS AND SYSTEM; **3,952,949,** same, METHOD OF MAKING SNOW, **filed** Sept. 28, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–636, *Herman K. Dupre v. Shumaker Mountain Corporation.*

3,707,930, American Hospital Supply Corporation, POWER-OPERATED PEDESTAL TABLE AND SAFETY CLUTCH THEREFOR; **3,888,444,** same, ADJUSTABLE SUPPORT COLUMN, **filed** Jan. 9, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c88, *American Hospital Supply Corporation v. Mayline Company Inc.* Defendant is permanently enjoined and restrained from infringing plaintiff's patents. Dated Oct. 24. 1979.

3,708,074, Steel Storage Systems, Inc., STEEL RACKING APPARATUS, **filed** Oct. 26, 1979, D.C. Kans. (Wichita), Doc. 79–1575, *Steel Storage Systems, Inc. v. Mai Steel Services, Inc.*

3,713,258, Einar Svensson, BUILDING STRUCTURE, **filed** Aug. 6, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–921V, *Haida Hide, Inc. and Einar Svensson v. George Gurnett.*

3,710,324. (See 3,614,740.)

3,724,789, Stephen L. Snyder, RAM AIR GLIDE PARACHUTE, **filed** Nov. 30, 1979, D.C. Md. (Baltimore), Doc. B–79–2225, *Stephen L. Snyder v. Mike Mount.*

3,733,309, E. I. du Pont de Nemours & Co., Inc., BIAXIALLY ORIENTED POLY (ETHYLENE TEREPHTHALATE) BOTTLE, **filed** Nov. 18, 1977, D.C. Del. (Wilmington), Doc. C.A. 77–450, *E. I. du Pont de Nemours & Co., Inc. v. PepsiCo, Inc. and Hoover Ball and Bearing Co., Inc.* Order removing action for statistical purposes dated Nov. 20, 1979.

3,736,036, Data Packaging Corporation, STORAGE SYSTEM FOR TAPE CASSETTES, **filed** Dec. 11, 1978, D.C. Minn. (St. Paul), Doc. 3–78–474, *Data Packaging Corporation v. Hartzell Corporation and Harzell Manufacturing Company.*

3,737,579, Medtronic, Inc., BODY TISSUE ELECTRODE AND DEVICE FOR SCREWING THE ELECTRODE INTO BODY TISSUE; **3,902,501,** same, ENDOCARDIAL ELECTRODE, **filed** May 29, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–256, *Medtronic, Inc. and Medtronic Puerto Rico, Inc. v. Daig Corporation.*

3,738,682, Orville A. Ritter, CLOSE COUPLED PULLING HITCH ASSEMBLY, **filed** Sept. 18, 1979, D.C. Kans. (Wichita), Doc. 79–1501, *B/J Manufacturing Co., Inc. v. Orville A. Ritter.*

3,740,556. (See 3,043,953.)

3,742,908, Mattel, Inc., ANIMAL HABITAT; **3,791,346,** Metaframe Corporation, RODENT HABITAT; **3,859,961,** Metaframe Corporation, ANIMAL PATH CONNECTING SYSTEM, **filed** Jan. 20, 1978, D.C.N.J. (Newark), Doc. C–76–189, *Mattel, Inc. and Metaframe Corporation v. Hartz Mountain Corporation.* Order of dismissal filed Apr. 5, 1978.

3,747,053, Lowrance Electronics, Inc., NOISE REJECTION CIRCUIT; **3,747,413,** same, LIGHT SHIELD FOR AN INDICATING INSTRUMENT, **filed** Nov. 19, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–571, *Lowrance Electronics, Inc. v. Vexilar, Inc.*

3,747,413. (See 3,747,053.)

3,748,640, Vincent Sardo, Jr., SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES; **Re. 28,804,** same, **filed** Oct. 19, 1979, D.C., S.D.N.Y., Doc. 79–C–5679 MJL. *Vincent Sardo, Jr. v. Chrysler Corporation.*

3,751,177. (See 3,274,863.)

3,758,285, Keith L. Knowlton, METHOD AND APPARATUS FOR MAKING GLASS FIBER SPRAYS, **filed** Sept. 18, 1979, D.C., M.D. Fla. (Jacksonville), Doc. 79–820–C–J–B, *Valtec Corporation v. Joseph Cuda et al.*

3,762,684, Anonda Plastics, Inc., ROTATABLE PIPE COUPLING, **filed** Nov. 9, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–04350–RMT (Gx), *Anonda Plastics, Inc. v. Grentec, Inc.*

3,766,817, Prodyne Enterprises, FOOD SLICER, **filed** Apr. 6, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–0435–H, *Prodyne Enterprises, Inc. v. Eddie Parker Interests, Inc.* Defendant is enjoined and restrained from infringing plaintiff's patent. Oct. 17, 1979.

3,791,346. (See 3,742,908.)

3,800,397, Bryan J. Grunewald, APPARATUS FOR DEVELOPING QUICKNESS IN SWINGING OF A BASEBALL BAT, **filed** Nov. 15, 1979, D.C., S.D. Calif. (San Diego), Doc. 79–1846, *Bryan J. Grunewald v. Power Swing Partners & Stephen A. Stephenson.*

3,815,099. (See 3,614,740.)

3,815,932, Roblin Industries, Inc., FRONT GATE CONSTRUCTION FOR SHOPPING CART; **4,067,591,** same, BASE FOR NESTABLE SHOPPING CART; **4,118,044,** same, GATE MECHANISM FOR CART, **filed** Aug. 7, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–C–617, *Roblin Industries, Inc. v. Gleason Corporation.*

3,818,791, William Zickos, INTERCHANGEABLE DRUM RESONATORS AND GENERATORS; **3,945,291,** same, DRUM CONSTRUCTION; **3,955,465,** same, DRUM CONSTRUCTION, **filed** Nov. 15, 1979, D.C., W.D. Mo. (Kansas City), Doc. 79–1019–CV–W–5, *J. K. Associates v. William T. Zickos.*

3,819,468, Sauder Industries, Inc., HIGH TEMPERATURE INSULATION MODULE; **3,993,237,** same, METHOD FOR PROVIDING HIGH-TEMPERATURE INTERNAL INSULATION, **filed** Aug. 19, 1977, D.C., N.D. Ohio (Cleveland), Doc. C77–898, *Sauder Industries, Inc. v. The Carborundum Company.*

3,822,056. (See 3,498,331.)

3,822,825. (See 3,706,414.)

3,859,961. (See 3,742,908.)

3,872,242. (See 3,043,953.)

3,887,816. (See 3,043,953.)

3,887,889. (See 3,043,953.)

3,888,444. (See 3,707,930.)

3,889,710, Julien H. Brost, CHECK VALVE WITH ELASTOMERIC VALVE ELEMENT, **filed** Nov. 14, 1979, D.C. Mass. (Boston), Doc. 79–2272–T, *Nypro, Incorporated v. Miniature Precision Components, Inc.*

3,902,501. (See 3,737,579.)

3,909,616. (See 3,043,953.)

3,911,400, Digital Equipment Corp., DRIVE CONDITION DETECTING CIRCUIT FOR SECONDARY STORAGE FACILITIES IN DATA PROCESSING SYSTEMS; **3,911,402,** same, DIAGNOSTIC CIRCUIT FOR DATA PROCESSING SYSTEM; **3,999,163,** same, SECONDARY STORAGE FACILITY FOR DATA PROCESSING SYSTEMS; **4,007,488,** same, DRIVE FOR CONNECTION TO MULTIPLE CONTROLLERS IN A DIGITAL DATA SECONDARY STORAGE FACILITY; **4,047,157,** same, SECONDARY STORAGE FACILITY FOR DATA PROCESSING, **filed** Jan. 15, 1979, D.C., N.D. Calif. (San Francisco), Doc. C–79–0072–RHS. *Microcomputer Systems Corp. v. Digital Equipment Corp.*

3,911,402. (See 3,911,400.)

3,932,939. (See 3,704,519.)

3,934,569, Robert F. Bobene, APPARATUS AND METHOD FOR ATOMIZING FUEL-AIR MIXTURE IN A CARBURETION SYSTEM; **4,094,290,** William O. Dismuke, FUEL ATOMIZER, **filed** Sept. 28, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4088, *Scotsman Automotive Corp. v. William O. Dismuke et al.*

3,945,291. (See 3,818,791.)

3,950,638, Lam, Incorporated, HIGH INTENSITY INDIRECT LIGHTING FIXTURES, **filed** Dec. 23, 1976, D.C. Colo. (Denver), Doc. 76–W–1216, *Lam Inc. v. Johns-Manville Corporation and Johns-Manville Sales Corporation.* Order setting date for new trial filed Nov. 5, 1979.

3,952,949. (See 3,706,414.)

3,955,465. (See 3,818,791.)

3,958,818. (See 3,043,953.)

3,966,410, Vilhelm J. Jahnsen, GROUP EXTRACTION OF ORGANIC COMPOUNDS PRESENT IN LIQUID SAMPLES, **filed** Dec. 3, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–1709, *Analytichem International Inc. and California Institute Research Inc. v. Har-Len Associates Inc.*

3,973,808, James R. Musselman, ICE STUD FOR SNOWMOBILE TRACKS, **filed** Nov. 21, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–74430, *James R. Musselman v. Kalamazoo Engineering, Inc.*

3,978,681, Research Corporation, METHOD AND APPARATUS FOR THE ADIABATIC EXPANSION OF LIQUID ANHYDROUS AMMONIA, **filed** Dec. 15, 1978, D.C. Nebr. (Omaha), Doc. CV78–0–550, *United States Steel Corporation and Research Corporation v. Daniel H. Brobst and Brobst and Associates.* Defendants are restrained and enjoined from further infringing plaintiff's patent. Dated Nov. 16, 1979.

3,979,525, Fairmont Foods Co., PROCESS FOR RETARDING MOLD GROWTH IN PARTIALLY BAKED PIZZA CRUSTS AND ARTICLES PRODUCED THEREBY; **4,079,666,** same, APPARATUS FOR TREATING BAKED PRODUCTS IN ORDER TO IMPROVE THE SHELF LIFE THEREOF, **filed** Aug. 8, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3272, *Multi-National Investment Corp. v. Keebler Company, Inc. and Brownie Special Products Co.*

3,980,852. (See 3,043,953.)

3,984,965, Harry Crisci, DEVICE FOR APPLYING CAPS TO BOTTLES, **filed** Oct. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3996, *Northern Engineering & Plastics Corp. et al. v. Blackhawk Molding Company, Inc.* Action dismissed with prejudice and without costs to any party filed Sept. 24, 1979.

3,987,784, Joseph A. Godrick, SOLAR ENERGY ABSORBER PANEL, **filed** Oct. 11, 1979, D.C., M.D. Ga. (Macon), Doc. CA–79–239–MAC, *Terra-Light, Inc. v. Sunplate, Inc. and Akins Manufacturing, Inc.*

3,993,237. (See 3,819,468.)

3,999,163. (See 3,911,400.)

3,999,475, National Equipment Corporation, DISPLAY APPARATUS FOR HOLDING FOOD AND THE LIKE; **4,062,983,** same, METHOD FOR MAINTAINING HEAT AND MOISTURE IN FOOD; **D. 238,471,** same, FOOD DISPLAY OVEN; **D. 245,958,** same, FOOD DISPLAY OVEN, **filed** Sept. 24, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–C–801, *Hatco Corporation v. National Equipment Corporation.* Plaintiffs notice of dismissal filed Oct. 22, 1979.

3,999,748, William A. Clarke, CHILDRENS GAME OF CATCH, **filed** Mar. 2, 1977, D.C., W.D. Pa. (Erie), Doc. 77–28 Erie, *William A. Clarke v. G. A. Kayser & Sons, Inc. et al.* Order entered dismissing plaintiff's claims for patent infringment and final judgment entered for defendants and against plaintiff's on Sept. 26, 1979. **Same, filed** Oct. 20, 1977, D.C., W.D. Pa. (Erie), Doc. 77–147 Erie, *William A. Clarke v. F. W. Woolworth Company.* Plaintiff's claims for patent infringement are dismissed and final judgment is entered for defendants and against plaintiffs on Sept. 27, 1979.

4,007,448. (See 3,911,400.)

4,015,525, Norwood Marking & Equipment Co., Inc., IMPRINTER AND ACTUATOR THEREFOR, **filed** Oct. 30, 1979. D.C., N.D. Ill. (Chicago), Doc. 79c4534, *Norwood Marking & Equipment Co., Inc. v. Bill Barber.*

4,047,157. (See 3,911,400.)

4,062,983. (See 3,999,475.)

4,067,367, Milam Adamson, TREE DELIMBER, **filed** Nov. 2, 1979, D.C., M.D. Ala. (Montgomery), Doc. CA–79–127–E. *Milam Adamson v. William W. Sykes.*

4,067,591. (See 3,815,932.)

4,068,402, Yutaka Tanaka, TOY VEHICLE AND TRACKWAY; **D. 248,887,** same, TOY TRACKWAY, **filed** Aug. 13, 1979, D.C., S.D.N.Y., Doc. 79–C–4231 TPG, *Toybox Corporation v. Illfelder Toy Company, Inc.*

4,068,478, Frank Meyers et al., CONTAINMENT BARRIER SECTION ARRANGEMENT, **filed** Sept. 13, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–1074S, *Kepner Plastics Fabricators, Inc. and Frank Meyers v. Enviro-Pro Industries.*

4,074,311, Tanner Electronic Systems Technology, Inc., TELEVISION SECURITY SYSTEM, **filed** Oct. 5, 1979, D.C., M.D. Ga. (Macon), Doc. CA–79–90–ATH, *Tanner Electronic Systems Technology, Inc. v. Eagle Comtronics, Inc.*

4,079,666. (See 3,979,525.)

4,094,290. (See 3,934,569.)

4,118,044. (See 3,815,932.)

4,123,785, Del Mar Avionics, RECORDER FOR CARDIAC SIGNALS WITH MANUALLY ACTUATED EVENT MARKING, **filed** Aug. 6, 1979, D.C., C.D. Calif. (Los Angeles), Doc. CV–79–02944 DWW (Kx), *Del Mar Avionics v. Sylvan Cole, doing business as Scole Engineering Co.*

4,144,720, Tyler Refrigeration Corporation, AIR DEFROST SYSTEM USING SECONDARY AIR BAND COMPONENTS. **filed** Oct. 19, 1979, D.C. Del. (Wilmington), Doc. 79–497. *Tyler Refrigeration Corporation v. Kysor Industrial Corporation.*

4,145,780, Classic Products Corp., WATERBED ASSEMBLY; **4,152,796,** same, WATERBED MATTRESS, **filed** Sept. 7, 1979, D.C., E.D. Pa. (Philadelphia), Doc. 79–3292, *Classic Products Corp. v. Dynaclean, Inc. and American Poly-Seal Co.*

4,151,554, Arthur R. Tucker, LIQUID COUPLED COLOR-TELEVISION IMAGE PROJECTOR, **filed** Nov. 15, 1979. D.C., M.D. Fla. (Orlando), Doc. 79–579–ORL–CIV–R, *Big Picture Inc. v. Barco Electronic N.V. and Vincent Donohoe.*

4,152,253, Don D. Summers, METHOD AND APPARATUS FOR A SELF-CLEANING DRILLING MUD SEPARATION SYSTEM, **filed** Oct. 9, 1979, D.C., W.D. La. (Shreveport), Doc. 79–1378, *Spiral, Inc. and Don D. Summers v. William Hagan and Score, Inc.*

4,152,796. (See 4,145,780.)

4,166,469, Philip O. Littleford, APPARATUS AND METHOD FOR INSERTING AN ELECTRODE, **filed** Sept. 18, 1979. D.C., M.D. Fla. (Orlando), Doc. 79–447–ORL–CIV–Y, *Philip Littleford, M. D. v. Mercy Community Hospital and Cook, Inc.*

Re. 27,381. (See 3,359,116.)

Re. 28,804. (See 3,748,640.)

Re. 29,401. (See 3,438,031.)

D. 217,079. (See 3,043,953.)

D. 225,473. (See 3,043,953.)

D. 238,471. (See 3,999,475.)

D. 245,958. (See 3,999,475.)

D. 248,887. (See 4,068,402.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,147,198, Re. S.N. 087,992, Filed Oct. 25, 1979, Cl. 160/135, PORTABLE DISPLAY SYSTEM, Willy Ytter, Owner of Record: *Extranersion, Incorporated, Dover, Del.,* Attorney or Agent: David M. Driscoll, et al., Ex. Gp.: 352

PATENT NOTICES

Certificates of Correction for February 19, 1980

Re. 29,499	4,136,033	4,163,763	4,172,029
Re. 29,956	4,136,081	4,163,786	4,172,120
3,925,751	4,139,998	4,164,382	4,172,237
3,931,218	4,140,645	4,164,525	4,172,341
3,934,221	4,141,889	4,164,548	4,172,370
3,947,630	4,142,833	4,166,123	4,172,443
3,947,809	4,143,197	4,166,716	4,172,476
4,009,126	4,143,283	4,166,827	4,172,867
4,075,045	4,146,540	4,167,276	4,172,880
4,078,677	4,147,221	4,168,866	4,172,934
4,095,104	4,148,954	4,170,371	4,173,128
4,099,754	4,158,513	4,170,566	4,173,255
4,106,157	4,159,064	4,170,691	4,174,127
4,115,427	4,160,177	4,171,007	4,175,291
4,116,785	4,161,685	4,171,080	4,175,795
4,117,005	4,162,520	4,171,361	4,176,670
4,123,543	4,162,853	4,171,480	4,177,452
4,124,257	4,162,871	4,171,532	
4,127,819	4,163,693	4,171,542	
4,130,589	4,163,759	4,171,635	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims lists.

Patent No. 3,546,249, H. B. Gerritsen and A. Schroeder, PEROXIDIC COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF, Interference No. 99,218, decided Sept. 17, 1979, Claims 1, 2, 5, 7 and 8.

Patent No. 3,838,390, D. Michon, NEW OPERATIONAL DISPOSITION FOR OBTAINING THREE-DIMENSIONAL SEISMIC INFORMATION, Interference No. 99,309, decided Sept. 17, 1979, Claims 4–7.

Patent No. 3,907,796, R. A. Jewell, K. Lin, IMIDAZO-S-TRIAZINEDIONES AND PYRIMIDO-S-TRIAZINEDIONES, Interference No. 99,588, decided Sept. 27, 1979, Claims 1 and 2.

Patent No. 3,909,337, T. Yabe, GREEN TIRE SHAPING APPARATUS, Interference No. 99,907, decided Nov. 29, 1979, Claims 1–4.

Patent No. 3,943,545, C. Kim, LOW INTERELECTRODE LEAKAGE STRUCTURE FOR CHARGE-COUPLED DEVICES, Interference No. 99,519, decided Sept. 12, 1979, Claims 1 and 3.

Patent No. 3,971,834, C. W. Uzelmeier, P. D. Jones, MODIFIED ACRYLATE RESIN, Interference No. 100,193, decided Nov. 8, 1979, Claims 1–6.

Patent No. 3,984,801, S. A. Mrenna, Z. J. Kruzic, REJECTION TYPE FUSE CLIP, Interference No. 99,815, decided Nov. 8, 1979, Claim 1.

Patent No. 4,051,084, H. Kuhlthau, H. Beecken, CATIONIC DYESTUFFS, Interference No. 100,198, decided Nov. 27, 1979, Claims 1, 3 and 4.

Patent No. 4,051,117, H. Kuhlthau, H. Beecken, TRIAZOLE-AZO-PHENYL CATIONIC DYESTUFFS, Interference No. 100,199, decided Nov. 9, 1979, Claims 1. 3–7.

Patents Available for Licensing or Sale

4,178,899. LOW-FRICTION PISTON. Harry Julich, 6807 Winter Lane, Annandale, Va. 22003.

4,172,449. BODY FLUID PRESSURE MONITOR. Pierre L. LeRoy and Walter M. Bruner, MDS, Inc. 249 East Main St. Newark, Del. 19711.

4,170,345. HOLDING CLAMP ASSEMBLY. Ralph G. Townsend, 4882 J Parkway, Sacramento, Calif. 95823.

4,166,517. PILOTS POWER ELEVATOR. Chuck Henderson, 12300 39th Avenue, Kenasha, Wis. 53142.

4,159,728. HOT WATER BAG. Gumni-Kraus GmbH. Stuttgart, Germany. Correspondence to Michael J. Striker. 360 Lexington Avenue, New York, N.Y. 10017.

4,119,289. ADJUSTABLE READING STAND. Julianna Kanocz, 86–53 Palo Alto St., Hollliswood, N.Y. 11423.

4,083,610. BEARING ASSEMBLY UTILIZING A TAPERED BUSHING HOLDER. John Kruchowski, Correspondence to: John Kruchowski, 148 West Park, South St. Paul. Minn. 55075.

3,149,651. PACKAGE UNIT SAW. Robert J. Belrose. 233 Garvey Drive, Springfield, Mass. 01109.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,103,646. APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER.

4,115,929. GAS DISTRIBUTOR FOR FLUIDIZING BEDS.

4,023,921. OIL BURNER FOR NOX EMISSION CONTROL.

4,108,615. VANED ANODE FOR HIGH INTENSITY STAGE OF ELECTROSTATIC PRECIPITATOR.

4,021,328. REACTOR FOR SOLVENT REFINED COAL AND METHOD.

4,094,615. BLADE ATTACHMENT STRUCTURE FOR GAS TURBINE ROTOR.

4,142,831. DIMPLED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,090,810. PIN-FINNED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,093,399. TURBINE ROTOR WITH CERAMIC BLADES.

4,084,922. TURBINE ROTOR WITH PIN MOUNTED CERAMIC TURBINE BLADES.

4,113,242. RELEASABLE HIGH PRESSURE SEAL AND METHOD OF FORMING SAME.

4,058,396. RECOVERY OF LEAD FOR BATTERIES.

4,049,885. CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY.

4,053,689. CONTACT BETWEEN METAL CAN AND CARBON/GRAPHITE FIBERS IN SODIUM/SULFUR CELLS.

4,070,527. EFFICIENT SODIUM/SULFUR BATTERY.

3,959,022. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES.

4,012,562. MODULAR ELECTRICAL ENERGY STORAGE DEVICE.

4,048,390. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

3,925,098. POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE.

4,146,683. SODIUM SULFUR CELL CONSTRUCTION AND METHOD.

4,110,516. SODIUM-SULFUR CELL CASINGS.

4,140,841. SULFUR ELECTRODE—SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,102,175. RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR.

4,127,035. AN ELECTROMAGNETIC TRANSDUCER.

4,030,347. BIAXIAL CAPACITANCE STRAIN TRANSDUCER.

4,120,752. FUEL PELLET FOR FUEL PIN OF NUCLEAR REACTOR CORE.

4,125,742. TIERED CONVOLUTED SHIELDED INSULATORS.

4,078,304. CUTTER FOR CORRUGATED PIPE FOR FLEXIBLE GAS INSULATED TRANSMISSION LINE.

4,063,355. CUTTER FOR HELICALLY CORRUGATED TUBE FOR FLEXIBLE GAS INSULATED CABLE.

4,091,230. EVAPORATION COOLED TRANSMISSION LINE SYSTEM.

4,110,551. EXTRUDED SHEATH SECTION FOR COMPRESSED GAS INSULATED TRANSMISSION LINES.

4,119,793. IMPROVED TRANSMISSION LINE BREAKDOWN VOLTAGE.

4,053,338. METHOD OF FABRICATING COMPRESSED INSULATED CABLE.

4,100,367. MULTIPLE PART INSULATOR FOR FLEXIBLE GAS-INSULATED TRANSMISSION LINE CABLE.

4,122,298. OFFSET CONSTANT THICKNESS WEB FOR INSULATOR SUPPORT DISK.

4,056,679. SODIUM FILLED FLEXIBLE TRANSMISSION CABLE.

4,101,730. TERMINATION FOR STRANDED CABLE.

4,097,682. MEANS FOR PROTECTING UNDERGROUND ELECTRICAL EQUIPMENT FROM THERMAL RUNAWAY.

4,140,337. HERMETIC QUICK CONNECTION AND SEAL FOR COUPLING LOW PRESSURE SYSTEMS.

4,126,808. HIGH VOLTAGE TWO STAGE TRIGGERED VACUUM GAP.

4,086,645. REPULSION COIL ACTUATOR FOR HIGH SPEED HIGH POWER CIRCUITS.

4,058,373. COMBUSTIBLE GAS-IN-OIL DETECTOR.

4,079,403. THYRISTOR DEVICE WITH SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE.

4,126,825. ELECTRONIC CURRENT TRANSDUCER FOR HIGH VOLTAGE TRANSMISSION LINES.

4,087,701. TRANSFORMER CASCADE FOR POWERING ELECTRONICS ON HIGH VOLTAGE TRANSMISSION LINES.

4,029,892. METHOD AND MEANS FOR TRAPPING PARTICLES IN ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,890. PARTICLE TRAPPING ELBOW JOINT FOR ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,891. PARTICLE TRAPPING SHEATH COUPLING FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,054,835. RAPID RESPONSE GENERATING VOLTMETERS.

4,082,933. STAB CONNECTOR FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,095,205. TRANSFORMER WITH IMPROVED INSULATOR.

4,117,525. OVERPRESSURE PROTECTION FOR VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,145,679. VAPORIZATION COOLED AND INSULATED ELECTRICAL APPARATUS.

4,129,845. VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,117,441. CURRENT LIMITING FUSE CONSTRUCTION AND METHOD.

4,109,228. CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER.

4,117,357. FLEXIBLE COUPLING FOR ROTOR ELEMENTS OF A SUPERCONDUCTING GENERATOR.

4,120,169. MULTIPHASIC PUMP FOR ROTATING CRYOGENIC MACHINERY.

4,092,555. SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR.

4,151,433. SPIRAL PANCAKE WINDING FOR TWO-POLE ELECTRICAL MACHINE SPECIFICALLY TURBINE GENERATOR.

4,096,403. IMPROVED SUPERCONDUCTING HYBRID MAGNETIC FLUX PUMP.

4,112,705. FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP.

4,042,012. HEAT PUMP SYSTEM AND IMPROVED HEAT TRANSFER.

4,137,798. TWO-SPEED DRIVE APPARATUS.

4,094,165. VARIABLE SPEED DRIVE UNIT FOR COMPRESSION OF HEAT PUMP.

General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Steam Turbine-Generator Legal Operation, General Electric Company, 1 River Road, Building 18A—5th Floor, Schenectady, N.Y. 12345.

4,163,227. APPARATUS FOR MONITORING ARCING OF BRUSHES IN A DYNAMOELECTRIC MACHINE.

Application for license may be addressed to the General Electric Company, Aircraft Engine Group, 1000 Western Avenue, Lynn, Mass. 01910, Attention : Patent Counsel.

3,547,379. AIRCRAFT NUCLEAR PROPULSION SYSTEM HAVING AN ALTERNATIVE POWER SOURCE.

3,547,380. AIRCRAFT NUCLEAR PROPULSION SYSTEM.

3,618,317. FUEL DELIVERY APPARATUS.

3,687,569. ROTOR WITH VARIABLE ANGLE BLADES.

3,693,354. AIRCRAFT ENGINE FAN DUCT BURNER SYSTEM.

3,703,081. GAS TURBINE ENGINE.

3,732,946. ULTRASONIC NOZZLE MEASURING SYSTEM.

3,765,795. COMPOSITELY FORMED ROTORS AND THEIR MANUFACTURE.

3,779,010. COMBINED THRUST REVERSING & THROAT VARYING MECHANISM FOR A GAS TURBINE ENGINE.

3,779,665. COMBINED VARIABLE ANGLE STATOR AND WINDMILL CONTROL SYSTEM.

3,889,882. RETRACTABLE SOUND SUPPRESSOR FOR A GAS TURBINE ENGINE.

4,010,767. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

4,030,291. THRUST REVERSER FOR A GAS TURBOFAN ENGINE.

4,036,246. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

4,045,727. MICROWAVE PROXIMITY DETECTOR.

4,075,833. VARIABLE AREA INLET FOR A GAS TURBINE ENGINE.

4,081,215. STABLE TWO-CHANNEL, SINGLE-FILTER SPECTROMETER.

4,102,603. MULTIPLE SECTION ROTOR DISK.

4,127,357. VARIABLE SHROUD FOR A TURBOMACHINE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,169,659. MULTIPLE STANDARD TELEVISION SYNC GENERATOR.

4,169,746. METHOD FOR MAKING SILICON ON SAPPHIRE TRANSISTOR UTILIZING PREDEPOSITION OF LEADS.

4,169,807. NOVEL SOLVENT DRYNG AGENT.

4,169,988. RASTER DISTORTION CORRECTION CIRCUIT.

4,170,024. TELEVISION CONTROL SYSTEM.

4,170,501. METHOD OF MAKING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE UTILIZING SIMULTANEOUS OUTDIFFUSION AND AUTODOPING DURING EPITAXIAL DEPOSITION.

4,170,616. METHOD OF FABRICATION OF A FRESNEL LENS.

4,170,778. FREQUENCY-SCANNED ANTENNA.

4,170,811. METHOD FOR COATING CATHODE MATERIAL ON CATHODE SUBSTRATE.

4,172,239. SIGNAL ATTENUATOR.

4,172,999. SELF-BIASING AMPLIFIER STAGE.

4,173,022. INTEGRATED GATE FIELD EFFECT TRANSISTORS HAVING CLOSED GATE STRUCTURE WITH CONTROLLED AVALANCHE CHARACTERISTICS.

4,173,023. BURST GATE CIRCUIT.

4,173,348. GROOVED RECORD PLAYBACK SYSTEM.

4,173,683. CHEMICALLY TREATING THE OVERCOAT OF A SEMICONDUCTOR DEVICE.

4,173,729. CATHODE-RAY TUBE HAVING A STEPPED SHADOW MASK.

4,173,742. ANTENNA ISOLATION DEVICE.

4,173,743. COUPLING A FREQUENCY MODULATED SIGNAL TO A TUNED LOAD.

4,173,768. CONTACT FOR SEMICONDUCTOR DEVICES.

4,174,217. METHOD FOR MAKING SEMICONDUCTOR STRUCTURE.

4,174,252. METHOD OF DEFINING CONTACT OPENINGS IN INSULATING LAYERS ON SEMICONDUCTOR DEVICES WITHOUT THE FORMATION OF UNDESIRABLE PINHOLES.

4,174,523. FLAT DISPLAY DEVICE.

4,174,531. PRINTED CIRCUIT BOARD WITH INCREASED ARC TRACK RESISTANCE.

4,174,881. RECORDING A SYNTHETIC FOCUSED-IMAGE HOLOGRAM ON A THERMALLY DEFORMABLE PLASTIC.

4,175,751. TOGGLE MECHANISM FOR VIDEO DISC PLAYER.

4,176,303. TELEVISION S-CORRECTION LINEARITY DEVICE.

4,176,304. REGULATING TELEVISION HORIZONTAL DEFLECTION ARRANGEMENT.

4,176,378. SIGNAL PICKUP ARM LIFTING/LOWERING AND GROOVE SKIPPER APPARATUS.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division
Room 2D 444, Pentagon, Washington, D.C. 20310

Patent 4,100,742. Turbocompound Engine with Turbocharger Control. Filed Dec. 9, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,108,191. Fan Mesh Disrupter. Filed Sept. 17, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,118,727. Mox Multi-layer Switching Device Comprising Niobium Oxide. Filed Sept. 9, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,144,906. Programmable Fluidic Pressure-to-Electronic Interface System. Filed July 14, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,149,170. Multiport Cable Choke. Filed Apr. 28, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,308. Method of Forming an Efficient Electron Emitter Cold Cathode. Filed Dec. 16, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,404. Pressure Testing of Rocket Motor Cases. Filed May 24, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,920. Rotor Blade Tipweight Assembly. Filed Dec. 2, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,233. Method for Preparing a Smoke Agent. Filed Oct. 19, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,153,761. Method of Removing Foulants from Ion Exchange Resins. Filed Apr. 21, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,154,092. Pneumatic Gross Leak Detector. Filed May 4, 1978. Patented May 15, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half Street, S.W.
Washington, D.C. 20324

Patent application 6,048,951. Propulsion Assist Stage for Geosynchronous Orbit Injection from Space Shuttle. Filed June 15, 1979.

Patent application 6,050,272. Oxide Passivated Mesa Epitaxial Diodes with Integral Plated Heat Sink. Filed June 19, 1979.

Patent 4,163,629. Turbine Vane Construction. Filed Dec. 23, 1977. Patented Aug. 7, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Room A 2-3018, Washington, D.C. 20545

Patent 4,140,771. Process for Preparing Active Oxide Powders. Filed Feb. 24, 1978. Patented Feb. 20, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP-4, Washington, D.C. 20546

Patent application 6,057,465. Pressure Control Valve. July 13, 1979.

Patent application 6,064,617. Skin Friction Measuring Device for Aircraft. Filed Aug. 7, 1979.

Patent application 6,069,485. Electrical Short Locator. Filed Aug. 24, 1979.

Patent application 6,070,771. Curing Agent for Polyepoxides and Epoxy Resins and Composites Cured Therewith. Filed Aug. 30, 1979.

Patent 4,162,169. Alkali-Metal Silicate Binders and Methods of Manufacture. Filed Dec. 21, 1977. Patented July 24, 1979. Not available NTIS.

Patent 4,162,701. Thermal Control Canister. Filed Nov. 21, 1977. Patented July 31, 1979. Not available NTIS.

Patent 4,162,928. Solar Cell Module. Filed Sept. 29, 1978. Patented July 31, 1979. Not available NTIS.

Patent 4,163,678. Solar Cell with Improved n-Region Contact and Method of Forming the Same. Filed June 30, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,164,079. Seat Cushion to Provide Realistic Acceleration Cues to Aircraft Simulator Pilot. Filed July 26, 1978. Patented Aug. 14, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half Street, S.W.
Washington, D.C. 20324

Patent application 6,035,580, Missile Hoisting Sling. Filed May 3, 1979.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements & Patent Branch, Administrative Services Division, Federal Bldg., Science & Education Administration, Hyattsville, Md. 20782

Patent application 6,061,169. Ternary Salts of Tris(Aminomethyl) Phosphines and their Oxides. Filed July 26, 1979.

Patent application 6,062,824. Purification of Sucrose Esters of Fatty Acids by a Method of Ultrafiltration. Filed Aug. 1, 1979.

Patent 4,160,357. Catching Surface Seal and Rotating Trunk for a Continuous Tree Chop Harvester. Filed Feb. 28, 1978. Patented July 10, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Room A 2-3018, Washington, D.C. 20545

Patent 4,145,680. Acoustic Imaging System. Filed Oct. 18, 1977. Patented Mar. 20, 1979. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th Street, S.W.
Washington, D.C. 20590

Patent 4,167,868. Large Hose Automatic Testing Device. Filed Nov. 27, 1978. Patented Sept. 18, 1979. Not available NTIS.

Patent 4,169,373. Tire Bead Inspection. Filed Sept. 27, 1978. Patented Oct. 2, 1979. Not available NTIS.

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	Sunnyvale Patent Library*	(408) 736-0795
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
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Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-15-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	7-24-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

REISSUES

FEBRUARY 19, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,214
TUNNEL-TYPE COMMERICAL-DUTY WASHING MACHINE

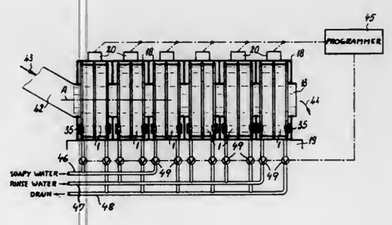
Guy M. Bhavsar, 68 Boulevard des Belges, Lyon, Rhone, France

Original No. 4,020,659, dated May 3, 1977, Ser. No. 592,673, Jul. 2, 1975. Application for reissue Feb. 7, 1979, Ser. No. 10,261

Claims priority, application France, Jul., 1974, 74 23898

Int. Cl.[2] D06F *21/04, 31/00, 37/06*

U.S. Cl. 68—27 **18 Claims**



10. An apparatus for treating a textile article with a liquid, comprising:

a plurality of axially spaced at least partially foraminous drums rotatable about a common horizontal axis and each provided with a respective outer wall defining a chamber and with a pair of axially spaced end walls flanking said chamber, each of said end walls being formed at said axis with a respective aperture;

respective scoop means in each drum effective on rotation thereof in one sense through more than a predetermined angle for lifting from the respective outer wall and axially displacing said article out of the respective chamber through a respective one of said apertures into another of said drums and ineffective on rotation of the drum, in the opposite sense for lifting said article;

drive means for angularly displacing said drums in said one sense through at least said predetermined angle and for rotating said drums in said opposite sense, each of said scoop means being at least partially foraminous and formed from a first generally cylindrical section having an edge attached to the respective outer wall and extending between the respective end walls, and a second generally frustoconical section forming a continuation of said cylindrical section and having a side edge joined to one of the respective end walls over a major arc of the periphery of the respective said one aperture, said edge of said cylindrical section lying generally in a plane including said axis and angularly bisecting the respective major arc where the respective frustoconical section joins the respective periphery;

housing means having an inlet end and an outlet end and providing between said ends individual housings forming a succession of upright partitions defining respective compartments each formed with a throughgoing opening and, each compartment receiving a respective one of said drums with the apertures thereof being aligned with said opening, each frustoconical section being joined at that end wall of the respective drum turned toward said outlet end; and

means for introducing treatment fluids into said compartments.

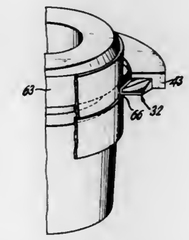
Re. 30,215
SEALING AND SHEARING MEMBER IN A PLASTIC RESIN BLOW MOLDING MACHINE

Ernest O. Kuenzig, Glen Head, and Frank L. Pennino, Farmingdale, both of N.Y., assignors to Forest Mechanical Products Corp., Kew Gardens, N.Y.

Original No. 4,032,278, dated Jun. 28, 1977, Ser. No. 663,124, Mar. 2, 1976. Application for reissue Jun. 23, 1978, Ser. No. 918,447

Int. Cl.[2] B29C *17/07*

U.S. Cl. 425—525 **12 Claims**



7. In a blow molding machine in which a plastic resin parison is extruded in tubular form along an axis from an extruder around a vertically aligned blow tube and in which said blow tube delivers compressed air to expand the parison to form against the internal walls of a two-part separable mold when the separable mold is in its closed position, said mold being positioned beneath said extruder along the axis of the blow tube and having open and closed positions, the mold having a separable two-part top neck portion, said blow tube carrying a cylindrical blow pin having a cylindrical shoulder portion and a cylindrical shear portion spaced axially from said shoulder portion, said blow pin being movable axially vertically upwards to aid in severing the parison after the mold parts are closed;

a plastic resin severing and closure device removably affixed at said top neck portion of each of said two mold parts and separable along with said mold parts, said device in cooperation with the blow pin severing the parison and providing an air-tight seal between the mold and the parison when the separable mold is in its closed position;

said severing and closure device comprising two base members, each base member being fixed to a top neck portion of a respective mold part and being operable to hold a top seal means and a bottom shear means fixed with respect to the mold part, each base member being in the approximate form of a one-half ring and having a flat surface generally perpendicular to the axis of said blow pin and having a flange portion extending generally perpendicularly from said flat portion, said flange portion being operable to align said top seal means and said shear means with respect to said blow pin axis, said base members being of a heat conductive metal alloy;

two top seal means for compressing but not shearing and thereby sealing and permitting blow pressure within said parison, each of said seal means being associated with a respective base member and each being generally flat and being approximately a one-half ring, each of said seal means being mounted such that an inner edge thereof is close to but not touching said shoulder portion of said blow pin when the mold parts are closed, said seal means being of heat hardened steel;

two bottom shear means for shearing the parison when the blow pin is moved vertically upwards, each of said bottom shear

means being separable along with said mold parts, each bottom shear means being generally flat and being approximately a one-half ring, each of said shear means having an inner face which meets in a shearing action against said shear portion of said blow pin, each of said shear means having an inner edge with an inner diameter which is less than the inner diameter of said inner edge of said seal means; each of said shear means being of heat-hardened steel; and

means removably affixing said shear means and said seal means so that they touch the flange portion of one of said base members and so that they are separable along with said mold parts.

Re. 30,216

TOBACCO SUCKER CONTROL AGENT AND METHOD

Calman J. Kish, North Plainfield, N.J., assignor to Fairmount Chemical Company, Inc., Newark, N.J.

Original No. 4,077,796, dated Mar. 7, 1978, Ser. No. 744,649, Nov. 24, 1976. Continuation-in-part of Ser. No. 549,815, Feb. 14, 1975, abandoned. Application for reissue Jul. 12, 1978, Ser. No. 923,820

Int. Cl.[2] **A01N** *5/00*

U.S. Cl. 71—78 **17 Claims**

1. A method of inhibiting the growth of suckers in tobacco plants which comprises applying to said tobacco plants after topping an effective amount for inhibiting tobacco sucker growth of an aqueous solution containing from about 10 to about 40% by weight of a saturated C_6 to C_{18} fatty alcohol and from about 5 to about 25% by weight of a member selected from the group consisting of the alkali metal, [alkanolamine] *alkylamine* containing up to 12 carbon atoms, and C_2–C_6 [alkylamine] *alkanolamine* salts of 1,2-dihydropyridazine-3,6-dione.

Re. 30,217

COPOLYMER OF POLYIMIDE OLIGOMERS AND TEREPHTHALONITRILE N,N-DIOXIDE AND THEIR METHODS OF PREPARATION

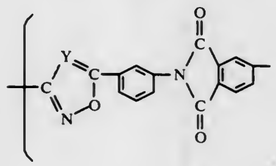
Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

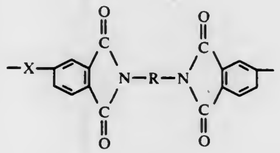
Original No. 3,864,309, dated Feb. 4, 1975, Ser. No. 416,483, Nov. 16, 1973. Continuation-in-part of Ser. No. 347,535, Apr. 3, 1973, abandoned, and Ser. No. 413,473, Nov. 6, 1973, Pat. No. 3,845,018, which is a continuation-in-part of Ser. No. 347,501, Apr. 3, 1973. Application for reissue Apr. 24, 1978, Ser. No. 899,765

Int. Cl.[2] **C08G** *73/12*

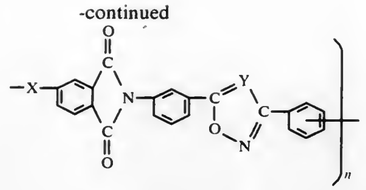
U.S. Cl. 525—426 **10 Claims**

1. Copolymers of addition cured polyimides formed from the reaction of aromatic bis(nitrileoxides) and cyano- or acetylene-substituted polyimide oligomers and consisting essentially of the following general formula:





-continued



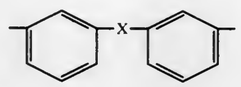
where

X=CO, O, CH_2, SO_2, or $-CF_2-)_n$

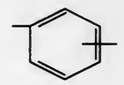
Y=CH or N, and

R=$-C_6H_4OC_6H_4-$, $-C_6H_4OC_6H_4OC_6H_4-$, or $-C_6H_4OC_6H_4OC_6H_4OC_6H_4-$

and where



may be replaced by



Re. 30,218

8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

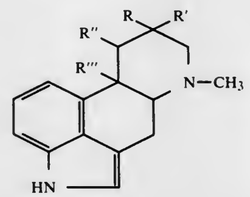
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,968,111, dated Jul. 6, 1976, Ser. No. 530,320, Dec. 6, 1974. Application for reissue Feb. 12, 1979, Ser. No. 11,258

Int. Cl.[2] **C07D** *457/02, 457/10, 457/04*

U.S. Cl. 546—67 **9 Claims**

1. A compound of the formula



wherein R is alk, carbo(C_1–C_3)alkoxy, Cl or Br;

R′ is carboxyl, carbo(C_1–C_3)alkoxy, or CH_2Z, wherein Y is S or O; and

R″ and R‴ when taken singly are H; and, when taken together with the carbon atoms to which they are attached, form a double bond and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acids.

Re. 30,219

METHOD OF PREPARING 8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

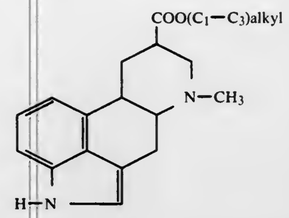
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 4,075,212, dated Feb. 21, 1978, Ser. No. 650,582, Jan. 19, 1976. Continuation-in-part of Ser. No. 530,320, Dec. 6, 1974, Pat. No. 3,968,111. Application for reissue Feb. 5, 1979, Ser. No. 9,633

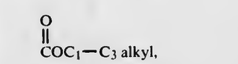
Int. Cl.[2] **C07D** *457/04*

U.S. Cl. 546—69 **1 Claim**

1. The process which comprises reacting a (C_1–C_3) alkyl dihydrolysergate of the formula



with at least 2 moles of non-hydrolytic base of the class consisting of lithium tetramethylpiperidide and potassium diisopropyl amide in an inert solvent to form a 1,8-dianion of the said (C_1–C_3)alkyl dihydrolysergate, and then reacting said dianion with not more than one mole of an alkylating agent, R‴″$(CH_2)_nX$ wherein R‴″ is CH_3, CH_2, CN or



X is halogen and n is 0, 1 or 2 to yield a (C_1–C_3)alkyl 8-R‴″ dihydrolysergate substantially free from any 1,8-di R‴″ dihydrolysergate and then isolating the thus formed (C_1–C_3)alkyl 8-R‴″ dihydrolysergate in substantially pure form from the reaction mixture.

Re. 30,220

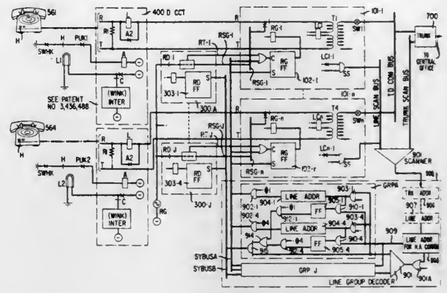
STATION LOOP CONTROL ARRANGEMENT FOR TELEPHONE SWITCHING SYSTEM

John F. O'Neill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,916,118, dated Oct. 28, 1975, Ser. No. 521,650, Nov. 7, 1974. Application for reissue Sep. 15, 1978, Ser. No. 943,343

Int. Cl.[2] **H04M** *1/00*

U.S. Cl. 179—99 H **12 Claims**



1. In a switching system having a plurality of telephone sets, line circuits, and trunks, means *including a time division bus* for selectively interconnecting said line circuits with said trunks, and means for defining active *and silent* intervals of ringing for a group of said line circuits, the combination comprising

a ringing relay in each of said line circuits normally operable during a defined active one of said intervals for applying ringing current to its respective line,

means for detecting an abandoned call condition *exhibited at a trunk*, and

means responsive to said detecting means and controlled by said defining means during the silent interval of said ringing in said group of line circuits for operating the ringing relay in the one of said line circuits connected by said time division bus to said trunk detected as exhibiting said abandoned call condition.

PLANT PATENTS

GRANTED FEBRUARY 19, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,503

ROSE PLANT

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 15, 1978, Ser. No. 969,800

Int. Cl.[2] **A01H** *5/00*

U.S. Cl. Plt.—17 **1 Claim**

1. An asexually reproduced rose plant of the Hybrid Tea class, substantially as herein illustrated and described, being especially characterized in a vigorous upright-spreading growth habit and a tendency to bear its blooms singly, on strong stems of medium length, said plant further being characterized in the coral-salmon color of its blooms, and the strong citrus-and-spice fragrance of the same.

4,504

DIEFFENBACHIA PLANT

Richard P. Welker, P.O. Box 637, Apopka, Fla. 32703

Filed Aug. 31, 1978, Ser. No. 938,976

Int. Cl.[2] **A01H** *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct variety of the Arum Family, substantially as herein shown and described.

PATENTS

GRANTED FEB. 19, 1980

ERRATA

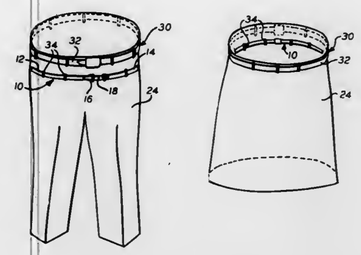
For CLASS	See PATENT NO.
433–090	4,188,724
433–129	4,188,725
128–303.14	4,188,927
430–380	4,189,319
430–145	4,189,320
430–381	4,189,321
430–284	4,189,322
430–281	4,189,323
435–087	4,189,349
435–215	4,189,350
283–006	4,189,353
430–111	4,189,390
548–207	4,189,433
548–257	4,189,434
549–030	4,189,435
549–072	4,189,436
525–455	4,189,450
525–262	4,189,451
525–444	4,189,452
544–211	4,189,570
568–801	4,189,602
525–472	4,189,611
335–229	4,189,699
250–262	4,189,705
367–093	4,189,722

PATENTS

GRANTED FEBRUARY 19, 1980

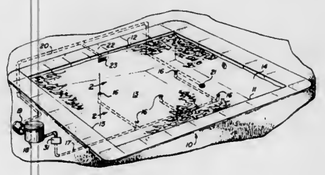
GENERAL AND MECHANICAL

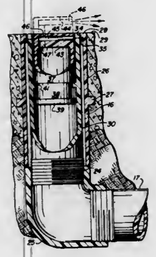
4,188,672
MINI-SUPPORT BELT FOR GARMENTS
Anne Kalso, 4025 N. 40th St., Phoenix, Ariz. 86018
Filed May 8, 1978, Ser. No. 904,163
Int. Cl.[2] A41F *9/02*
U.S. Cl. 2—221 **12 Claims**



1. A mini-support belt having a width of from about 3 to 10 cm. for a garment comprising first and second sections formed of non-elastic flexible material, each of said sections having at one end thereof one of a pair of cooperable closure elements adapted to releasably interconnect said first and second sections, said first and second sections, when interconnected, being of sufficient length to extend across the front only of a person's torso below the waist from a location in substantial alignment with one hip to a corresponding location on the other hip whereby the tightening force at the front of the belt is converted into a constraining force at each hip bone to relieve rearward pressure on the hips.

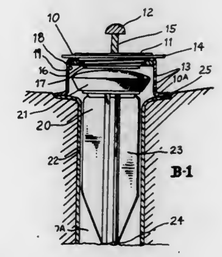
4,188,673
ROTATABLE POP-UP WATER DELIVERY HEAD FOR POOL CLEANING SYSTEMS
Heard L. Carter, 1121 N. Hayden Rd., Scottsdale, Ariz. 85257
Filed Oct. 11, 1978, Ser. No. 950,461
Int. Cl.[2] E04H *3/20;* **B08B** *3/02, 9/00*
U.S. Cl. 4—172.17 **2 Claims**





1. A rotatable pop-up water delivery head for swimming pool cleaning systems comprising:
a generally cylindrical open ended housing for connection to an inlet plumbing conduit communicating between said housing and a source of water under pressure, and
a piston like means mounted in said housing for reciprocal movement longitudinally of said housing a predetermined distance by water pressure applied thereto from the conduit, said piston like means comprising an unrestrained randomly rotatable hollow cylindrical piston having an open lower end and a closed upper end,
said closed upper end of said piston comprising a piston head defining a passageway extending therethrough with one end opening outwardly of said piston and defining an outlet port and the other end extending through the side of said piston head to a location exposed to water pressure from the conduit and defining a vertically extending water inlet port, said inlet port being formed in the closed upper end of said hollow cylindrical piston at a point spaced from and parallel with the longitudinal axis of said piston head,
said passageway extending in a substantially straight line beginning at said inlet port and extending horizontally across the end of said head at a given distance from the longitudinal axis of said head,
said outlet port projecting a pressurized stream of water in a direction laterally to the axis of rotation of said head and in substantially parallel and scrubbing relation to an inner surface of an associated pool wall when said piston like means is moved partially out of said other end of said housing exposing said outlet port to the interior of the associated swimming pool,
said head upon interruption of water pressure to said housing moving back into said housing under the action of gravity on said head and assuming a different position with the interior of said housing than the position occupied when previously driven partially out of said housing,
whereby the pressure of the water leaving the outlet port reacting on the pool water adjacent the head causing random rotational movement of the piston like means relative to the housing during its reciprocal movement in the housing.

4,188,674
CONTACT LENS SAVING DEVICES
Louis C. Mardirosian, 308 S. Walnut St., Apt. A, Carmi, Ill. 62821
Filed Jun. 15, 1978, Ser. No. 915,930
Int. Cl.[2] E03C *1/26*
U.S. Cl. 4—292 **4 Claims**



1. A contact lens saving device comprising in combination:
a plate having a plurality of openings therein,
an outer rim surrounding and underlying said plate fastened thereto,
a first cylindrical sleeve underlying said outer rim fastened thereto, and provided with threads on an outer face

thereof which terminates in an extension flange which retards lateral translation of said device when disposed in a drain opening of a sink basin,

whereby said openings are large enough to permit the egress of water from the basin but small enough to trap a contact lense thereagainst and in which a second sleeve having inner threads thereon engage the threads of said first sleeve, said second sleeve having a greater verticle dimension than said first sleeve,

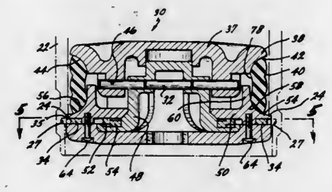
an annular base surrounding said second sleeve at its lowermost extent,

and holes on said second sleeve whereby said second sleeve serves to raise said device to allow room for a conventional basin stopper to open and close.

4,188,675
CONDUIT PLUG

Herbert H. Ast, Pacific Palisades, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Irvine, Calif.

Filed Jun. 30, 1978, Ser. No. 920,963
Int. Cl.[2] A47K *1/14*
U.S. Cl. 4—295 **17 Claims**



1. An axially insertable and removable conduit plug having a radially movable sealing member for forming a fluid-tight seal against axial flow in a conduit, comprising in combination:

a first plug member having a perimeter similar in shape to the conduit, said plug member having a peripheral rim, a hub portion having a flange-like section for supporting a sealing member and a bearing surface with a decreasing diameter gradient from said rim;

a second plug member having a perimeter similar in shape to said first plug member and having a peripheral rim and a bearing surface with a decreasing diameter gradient from said rim;

connecting means for coaxially coupling said first and second plug members for relative axial motion to increase and decrease the axial separation therebetween; and

an annular sealing member, elongated in the axial direction, to fit between said rims to said fully separated first and second plug members, said sealing member having an exterior sealing surface and an interior seating surface supportably mounted on said flange-like section of said hub portion; said sealing member being displaced radially outwardly as a result of said plug members decreasing their axial separation.

4,188,676
PUSH-PUSH DRAIN CLOSURE ASSEMBLY

Julius L. Tolnai, Los Angeles, and Matthew G. Tarnay, Pasadena, both of Calif., assignors to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Sep. 1, 1978, Ser. No. 938,841
Int. Cl.[2] A47K *1/14*
U.S. Cl. 4—295 **4 Claims**

1. In a push-push drain closure assembly cooperable with an upwardly facing seat about the drain opening of a bathtub, lavatory or the like:

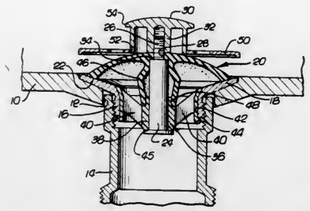
a. a socket fitted to the drain opening;

b. a stem substantially centrally mounted by the socket for limited vertical movement therein;

c. a seal member centrally mounted on the top of said stem and having a free peripheral sealing rim cooperable with said seat, said seal member normally having a pronounced curvature determining bistable normal and opposite involuted orientations of said rim relative to its central portion;

d. an actuator button attached to the center of said seal member for movement for depressing the seal member to snap it to its upwardly involuted position for opening the drain;

e. an actuator plate slidably accommodated on, and retained



by, said actuator button, said actuator plate overlying said seal member and being operative to depress the peripheral portion of the seal member to snap it to its downwardly normal position for closing the drain;

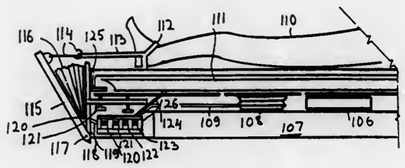
f. spring means for returning the stem to its upward limited position; and

g. said actuator plate shielding said seal member from the current of waste water and from the spout stream to prevent accidental movement of said seal member to its opposite position.

4,188,677
LOUNGER BED AND ADJUSTABLE BODY SUPPORTING ASSEMBLY

Henry C. Zur, 10 W. Griswold Ave., Phoenix, Ariz. 85021

Filed Nov. 30, 1977, Ser. No. 855,843
Int. Cl.[2] A61G *7/10*
U.S. Cl. 5—66 **25 Claims**



1. An adjustable body supporting assembly comprising

a. a base;

b. a middle body support fixedly mounted in a raised position on said base;

c. a back support pivotally connected to said middle support a knee support, pivotally connected to the other side of said middle support, and a leg support pivotally connected to the other side of said knee support;

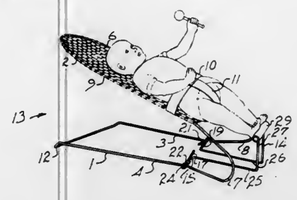
d. means to secure or release said pivoting supports in a raised position aligned with said raised middle support such as holding devices pivotally mounted below said supports which can be turned aside to permit downward movement of a body support resting on such holding device; and

wherein the same means serving for the adjustable elevation of a support panel from its aligned position, serves also for the adjustable downward movement of the body support panel from its aligned position with said middle support.

4,188,678
NURSERY EQUIPMENT

Keith C. Rawolle, 33 Leslie St., Murray Bridge, Australia (5253)

Filed Nov. 23, 1977, Ser. No. 854,268
Claims priority, application Australia, Nov. 24, 1976, PC8247
Int. Cl.[2] A47C *7/02*
U.S. Cl. 5—105 **6 Claims**



1. An attachment for a bouncing cradle of a type described including a wire frame having a baby support U-shaped portion with a support layer extending across the baby support portion, and a base U-shaped portion, the base U-shaped portion having legs acting with the legs of the U-shape of the baby support portion in such a way as to provide resilient support for a baby and to support the baby in an inclined position, the attachment being characterized according to this invention by including a frame having at least two clamping means spaced apart and each positioned to engage with a releasable clamping action a leg of the base portion, a portion of the wire frame extending forwardly and upwardly, a reaction member at an upper forward end of the frame adapted to provide a reaction pad against which a baby's feet can safely engage; and the frame having one wire member shaped to have at both ends a U-shaped clamping portion the planar direction of the U-shape being transverse to a forward direction, whereby to provide a releasable clamping action engaging the side leg of the base portion, and the open mouth of the U-shape in each case being innermost as compared to the base of the U-shape, a lower leg of each U-shape at an innermost position being the portion that extends forwardly and upwardly this first extending in a position substantially horizontal and adapted to be at least in part ground engaging, and at a forwardmost end rising to an uppermost position and then extending transversely to join with the other side of the wire member, and holding means to hold closed the open mouth of each U-shaped clamping portion to effect a clamping action on the respective leg of the base portion of the baby support device.

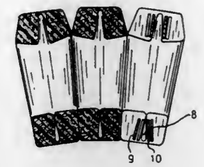
4,188,679
ANNULAR SHAPED BUOYANCY ELEMENT FOR TRANSPORT HOSES

Fritz Hollaender, Hamburg, and Klaus Schneider, Hausbruch, both of Fed. Rep. of Germany, assignors to Phoeniz AG, Hamburg and Eddelbuttel & Schneider, Grenzkehre, both of, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,293
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649960
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **10 Claims**

1. An annular-shaped buoyancy element for transport hoses which are used on water, comprising:

two generally semicircular-shaped buoyancy members, each of which includes a core made of foam plastic material, completely encased in a sheath made of polymer material, a pair of end faces and coupling means mounted on each of said end faces thereof to permit said members to be coupled together in which coupled condition they cooperate to define said annular-shaped buoyancy element, each of said members also having a radially interior face and a pair of opposed flexible wall portions which, in a relaxed state, define therebetween a generally V-shaped, radially-extending groove opening onto said interior face, adjacent to the center thereof, said wall portions defining at the base of said groove a yieldable joint which permits in a

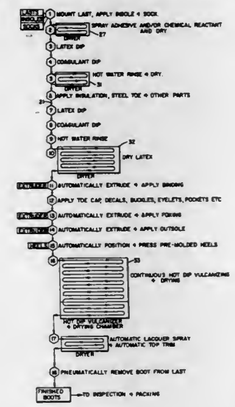


compressed state, the movement of said wall portions into at least partial abutment with one another so as to close said groove.

4,188,680
METHOD FOR MANUFACTURING WATERPROOF BOOTS

Richard R. Adams, Bettendorf, Iowa, assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 5, 1978, Ser. No. 893,820
Int. Cl.[2] A43D *9/00*; A43B *1/10*
U.S. Cl. 12—142 E **7 Claims**



1. A continual method of making waterproof footwear comprising the steps of:

(a) mounting an elastic fabric sock that is to be the inner lining of said footwear upon a shaped last, said sock having a foot portion and an upper portion;

(b) coating said sock with a coagulant capable of effecting bonding with liquid rubber;

(c) applying liquid rubber to form one or more external coatings thereof over the sock by dipping the last into liquid latex and curing said rubber;

(d) conveying the last carrying the rubber coated article to successive stations where:

(1) a binding is attached around the upper portion of said rubber coated article;

(2) toe caps and other formations and/or devices individual to the type of footwear being made are mounted on the rubber coated article; and

(3) foxing, outsole and heel elements are attached over the rubber coating at the foot portion of the rubber coated article;

(e) then conveying the last containing the foregoing to a hot liquid bath station for vulcanizing in final assembly;

(f) trimming and finishing the assembly; and then

(g) removing the article from the last.

4,188,681

SUPPORT STRUCTURE

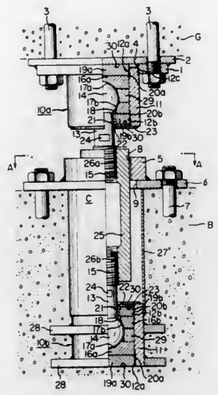
Hiroshi Tada, Yokohama, and Toshiro Nozu, Tokyo, both of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,633

Claims priority, application Japan, Sep. 17, 1977, 52-111249; Dec. 29, 1977, 52-157913; Dec. 29, 1977, 52-157914; Aug. 29, 1978, 53-103437

Int. Cl.² E01D *19/06*

U.S. Cl. 14—16.1 **9 Claims**



1. A support structure comprising a pair of upper and lower support units each including a housing and a ball stud having a ball portion placed in said housing and a shank portion formed integrally with said ball portion, said upper support unit having its ball stud shank portion extending downward from said housing fixed to an upper structure such as a bridge girder, said lower support unit having its ball stud shank portion extending upward from said housing fixedly embedded in a lower structure such as a bridge base in the position facing said upper support unit, said upper and lower support units connected to each other by their ball stud portions, and a retaining member fixed on a base plate fixed on said lower structure and fitted around the shank portion of said coupled upper and lower support units.

4,188,682

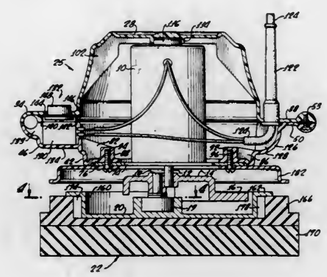
AUTOMOBILE CLEANING AND WAXING TOOL

Robert E. Burglin, 1558 S. Anaheim Blvd., Ste. A, Anaheim, Calif. 92805, and Sam S. Itaya, 420 Lakeview Rd., Pasadena, Calif. 91105

Filed Apr. 28, 1978, Ser. No. 900,885

Int. Cl.² B60S *3/06;* **A46B** *13/00*

U.S. Cl. 15—97 R **17 Claims**



1. For use with a hand held automobile polisher having an electric motor connected to orbitally drive a polishing pad, an improved polisher housing comprising,

a housing shell having

an outer peripheral side wall, a shell cover connected to said wall at one end thereof,

an elongated hollow handle spaced outwardly of and at least partly circumscribing said housing shell, said handle being formed of first and second handle parts joined to one another along a surface that extends longitudinally of said elongated handle, one of said handle parts being integral with said housing shell, the other of said parts being attached to said one part, and electrical elements for controlling said motor mounted to and at least partly within said hollow handle,

said electrical elements including a switch for controlling flow of electrical current to said motor, said switch having a switch body positioned within said hollow handle, and a switch operator projecting from said hollow handle,

one of said handle parts being formed with a cavity receiving said switch body, the other of said handle parts being formed with an aperture for receiving said switch operator,

said shell being formed of first and second interconnected shell parts, said one handle part being integral with said first shell part and said other handle part being integral with said second shell part, said handle parts including mutually mating handle rings circumscribing said shell and mutually mating integral handle supports extending radially between said shell parts and said rings.

4,188,683

DRIVE UNIT FOR A SEWER AUGERING MACHINE

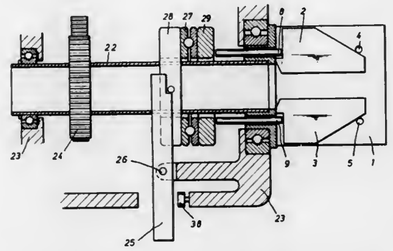
Horst Klunder, Albert Schweizer Strasse 52, 6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 889,045

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714124

Int. Cl.² B08B *9/02*

U.S. Cl. 15—104.3 SN **8 Claims**



1. In a sewer augering machine having a flexible cable, the combination of:

a drive unit provided with a rotatable, tubular shaft adapted to receive said cable; and

a chuck having a tubular clamping jaw carrier secured to the shaft exteriorly of said unit in alignment with the shaft for rotation of the carrier by the shaft,

said carrier being provided with a pair of jaws therewithin shiftable to and from a closed position clamped against the cable when the cable is extended from the shaft through the carrier,

said carrier having releasable means for holding the jaws within the carrier, said releasable means including a push rod for each jaw respectively for shifting the jaws to said closed position,

said carrier having opposed jaw access means rendering the jaws removable from the carrier while the carrier remains secured to the shaft and upon release of said releasable means.

4,188,684

APPARATUS FOR ARTICULATION OF MOVABLE PANELS

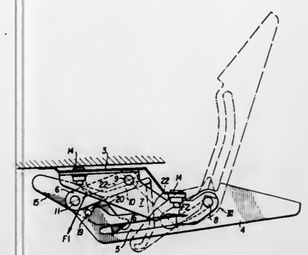
Jean C. Pennec, Trappes, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 30, 1978, Ser. No. 920,966

Claims priority, application France, Jun. 30, 1977, 77 20081

Int. Cl.² E05D *1/00*

U.S. Cl. 16—128.1 **3 Claims**



1. An apparatus for the articulation of movable panels, particularly automobile trunk lids, comprising:

a first link having a gooseneck;

a torsion bar acting upon said link;

a second link having a longitudinal axis and being pivotable about an axis integral with a fixed part of the trunk and being articulated with said first link;

an elongated slot, located on said first link, and acting as a cam to engage a guide pin integral with the fixed part of the trunk; and

a catch, subjected to a torque by said torsion bar, mounted so as to pivot about the axis of articulation between said first and second links, and having a head latchable with said guide pin when the lid is in the fully open position, said catch including on its upper edge, a recess in the form of a second cam with which said torsion bar is engageable, and the profile of which is such that the force exerted by said torsion bar on said catch always acts from the same side across the line between the axes of said second link in the course of opening said lid.

4,188,685

MOUNTING PLATE FOR HINGES OR THE LIKE

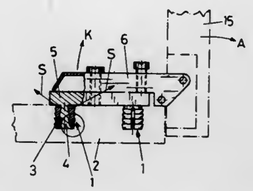
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed Apr. 17, 1978, Ser. No. 897,163

Claims priority, application Austria, Apr. 15, 1977, 2639/77; Jun. 10, 1977, 4098/77; Mar. 24, 1978, 2122/77

Int. Cl.² E05D *5/02*

U.S. Cl. 16—159 **16 Claims**



1. A mounting plate for furniture hinges, said mounting plate being of the type adapted to be secured to a first furniture element and adapted to support a hinge arm which is hingedly connected to a second furniture element, said mounting plate comprising:

a plate member;

at least one rigid expansion member integrally and immovably fixed to said plate member and extending therefrom, said expansion member having a first axial end adjacent said plate member and a second axial end spaced therefrom;

a dowel member formed of a deformable material and having an axial opening, said expansion member extending into said axial opening, with said dowel member surrounding said expansion member, said dowel member having a first axial end and a second axial end respectively adjacent said first and second axial ends of said expansion member;

said dowel member having an exterior having outwardly extending ribs adapted to be anchored in a wall of a bore in a first furniture element when said dowel member and expansion member are inserted therein;

said expansion member being mounted within said dowel member for limited axial movement relative thereto, such that when an external force is applied to said plate member to move said plate member away from the first furniture element, said expansion member will move axially of said dowel member, in a direction from said second end thereof to said first end thereof, by a limited extent;

said dowel member having opposite interior surfaces converging from said second end to said first end of said dowel member;

said expansion member having opposite exterior surfaces, complementary to said interior surfaces, converging from said second end to said first end of said expansion member; and

said interior surfaces and said exterior surfaces being dimensioned such that upon axial movement of said expansion member with respect to said dowel member, said exterior surfaces of said expansion member will bear against said interior surfaces of said dowel member, thereby deforming said dowel member and forcing said ribs further against the wall of the bore in the first furniture element.

4,188,686

APPARATUS FOR COLD SEALING THE GATHERED END OF A PLASTIC BAG

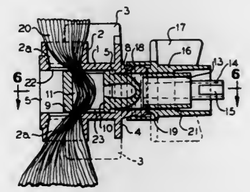
Gunter Baum, Auhofstrasse 24, Zurich Ch 8051, Switzerland

Filed Apr. 3, 1978, Ser. No. 893,015

Claims priority, application Switzerland, Apr. 4, 1977, 4310/77

Int. Cl.² B65D *77/10;* **B65B** *7/06*

U.S. Cl. 24—30.5 L **5 Claims**



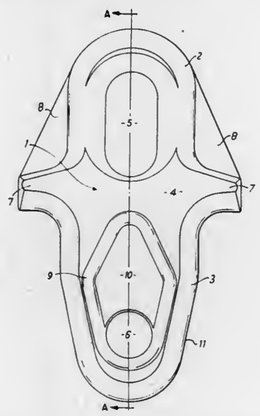
1. A clamp for cold sealing the gathered open end of a bag formed of thin walled, flexible thermoplastic material comprising, in combination:

(1) a tubular body member having external flange means permitting it to be securely held by the hand of the user and a longitudinal bore extending therethrough; one end portion of said bore being non-circular; and the other end portion being defined by a cylindrical sleeve portion;

(2) a plunger slidably mounted in said bore for axial movements relative thereto, said plunger having a non-circular portion slidably cooperating with said non-circular portion of said bore to prevent relative rotational movement of said plunger and body member;

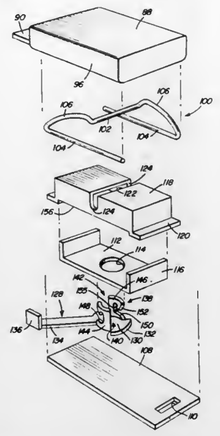
(3) screw threads on one axial end of said plunger;
(4) a nut member cooperable with said screw threads;
(5) means mounting said nut member on said sleeve portion of the body member for rotation about the axis of said longitudinal bore but axially fixed relative to said body member, whereby rotation of said nut member produces axial shifting of said plunger relative to said body member;
(6) said body member and said other end of said plunger each having a transverse passage therethrough, which passages are alignable in one axial position of said plunger relative to said body member and are proportioned to receive therein the gathered open end of a thin walled thermoplastic bag, whereby subsequent rotation of said nut produces a high compressive force on said gathered thermoplastic material between a wall of said transverse plunger passage and a wall of said transverse body member passage sufficient to seal the gathered thermoplastic by cold flow without the application of external heat.

4,188,687
STOPPER COMPONENTS FOR USE IN FISHING TRAWLS
Michael J. Millington, Kidderminster, England, assignor to Parsons Controls Limited, Stourport-on-Severn, England
Filed Jul. 5, 1978, Ser. No. 922,121
Claims priority, application United Kingdom, Jul. 6, 1977, 28356/77
Int. Cl.[2] A01K *73/02*
U.S. Cl. 24—114.5 **5 Claims**



1. A stopper component for use in a fishing trawl of a general double chain link form having opposed end portions each aligned in the same plane wherein the end portions include a first closed loop defining an elongated aperture, and a second tapered closed loop enclosing a recessed portion which in turn defines a circular aperture such that angular displacements between the stopper component and a component connected to the second closed loop can occur, said first and second closed loops merging together at a central portion, said central portion extending laterally beyond said first closed loop to form a radiused shoulder.

4,188,688
FASTENER
Henri Y. d'Orgelys, 3936 San Clerc Rd., Jacksonville, Fla. 32217
Filed Feb. 24, 1978, Ser. No. 881,642
Int. Cl.[2] A44B *17/00, 9/18*
U.S. Cl. 24—211 P **3 Claims**

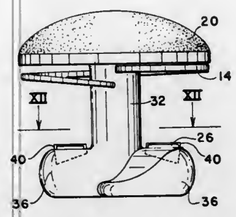


1. A detachable fastener, comprising:
a lock housing having at least one slot formed therein;
a fastener housing having an open inner end portion;
a locking bar mounted within the fastener housing and having at least a portion thereof for disposition within the lock housing through the slot in said lock housing;
a locking member rotatably received within the lock housing, said locking member including a pair of spaced walls each having edge portions, a first bayonet slot being disposed in one edge portion of one spaced wall and a second bayonet slot being disposed in the opposite edge portion of the other spaced wall, the slot in one wall opening in the opposite direction from the slot in the other wall, at least one bayonet slot being capable of receiving a portion of the locking bar when said locking bar is disposed within the lock housing through the slot in said lock housing to lock the locking bar to the locking member;
a base plate member, the lock housing being mounted to the base plate member;
first means on one end of the base plate member for connecting one end of an elongated article to the base plate member; and,
second means on one end of the fastener housing for connecting the other end of the elongated article to the fastener housing, the lock housing being received within the open inner end portion of the fastener housing for receipt of said portion of the locking bar within the slot in the lock housing for engagement within at least one of the bayonet slots in the locking member to fasten the fastener housing to the lock housing and thus to the base plate member to detachably fasten the spaced ends of the elongated article together in spaced relation to each other.

4,188,689
TIE BINDER
Raymond A. Patrin, GPO Box 731, New York, N.Y. 10001
Filed Apr. 18, 1977, Ser. No. 788,544
Int. Cl.[2] A44B *17/00;* **F16B** *19/00*
U.S. Cl. 24—221 R **2 Claims**

1. A tie binder, comprising:
a head,
a shank attached to a bottom of the head,
a spiral engaging means attached to a bottom of the shank,

whereby the head may be engaged to and secured to work pieces for binding,
a lock washer captively carried on the shank of the tie binder,
the spiral engaging means defining a spiral wedge surface attached to the bottom of the shank,



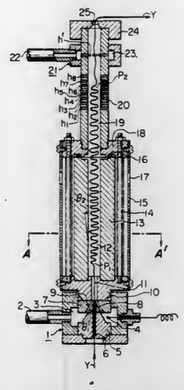
a frustrum conical roller rotatably mounted within recess means at the uppermost portion of the spiral wedge surface, and
the frustrum conical roller including grease and oil holes therethrough, whereby grease and oil may be secured within and on the frustrum conical roller.

4,188,690
NONWOVEN FABRIC AND MANUFACTURING METHOD THEREOF
Seigi Suzuki; Toshio Yoshihara, both of Ohtake, Japan, and Masayoshi Fujizaki, deceased, late of Ohtake, Japan (by Yasugoro Fujizaki, Tomoo Fujizaki, successors), assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan
Division of Ser. No. 771,803, Feb. 24, 1977. This application Sep. 25, 1978, Ser. No. 945,471
Claims priority, application Japan, Feb. 25, 1976, 51-19710
Int. Cl.[2] D04H *1/06*
U.S. Cl. 28—103 **8 Claims**



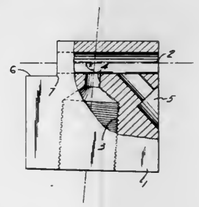
1. A method for manufacturing a nonwoven fabric, which comprises placing on a smooth or reticulated supporting member with an areal proportion of apertures less than 10%, a web, 35 to 170 g/m^2 in basis weight, composed of highly shrinkable synthetic fiber having a potential heat shrinkage of 50% or more,
exposing said web to the impact of fine jet streams of water discharged under a pressure of 10 to 35 kg/cm^2, thereby allowing individual fibers to entangle one another, thereafter
subjecting the web to wet heat treatment under free length conditions to allow the web to shrink by 50% or more in area,
drying the shrunk web at a temperature at which no change takes place in the shape and internal structure of individual fibers, and then
subjecting the dried web to heat setting under an applied pressure of 200 g/cm^2 or more.

4,188,691
PROCESS AND APPARATUS FOR CRIMPING FILAMENT YARN
Mitsuo Matsumoto; Kazushige Hayashi; Tsutomu Nakamura, and Minoru Yamachika, all of Osaka, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Sep. 20, 1977, Ser. No. 834,922
Claims priority, application Japan, Oct. 5, 1976, 51/119004
Int. Cl.[2] D02G *1/12, 1/16, 1/20*
U.S. Cl. 28—255 **22 Claims**



1. A process for fluid crimping filament yarn, said process comprising forcing a hot fluid entrained filament yarn into a stuffing chamber in one direction to form a filament yarn block which extends into a staying control chamber downstream from said stuffing chamber, forcing a cold fluid into said staying control chamber in the opposite direction, exhausting the hot fluid from a hot fluid outlet located in said stuffing chamber, and exhausting the cold fluid through a plurality of exhaust orifices located in series along the length of said staying control chamber whereby the end of said filament yarn block in said staying control chamber controls the number of orifices exposed for outlet of said cold fluid to control the back pressure acting on the filament yarn block.

4,188,692
AIR JET FOR YARN ENTANGLEMENT
Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.
Filed Mar. 26, 1979, Ser. No. 23,564
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—271 **3 Claims**



1. An air jet device for the production of entangled yarn comprising a block; a main passageway extending therethrough from the upstream side to the downstream side; a second passageway intercepting the bottom of said main passageway at an acute angle and slanting downward therefrom in the upstream direction; and air inlet duct for introducing air into the main passageway, said inlet duct intercepting the bottom of said main passageway with the axis of the main passageway and the axis of the air inlet duct being in substan-

tially the same plane and intersecting at an angle of about 86°–88.5° at a point which is not more than 0.20 inch from the downstream end of the main passageway, the air inlet duct slanting downward from said main passageway in the downstream direction; and a lip adjacent to the bottom of the downstream end of the main passageway and extending in the downstream direction.

4,188,693

METHOD AND APPARATUS FOR ASSEMBLING SLATTED BLINDS

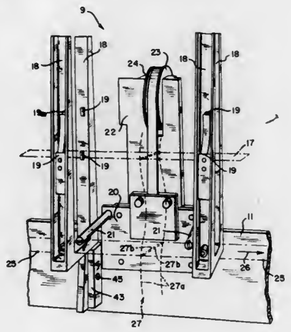
G. H. Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jul. 13, 1977, Ser. No. 815,317

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644276

Int. Cl.² B23P *19/04*

U.S. Cl. 29—24.5 **21 Claims**



1. The method of inserting a slat between a rung pair of a ladder for a slatted blind which ladder has a pair of spaced, substantially parallel, lateral uprights and a rung pair for each slat extending transversely to and between said uprights, comprising spreading and holding said lateral uprights apart to stretch a rung pair, inserting only a portion of the width of one end of a slat into the space between the stretched rung pair, said one end including an edge of significant length which in part defines said portion of the width of a slat, said inserting step including presenting said edge to said rung pair at an angle with respect to the length of said rung pair, and subsequently inserting the remainder of the width of said one end of said slat between the stretched rung pair.

4,188,694

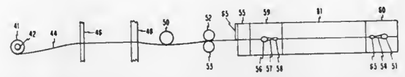
CORONA GRID WIRE ASSEMBLY AND MOUNTING

Robert T. Rhodes, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,577

Int. Cl.² H01J *9/14;* **B22D** *19/00*

U.S. Cl. 29—25.17 **5 Claims**



1. The method of fabricating a corona grid wire element with cast ends portions comprising axially feeding a wire into a mold, forming a first end portion about said wire adjacent the distal end thereof within said mold, applying tension to said wire between said first end portion and a clamping means secured to said wire, forming a second end portion about said wire within said mold at a position intermediate said first end portion and said clamping means, and severing said wire adjacent said second end portion at the side of said second end portion opposite said first end portion.

4,188,695

PANEL PROCESSING APPARATUS

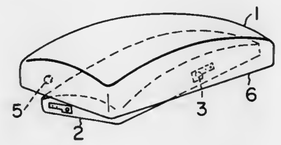
Tadao Oyama, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 21, 1978, Ser. No. 879,755

Claims priority, application Japan, Jun. 3, 1977, 52/64796

Int. Cl.² H01J *9/42*

U.S. Cl. 29—25.19 **4 Claims**



1. In a panel processing apparatus including
means for mounting a shadow mask on a panel; and
panel conveyor means;
the improvement comprising:
shadow mask height variation detecting means for detecting variations in the height of different portions of the shadow mask caused by improper mounting of shadow mask on said panel, said panel conveyor means being operable to transfer a panel with an at least partially mounted shadow mask from said mounting means onto said detecting means.

4,188,696

ABRADING TOOL

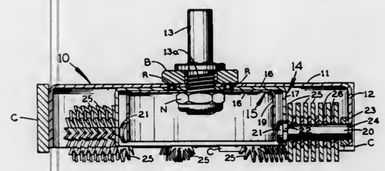
Robert C. Collins, 746 NE. 67th St., Miami, Fla. 33138, and Wallace E. Weber, 6832 SW. 81 St., Miami, Fla. 33143

Filed Mar. 24, 1978, Ser. No. 889,653

Int. Cl.² B21C *43/00*

U.S. Cl. 29—81 J **2 Claims**

1. In an underwater abrading tool for attachment to a power tool, said abrading tool having:
a cylindrical outer cup having a spindle aperture through its end coaxial with the principal axis of said outer cup;
a second cylindrical cup nested in said outer cup having a peripheral wall in uniform spaced relation from the peripheral wall of said outer cup and having a spindle aperture coaxially positioned in the end thereof nested in said outer cup;
a spindle means positioned through each said spindle aperture and coaxial with said principal axis including a detachable fastening means at one end portion therof for securing each said end of each said cups in adjacent relation on said spindle means with the opposite end of said spindle means forming a shank for engagement in a power driven chuck of the power tool;
a plurality of axles spaced angularly from each other about said principal axis and extending radially between said peripheral walls of said cups and supported by said cups;
and a plurality of abrading disc means journaled for rotation on each of said axles in the space between said peripheral wall of said outer cup and said peripheral wall of said second cup whereby said abrading disc means will rotate and abrade barnacles when in contact therwith when said shank is secured in chuck means and rotated thereby, said abrading discs having a tendency to ride over thick deposits of barnacles in an underwater location;
the improvement which comprises:
a plurality of knocker means on the outside of said outer peripheral wall of said outer cup for engagement with



thick barnacles in an underwater location in advance of the engagement of said abrading discs therewith as said abrading tool is rotated by the power tool and is moved across said barnacles;
each of said knockers being located between a pair of said axles to assure that each knocker engages thick barnacles ahead of the following abrading discs for knocking off thick material and leaving an underlying surface to be abraded by said abrading discs;
said abrading discs projecting beyond an axial extremity of each of said knockers through the open end of said cups for abrading thinner barnacles without interference from said knockers;
said spindle means comprising an adapter body for connecting said abrading tool to the power tool;
means for releasably clamping said adapter body to said cups of the abrading tool;
and flexible and resilient cushion means engaged between said fastening means of the abrading tool and said adapter body for permitting limited flexing of the abrading tool with respect to the adapter body.

4,188,697

METHOD OF MAKING MOTORCYCLE SEAT FRAME

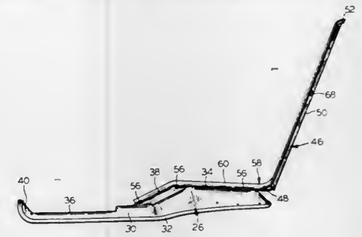
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.

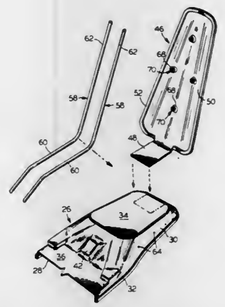
Division of Ser. No. 827,542, Aug. 25, 1977, Pat. No. 4,125,285. This application Aug. 21, 1978, Ser. No. 935,383

Int. Cl.² B68G *7/00*

U.S. Cl. 29—91.1 **6 Claims**

1. In a method for making a motorcycle seat, the steps comprising:
A. forming a length of metal sheet into a base having a top wall and a sidewall extending generally downwardly therefrom, said base having forward and rearward ends;
B. forming a length of sheet metal into a back rest member having a generally L-shaped configuration defined by a pair of arm portions, one arm portion being of relatively short length and of relatively narrow width and the other arm portion being of substantially greater length and width;
C. forming a pair of support rods into a generally L-shaped configuration, the included angle thereof closely approximating the included angle of the L-shaped configuration of said back rest member;
D. securing said rods and back rest member to each other and to the upper surface of said top wall of said base so that said other arm portion of said back rest member extends upwardly from the rearward end of said base and said one arm portion of said back rest member extends forwardly thereof, said rods extending forwardly along





the forward face of said back rest member other arm portion and being secured thereto; and
E. securing cushion means to said base and back rest member including disposing resilient material on the upper surface of said base and the forward surface of said back rest member other arm portion and providing a cover extending over said resilient material on said base and about said back rest member.

4,188,698

SEALING ARRANGEMENT AT A ROLL

Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 866,066

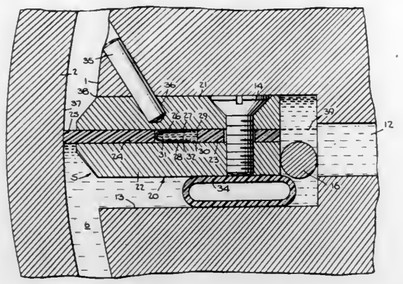
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718414; Jul. 12, 1977, 2731365

Int. Cl.² B21B *13/00*

U.S. Cl. 29—116 AD **14 Claims**

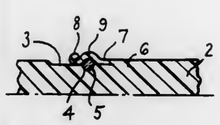
1. A sealing arrangement for a roll assembly comprising a non-rotative core in which circumferentially interspaced longitudinal slots are formed, said core being surrounded by a rotative hollow cylindrical roll, said core and cylindrical roll being radially interspaced and forming an annular space therebetween, and longitudinal seals radially movably positioned in said slots and pressed against the inside of said cylindrical roll to form said annular space into two chambers one of which contains liquid under pressure; wherein the improvement comprises said seals each being in the form of a longitudinal seal carrier radially immovably positioned in one of said slots and extending radially therefrom so as to radially partially span said space, said carrier forming a radial seal slot of substantially

less thickness than the carrier and facing the inside of said cylindrical roll, and a thin sealing strip extending the length of said seal slot and radially positioned therein, said sealing strip having a substantial portion within said seal slot and supported by the flanks of the seal slot and a portion of the sealing strip



extending radially from the seal slot and spanning said space for its radial extent between said seal carrier and the inside of said cylindrical roll, said sealing strip being radially movable in said seal slot and said carrier having pressure means for pressing said sealing strip radially against the inside of the cylindrical roll.

4,188,699
METHODS OF MAKING SEALING MEMBERS
James Young, London, England, assignor to Scientific Glassware Ltd., London, England
Division of Ser. No. 814,154, Jul. 17, 1977, Pat. No. 4,111,440.
This application Jun. 28, 1978, Ser. No. 919,806
Int. Cl.[2] B21D *53/00*
U.S. Cl. 29—157.1 R **6 Claims**



1. A method of making a sealing member for association with a bore in a barrel member, said method comprising the steps of:

(a) cutting into and rolling a thin layer from a rod of circular cross-section made of a substantially chemically inert, tough, compressible material, leaving the rolled layer integral with the rod,

(b) forming an annular groove in that portion of the rod from which the thin layer was rolled,

(c) mounting a sealing ring made of an elastomeric material in said annular groove,

(d) unrolling the rolled layer so as to cover the sealing ring and leave a rolled portion of the layer on one side of the ring, and

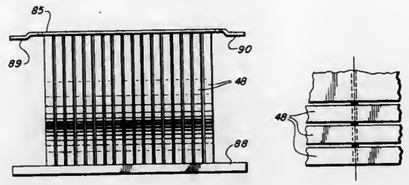
(e) compressing the rolled portion thereby to sealingly enclose the ring.

4,188,700
METHOD OF CONSTRUCTING AN ATTRITION MILL GRATE
Richard Rymer, 4128 E. Saxony Dr. SE., Grand Rapids, Mich. 49508
Filed May 25, 1978, Ser. No. 909,509
Int. Cl.[2] B23K *31/02*
U.S. Cl. 29—163.5 R **4 Claims**

1. A method of manufacturing a cylindrical grate, comprising:

arranging a plurality of elongated substantially straight bars in spaced paralled relationship;

bonding the adjacent of said bars together, said bonding being exclusively by bonding material deposited essentially between the spaced bars at positions spaced in the direction of the length of said bars;

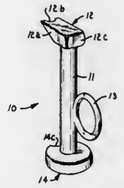


forming the resulting bonded assembly of bars into a cylindrical configuration;

bonding the opposite ends of said assembly to form a continuous cylindrical structure; and

at least partially closing the ends of said cylindrical structure.

4,188,701
HINGE PIN REMOVER
Joseph B. Ludwig, 518 N. Howard Ave., Lee's Summit, Mo. 64063
Filed Apr. 27, 1978, Ser. No. 900,804
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—275 **4 Claims**



1. A tool for removing from a hinge a hinge pin having a bulbous head and a shank portion of fixed length, said tool comprising:

a shank;

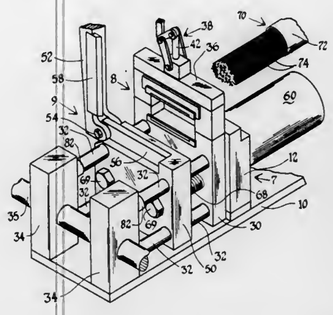
a bifurcated wedge secured to the upper end of the shank for placement between the hinge and the bulbous head of the hinge pin and for engagement with the undersurface of the bulbous head of the hinge pin;

a first striker plate substantially parallel to the shank and adapted to receive impacts to force the wedge between the hinge pin and the undersurface of the hinge pin head;

a support foot secured to the shank a distance from the wedge less than the length of the shank portion of the hinge pin and aligned on the shank beneath the wedge, said support foot including a hinge receiving notch adapted to engage the hinge at least at two different points when the wedge is disposed between the hinge and the hinge pin head;

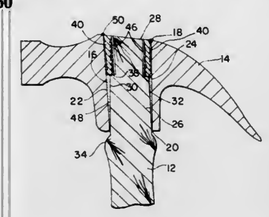
a second striker plate substantially perpendicular to the shank and adapted to receive impacts to force the pin from the hinge when the wedge contacts the undersurface of the hinge pin head.

4,188,702
METHOD AND APPARATUS FOR ORIENTING AND STRIPPING AN END PORTION OF A BUNDLE OF WIRES
Calvin J. Herbert, Glendale, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Dec. 27, 1978, Ser. No. 973,667
Int. Cl.[2] H02G *1/12*
U.S. Cl. 29—427 **8 Claims**



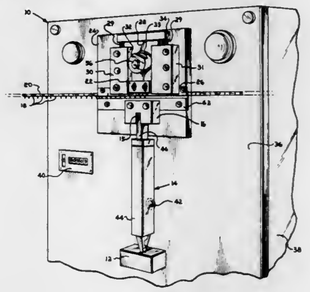
1. Apparatus for orienting and stripping an end portion of a bundle of wires comprising, in combination, an insulation stripper having a pair of blades with elongated mutually parallel planar cutting edges and means for moving said blades between an open position with said blade cutting edges spaced apart a distance to receive therebetween a bundle of wires having metallic conductors of a common diameter sheathed with insulation and a closed position with said blade cutting edges spaced apart another distance approximately said common conductor diameter; a clamp mounted to one side of said stripper; a wire cutter mounted to the other side of said stripper; and means for reciprocally moving said stripper and said cutter in tandem with respect to said clamp.

4,188,703
IMPACT TOOL, HANDLE ASSEMBLY THEREFOR, AND METHOD OF ATTACHING HANDLE TO HEAD
Herbert L. Fish, 6525 Kerns Rd., Falls Church, Va. 22044
Division of Ser. No. 590,565, Jun. 26, 1975, Pat. No. 4,085,784.
This application Feb. 9, 1978, Ser. No. 876,530
Int. Cl.[2] B25G *3/00;* **B25D** *1/00*
U.S. Cl. 29—460 **8 Claims**



1. A method of attaching a handle to a head of an impact tool, said head having a tapered eye therethrough extending from an outer opening to a smaller inner opening, with a pair of opposite surfaces of said eye diverging from said inner opening to said outer opening, said method comprising forming a longitudinal notch at at least one side of an end portion of said handle, with said notch having a longitudinal surface extending along said handle from a terminal surface of said end portion and with said longitudinal surface diverging from the longitudinal surface of the opposite side of the handle end portion in a direction toward said terminal surface, inserting said end portion of said handle into said eye through said inner opening until said terminal surface is adjacent to the outer opening, thereafter providing in the space between the longitudinal surface of said notch and an adjacent taper-forming surface of said eye a hard insert that has a longitudinal surface engaging the longitudinal surface of said notch and a further longitudinal surface engaging said taper-forming surface of said eye, and bracing said longitudinal surface of said opposite side of the handle end portion by an adjacent taper-forming surface of said eye, said notch being formed with a transverse end surface located intermediate said inner and outer openings when said handle has been attached to said head and said longitudinal surface of said notch extending continuously from said transverse end surface to said terminal surface of said end portion of said handle, whereby withdrawal of said handle from said head through said inner opening is prevented.

4,188,704
HAND TOOL AND LOADER
John H. Gavin, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 782,013, Mar. 28, 1977, Pat. No. 4,077,117, which is a continuation-in-part of Ser. No. 662,549, Mar. 1, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,061
Int. Cl.[2] H05K *3/32*
U.S. Cl. 29—564.6 **1 Claim**

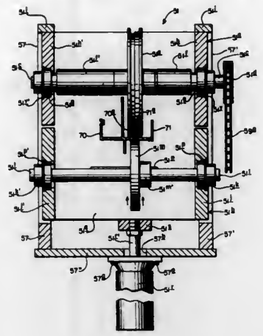


1. In combination a hand tool for inserting contacts into an apertured circuit element and an apparatus for loading electrical contacts into said hand tool, the loading apparatus comprising: a support; a track on the support for a strip of contacts; cam operated slides on the support, said slides having parts thereon for successively advancing the strip, and severing a contact; a guide block mounted on the support and provided with a through channel beneath the location where a contact is severed; a fixture on the support for holding said hand tool with one end of said hand tool resting on the fixture and the other end beneath said channel, said hand tool having a passage for receiving a plurality of contacts and said passage having an inlet beneath said channel when said hand tool is on said fixture.

4,188,705
THERMAL BARRIER STITCHING APPARATUS
James C. Jackson, Bartlesville, Okla., assignor to Ethyl Corporation, Richmond, Va.
Continuation of Ser. No. 697,986, Jun. 21, 1976, abandoned.
This application Sep. 18, 1978, Ser. No. 942,953
Int. Cl.[2] B23P *23/04*
U.S. Cl. 29—564.6 **16 Claims**

1. An apparatus for making a unitary thermal break construction element comprising a feed means for inserting an insulating material into metal shapes, adjacent to and following said feed means a guide means for positioning two spaced apart metal shapes thereon into which the insulating material is to be inserted, adjacent to and following said guide means a crimping means for receiving the two metal shapes with the insulat-

ing material therein and for crimping each of the metal shapes on the insulating material thereby providing the unitary thermal break construction element, said crimping means including a plurality of crimping stations and a plurality of guide stations, with a guide station being positioned before each crimping station, each guide station positioned before each crimping



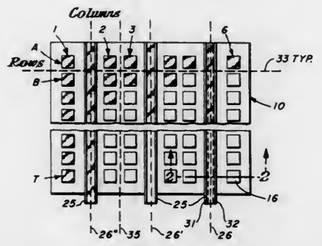
station including a removable block assembly having adjusting means thereon for accommodating said guide stations to metal shapes of various cross-sectional configurations, and each of said crimping stations including an adjusting means for accommodating said crimping stations to metal shapes of various cross-sectional configurations.

4,188,706

METHOD FOR MAKING A PLURALITY OF SOLID ELECTROLYTE CAPACITORS AND CAPACITORS MADE THEREBY

Richard J. Millard, Williamstown, Mass., and David M. Cheseldine, Bennington, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 18, 1978, Ser. No. 897,463
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 **17 Claims**



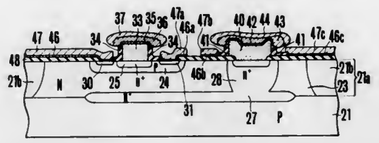
6. A method for making a plurality of solid electrolyte capacitors comprising (a) depositing pads of a valve-metal-powder-containing ink in rows and columns on a surface of a substrate of said valve metal; (b) heating to sinter in each said ink pad the particles of said powder to each other and to said substrate and to transform said ink pads into porous pads of said valve metal; (c) forming a valve-metal oxide film over the surfaces of said porous pads, and applying successively over said pad surfaces a solid electrolyte and a solderable counter-electrode; (d) filling the streets, which separate said rows and said columns, with a liquid insulating resin; (e) curing said insulating resin; (f) cutting away a portion of said cured insulating resin to form slots therein that are centrally located within the alternate of the columnar of said streets, said columnar streets being defined as those which separate said columns, each of said alternate streets being substantially wider than each of the other columnar streets; (g) placing a U-shaped metal channel in each of said slots, each of said channels having a width no greater than that of the corresponding of said receiving slots; (h) attaching and electrically connecting a bottom portion of said each channel to said substrate surface; (i) severing simultaneously said substrate and said each channel along a line which has a central and axial relationship to said each channel.

4,188,707

SEMICONDUCTOR DEVICES AND METHOD OF MANUFACTURING THE SAME

Masaru Asano, Tokyo; Tetsushi Sakai, Sayama, and Yoshio Sunohara, Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,552
Claims priority, application Japan, Jul. 15, 1976, 51-83493
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **7 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of forming a polycrystalline silicon semiconductor body at a predetermined position on the surface of a semiconductor substrate, and forming a metal electrode on the top surface of said polycrystalline silicon semiconductor body such that the metal electrode extends in the lateral direction beyond the periphery of top surface of said polycrystalline silicon semiconductor body, and wherein said polycrystalline silicon semiconductor body is formed by the steps of forming a plurality of diffused regions in said semiconductor substrate, said diffused regions constituting a transistor, forming a polycrystalline silicon semiconductor layer having a uniform impurity concentration on said diffused regions and on a first insulating film which is used as a mask for forming said diffused regions, and forming said polycrystalline silicon semiconductor while preserving said polycrystalline silicon semiconductor layer on one of said diffused regions, and wherein said metal electrode is formed by the steps of forming a second insulating film on the entire surface of said semiconductor substrate, applying a first photoresist film upon said second insulating film, exposing the top surface of said polycrystalline silicon body, forming a first prime metal film over the entire surface of said semiconductor substrate under the condition described above, forming a second photoresist film on said first prime metal film, exposing the top surface of said polycrystalline silicon semiconductor body, forming a metal mask pattern on the top surface of said polycrystalline silicon body by applying a voltage to said first prime metal film such that said metal mask pattern extends in the lateral direction beyond the periphery of the top surface of said polycrystalline silicon semiconductor body, removing said second photoresist film and said first prime metal film by using said metal mask pattern as a mask, forming a contact region in the other diffused region adjacent said one diffused region by using said metal mask pattern as a mask, removing said metal mask pattern, said photoresist film and said first prime metal film, applying a third photoresist film on the entire surface of said semiconductor substrate, exposing the top surface of said polycrystalline silicon semiconductor body, removing said third photoresist film, forming a second prime metal film over the entire surface of said semiconductor substrate, forming a fourth photoresist film on said second prime metal film, exposing the second prime metal film on the top surface of said polycrystalline silicon semiconductor body, and forming said metal electrode on the

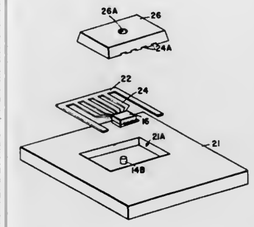
exposed second prime metal film by applying a voltage thereto such that the metal electrode extends in the lateral direction from the periphery of the top surface of said polycrystalline silicon semiconductor body, and said method further comprising the steps of removing said third photoresist film by utilizing said metal electrode as a mask, applying a conductor metal film on said metal electrode and said second prime metal film by applying a voltage on said second prime metal film, and removing remaining third photoresist film, unnecessary conductor metal film and said second prime metal film.

4,188,708

INTEGRATED CIRCUIT PACKAGE WITH OPTICAL INPUT COUPLER

Thomas M. Frederiksen, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 839,137, Oct. 3, 1977, Pat. No. 4,136,357.
This application Oct. 23, 1978, Ser. No. 953,769
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—572 **5 Claims**



1. A method for fabricating an integrated semiconductor structure comprising the steps of:
inserting an integrated semiconductor device having a light compling element therein into a mold set, said mold set having a recess portion containing a conical shaped plug located at the bottom of said recess portion, said element being located in alignment with said plug; injecting a clear dielectric encapsulant material into said mold set completely covering said device to form both an encapsulating material and a light transmitive medium for said integrated semiconductor device: removing said integrated semiconductor device from said mold set wherein a recess is formed in the clear dielectric encapsulant material in alignment with said element; and inserting one end of a light pipe element into the recess in said encapsulating material to permit coupling of light through said light coupling element.

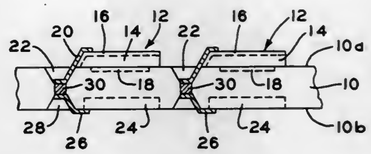
4,188,709

DOUBLE SIDED HYBRID MOSAIC FOCAL PLANE

Robert V. Lorenze, Jr., Westford, and William J. White, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 766,327, Feb. 10, 1977, Pat. No. 4,104,674.
This application Jun. 16, 1978, Ser. No. 916,035
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 R **2 Claims**

1. A method of forming an infrared detector comprising:
providing a semiconductor substrate having first and second surfaces, and having solid-state signal processing circuitry formed therein proximate the second surface;
forming first valleys in the first surface and second valleys in the second surface, the first and second valleys being arranged in opposing pairs;
ion implanting the substrate regions connecting opposing pairs of first and second valleys;
forming contact areas on the first surface of said semiconductor substrate;
epitaxially growing infrared detector material on the first surface of said semiconductor substrate;
delineating said infrared detector material to form individual infrared detector elements;
forming p-n junctions in the infrared detector elements so that a first side of each p-n junction is intimately connected to a contact area on the first surface of said semiconductor substrate;



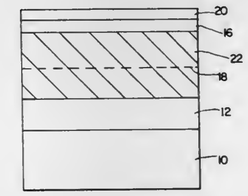
forming electrical connections between the second side of each p-n junction and one of said first valleys; and
forming electrical connections between said second valleys and the solid-state signal processing circuitry.

4,188,710

OHMIC CONTACTS FOR GROUP III-V N-TYPE SEMICONDUCTORS USING EPITAXIAL GERMANIUM FILMS

John E. Davey, Alexandria, and Aristos Christou, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1978, Ser. No. 933,017
Int. Cl.[2] H01L *21/22, 21/225*
U.S. Cl. 29—580 **14 Claims**



1. A method for making an ohmic contact to an n-type III-V semiconductor material, comprising the steps of:
cleaning the material successively in trichloroethylne, acetone, and deionized water;
etching said material in diluted hydrofluoric acid;
rinsing the material in deionized water;
re-etching said material in a hydrofluoric acid-hydrogen peroxide solution;
re-rinsing the material in deionized water;
placing the material in an oil-free vacuum of at least 2×10^{-7} Torr and maintaining the material at a temperature of 575° C. ± 2° C. for approximately fifteen minutes for desorbing any surface oxides of the material;
forming an epitaxial layer of germanium on said material in said vacuum, the material being maintained at a temperature sufficient to develop an epitaxial growth for completely covering and uniformly wetting said material;
forming an overlayer of a metal selected from the group consisting of nickel and a refractory metal from Groups V and VI of the Periodic Table on said epitaxial layer for developing a semiconductor structure, said material being maintained at a temperature sufficient to minimize sticking coefficients of residual gases without causing a reaction between the overlayer and the material during the forming of the overlayer; and
annealing said structure at a temperature sufficient for dif-

fussing the overlayer and epitaxial layer with said material and for forming said ohmic contact, said temperature being within the range of 350° C. and 525° C. for nickel and within the range of 400° C. to 500° C. for a refractory metal from Groups V and VI of the Periodic Table.

4,188,711

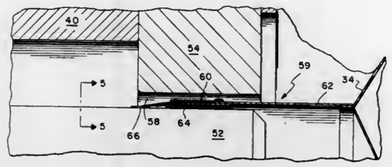
METHOD OF MAKING BROAD BAND DYNAMIC LOUDSPEAKER

Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Division of Ser. No. 669,315, Mar. 22, 1976, Pat. No. 4,115,667, which is a continuation-in-part of Ser. No. 372,074, Jun. 21, 1973, Pat. No. 3,983,337. This application Dec. 8, 1977, Ser. No. 858,726

Int. Cl.[2] **H04R** *31/00*

U.S. Cl. 29—594 **12 Claims**



1. The method of making a coil assembly for a loudspeaker comprising:

forming a first cylinder of a first diameter from a thin sheet of permanently deformable material having a low coefficient of friction,

forming a sheet of paper into a second cylinder concentric with and connected to a region of the first cylinder,

winding wire on at least one of said cylinders to form a coil, and

permanently deforming a portion of the first cylinder to a second smaller diameter to form a bearing surface having a smaller diameter than the remaining portion of the first cylinder,

whereby the second cylinder can be connected to a speaker cone and the coil may be disposed around the center pole of a magnetic structure with the bearing surface engaging and sliding on the center pole.

4,188,712

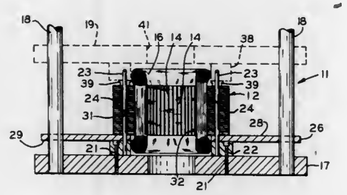
METHOD FOR MAKING STATORS FOR DYNAMOELECTRIC MACHINES

Richard D. Burns, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 21, 1977, Ser. No. 835,294

Int. Cl.[3] **H02K** *15/02*

U.S. Cl. 29—596 **10 Claims**



1. A method of manufacturing a bolt-down hermetic compressor stator comprising a core made up of a plurality of laminations having a concentric central bore for accommodating a rotor, a number of conductor accommodating slots having conductor material accommodated therein, and a plurality of mounting bolt receiving apertures and wherein the dimensional variations between the apertures and bore is not substantially greater than about three thousandths of an inch; the method involving the use of apparatus located at a fixed location that includes a ram and a burnisher, the method comprising: accurately aligning the bolt receiving apertures of a stack of loose laminations and compressing the loose stack in the vicinity of the apertures with a predetermined force applied by the ram of said apparatus and with the force localized at the regions of the apertures so that dimensional variations between the apertures and bore are concentrated at the bore; shaping the bore with said burnisher of said apparatus while the laminations continue to be aligned and compressed by said ram of said apparatus, so that the bore is concentric relative to the location of the apertures; and releasing the compression on the stack of laminations.

4,188,713

METHOD OF MAKING A COMMUTATOR FOR SMALL-SIZED ELECTRIC MOTOR

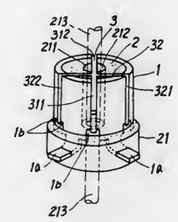
Masatoshi Kawano, Katano; Tsutomu Hashimoto, Shijonawate; Hiroshi Maeda, Hirakata, and Miyuki Furuya, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 23, 1977, Ser. No. 855,001

Claims priority, application Japan, Dec. 14, 1976, 51-167997

Int. Cl.[2] **H01R** *43/08*

U.S. Cl. 29—597 **3 Claims**



1. A method for providing a commutator structure for a small-sized electric motor, comprising:

(a) providing a metallic tube having a plurality of angularly spaced notches in one end thereof and providing a plurality of outwardly radiating metallic tabs on said metallic tube adjacent said one end thereof, one such tab being disposed angularly between each two angularly adjacent ones of said notches;

(b) providing the tube with a filling of plastic resin;

embedding said metallic tube axially beyond the bottoms of said notches in said filling of plastic resin and about the bases of said tabs, so that the distal ends of said tabs protrude out through said filling, as part of step (b);

(c) permitting the filling to harden into a molded-in-place generally cylindrical body of hardened plastic resin; and

(d) cutting longitudinally through said tube from the opposite end thereof and body only twice, at such an angular disposition and axial extent as to intersect, with each such cut, two of said notches, but with insufficient axial extent as to cut the body in two, one such cut being made along a diametrical plane of said commutator structure and the other such cut intermediately intersecting said one such cut, at a site radially displaced from the longitudinal axis of said commutator structure along said diametrical plane.

4,188,714

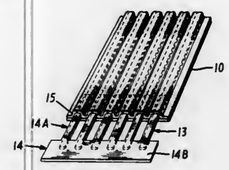
RIGID TERMINATION FOR FLEXIBLE PRINTED CIRCUITS

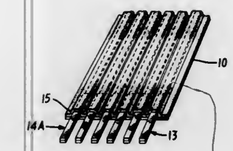
Larry Jean, Nashua, N.H., assignor to Teledyne Electro-Mechanisms, Nashua, N.H.

Filed Apr. 17, 1978, Ser. No. 896,747

Int. Cl.[2] **H01R** *43/02*

U.S. Cl. 29—628 **5 Claims**





1. A process for making a jumper strip with pin-like lead terminations comprising the steps of:

laminating a conductor sheet and a smaller adhesive-coated first insulation sheet together so that the conductor sheet extends beyond the area of the first insulation sheet in areas where the termination pins are to be formed;

forming a conductor pattern from the conductor sheet, which pattern includes conductor leads ending in the area beyond the first insulation sheet;

registering a lead frame of rigid members separate from the conductor sheet over the conductor leads, at least in the area beyond the first insulation sheet, said lead frame being in a form in which the rigid members are attached to a common web, said rigid members having a length sufficient to extend from the ends of the leads to a position over the first insulation sheet and being spaced on said common web on the same centers as the jumper strip terminations;

soldering together the parts of the rigid members and the conductor leads that extend beyond the first insulation sheet in order to form the termination pins; and

removing the web from the frame.

4,188,715

METHOD OF FABRICATING AN INSULATOR FOR AN ELECTRICAL CONNECTOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Claude Rodriguez, Carrollton, all of Tex., assignors to Elfab Corporation, Dallas, Tex.

Division of Ser. No. 770,578, Feb. 22, 1977, which is a continuation-in-part of Ser. No. 597,751, Jul. 21, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,164

Int. Cl.[2] **H01R** *43/00*

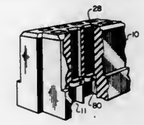
U.S. Cl. 29—629 **1 Claim**

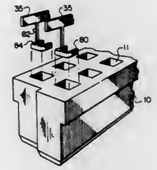
1. A method of fabricating a removable insulative housing assembly for an electrical connector, the insulator having a plurality of apertures formed in the bottom therethrough for receiving contacts loaded and seated therein and having load bearing inserts positioned thereacross providing a substantially rigid seating shoulder for load bearing surfaces on the contacts, wherein said load bearing inserts serve to increase the strength of the seating shoulder in the insulator housing apertures and reduce the need for a large contact load bearing surface, said method comprising:

forming a plurality of load bearing inserts in the shape of flat rings each having a planar upper and lower surface and each being connected to a common support strip by a frangeable portion;

molding the insulator with said apertures having a lower portion undercutting an upper portion and forming a shoulder therebetween;

loading the inserts into the apertures through the bottom thereof in a generally transversely extending relationship thereto;





seating the upper planar surface of each insert against the shoulder formed in each of the apertures to provide the lower planar surface of each insert for engagement with a contact inserted into the insulator aperture said load bearing inserts being seated such that the axial thickness of each insert is substantially smaller than the aperture length;

removing the common support strip by severing the frangible section; and

inserting contacts into the insulator apertures and seating the contact load bearing surfaces against the lower planar surface of each insert.

4,188,716

APPARATUS FOR GAPPING A SLIDE FASTENER CHAIN

Hideo Shimai, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 930,972

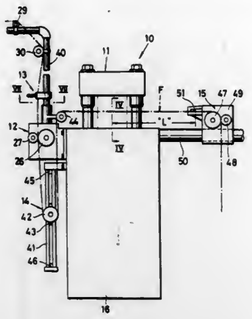
Claims priority, application Japan, Aug. 10, 1977, 52-95696

Int. Cl.[2] **B21D** *53/50;* **B29D** *5/00*

U.S. Cl. 29—770 **4 Claims**

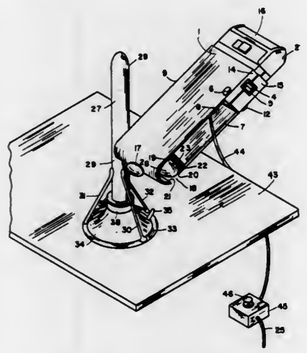
1. Apparatus for producing a series of gaps free of fastener elements in and along a continuous length of slide fastener chain having a pair of oppositely disposed stringer tapes each carrying along one longitudinal edge a row of fastener elements with coupling head portions and connecting portions, which apparatus comprises: a support member; a plurality of sequentially arranged processing units mounted on said support member including a feeding unit having a drive and a pressure roller for transporting the fastener chain at a predetermined rate of speed; a pre-spreading unit having oppositely disposed guide arms, one movable relative to the other, defining therebetween a channel for the passage of the fastener chain, said unit including a plunger adapted to enter between and spread apart the confronting edges of the stringer tapes while the latter are being advanced; a tensioning unit for applying a constant tension to a length of fastener chain, said unit including a guide rail, a weighted roller with a bearing movable along said rail and a guide roller located adjacent said

feeding unit; a gapping unit having coacting punch and die means for severing a group of fastener elements of said prespread and tensioned fastener chain length across their coupling head portions and a pair of grippers adapted to grip and remove the connecting portions of said group of elements from



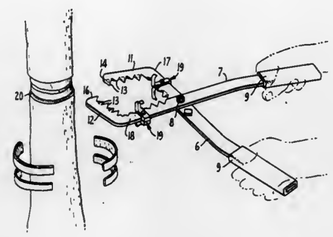
the respective tapes; and a withdrawal unit having a drive and a pressure roller for withdrawing the fastener chain from the apparatus intermittently along a length corresponding to the spacing between adjacent gaps to be produced in said slide fastener chain.

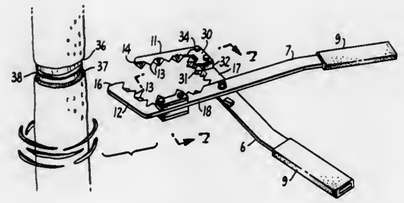
4,188,717
APPARATUS AID
Henry T. Mansfield, P.O. Box 434, Barnwell, S.C. 29812
Filed Oct. 19, 1977, Ser. No. 843,449
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] B26B *21/40*
U.S. Cl. 30—90 **4 Claims**

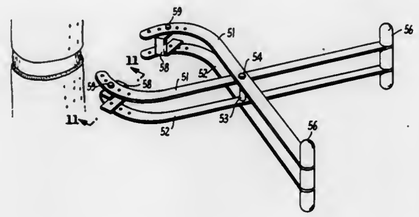


1. A device for use with an apparatus comprising:
(a) holding means operative to hold said apparatus;
(b) stabilizing means operative to secure said holding means in a stable position, said stabilizing means comprising support means operative to support said device, and attaching means operative to attach said holding means to said support means; said attaching means comprising a base with a curved bottom; a single continuous arcular piece, with an opening, emanating from said base; and with a portion of said arcular piece being a continuation of said curved bottom of said base; and a void area between the end of said single continuous arcular piece and the bottom lip of said base through which said support means is placed within said opening, said curved bottom of said base continuing from said portion of said piece which is not said curved bottom of said base to said bottom lip of said base; and fastening means extending through said arcular piece, in the portion of said arcular piece which is not said curved bottom of said base, operative to press said support means against said curved bottom and said bottom lip of said base.

4,188,718
TREE GIRDLING DEVICE
Edric W. Vredenburg, Sr., P.O. Box 135, Fortine, Mont. 59918
Filed Oct. 10, 1978, Ser. No. 949,811
Int. Cl.[2] A01G *3/03*
U.S. Cl. 30—121 **2 Claims**



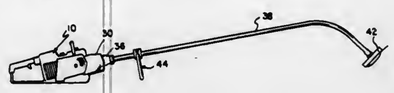




1. A tree girdling device having a pair of levers hinged intermediate their ends and having handles at one end of each of the pair of levers for moving them about the hinge and having their other ends formed with tree encircling element, each elements having a first straight portion continuing the lever with a second terminal portion, said terminal portion being straight and extending at approximately 90° to the first portion and toward an opposite like portion on the other lever to define a bent section in each lever, said levers being joined at a pivot means, each of the portions having a plurality of teeth formed thereon for bark cutting engagement with a tree, a plurality of spaced arcuate cutters immovably mounted on opposite sides of said first straight portions between said bent section and said pivot means, each cutter having a base mounted on a surface of said first portion adjacent said teeth and extending away from said teeth and a tree engaging portion connected to said base to engage a tree at a location spaced from said teeth to form spaced upper and lower cuts in a tree spaced from and separate from an intermediate cut formed in said tree by said teeth which is located between said upper and lower cuts, said cutters being oriented in a plane which is

essentially perpendicular to a plane containing said first portions and in which such first portions move.

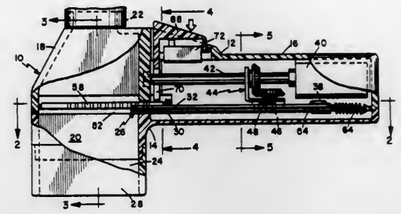
4,188,719
LAWN TRIMMER CHAIN SAW ATTACHMENT
Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.
Filed Jan. 23, 1978, Ser. No. 871,603
Int. Cl.[2] A01D *35/26, 50/00*
U.S. Cl. 30—122 **15 Claims**



1. A conversion attachment for forming a conversion assembly with a chain saw power head having a saw bar mounting pad and a drive sprocket on a sprocket shaft, comprising
an attachment mounting blade adapted to be received on the chain bar mounting pad,
a housing carried by such mounting blade,
an input shaft mounted in said housing for rotation on an axis parallel to the chain saw sprocket shaft, a sprocket on said input shaft adapted to be connected to the chain saw sprocket by a chain,
an output shaft mounted in said housing for rotation on an axis at an angle to said input shaft, and gear means interconnecting said input and output shafts,
an elongated frame member for a ground implement mounted to said housing and extending therefrom and a cutter head operatively supported by said frame member at the opposite end thereof,
a transmission shaft connecting said output shaft to drive said cutter head,
the chain saw conversion assembly having a normal manually-carried operating position in which the frame shaft extends forward and downward to a position close to the ground, and said cutter head being a lawn trimmer head or the like having a cutting element in the form of a flexible line of plastics material extending freely from the periphery of the rotary cutter head and adapted to operate as a flail when the head is driven at operating speed,
said frame shaft being a tube which has an upper straight section and a lower bent section, a head-supporting arbor shaft being mounted in a bearing at the lower end of the frame tube, and said transmission shaft being a flexible drive shaft extending through the frame tube,
said housing carried by said mounting blade including a split sleeve coaxial with the output shaft of the housing, and the upper end of said frame tube being received in said split sleeve and clamped therein, the tube being rotatably adjustable in the split sleeve to vary the aspect of the bent portion of the frame tube and the cutting plane of the head relative to said normal operating position of the assembly.

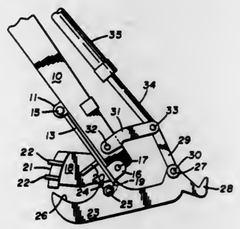
4,188,720
STYLIST HAIR CLIPPER
Anahid Korf, 3131 Xenophon St., San Diego, Calif. 92106
Filed Jun. 22, 1978, Ser. No. 918,007
Int. Cl.[2] B26B *19/44*
U.S. Cl. 30—133 **8 Claims**

1. A precision hair clipper for cutting hair to an uniform length at a selectable spacing from the scalp, said clipper comprising:
(a) a housing defining a tubular flow chamber having an applicator end and a suction end connectable to a source of vacuum, said housing having a projection extending laterally from said tubular flow chamber holding drive means elements;
(b) an oscillating blade mounted in said housing lying in a plane intercepting said flow chamber orthogonally, said blade comprising two complementing toothed blade elements; and
(c) drive means which comprise an electrical motor stationarily mounted in said projection,
means for translating the rotary motion of the motor into the reciprocal movement of one of said elements relative to the other in a shearing motion,



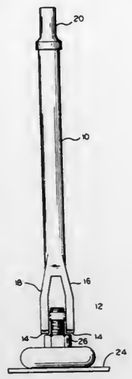
rack means within said plane positioned orthogonally to the direction of said reciprocal movement, and
propelling means associated with said blade and cooperating with said rack means for advancing said blade substantially orthogonally and linearly across said flow chamber in order to clip at uniform length generally parallely extending hair entrained through said flow chamber by air flow created by vacuum source.

4,188,721
ATTACHMENT FOR A BACK HOE
Michael Ramun, and John R. Ramun, both of 2100 Poland Ave., Youngstown, Ohio 44502
Filed Nov. 2, 1978, Ser. No. 957,406
Int. Cl.[2] E02F *3/28*
U.S. Cl. 30—134 **6 Claims**



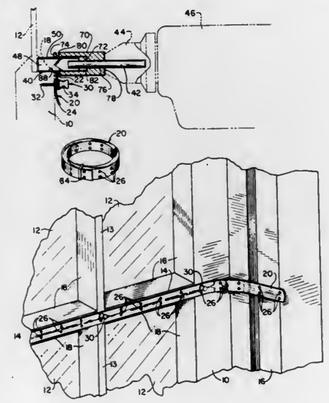
1. A cutting and manipulating attachment for a back hoe the bucket of which has been removed and having a boom with a controlled piston and cylinder connected thereto, the attachment comprising an adaptor plate secured to said boom, a fixed blade secured at one of its ends to said plate, guide means on the other end of said fixed blade spaced with respect thereto, a movable blade pivotally secured between its ends to said fixed blade with one portion in shearing relation to said fixed blade, a hook formed on the end of the other portion of said movable blade, means adjacent said hook linking said movable blade to the controlled piston and cylinder on said boom whereby said movable blade and hook are movable by said piston and cylinder in a cutting and pulling action.

4,188,722
CUTTING TOOL FOR REMOVING A NUT SECURELY FASTENED TO A BOLT
John O. Young, 8448 W. 83rd St., Justice, Ill. 60458
Filed Aug. 10, 1978, Ser. No. 932,560
Int. Cl.[2] B25D *3/00, 17/02*
U.S. Cl. 30—168 **8 Claims**



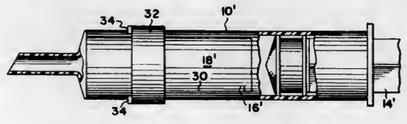
1. A cutting tool for removing a nut which is securely fastened to a bolt comprising:
an elongated rod; means defining arms disposed at the lower end of said rod; cutting means disposed at the lower edges of said arms; and a collar rigidly disposed between said arms and having an inside diameter greater than the diameter of said bolt whereby said collar loosely fits over the free end of said bolt positioning said cutting means on said nut fastened to said bolt so that said nut is split in half and thereby separated from said bolt when an impact force is applied to one end of said rod while permitting said elongated rod to be pivoted about the free end of said bolt to facilitate removal of said nut in locations that are difficult to reach with commonly known tools.

4,188,723
WINDOW PUTTY REMOVAL APPARATUS
Richard W. Fuchs, 17 Deerfield La., Simsbury, Conn. 06070
Filed Aug. 5, 1977, Ser. No. 822,051
Int. Cl.[2] B26B *7/00*
U.S. Cl. 30—276 **1 Claim**



1. In apparatus suited to be driven by a portable power tool having a chuck and to remove putty from a window sash without removing the window sash from its frame comprising an elongated guide strip, means to removably mount the guide strip on the window sash adjacent a strip of putty to be removed, a rotary cutter having a cutting head and a shank, and adapter mounted on the shank and having an axial bore to provide a cylindrical sleeve extending axially over a portion of the cutting head, the improvement wherein the guide strip is coilable and of concavo-convex cross-section to provide a guide of variable effective length, the adapter is journaled on the shank of the rotary cutter for rotation and limited axial movement relative thereto, said adapter being engageable with the chuck to fix the maximum distance the cutting head extends beyond the sleeve thereby to fix the depth of cut, and the sleeve has a reduced outer periphery adjacent its free end to engage the guide strip to prevent contact between the cutter and the guide strip as the cutter moves laterally along the guide strip to remove the putty.

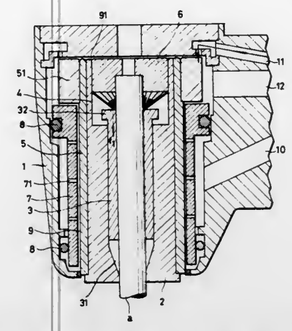
4,188,724
DENTAL IMPRESSION GUN
James F. Lichon, 1116 River Forest, Saginaw, Mich. 48603
Filed Dec. 15, 1977, Ser. No. 860,844
Int. Cl.[2] A61C *9/00*
U.S. Cl. 433—90 **5 Claims**



1. In a dental impression gun for applying a fast setting material, said gun comprising a hollow cylindrical tube having a nozzle at one end and a plunger slidably received in said tube for movement from a first position adjacent the opposite end of said tube toward said one end to force material from the interior of said tube outwardly through the nozzle; the improvement comprising a charging passage in a side wall of said tube, said passage terminating at one end adjacent said one end of said tube and at its other end short of said plunger when the latter is in said first position, said passage being of a size sufficient to enable the rapid loading of a charge of such material into the interior of said tube and wholly between said one end of the latter and said plunger; closure means for selectively opening and closing said passage; and retainer means slidably encircling said tube and being movable from a first position between said passage and said other end of said tube wherein said closure means is enabled to be opened, to a second position overlying said closure means, thereby enabling said closure means to be maintained in passage-closing position against force exerted on said closure means by said material while being discharged from said nozzle by said plunger.

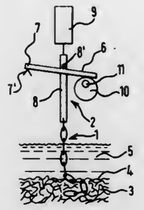
4,188,725
DENTAL HAND-PIECE WITH AN AIR TURBINE
Kenzo Kataoka, Uji, and Shoji Nakayama, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Apr. 13, 1978, Ser. No. 895,742
Int. Cl.[2] A61C *1/12*
U.S. Cl. 433—129 **1 Claim**

1. A dental hand-piece with an air turbine wherein a collet chuck holding a cutting tool spindle and a clamping member, which stands in immovable relation to a turbine rotary body, enough to clamp tapered chuck pawls of said collet chuck convergantly from the outside are incorporated into said rotary body supported by a shaft bearing inside a head casing in such a relative position that said collet chuck and said clamping member will be set concentrically and movably in the thrusting direction with said rotary body inside which further a moving element, said moving element is a polypetalous elastic ring having a plurality of split grooves cut out, to say the least, from the small diameter side, maintaining a relative position concentrically with the axis of said cutting tool spindle is kept in a stationary state during the down-time, but comes to be allowed to do the fine efflorescing movement toward the outside owing to the centrifugal force acting thereon during its



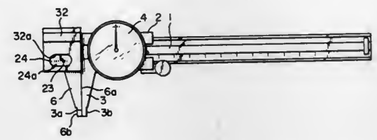
rotating together with said rotary body, and said hand-piece is characterized by being designed in such manner that the efflorescent movement of said moving element with the help of said centrifugal force can provoke the sliding movement tending to compress said collet chuck and clamp convergently said chuck pawls between said collet chuck and said clamping member.

4,188,726
LEVEL-DETERMINING DEVICE
William A. Wemyss, W. Hyde House, London Rd., Great Missenden, Bucks, England
Filed Jul. 24, 1978, Ser. No. 927,339
Claims priority, application United Kingdom, Aug. 1, 1977, 32114/77
Int. Cl.[2] G01B *3/11;* **G01F** *23/04*
U.S. Cl. 33—126.6 **11 Claims**



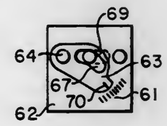
1. A level determining device comprising an elongated flexible chain, pivotally-mounted support means connected to the upper end of said chain for suspending the chain into contact with a material whose level is to be determined, means operable to pivotally move said support means back and forth to correspondingly raise and lower the chain with respect to level changes of said material, and weight sensing means arranged to counterbalance the pivotal movement of the support means as said chain is lowered by said support means until a freely hanging part of the chain is in contact with said material at the level to be determined, said weight sensing means providing a reading or output representative on the weight and hence the length of said freely hanging part so that said level can be determined from said weight reading.

4,188,727
CONSTANT PRESSURE SLIDE CALIPERS FOR INSIDE-OUTSIDE MEASUREMENTS
Yukito Matui, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan
Filed Jun. 22, 1978, Ser. No. 917,885
Claims priority, application Japan, Jun. 30, 1977, 52/86558[U]
Int. Cl.[2] G01B *03/20*
U.S. Cl. 33—147 T **5 Claims**



1. Constant pressure slide calipers for inside-outside measurements, comprising:
a main beam;
a vernier having a first measuring jaw and slidable along said main beam;
a dial display attached to said vernier and indicating displacement of said vernier;
a second measuring jaw,
means mounting the second jaw for movement longitudinally of said main beam,
spring means for urging said second jaw in either direction longitudinally of said beam,
selector means for selecting the direction said second jaw is urged by said spring means,
and indicator means for indicating the measuring pressure applied to said second jaw during a measurement.

4,188,728
VARIABLE INDEXING PEGS
LeRoy M. Denning, 5925 Creekview Dr., Clarence Center, N.Y. 14032
Filed Jun. 21, 1977, Ser. No. 808,465
Int. Cl.[2] B41B *1/00*
U.S. Cl. 33—184.5 **20 Claims**



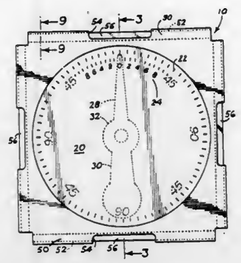
6. A variable indexing peg for an indexed registering device comprising a pin plate with anchor pin registering holes corresponding in size, shape and distance therebetween to selected indexing holes of said indexed registering device, having extending through at least one of said registering holes an anchor pin adapted for removable insertion in at least one indexing hole of said indexed registering device, a carrier pin, means for attaching said carrier pin to the pin plate, said pin plate having a slotted opening between said anchor registering holes of such size and shape to allow the attachment of said carrier pin at any position along the length of said slot.

4,188,729

SCRIBING PROTRACTOR

Edwin E. Peterson, 4109 Chenowith, Box D 19, The Dalles, Oreg. 97058

Filed Nov. 20, 1978, Ser. No. 962,083
Int. Cl.² C01B *19/62*
U.S. Cl. 33—332 **3 Claims**



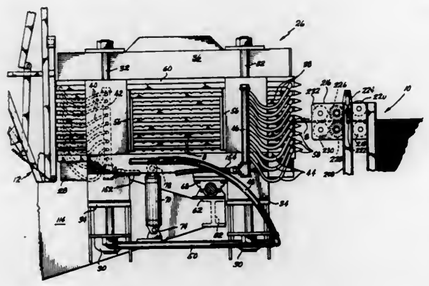
1. A scribing protractor comprising:
(a) a case having a base adapted for placement adjacent a surface to be measured,
(b) a dial calibrated in selected units of angular measurement mounted in the case,
(c) plumb needle means pivotally mounted in the case, overlying the dial,
(d) the plumb needle means comprising a needle having a pointed end and a counterweighted shank end and pivotal mounting means mounting the needle to the case intermediate the ends of the needle,
(e) a longitudinally discountinuous sleeve on the base of the case,
(f) the sleeve being adapted to contain a piece of coloring material with the piece positioned for contact with the surface to be measured, and
(g) the sleeve having inwardly turned margins arranged for frictional contact with the piece of coloring material for retaining the same in operative position within the sleeve.

4,188,730

METHOD FOR VENEER REDRYING AND HANDLING

Richard C. Allen, and Darrell E. Pierson, both of Federal Way, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,452
Int. Cl.² F26B *3/20*
U.S. Cl. 34—13.8 **3 Claims**



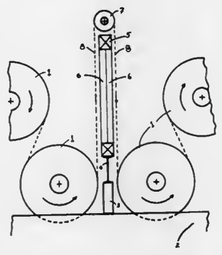
1. A method for the redrying of partially dried wood veneer in a contact veneer redryer having at least two substantially flat metal plates therein for the insertion therebetween of partially dried veneer sheets, the plates being controllable for opening and closing, comprising:
inserting at least one sheet of partially dried veneer between the metal plates having at least one portion therein in which the moisture content exceeds 18%, with a substantial portion of the sheet having a moisture content below 18%;
closing the metal plates and applying continuous uniform pressure over a portion of both surfaces of the partially dried veneer sheet within a range of from 5 psi to 70 psi and for a time period within a range of from 20 seconds to 2 minutes;
elevating the temperature of the contact surfaces of the metal plates to a level within a range of from 250° F. to 400° F. and continuously holding the temperature within the range for the time period during which the pressure is applied; and
simultaneously with the application of the pressure and temperature, continuously exhausting the remaining water and steam generated to atmosphere, through a plurality of exhaust grooves positioned in at least one of the metal plates on a contact surface thereof.

4,188,731

METHOD AND APPARATUS FOR ELIMINATING WET STREAKS IN FIBROUS SHEETS OR WEBS BY INFRA-RED RADIATION

Fred W. Rauskolb, 86 Main St., Thomaston, Me. 04861

Continuation of Ser. No. 717,498, Aug. 25, 1976, abandoned.
This application Jul. 17, 1978, Ser. No. 925,051
Int. Cl.² F26B *3/30*
U.S. Cl. 34—41 **5 Claims**



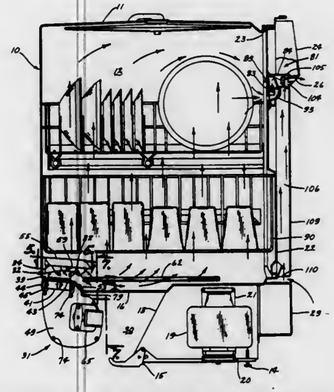
1. The method of eliminating wet streaks in a fibrous web traveling through a dryer, said method including the steps of plotting a drying curve based on actual operation of the dryer with a moisture content in the web at the out-feed end of the dryer charactertistic of an over-dried product, plotting at least two derived curves with successively increased moisture contents at said out-feed end, the first a desired moisture content curve and the second moisture content curve characteristic of the maximum moisture content expected in wet streaks under future operation characteristic of the desired moisture content curve, each derived curve being multiplied by an extrapolation constant, said constant being the total effective length percentage of the dryer divided by the percentage of the total effective length of the dryer section at which the desired moisture content occurs on the actual drying curve, and for the curve of the expected maximum moisture content in wet streaks, the point at which the expected wet streak moisture content occurs on the actual drying curve, replotting said derived curves in terms of total effective length of the dryer section and the total volume of water as percent of the volume of total voids in the web, then selecting a location lengthwise of the dryer section where a comparison of points for a given location in the dryer section shows a substantial difference between the two replotted derived curves in the volume of water there represented as within the web with two moisture content levels representing internal thermal paths of different characteristics, adjusting the operation of the dryer to establish drying in accordance with the desired moisture content curve, and then applying to at least one surface of the web additional heat by means of high-intensity infra-red radiation transversely of the web where the moisture content of the web is excessive, the resistance of the thermal path at the lower moisture content level preventing any significant modification of that moisture content level, while the resistance of the thermal path at the upper moisture content level permits a significant reduction of the excess moisture content represented by such difference, thereby to so level the moisture profile of the web at the out-feed end of the dryer section that its moisture content is substantially uniform across the web.

4,188,732

DISHWASHER AIRFLOW DRYING SYSTEM

Lawrence L. Quayle, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 6, 1978, Ser. No. 940,028
Int. Cl.² B08B *3/02*
U.S. Cl. 34—54 **8 Claims**



1. An airflow system for a dishwasher having a washing chamber, means for washing articles within said chamber, an access door operable between open and closed positions relative to said chamber, and sequence control means for controlling said dishwasher through a sequence of operations including an article washing operation and an article drying operation, the combination comprising: air inlet means for defining an airflow path into said chamber; air circulation means communicating with said chamber through said air inlet means for introducing an airflow into said chamber during said article drying operation; air outlet means for exhausting to the atmosphere the airflow from said chamber after passing over said articles; and inlet valve means and outlet valve means each including a freely supported valve member biased to a closed posture against a stop and movable against said biasing to a stop at an open posture responsive to said airflow and automatically operable to said closed posture upon interruption of said airflow, said outlet valve member also being responsive to increased pressure in said chamber for momentarily opening while said inlet valve member remains closed to relieve internal pressure build-up in said chamber through said air outlet means.

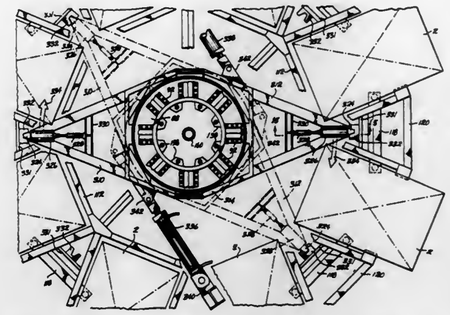
4,188,733

APPARATUS FOR INDEXING A ROTARY FRAME

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,439
Int. Cl.² F26B *25/00*
U.S. Cl. 34—236 **3 Claims**

1. In an apparatus for indexing a large rotatable frame having a substantial portion of its mass mounted on its periphery radially outward of a main bearing, the improvement comprising:
a rotatable base frame surrounding at least a portion of the main bearing;
at least one indexing arm extending radially outwardly from the rotatable base frame to a location substantially adjacent the periphery of the large frame;
means circumferentially spaced about the periphery of the frame, said spacing being predetermined according to the



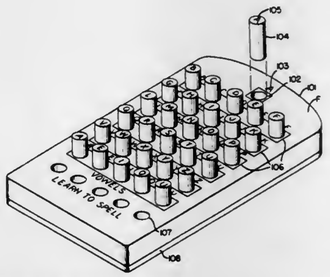
angle through which the indexing arm will travel, for sequentially grasping and releasing the outer end of the indexing arm; and
means for sequentially turning the base frame about a vertical axis through a predetermined angle corresponding to preselected distance of travel of a point on the periphery of the large frame.

4,188,734

EDUCATIONAL TOY

Cy Rich, Belhaven, N.C. 27810

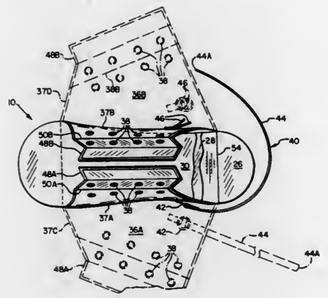
Filed Apr. 26, 1978, Ser. No. 900,322
Int. Cl.² G09B *17/00*
U.S. Cl. 35—35 H **29 Claims**



1. An educational toy comprising:
(a) a board having a plurality of holes on a first portion of a front surface and a back surface of said board, a first set comprising a plurality of indicia representing a language concept being positioned on the front surface of the board, each member of the first set being associated with a respective one of said holes, a second set comprising a plurality of indicia representing a mathematical concept being positioned on the back surface of the board, each member of the second set being associated with a respective one of said holes and aperture means in said board on a second portion of said front and back surfaces; and
(b) a plurality of pegs, each peg corresponding in cross-sectional shape to the cross-sectional shape of at least one of said holes, one member of the first set of indicia being positioned on one end of each of said pegs, and one member of the second set of indicia being positioned on the opposite end of said pegs, said pegs being placeable within

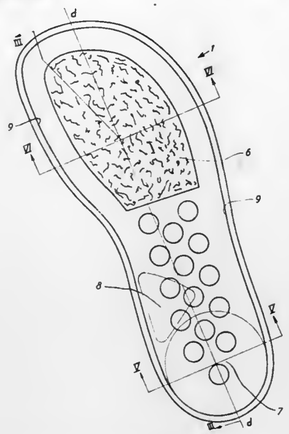
said holes on said first portion for accommodating learning of the members of said sets by associating indicia on said pegs with the indicia associated with the holes and said pegs being placeable within said aperture means on said second portion for utilizing the members of the sets to learn more advanced aspects of said concepts.

4,188,735
ADJUSTABLE SEMI-FLEXIBLE HEALTH SHOE
John E. Hahn, 11320 SW. Viewmount Ct., Tigard, Oreg. 97223
Filed Mar. 27, 1978, Ser. No. 890,386
Int. Cl.[2] A43B *3/12*
U.S. Cl. 36—11.5 **4 Claims**



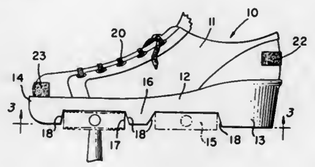
1. An adjustable semi-rigid post-operative shoe adapted to be worn on either foot during ambulation following surgical and other therapeutical treatment of the user's lower extremities, comprising:
(a) an elongate sole of durable polymeric material having a generally semi-circular toe end portion of predetermined cross section, a generally semi-circular heel end portion of predetermined cross section less than that of said toe end portion, opposing lateral and medial sides, a top major surface adapted to directly engage said foot and a bottom major surface adapted to engage a supportive surface during ambulation, said sides each being generally concave in longitudinal cross section from said toe end portion to said heel end portion providing said sole with a minimum width adjacent the midsole area thereof;
(b) open-toe and open-heel means for stably securing said user's foot atop said sole being characterized by elongate lateral and medial flaps of durable, flexible material having good breathing characteristics, each flap having a lower lateral edge fixedly attached respectively to said lateral and medial sides at a multiplicity of points along the length of said lateral and medial sides, each flap further having an upper section extending respectively from each said lateral edge transversely across said sole for a distance significantly greater than one-half said minimum width;
(c) fastener means for connecting said lateral and medial flaps with one another thereby forming a first loop of determinable length; and
(d) strap means of durable, flexible material for urging said user's foot forwardly against said lateral and medial flaps, and having opposing ends attached respectively to said flaps and a heel retaining portion of determinable length forming a second loop extending rearwardly from said lateral and medial flaps over the heel area of said shoe.

4,188,736
FOOTWEAR WITH SPECIALLY FORMED INSOLE
Joergen Keller, Vordingborg, Denmark, assignor to A/S Jac. Engelbredt, Vordingborg, Denmark
Filed Mar. 1, 1978, Ser. No. 882,089
Claims priority, application Denmark, Apr. 3, 1977, 951/77
Int. Cl.[2] A43B *23/28, 13/38*
U.S. Cl. 36—80 **1 Claim**



1. Footwear having an upper portion and a sole comprising an insole having an indentation for contact with the ball of the heel of the foot and a heel stop comprising a small elevation in front of the indentation and at a location to be under the rear portion of the internal part of the arch when said footwear is positioned on a foot, the surface of said insole being substantially level between the indentation for contact with the heel and the location of the ball of the little toe whereby the foot is prevented from sliding forward in said footwear, said insole being provided with a yielding and workable support at the location of the ball of the foot and toes, said support being level with the rest of the insole, the outside surface of the sole below the ball of the big toe and the ball of the heel being curved upwardly from a generatrix perpendicular to the direction of motion of the foot toward the edge of the sole, said sole being formed with a straight axis which passes through the center of the indentation for contact with the ball of the heel through the location of the metatarsal bone of the second toe.

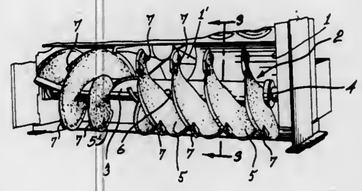
4,188,737
SPORT SHOES
Sanford A. Haver, New York, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jul. 7, 1978, Ser. No. 922,693
Int. Cl.[2] A43B *5/00, 23/00*
U.S. Cl. 36—131 **8 Claims**



1. A shoe for use in propelling bicycles equipped with pedals, said shoe comprising, in combination:
(a) an upper portion adapted and constructed to encompass a foot;

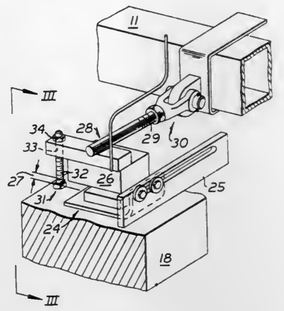
(b) an outsole secured to said upper portion;
(c) said outsole having a heel portion;
(d) said outsole having a toe portion;
(e) said outsole having at least one transverse recess disposed between said heel portion and said toe portion extending completely from side to side of the outsole adapted and constructed to encompass at least a portion of an upwardly facing pedal;
(f) said recess having transverse upwardly converging sloping walls terminating in a longitudinally connecting flat portion.

4,188,738
ENDLESS SCREW PROPELLER UNIT FOR A SNOW THROWER
Paul-Eugéne Vohl, 1738 Principale St., St. Marc des Carriéres, Canada
Filed Jul. 5, 1978, Ser. No. 922,073
Int. Cl.[2] E01H *5/09*
U.S. Cl. 37—43 E **1 Claim**



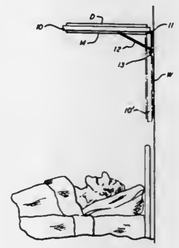
1. A snowblower screw comprising a shaft-like hub journalled in a casing for rotation about its longitudinal axis, a helicoidal blade surrounding and fixed to said hub at its inner peripheral edge, said blade having an outer peripheral edge substantially equally radially distant for the most part from the rotational axis of said hub, said blade having a leading face and an opposite trailing face relative to the direction in which the snow and ice engaged by said leading face move axially of said hub, said blade defining a radially inward main portion and a radially outer marginal portion adjacent to said outer peripheral edge, said outer marginal portion forming an obtuse angle with the main portion of said blade and projecting from said leading face, a plurality of rectangular shape hammer head-like blocks secured to said blade and substantially equally spaced around said blade, each block protruding from the trailing face of said blade but forming no protuberance at the leading face of said blade, each block having a radially outer face substantially flush with the outer peripheral edge of said blade, and an upstream face relative to the direction of rotation of said hub which is thicker than the thickness of said blade, said peripheral outer edge having edge portions, one for each block, which radially diminishes toward and up to the respective blocks, each outer edge portion having an upstream and merging with the full radius peripheral outer edge and a downstream end substantially coinciding with the junction of said inclined outer marginal portion with the main portion of said blade, each outer edge portion being disposed immediately upstream from the upstream face of the respective block, whereby said upstream face of the block is fully exposed substantially across its entire width, so that said upstream face may hit and break ice upon rotation of said screw, while said leading face of said blade presents a smooth surface devoid of any projection for engaging and pushing the snow and ice for movement axially of said hub, and while said radially outer face of said blocks forms a smooth continuation of the full radius outer peripheral edge of said blade to prevent damage to any road paving which said screw may contact.

4,188,739
MAGNETIC SWITCH ADJUSTING SYSTEM
Warner G. Richardson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jun. 15, 1978, Ser. No. 916,022
Int. Cl.[2] E02F *5/00;* **H01H** *9/00*
U.S. Cl. 37—126 AE **8 Claims**



1. In a work vehicle having a frame, a movable first member, a first magnetic switch portion connected to the first member and a second magnetic switch portion connected to the frame, the improvement comprising:
means for pivotally connecting the second magnetic switch portion to the frame for generally vertical movement of the second switch portion in response to movement of the first member and for maintaining said second switch portion spaced a preselected distance from said first member in response to said pivotal movement of said second switch portion.

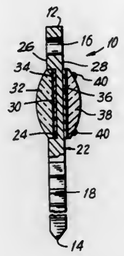
4,188,740
MIRROR-PICTURE
Everett W. Forman, 31 Harper St., Stamford, N.Y. 12167
Filed Apr. 6, 1978, Ser. No. 894,191
Int. Cl.[2] G09F *19/16*
U.S. Cl. 40—152.1 **8 Claims**



1. A mirror-display device, comprising, in combination: a plate-like mirror and a display sheet bearing indicia; a frame supporting said mirror and display sheet in back-to-back relationship so that the reflecting surface of said mirror is visibly exposed on one side of said frame and said indicia on said display sheet are visibly exposed on the opposite side of said frame; attachment means for attaching said frame to a vertical wall surface to allow rotation of said frame, mirror and display sheet between a first position in which said mirror and display sheet extend substantially vertically with said display sheet exposed and said mirror turned toward said wall surface and concealed, and a second position in which said mirror and display sheet extend substantially horizontally with said mirror reflecting substantially vertically downwardly; and support

means for maintaining said frame in said second position, said mirror being inset into said frame to provide a recess bounded by the periphery of said frame, and said attachment means comprising rod means pivotally mounted on said frame to fit within said recess, whereby said rod means will be substantially concealed when said frame lies in said first position.

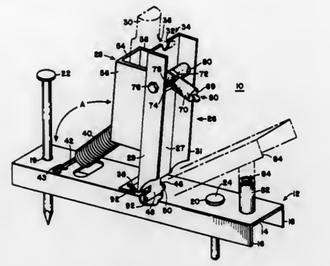
4,188,741
KEY
Lawrence L. Levy, 980 Iris La., Baldwin, N.Y. 11510
Filed Apr. 14, 1978, Ser. No. 896,555
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—330 **6 Claims**



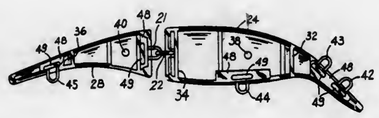
1. A key, comprising, in combination: an elongated body portion extending between gripping and entering ends thereof, said elongated body portion including opposite substantially planar surfaces formed with predetermined recesses therewithin, said gripping end comprising a relatively enlarged portion normally gripped by the thumb and at least one other of the user's fingers during operation of the key within a cylinder lock, at least one of the opposite surfaces of said relatively enlarged portion being formed with a groove of a predetermined depth beneath said surface; a strip of material disposed within said groove against the bottommost portions thereof, said strip capable of bearing first indicia of the user's choice placed thereon by the user; a substantially transparent magnifying member having portions thereof normally in contact with and overlying said strip for magnifying the indicia added to said strip for reference thereto thereafter, said groove being disposed within a first of said opposite sides, a second of said opposite sides carrying a second strip of material capable of bearing second indicia of the user's choice placed thereon by the user, a second substantially transparent magnifying member having portions thereof normally in contact with and overlying said second strip for magnifying the indicia added to said strip for reference thereto thereafter by the user, one of said first and second magnifying members carries a plurality of relatively small projections capable of being contacted by a finger of the user, thereby facilitating identifying the key and its associated lock without viewing same.

4,188,742
ROD HOLDER HAVING FISH ACTIVATED HOOK SETTING MECHANISM
Stanley R. Oulman, 8608 E. Pecos La., Scottsdale, Ariz. 85253
Filed Apr. 24, 1978, Ser. No. 899,278
Int. Cl.[2] A01K *91/06*
U.S. Cl. 43—15 **15 Claims**

1. A fishing aid mechanism including in combination:
- a base member;
- an arm member having at least one end and a pole holding means;
- pivotal fastener means attaching said base member to said one end of said arm member;
- spring means extending between said base member and said arm member;
- releasable interlocking means having a first mating portion affixed to said arm member and a second mating portion affixed to said base member, one of said mating portions including a tapered end having at least one shoulder thereon, and said other mating portion including a wall having a lateral protrusion extending therefrom, said lateral protrusion being adapted to interlock with said shoulder to hold said arm member in a first predetermined position against a force generated by said spring means until said mating portions are moved laterally a sufficient distance relative to each other such that said mating portions are no longer interlocked, said mating portions releasing each other in response to said movement of said arm member relative to said base member to allow said spring means to abruptly move said arm member to another predetermined position; and
- said wall of said other mating portion surrounding an aperture of a first perimeter, and said one of said mating portions including a further portion of a second perimeter which has a length that is greater than said first perimeter so that said tapered end of said one of said mating portions can be inserted only a predetermined distance into said aperture.

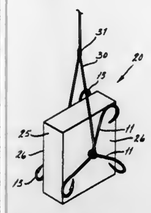


4,188,743
FISHING LURE
Carl Nothdurft, 22412 LaVon, St. Clair Shores, Mich. 48080
Filed Sep. 29, 1977, Ser. No. 837,856
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.15 **5 Claims**



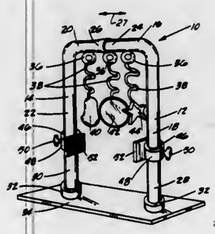
1. Improvement in a fishing lure having a molded body part and a projecting attaching loop, said improvement comprising said attaching loop being a wire member having a loop portion and free end portions forming two legs, said legs being bent in the same direction at right angles to the plane of said loop portion, said legs being coined to enlarge them in the plane in which they are disposed, said loop portion projecting from said body part at two locations so that it cannot be pulled or twisted open, said coined ends on the two legs and the two right angled bends being embedded in said body part to enhance the retention of said attaching loop in said body part.

4,188,744
MULTIPLE HOOK APPARATUS FOR CAKE FISH-BAIT
Charles Tochtrop, Rte. 2, Sunrise Trailer Ct., Warrenton, Mo. 63383
Filed Oct. 27, 1978, Ser. No. 955,451
Int. Cl.[2] A01K *83/06*
U.S. Cl. 43—44.82 **7 Claims**



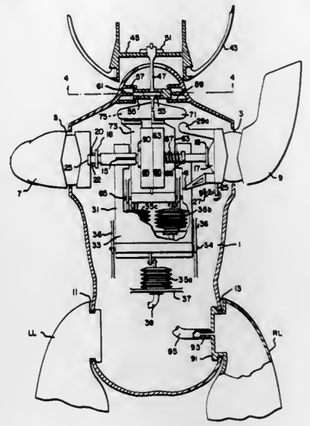
1. For attachment to cake-type fish-bait, a fish-hook assembly comprising three or more fishing hooks, each having a substantially straight shank portion terminating in a planar hook portion curved through substantially 180°, each further having an eye at the opposite end of said shank portion in a plane substantially perpendicular to that of the curved hook portion, and
- means to fasten said fishing hooks together at their eyes with the said eyes being in stacked alignment about a common axis, their said shank portions projecting radially from said axis spaced angularly from each other in a substantially common plane, and their said curved hook portions each projecting in the same direction substantially perpendicularly from such common plane.

4,188,745
INFANT TOY
Phillip D. Harvey, and Miden G. Harvey, both of 910 Peterson Ave., Wichita, Kans. 67212
Filed Oct. 17, 1977, Ser. No. 842,786
Int. Cl.[2] A63H *3/50*
U.S. Cl. 46—32 **5 Claims**



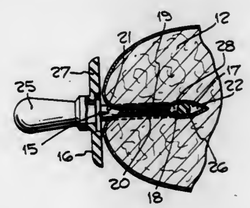
3. An infant toy for mounting on an infant seat or placing it in an infant bed, the infant toy comprising:
- a first inverted "L"-shaped tube having a horizontal arm and an elongated vertical arm;
- a second inverted "L"-shaped tube having a horizontal arm and an elongated vertical arm, the end of the horizontal arm of the first tube slidably received in the end of the horizontal arm of the second tube;
- a plurality of play objects, each of the play objects attached to a coiled rubber spring, the end of the springs attached to the horizontal arms of the first and second tubes and suspended therefrom, the play objects attractable to the eye for amusing the infant; and
- attachment means for holding the vertical arms of the first and second tubes in an upright position and securing the tubes to the infant seat or infant bed.

4,188,746
RESPONSIVE DOLL
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055
Filed Feb. 10, 1977, Ser. No. 767,491
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—44 **19 Claims**



1. A toy figure such as a doll provided with a plurality of movable body parts,
- means biasing each of said parts to a predetermined position,
- a plurality of energizable operating means common to and within the doll body for moving a respective one of said parts against its bias and away from such position when energized,
- manually controlled means cooperable with each of said operating means for intermittently energizing it to reciprocate a corresponding part, and
- selecting means movably mounted on the doll for effecting cooperation between any one of said operating means and the manually controlled means.

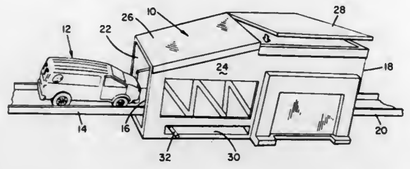
4,188,747
INFANT PACIFIER COMBINATION
Remi T. Kramer, 8661 Delmonico Ave., Canoga Park, Calif. 91304
Filed Jul. 3, 1978, Ser. No. 921,202
Int. Cl.[2] A63H *3/00*
U.S. Cl. 46—116 **5 Claims**



1. An infant pacifier combination in the form of a doll-like body naturally attractive to and of size for being embraced by a human infant, said combination comprising a body having one or more protruberances, a receptacle located on one of the protuberances, the receptacle being concealed within the body and having wall portions of the body forming an outwardly facing opening for the receptacle and open to the exterior, a releasable yieldable holder in said receptacle and concealed from the exterior, a pacifier member having a nipple like protrusion on one side and a retainer counter-member on the

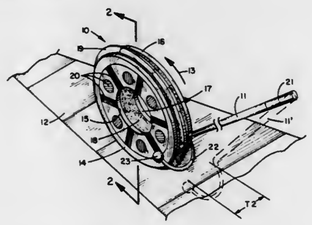
opposite side, a part of the retainer counter-member being complementary with respect to the yieldable holder when said retainer counter-member is located within the receptacle, whereby the pacifier member is held releasably in place on the body.

4,188,748
TOY VEHICLE AND HOUSING SET
Hubert A. Rich, Westminster, and Herbert May, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 29, 1978, Ser. No. 946,997
Int. Cl.² A63H *11/10*
U.S. Cl. 46—202 **14 Claims**



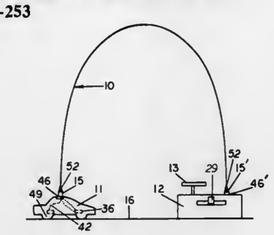
1. In a toy vehicle and accessory set, the combination comprising:
a toy vehicle having a body;
a shell member configured for simulating a body of another type vehicle;
means on said shell member configured for engaging portions of said toy vehicle body, said shell member having a size sufficient for concealing said toy vehicle body when so engaged;
a housing having sidewalls and a track portion adjacent the bottom thereof, said housing having an entrance end and an exit end for passage of said toy vehicle therethrough; and
coacting means on said shell member and said housing for removing said shell member from said vehicle during traversal of said vehicle on said track portion from the entrance to the exit end of said housing; and
means within said housing for retaining said so-removed shell member therein.

4,188,749
TOY WHEEL AND DRIVING ROD
Louise I. Oliver, 538 W. 79th St., Los Angeles, Calif. 90044
Filed Dec. 26, 1978, Ser. No. 972,702
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **4 Claims**



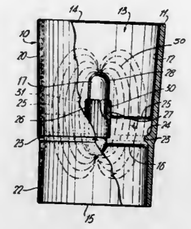
1. A toy wheel and driving rod comprising, in combination:
(a) a first flat disc of given outside diameter having a central opening of diameter from 0.2 to 0.8 said given outside diameter;
(b) a second flat disc of the same given outside diameter as said first flat disc having a central opening of the same diameter as the central opening in said first flat disc;
(c) a filler ring of sponge-like foam sandwiched between and secured to the inner faces of said first and second discs to define said wheel;
(d) a metal rim encircling the periphery of said filler ring midway between said discs, the discs, filler ring and metal rim all being coaxial; and
(e) a driving rod having a handle and elongated stem terminating in a hook dimensioned to straddle the outer peripheral edges of the assembled wheel so that the wheel can be nudged along by said rod in rolling engagement with the ground and whereby should the wheel roll away in an unintended direction, the hook portion of the rod can be passed through the central opening of the wheel to capture the wheel.

4,188,750
CONTROL CABLE
Raymond J. Lohr, 5043 Sterrettania, Erie, Pa. 16506
Filed Oct. 31, 1977, Ser. No. 846,718
Int. Cl.² A63H *29/22, 33/26*
U.S. Cl. 46—253 **9 Claims**



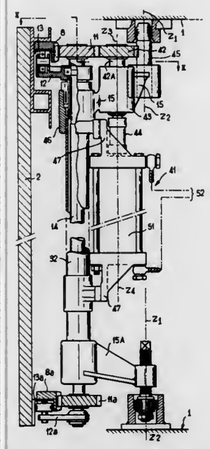
1. A control cable for connecting a control member to a device both mechanically and electrically comprising,
a resilient, single, flexible spring wire having a first end and a second end,
a relatively flexible conductor having a first end and a second end,
said conductor being generally co-extensive with said wire,
first control means on said first end of said wire connecting said wire to a mechanical control member,
first connector means on said first end of said wire providing an electrical path to a source of electricity,
second control means on said second end of said wire connecting said wire to said mechanical control member on said device,
second connector means on said second end of said wire providing an electrical path to a drive member on said device,
said control cable being supported by the said wire in arched relation above a level surface whereby the control cable provides a mechanical connection from said mechanical control member to said device and an electrical connection from said source of electricity to said device for driving and steering.

4,188,751
MAGNETIC SEED TREATING DEVICE
Minoru Saruwatari, 1030-34th Ave., SE., Calgary, Alberta, Canada (T2G 1V4)
Continuation-in-part of Ser. No. 647,483, Jan. 8, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,415
Claims priority, application Canada, Oct. 23, 1975, 238193
Int. Cl.² A01G *7/04*
U.S. Cl. 47—1.3 **31 Claims**



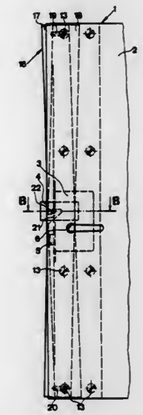
1. A magnetic seed treating device comprising a tubular member defining an internal seed passageway extending between an inlet end and an outlet end thereof, means to subject seeds traversing said passageway to a magnetic field consisting of a permanent magnet having a longitudinal axis extending between opposite poles thereof, the means mounting said magnet coaxially within said passageway.

4,188,752
OBLIQUE-DISPLACEMENT SLIDING DOOR
Bernard Monot, Aubervilliers, France, assignor to Faiveley S.A., Saint Ouen, France
Filed Feb. 28, 1978, Ser. No. 882,216
Claims priority, application France, Apr. 13, 1977, 77 11095
Int. Cl.² E05D *15/10*
U.S. Cl. 49—218 **5 Claims**



1. An oblique-displacement sliding door comprising a stationary frame and at least one sliding leaf associated with guiding means attached to the frame for engaging the leaf transversely within the frame in the closed position and for disengaging said leaf in the opposite direction at the beginning of the opening movement, operating means for producing action on said leaf in the direction of sliding motion, a leaf-stabilizing system in which provision is made on the leaf for two separate toothed racks which are parallel to the direction of sliding motion and each associated with a pinion supported by a carriage retained by a guide which is parallel to said toothed rack, the two pinions aforesaid being coupled by means of a coordinating shaft which is placed transversely with respect to the guides, and two articulated stabilizing crank-arms each connected at one end to a carriage and at the other end to the door-frame, the axes of the two articulations for pivotally mounting the crank-arms on the door-frame being substantially coincident and parallel to the coordinating shaft, the operating means being such as to comprise a motor and a mechanism for driving the pinions of the leaf-stabilizing system in rotation, the aforementioned motor and drive mechanism being rigidly fixed to at least one of the two crank-arms which are pivotally mounted on the door-frame, wherein the motor for driving the pinions of the leaf-stabilizing system is a rotary motor associated with an auxiliary pinion disposed in meshing engagement with one of the aforementioned pinions.

4,188,753
DOOR ARRANGEMENT, ESPECIALLY FOR A RESIDENTIAL STRUCTURE
Virginio Colombo, Bollate, Italy, assignor to Inventio AG, Hergiswil, Switzerland
Filed Dec. 15, 1977, Ser. No. 860,784
Claims priority, application Switzerland, Dec. 20, 1976, 15982/76
Int. Cl.² E05B *65/06*
U.S. Cl. 49—394 **8 Claims**



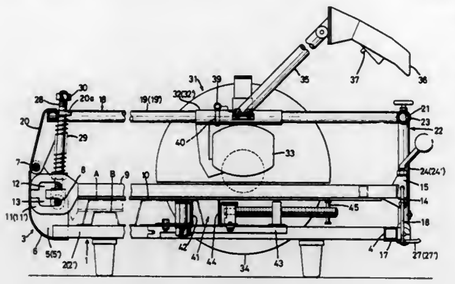
1. A door arrangement, especially for closing the entrance to a residence having a door opening, comprising:
a door frame mounted in the door opening;
said door frame comprising metal hollow sections;
a single-wing door composed of metal hollow sections;
said door being lined with coverings;
hinge means for hingedly connecting the door with the door frame at the inside of the door arrangement;
a door lock having a locking bolt and latch provided at the inside of the door arrangement;
substantially U-shaped guides provided at the door frame;
said substantially U-shaped guides engaging about the door both at the side of the hinge means and at the side of the door lock over the entire height of the door when the door assumes a closed position;
said door having a movable door part which is engaged in a U-shaped manner by the door frame at the side of the door lock;
said movable door part having its pivot axis substantially perpendicular to the pivot axis of the door; and
means for mounting said movable door part to be pivotably movable transversely with respect to the direction of opening of the door.

4,188,754

PORTABLE CUTTER

Koichi Yamamoto, 75, Kasuga, Taishi-cho, Minamikawachi-gun, Osaka-fu, Japan

Filed May 8, 1978, Ser. No. 903,675
Claims priority, application Japan, May 23, 1977, 52-61497
Int. Cl.[2] B24B *27/06;* B25B *5/06*
U.S. Cl. 51—37 **4 Claims**



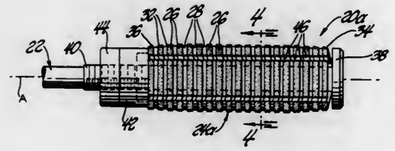
1. A portable cutter for cutting structural materials comprising:
- a bed frame for supporting the material to be cut thereon;
- a laterally extending mounting shaft mounted on said bed frame at the front end thereof;
- a fixing rod extending longitudinally along said bed frame and spaced thereabove for clamping material to be cut against said bed frame;
- a mounting plate secured to said fixing rod at the front end thereof and having a plurality of sockets therein at different distances above said bed frame and pivotally engageable with said mounting shaft;
- a machine frame rotatably mounted on said bed frame above said fixing rod;
- cutting means horizontally slidably mounted on said machine frame;
- means on the rear end of said fixing rod for fastening the fixing rod to the bed frame with said fixing rod substantially parallel to said bed frame for clamping the material to be cut between said fixing rod and said bed frame; and
- means on said machine frame for fastening the machine frame to said bed frame with said machine frame parallel to said bed frame.

4,188,755

EXPANDABLE ABRADING TOOL AND ABRASIVE INSERT AND WASHERS THEREOF

Paul Fitzpatrick, Fenton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 19, 1978, Ser. No. 897,625
Int. Cl.[2] B24D *17/00*
U.S. Cl. 51—206 P **3 Claims**



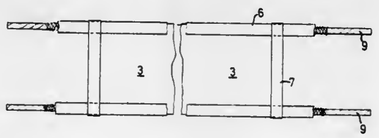
1. An abrading tool comprising: an arbor having a central axis of rotation and an outer mounting surface; an abrasive insert having leading and trailing ends; at least the leading end of the insert being tapered; the insert including a plurality of washers and spacers stacked in an axially alternating relationship and having aligned central openings through which the arbor extends to mount the insert thereon; said washers and spacers each having a frustoconical shape that points toward one end of the insert; each washer having opposite axial sides and a round outer edge that extends between the axial sides thereof; the round outer edge of each washer including an abrasive secured thereto for performing a cutting operation upon tool rotation; each spacer having opposite axial sides engaged with the adjacent washers so that each washer is spaced axially from the adjacent washers; each spacer also having a nonconductive outer edge at which the outer edges of the adjacent washers are spaced axially from each other; a clamp on the arbor for adjustably clamping the ends of the insert with a clamping force that can be increased to flatten the frustoconical shapes of the washers and the spacers and thereby control the diameters of the outer edges on the washers at which cutting takes place; and the outer edge of each washer and spacer including a plurality of flutes for decreasing the clamping force required to flatten the washers and spacers, and said flutes being aligned along the length of the insert so as to provide a path for machined chips to be removed.

4,188,756

HEAT-INSULATED PLASTIC HALL

Sven O. B. Ljungbo, Bålsta, Sweden, assignor to Erecta AG, Zug, Switzerland

Filed Dec. 19, 1977, Ser. No. 862,281
Claims priority, application Sweden, Dec. 22, 1976, 7614428; Norway, Sep. 27, 1977, 773307
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—83 **4 Claims**



1. A heat insulation component adapted for use in constructing the exterior surface of a building, such as a hall, comprising
- (a) a generally rectangular soft cellular synthetic plastic core member (**2**) having a pair of opposed generally flat parallel top and bottom surfaces, said core member having a thickness of from about 5 to about 50 mm and a width of from about 1 to about 2 meters;
- (b) a pair of first sheets (**3**) of unreinforced soft flexible synthetic plastic material bonded to said top and bottom core surfaces; and
- (c) pairs of second (**6**) and third (**7**) synthetic plastic reinforcement sheets extending around the longitudinal and end edge portions of said core member, respectively, said second and third sheets being bonded to said first sheets, said second sheets (**6**) being spaced from the longitudinal edges of said core member to define rope-receiving passages extending the length of the component.

4,188,757

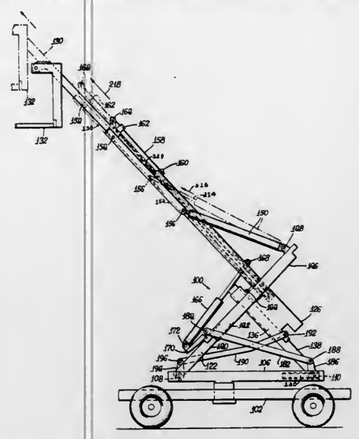
TELESCOPING AERIAL LIFT

Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 758,810, Jan. 12, 1977, Pat. No. 4,070,807. This application Oct. 5, 1977, Ser. No. 839,721
Int. Cl.[2] B66C *23/00;* E04G *1/22*
U.S. Cl. 52—111 **13 Claims**

1. An aerial lift, comprising:
- a supporting means;
- a boom having an extensible load end, a lower section terminating in a pivot end, an intermediate section telescoping with the lower section, and an upper section telescoping with the intermediate section;

- means for mounting said boom to said supporting means such that said pivot end is horizontally movable;
- a support arm extending between and pivotally connected to said support means and said boom;
- means rigidly coupling the support arm to the extensible end of the boom, said coupling means being coupled between the support arm and the intermediate section of the boom;



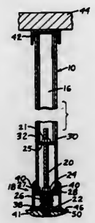
- means for raising and lowering said boom such that, as said boom is raised, the pivot end of said boom moves substantially horizontally, said support arm pivots about said supporting means and said boom, and said means coupling said support arm to the extensible end of said boom causes said extensible portion to extend for raising the load end of the boom substantially vertically, and
- means for extending the upper section of the boom as the intermediate section is extended.

4,188,758

BASE FOR MOVABLE WALL PARTS

Charles Swann, 2422 Eugenia Ave., Nashville, Tenn. 37211

Continuation-in-part of Ser. No. 943,788, Sep. 20, 1978. This application Dec. 19, 1978, Ser. No. 970,915
Int. Cl.[2] E04B *2/56*
U.S. Cl. 52—241 **6 Claims**



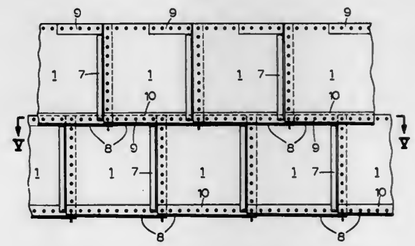
1. In a kit a base assembly for a unitary post-panel structure, said base assembly comprising as cooperative components thereof:
- (1) a base member adapted to fit on the outside of the bottom of a panel, said panel having a cavity in the bottom thereof,
- (2) inside and outside U-channels for fitting inside and outside the bottom of said base member,
- (3) at least one threaded rod for fitting upward into said cavity in the bottom of said panel,
- (4) at least one nut spaced along each of said at least one threaded rod,
- (5) a spring adapted to fit around the lower part of said rod and extend downward from said U-channels to a firm surface to compress said base member against said firm surface and
- (6) a bottom adjustable nut adapted to space said base member and panel in a desired position with respect to one another when said base assembly is used in mounting panel.

4,188,759

SHEET FOR CONSTRUCTING THE WALL OF A SUBSTANTIALLY CYLINDRICAL SILO; AS WELL AS SUBSTANTIALLY CYLINDRICAL SILO

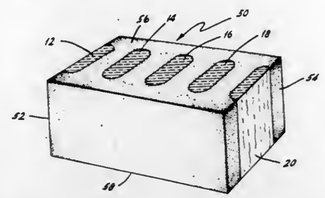
Fredericus Liet, and Cornelis H. Liet, both of Losser, Netherlands, assignors to Trioliet-Mullos Silo Nederland B.V., Losser, Netherlands

Continuation-in-part of Ser. No. 845,713, Oct. 26, 1977, abandoned, which is a division of Ser. No. 597,510, Jul. 21, 1975, Pat. No. 4,057,295. This application Feb. 12, 1979, Ser. No. 11,654
Claims priority, application Netherlands, Jul. 22, 1974, 7409901
Int. Cl.[2] E04B *1/32;* E04G *11/04;* E04C *1/10*
U.S. Cl. 52—245 **24 Claims**



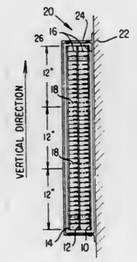
1. A substantially cylindrical silo having a wall which is constructed from a plurality of sheets, each sheet having a substantially rectangular periphery and being slightly cylindrically curved, each sheet comprising first and second straight edges opposite one another and first and second curved edges also opposite one another, each sheet being provided with rows of bolt holes adjacent the four edges, the first straight edge and the first curved edge being provided with a flange, both flanges being positioned at the same side of the sheet and extending approximately perpendicularly to the sheet surface, the second straight edge and the second curved edge having no flange, the flange on the first straight edge ending at a distance from the second curved edge, a substantially rectangular edge area adjacent this second curved edge being offset with respect to the adjacent portion of the sheet over a distance corresponding approximately to the thickness of the sheet, said offset edge area beginning at a distance from the end of the second curved edge joining the second straight edge, while this edge area ends at a distance from the opposite end of the second curved edge, a second substantially rectangular edge area adjacent the first curved edge extending along the whole length of this first curved edge and being offset in the same direction as the first mentioned offset edge area over a distance corresponding approximately to the thickness of the sheet, the flange on the first straight edge ending at a short distance from the first curved edge and the flange on the first curved edge being provided with bolt holes near both its ends, the sheets being arranged in horizontal rings positioned one above the other, the first straight edge of one sheet overlapping the second straight edge of the adjacent sheet in each ring, while in successive rings the first curved edge of one sheet overlaps the second curved edge of the adjacent sheet.

4,188,760
MASONRY BUILDING BLOCK AND METHOD FOR FORMING SUCH A BLOCK
John L. Frost, 1454 Scrope Rd., Rydal, Pa. 19046
Filed Jun. 20, 1978, Ser. No. 917,376
Int. Cl.² E04B *2/00*
U.S. Cl. 52—405 **3 Claims**



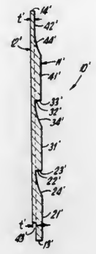
1. An insulating masonry building block in the form of a rectangular parallelpiped having end walls, side walls and top and bottom walls comprising:
an insert formed from insulating material, said insert including a plurality of web sections spaced uniformly apart longitudinally of the block, each web section extending vertically the full height of the block and extending horizontally to a point short of the side walls of the block, and said insert having rib portions of substantially lesser vertical and horizontal extent than said web sections extending longitudinally of the block connection each web section with the next adjacent web section at substantially its mid-point; and, cementitious aggregate material molded around said insert filling the rectangular parallelpiped shape of said block and in intimate contact with said insert.

4,188,761
SPACER-SEALER STRIP FOR REFLECTIVE INSULATION ASSEMBLIES
Donald E. McKay, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio
Filed Feb. 22, 1978, Ser. No. 880,258
Int. Cl.² E04B *5/57*
U.S. Cl. 52—474 **7 Claims**



1. A combination spacer-sealer assembly for flexible reflective insulation sheets comprising:
a flexible first reflective insulation sheet;
a corrugated strip of material mounted on its edge along the perimeter of said first reflective insulation sheet; and
a flexible second reflective insulation sheet located on said corrugated strip of material to be spaced from said first sheet of reflective insulation by said corrugated strip of material and to thereby seal a volume of space between said first and second sheets of reflective insulation within the perimeter of said corrugated strip of material enclosure means maintaining said first reflective insulation sheet, said second reflective insulation sheet and said corrugated strip as an assembly; and wherein
said corrugated strip forming its own fastening means area loosely retaining said corrugated strip of material to said first sheet of reflective insulation without impairing the integrity of the volume sealed between said first and second sheet of reflective insulation during any bending of said first and second reflective insulation sheets.

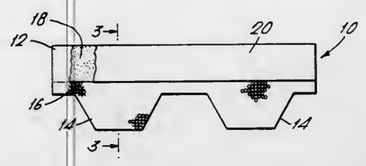
4,188,762
TRIPLE LAP HARDBOARD SIDING
Stephen J. Tellman, Patterson, N.Y., assignor to Champion International Corporation, Stamford, Conn.
Filed Jun. 14, 1978, Ser. No. 915,372
Int. Cl.² E04D *3/18*
U.S. Cl. 52—541 **3 Claims**



1. A triple lap hardboard siding formed from a single, elongated strip of hardboard material of a thickness of approximately 7/16 of an inch and a width of approximately 12 inches, said siding having front and back opposed surfaces, a leading edge and a trailing edge, respectively disposed at opposite ends of the width of the strip, said siding including a first flat surface extending parallel to the back surface from the trailing edge of the siding and terminating at a point intermediate the width of the strip; a first arcuate cut portion extending from the terminating point of said first flat portion and penetrating the strip to a point intermediate the thickness thereof; a first vertical cut portion extending perpendicular to said back surface from the terminating point of said first arcuate cut and terminating at the front surface of the strip to form a first vertical wall member; a second flat portion extending parallel to the back surface from said first vertical wall member and terminating at a point intermediate the width of the strip, the width of said second flat portion being substantially equal to that of said first flat portion; a second arcuate cut portion extending from the terminating point of said second flat portion and penetrating the strip to a point intermediate the thickness thereof; a second vertical cut portion extending perpendicular to said back surface from the termination of said second arcuate cut and terminating at the front surface of the strip to form a second vertical portion; a third flat portion extending parallel to said back surface from said second vertical wall member and terminating at a point intermediate the width of the strip, said third flat portion having substantially the same width as said second and first flat portions; a third arcuate cut extending from the termination of said third flat portion and penetrating the strip to a point intermediate the thickness thereof; a flat cut portion extending from the termination of said third arcuate cut to the leading edge of said strip, said flat cut portion being parallel to said back surface and being of a length of at least ¾ inch; said first, second and third arcuate cuts each having a radius of approximately 2″ to 2⅜″, such that the third arcuate cut fairs into the flat cut portion, said first, second and third arcuate cuts each penetrating said strip at approximately the same thickness level; said back surface of the strip including a substantially rectangular cut portion at the trailing edge of the strip, the thickness of said rectangular cut portion being substantially the same as the thickness of the strip between said back surface and said flat cut portion at the leading edge thereof, and with the width of said rectangular cut portion being substantially the same as the width of said flat cut portion which extends from

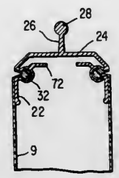
the termination of said third arcuate cut to the leading edge of said strip, such that the leading edge of one strip of hardboard siding cooperates with the trailing edge of another strip of hardboard siding to form a continuous siding installation.

4,188,763
ROOFING SHINGLE
Eyvind M. Thiis-Evensen, Eidanger, Norway, assignor to Isola Fabrikker A/S, Eidanger, Norway
Filed Apr. 6, 1978, Ser. No. 893,974
Claims priority, application Norway, Apr. 14, 1977, 771308
Int. Cl.² E04D *1/22*
U.S. Cl. 52—557 **11 Claims**



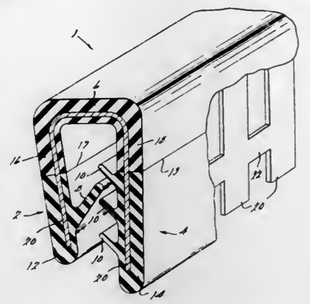
1. A roofing shingle comprising a web having at least one tongue, the top surface of the web having a pattern which simulates roofing slate or roofing tiles, the bottom surface of the web having a monolayer of particulated material having a diameter of at least 1 mm covering at least a portion of the tongue, the particulated material comprising spheres of an expanded plastic material.

4,188,764
PREFABRICATED GREENHOUSE STRUCTURE
Charles R. Gode, 2521 Armour La., Redondo Beach, Calif. 90278
Filed Apr. 3, 1978, Ser. No. 892,776
Int. Cl.² F04C *1/10*
U.S. Cl. 52—582 **33 Claims**



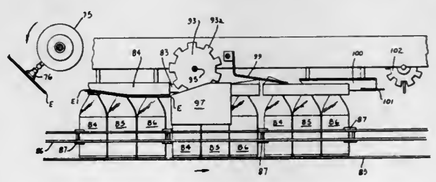
9. A building panel of generally rectangular shape consisting of peripheral channel members and a flexible sheet spanning the space defined by the channel members, the edge portions of the flexible sheet being captured within longitudinal grooves provided in the channel members, at least one resilient spline received within said longitudinal grooves and holding the edge portions of the flexible sheet to the channel members, the longitudinal groove being generally keyhole-shaped in cross-section, the keyhole including a generally circular interior head opening, a constricted throat portion, and planar side wall portions connected to the side wall of the channel member, the side wall surfaces extending between the head opening and the side wall, the side portion over which the sheet edge portion under tension passes defining an angle with respect to the side wall is substantially different than the angle defined by the other side portion with the side wall, the side portion over which the sheet edge portion under tension passes also defining an acute angle with the plane tangent to the interior head opening at their line of intersection that is substantially less than the acute angle defined by the other side portion with the plane tangent to the interior head opening at their line of intersection, and means attaching the channel members together at their intersecting corners.

4,188,765
DUAL DUROMETER FLANGE COVER
Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Dearborn, Mich.
Filed Jun. 12, 1978, Ser. No. 914,935
Int. Cl.² E04F *19/02*
U.S. Cl. 52—716 **5 Claims**



1. In a flange cover for frictionally engaging a supporting edge flange, said cover comprising an elongated strip of thermoplastic material folded longitudinally thereof so that said strip is substantially U-shaped in cross section defined by a web portion and a pair of spaced leg portions, said elongated strip of thermoplastic material being supported by a core structure comprising a plurality of longitudinally spaced, parallel ribs whereby the web and leg portions of said thermoplastic strip have interior and exterior portions on opposite sides of said core structure, the improvement wherein each leg portion of said strip has an average durometer less than the average durometer of the web portion thereof, the exterior portion of each leg of said thermoplastic strip having a durometer relatively higher than the durometer of the interior portion thereof.

4,188,766
PACKAGING MACHINE
Will L. Culpepper, Tucker, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 22, 1978, Ser. No. 963,004
Int. Cl.² B65B *21/00*
U.S. Cl. 53—49 **8 Claims**



1. A machine for applying a carrier blank to a plurality of bottles said blank having a main panel (**1**) in which a longitudinal fold line (**8**) is formed to define a pair of panel sections (**1a**,**1b**) and in which a plurality of spaced apertures (**2**–**4**) are formed along said fold line and with a plurality of support tabs (**10**,**21**,**22**,**17**) (**13**,**19**,**20**,**18**) foldably joined to each of said panel sections and with the free end of each tab defining an edge portion of one of said apertures and certain adjacent tabs being foldably joined to different panel sections along angularly related fold lines (**12**,**15**) which diverge toward the associated aperture (**2**) and said adjacent tabs being interconnected along

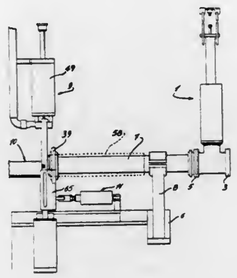
their adjacent edges, said machine comprising means (**85,87**) for moving a row of aligned bottles along a predetermined path, means for moving a carrier blank in synchronism with said bottles and with the apertures therein disposed above and in coincidental relation with said bottles respectively, a pair of static plows (**81,82**) disposed above and in straddling relation to said row of bottles for moving the carrier downwardly so that the apertures therein envelope the necks of the bottles respectively, and a rotatable element (**93**) having a plurality of radially arranged spokes (**93***a*) disposed above the carrier blank and arranged so that each spoke engages said longitudinal fold line (**8**) thereby to deflect said panel sections downwardly toward each other and to facilitate upward folding of said support tabs.

4,188,767

APPARATUS FOR PORTIONING AND ENCASING MEAT PRODUCTS

Ludwig Piereder, Pierrefonds, Canada, assignor to Piereder Machinery Ltd-Machinerie L. Iereder Ltee, Montreal, Canada

Filed Jun. 13, 1978, Ser. No. 914,995
Int. Cl.² B65B *3/14, 3/16*
U.S. Cl. 53—122 **8 Claims**



1. Apparatus for automatically providing a predetermined portion of a meat product, received from a source, in a casing, comprising;

a portioning means;

a storage horn;

valve means for passing said product from said source to said portioning means, and, subsequently, from said portioning means to said horn;

characterized in that said valve means comprises three ports;

a first one of said ports being in communication with said source;

a second one of said ports being in communication with said portioning means; and

a third one of said ports being in communication with said storage horn;

means for closing said first port and said third port such that, when said first port is open, said third port is closed, and when said third port is open, said first port is closed;

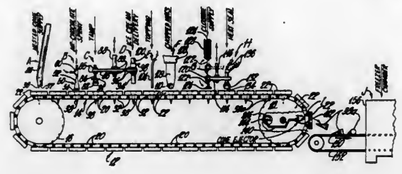
whereby, when said first port is open and said third port is closed, meat arriving from the source will be forced into said portioning means, and when said third port is open and said first port is closed, meat from said portioning means will be forced into said storage horn.

4,188,768

APPARATUS FOR PRODUCING FROZEN CONFECTIONS

Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Division of Ser. No. 755,180, Dec. 29, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,672
Int. Cl.² A23G *9/28;* **B65B** *1/04*
U.S. Cl. 53—282 **9 Claims**



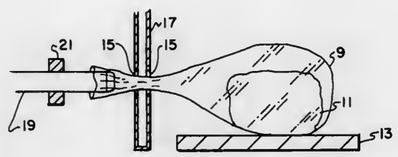
1. Apparatus for processing frozen dessert products including, in combination, movable conveyor means having members for mounting comestible cones, chamber means to receive liquid chocolate composition and compressed air, means connecting the chamber means with a supply of liquid chocolate composition, means connecting the chamber means with a supply of compressed air, the compressed air in the chamber means mixing with and atomizing the chocolate composition in the chamber means, nozzle means associated with the chamber means whereby particles of the liquid chocolate composition atomized by the compressed air are successively delivered by the nozzle means into the interior of the comestible cones providing a coating of the chocolate composition therein, means for delivering a freezable dessert constituent into each of the coated comestible cones, and a cooling chamber associated with the conveyor means for receiving the processed product, said cooling chamber being of a temperature to congeal the dessert constituent.

4,188,769

MICROWAVE SEALING OF THERMOPLASTIC MATERIAL

Marvin L. Bright, Jr., Pauline, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 21, 1978, Ser. No. 898,744
Int. Cl.² B65B *31/04, 51/22*
U.S. Cl. 53—434 **11 Claims**



9. A process of packaging comprising:

placing an article within a flexible container;

gathering the opening of said container into a compact configuration;

placing said compact configuration within a standing wave guide; and

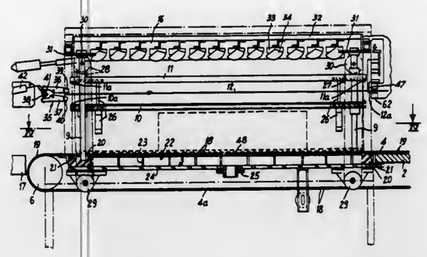
subjecting said compact configuration within said wave guide to a source of microwave energy for a period of time sufficient to unify said compact configuration into a unitary closure, said compact configuration having an effective diameter of less than one-half the wavelength of said microwave energy.

4,188,770

MACHINE FOR PACKAGING VARIOUS ARTICLES

Marcel J. Tabur, Boulevard Pierre Lefaucheux, 72100 Le Mans, Sarthe, France

Filed Dec. 12, 1977, Ser. No. 859,940
Int. Cl.² B65B *31/02*
U.S. Cl. 53—509 **15 Claims**



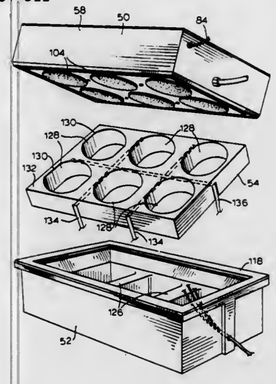
10. In a machine for packaging at least one article between a substrate supporting such article and a plastic film, such machine including a vacuum chamber, conveyor means extending upstream from the vacuum chamber for moving the substrate to the vacuum chamber, a frame supporting the conveyor means and means for draping plastic film over the article and the substrate, the improvement comprising a loading station located adjacent to the conveyor means and upstream from the vacuum chamber, said loading station including a movable table having a tabletop for supporting the substrate, means guiding said table for movement between a position in which said tabletop overlies the conveyor means and a position in which said tabletop is retracted from the conveyor means and retainer means mounted on the frame for effecting transfer of the substrate onto the conveyor means by movement of the tabletop from its position overlying the conveyor means to its position retracted from the conveyor means.

4,188,771

MEAT PACKAGING MACHINE

Rhoden R. Kyle, Mississauga, Canada, assignor to C.A. Pemberton & Co. Limited, Toronto, Canada

Filed Feb. 22, 1978, Ser. No. 880,187
Int. Cl.² B65B *31/02*
U.S. Cl. 53—511 **3 Claims**



3. In a meat packaging machine in which meat products are vacuum packed between first and second webs of heat sealable thermo-plastic material which are driven along a sealing plane which extends through a sealing station, the first web being formed to provide a plurality of pockets, at least two pockets to each package, the pockets being bounded and spaced from one another by a unitary sealing flange and, in said sealing station, the second web extending across the first web so that first portions thereof are disposed in a face-to-face relationship with and are coextensive with said sealing flange of said first web so that the first and second webs may be moved towards one another to form a continuous sealing interface between said first portions of said web and said sealing flange, said second web also having end closure portions extending across and closing the upper ends of each pocket located in said sealing station, the improvement of a sealing station comprising;

(a) a sealing head disposed on one side of said sealing plane having a vacuum chamber formed therein which opens toward said sealing plane, a sealing platen mounted in said vacuum chamber, said sealing platen having a sealing face directed toward said sealing plane,

(b) a sealing die base disposed on the other side of said sealing plane directly opposite said sealing head, said base having a vacuum chamber opening outwardly therefrom toward said sealing plane and a planar sealing surface directed outwardly from said vacuum chamber toward said sealing plane, a plurality of contoured apertures opening inwardly from said planar sealing surface, said apertures being contoured and proportioned to extend around the side of the preformed pockets of the first web in a closely spaced relationship therewith whereby said sealing surface may extend closely adjacent to the periphery of the meat product,

(c) heater means in said sealing die base and in said sealing head, said heater means being operable to heat substantially the entire sealing face of said head and substantially the entire planar heat sealing surface of said sealing die base to a temperature sufficient to effect a rapid heat seal over the entire sealing interface of the webs located therebetween in use,

(d) said planar sealing surface of said sealing die extending continuously from one aperture to the other and to the perimeter of said planar sealing surface, said sealing face of said sealing platen being co-extensive with said sealing surface of said die base thereby to form a sealing interface extending continuously between adjacent apertures and the perimeter of the planar sealing surface of the base,

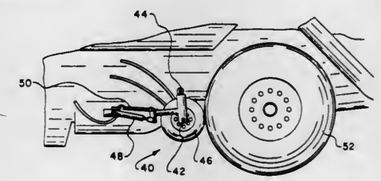
(e) means for effecting relative movement between the sealing die base and sealing head to move them between an open position for admitting and discharging webs to and from sealing station and a closed position in which the first and second webs are clamped between said heat sealing surfaces of said head and said sealing die base to permit simultaneous heat sealing of the entire sealing interface.

4,188,772

HYDRAULIC SPEED CONTROL SYSTEM FOR THE PICK-UP REEL OF A PEANUT COMBINE

Betram L. Jordan, and John D. Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Continuation-in-part of Ser. No. 803,523, Jun. 6, 1977, abandoned. This application Aug. 16, 1978, Ser. No. 934,007
Int. Cl.² A01D *69/00*
U.S. Cl. 56—10.2 **12 Claims**



1. In a harvesting machine having a crop engaging reel

rotatively mounted about the front of a harvester, the improvment comprising a hydraulic speed control system for automatically controlling the peripheral speed of said reel of said crop harvesting machine during crop harvesting operartion such that the peripheral speed of said reel is generally constant until the harvester's ground speed exceeds a selected speed at which time the hydraulic control system is operative to drive the reel such that the peripheral speed thereof is controlled in accordance with harvester ground speed, said hydraulic speed control system comprising: a first pump means operatively connected to a generally constant drive source and operatively connected to a source of hydraulic fluid for pumping a generally constant output flow of fluid; a hydraulic motor operatively connected to said reel for rotatively driving the same, and wherein said hydraulic motor is operatively connected in said speed control system and to said first pump means such that the fluid output from said first pump means may be directed to said hydraulic motor for driving said reel at a generally constant peripheral speed while said harvester is stationary; a second pump means operatively connected in said hydraulic control system for directing fluid from a fluid source to said hydraulic motor and wherein said second pump means is operatively connected to a second drive source that is responsive to ground speed and which acts to drive said second pump means at a speed proportional to ground speed; and wherein said second pump means is operatively associated with said first pump means for cooperating therewith to drive said reel at a generally constant speed as long as the harvester ground speed is equal to or less than a selected speed, and wherein while the harvester ground speed is equal to or less than said selected speed, said second pump means is effective to first pump portions of the output flow of said first pump means to said hydraulic motor while said first pump means is effective to pump any remaining portions of the output flow therefrom to said hydraulic motor such that the generally constant volumetric output of said first pump means is directed to said hydraulic motor driving said reel while said harvester ground speed is equal to or less than the said selected speed; and wherein said second pump means is operative to draw fluid from said fluid source when said harvester ground speed exceeds said selected speed and the drawn fluid is combined with the output flow of said first pump means to drive said hydraulic motor at a speed proportional to ground speed as long as said ground speed of said harvester exceeds said selected speed, such that the peripheral speed of said reel is generally equal to the harvester ground speed.

4,188,773

MOWER-CONDITIONER

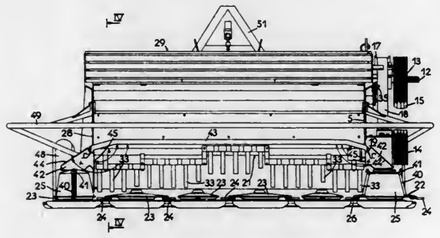
Pierre Kaetzel, Saverne, France, assignor to Samibem, S.A., Marmoutier, France

Filed Feb. 2, 1978, Ser. No. 874,644

Claims priority, application France, Sep. 16, 1977, 77 28541

Int. Cl.[2] A01D *35/264*

U.S. Cl. 56—192 **8 Claims**



1. A mower-conditioner comprising a cutting mechanism, at least one rotating element over said cutting mechanism, means to rotate said element about a vertical axis, a conditioning mechanism comprising at least one rotor, and means to drive said at least one rotor about a horizontal axis, said rotor being disposed in a conditioning passage the width of which is less than the cutting width, said rotating element being disposed laterally outside said conditioning passage and being in the form of a truncated cone that separates standing fodder from cut fodder, and a fixed deflector disposed above said truncated cone and extending forwardly upwardly and also toward the interior of said conditioning passage and merging with a front edge of said conditioning passage in a smoothly continuous manner.

4,188,774

ELECTRO-MECHANICAL CALENDAR TIMEPIECE

René Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Sep. 30, 1977, Ser. No. 838,049

Claims priority, application Switzerland, Oct. 4, 1976, 12509/76

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—4 A **16 Claims**



1. Means for automatically correcting the date indicator of an electro-mechanical timepiece each month, said means comprising:

date indicator means contained in said timepiece for displaying the date of the month, said date indicator means being advanceable day by day during each month from a first position at the first day of a month to said first position at the first day of the next month;

a pulse driven motor having output means coupled to said date indicator means for advancing the date indicator means, said output means being advanced one step by said motor in response to each pulse of a pulsed drive signal applied to said motor, and said output means having an output advance speed corresponding to the frequency of the pulses of said pulsed drive signal, said output means advancing said date indicator means one date in response to a plurality of pulses of said drive signal;

first circuit means coupled to said motor for generating said pulsed drive signal, said pulsed drive signal having a fixed number of pulses each month to advance said date indicator during each month to said first position at the first day of the next month,

said first circuit means including second circuit means for applying to said motor a first predetermined number of said pulses corresponding to the number of dates in each month at a normal advance frequency normally to advance said date indicator, and

said first circuit means further including third circuit means for applying to said motor the remaining number of said fixed number of pulses for each month having less than 31 days at a rapid advance frequency greater than said normal advance frequency, said remaining number corresponding to the number of dates of each month less than **31**, rapidly to advance said date indicator to said first position.

4,188,775

FREQUENCY ADJUSTMENT MEANS FOR ELECTRIC TIMEPIECE

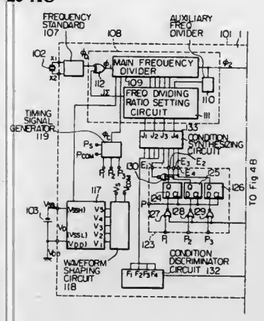
Yoshinobu Kashima, Tanashi, Japan, assignor to Citizen Watch Company Limited, Japan

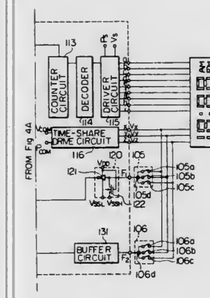
Filed Nov. 14, 1977, Ser. No. 851,187

Claims priority, application Japan, Nov. 16, 1976, 51/136864; Aug. 9, 1977, 52/95469

Int. Cl.[2] G04C *17/02*

U.S. Cl. 58—23 AC **12 Claims**





1. An electronic timepiece comprising:

an integrated circuit chip including a frequency standard providing a relatively high frequency signal, a frequency converter for dividing down the relatively high frequency signal to provide a low frequency time unit signal, a time counter circuit responsive to the low frequency time unit signal to provide time information signals, a decoder coupled to the time counter circuit for providing display information signals in response to the time information signals, and a driver circuit responsive to the display information signals to provide drive signals;

an electro-optical display device responsive to the drive signals to provide a display of time information; and

a frequency adjustment circuit for adjusting a frequency of said relatively high frequency signal to a correct value;

said frequency adjustment circuit including a plurality of frequency adjustment ratio setting terminals provided on said integrated circuit chip and adapted to be selectively coupled to output terminals of said driver circuit, respectively, to provide output signals indicative of frequency adjustment ratios, means for generating output pulses in number in dependence on said output signals, and means for adjusting said relatively high frequency signal to said correct value in response to said output pulses.

4,188,776

ELECTRONIC WATCH

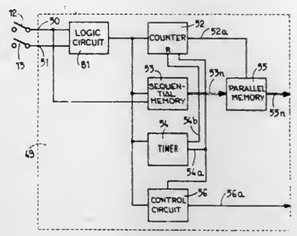
Igor Scherrer, Colombier, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,106

Claims priority, application Switzerland, Dec. 16, 1976, 15972/76

Int. Cl.[2] G04C *3/00, 9/00*

U.S. Cl. 58—23 R **12 Claims**



1. A method of selecting a function of a watch, said method comprising:

producing a predetermined number and a predetermined sequence of electrical code signals, said number and sequence of code signals corresponding to at least one watch function;

storing said sequence of code signals;

counting said code signals which are produced within a predetermined time period;

comparing said count of said code signals with said predetermined number; and

decoding said stored sequence of code signals when said count of said code signals equals said predetermined number within said time period.

4,188,777

ELECTRO-MECHANICAL CALENDAR WATCH

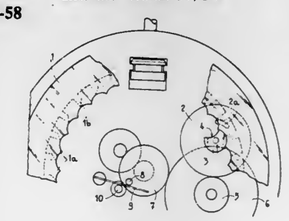
René Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Sep. 30, 1977, Ser. No. 838,050

Claims priority, application Switzerland, Oct. 4, 1976, 12508/76

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—58 **9 Claims**



1. An electromechanical calendar watch comprising:

date indicator means mounted in said watch for indicating the days of a month, said means being advanceable to change the indicated day once every 24 hours;

hour indicator means revolving in said watch for indicating hours of each day during two normal revolutions of 12 hours each;

gear means coupled to said date indicator means and said hour indicator means for advancing said date indicator means one day during at least a third revolution of said hour indicator means occurring after said two normal revolutions;

drive means coupled to one of said date indicator means, said hour indicator means and said gear means, for driving said

date indicator means, said hour indicator means and said gear means; and

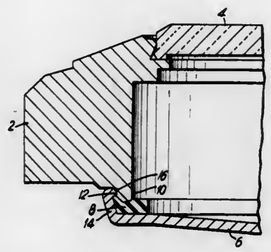
control means coupled to said drive means and said hour indicator means for controlling said drive means at a normal operating speed during said two normal revolutions of said hour indicator means and at an advancing speed which is significantly greater than normal operating speed during said third revolution of said hour indicator means.

4,188,778

CASEBACK WITH NONCIRCULAR, MULTILOBED SNAP-FIT SURFACE

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Jul. 14, 1978, Ser. No. 924,779
Int. Cl.² G04B *37/00*
U.S. Cl. 58—88 R **11 Claims**



1. In a timepiece of the type having a case with an access opening and an engagement surface of circular cross-section on a back side and a back cover snap-fitted to the engagement surface to cover said opening, the improvement which comprises:

a back cover member having improved snap-fitting means for facilitating attachment and removal of said cover member to the case, said snap-fitting means comprising a peripheral engagement surface of noncircular, multilobed cross-section having a lobal diameter selected in relation to the diameter of the circular engagement surface of the case such that said engagement surfaces are in snap-fit relation only at multiple, spaced locations corresponding in number to the number of lobes on said circular engagement surface;

whereby said noncircular engagement surface can flex elastically between said spaced locations and thus facilitate snap-fitting of said back cover member to and from said case at any circumferential position of the back cover relative to the case.

4,188,779

ELECTRONIC TIMEPIECE CAPABLE OF SIMULATING AND DISPLAYING A GAME OF CHANCE

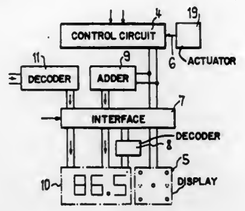
Jean-Claude Fatton, Le Landeron, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Oct. 11, 1977, Ser. No. 841,213
Claims priority, application Switzerland, Oct. 21, 1976, 13300/76
Int. Cl.² G04B *47/04*
U.S. Cl. 58—153 **16 Claims**

1. An electronic timepiece capable of displaying the time and of simulating and displaying a game of chance, said timepiece comprising an oscillator and a display device for indicating the time, at least part of said display device being used to display game elements which simulate a game of chance, wherein at least part of the time measuring circuits of said timepiece are utilized for the game of chance, said timepiece further comprising:

a counter at least indirectly connected to said oscillator for counting the signals delivered at the input of said counter by said oscillator, said oscillator also being used continuously by the time measuring circuits for keeping time;

decoder means connected to the output of said counter for controlling the display of said game elements; and



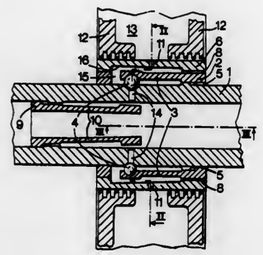
actuator means connected in the circuit of said timepiece after said oscillator for interrupting and storing the continuously changing information counted in said counter, so that the stored information is capable of controlling the display of said game elements.

4,188,780

CENTRIFUGALLY CONTROLLED FUEL SYSTEM

Robert N. Penny, Solihull, England, assignor to Noel Penny Turbines Limited, Coventry, England

Filed Oct. 20, 1977, Ser. No. 843,791
Claims priority, application United Kingdom, Oct. 21, 1976, 43634/76
Int. Cl.² F02C *9/04*
U.S. Cl. 60—39.28 R **9 Claims**



1. A fuel system comprising an engine-driven tubular shaft to be rotated at engine speed or at a speed proportional thereto, a fuel inlet in the shaft and through which fuel is introduced into the interior of the shaft during operation of an engine to which the fuel is to be supplied, at least one port in the peripheral wall of the shaft communicating externally of the shaft with a combustion region of the engine, at least one first resiliently-supported valve member mounted on the outside of the peripheral wall of the shaft in registration with the port therein and movable away from the shaft centrifugally as the speed of rotation of the shaft increases to open the port and thus to allow fuel to flow through the port to the combustion region.

4,188,781

NON-LINEAR DUAL MODE REGULATOR CIRCUIT

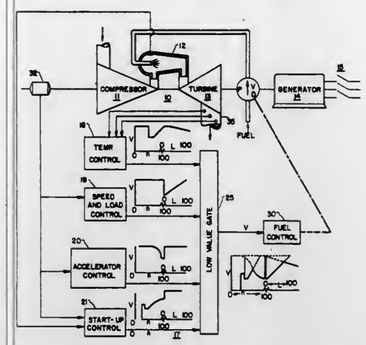
Daniel Johnson, Rexford, and Raymond T. Girard, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1978, Ser. No. 899,795
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **10 Claims**

1. In a turbine-generator control system having means to control fuel flow to the turbine in accordance with an electrical fuel command signal, a non-linear droop control circuit comprising:

means for obtaining a difference signal proportional to the difference between a reference signal proportional to synchronous speed and a signal proportional to the actual turbine speed;

limiter means responsive to said difference signal for providing an output signal proportional to said difference signal below a preselected threshold and a magnitude limited signal above said preselected threshold; and



first summing amplifier means for summing said difference signal and the output signal from said limiter means;

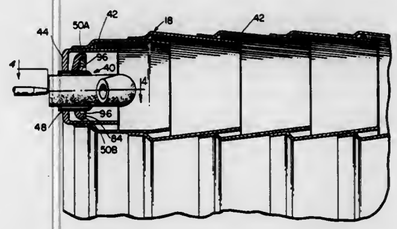
second summing amplifier means for summing the output of said first summing amplifier and said signal proportional to actual turbine speed for providing said command signal, said command signal enabling fuel flow at a faster rate for an output signal above said threshold than for an output signal below said threshold.

4,188,782

FUEL VAPORIZING COMBUSTOR TUBE

B. Clark Smith, and Gene A. Anders, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 14, 1977, Ser. No. 860,644
Int. Cl.² F02C *7/22*
U.S. Cl. 60—733 **24 Claims**



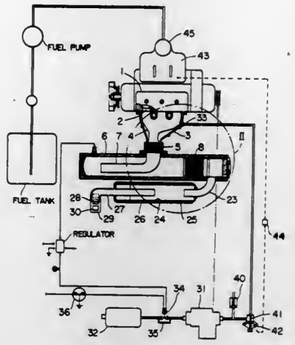
1. A continuous fuel vaporizer tube adapted for use in a vaporizing type combustor, said tube including a hollow stem portion with an open end base, a head portion atop said stem and including a hollow leg portion extending laterally from said head portion, the hollow interiors of said stem portions, said head portion, and said leg portion constituting a continuous closed duct with a smooth continuous flow path contour therethrough, said leg portion terminating in a vapor discharge orifice disposed at an acute angle to the axis of said stem portion, and operable to direct the path of a discharged vapor stream at an acute angle away from said stem and thereby displace the vapor stream path away from the base of said stem.

4,188,783

EXHAUST GAS PURIFICATION DEVICE

Shigemasa Sayo; Yasuyuki Sugiura, both of Hamamatsu; Katutoshi Ueda, Iwata; Hirohiko Fujiwara, Hamamatsu, and Toshikatsu Hibi, Hamana, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Hamana, Japan

Filed Aug. 10, 1977, Ser. No. 823,443
Int. Cl.² F01N *3/15*
U.S. Cl. 60—277 **3 Claims**



1. In an exhaust gas purification device for use in an internal combustion engine of the type including an exhaust manifold, a purification cylinder connected with said exhaust manifold, a first honey comb catalyst, a second honey comb catalyst positioned at a downstream portion of said purification cylinder, and a muffler connected with said purification cylinder on the downstream side of said second catalyst; an improvement wherein both of said first and second catalysts consist of oxidation catalyst, the first and second honey comb catalysts being separated and respectively provided at the exit portion of the exhaust manifold and at the inner portion of the purification cylinder, a secondary air inlet being provided at an upstream portion of the first honey comb catalyst, said first and second honey comb catalysts are respectively supported by steel wool rings, each of said rings comprising a coarse portion adapted for cushion and a dense portion adapted for sealing, and an intake pipe is provided at the central portion of the cylindrical wall of said purification cylinder, said purification cylinder being surrounded by an outer sleeve so that both ends of said cylinder can expand freely and axially when heated, said outer sleeve being fitted with a heat insulating layer.

4,188,784

ARTICULATED EXHAUST SYSTEM

John F. Hall, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 735,462, Oct. 26, 1976, abandoned.
This application Dec. 5, 1977, Ser. No. 857,488
Int. Cl.² F01N *7/10*
U.S. Cl. 60—323 **13 Claims**



1. In an exhaust system for a transversely mounted automobile engine having a transversely extending roll axis which

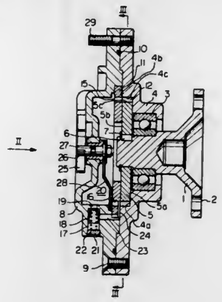
results in predominant movements of the parts attached to the engine in planes substantially normal to the roll axis; an exhaust gas passage comprising an exhaust manifold with an outlet portion thereof attached to the engine for conducting exhaust gases from the engine and also an exhaust header with an inlet portion for conducting exhaust gases from the manifold to atmospheres; means forming an articulated connection between the outlet portion of the manifold and the inlet portion of the header including two annular coupling portions of the gas passage associated respectively with the members comprising the manifold outlet portion and the header inlet portion and having seal surfaces removably interfitting one within the other in mutual sliding and sealing engagement around the gas passage; the coupling portions being carried by the members respectively for movement therewith and with one coupling portion being in the form of a distinct annularly shaped seal member extending around one of the members; means around the one member for preventing axial movement of the seal member in one direction away from the other coupling portion and having outwardly extending portions; means for urging the members and coupling portions together to effect sealing engagement therebetween including a pair of springs, each being diametrically positioned with respect to the axis of the members and together lying in a plane which extends substantially normal to the aforedescribed plane of predominant movement; the springs being secured between the members so as to yieldably urge the members axially toward one another to form a sealing contact between the coupling portions.

4,188,785

FLUID COUPLING

Masahisa Ando, Aichi; Keigo Kato, Toyota; Masami Yamazaki, Toyota, and Tetsuro Akagi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 4, 1978, Ser. No. 893,437
Claims priority, application Japan, Jan. 7, 1978, 53-366
Int. Cl.² F16D *31/00*
U.S. Cl. 60—325 **8 Claims**



1. A fluid coupling comprising: a housing being used as one of a rotary driving means and a rotary driven means, a rotor rotatably mounted in said housing and being used as the other of said rotary driving means and said rotary driven means, a fluid pumping means having a pump chamber formed between said housing and said rotor with a fluid inlet port and a fluid outlet port, and a fluid circulation passage formed between said chamber and said housing and communicating with said chamber through said inlet port and outlet port, so that fluid in said fluid pumping means circulates from said fluid circulation passage into said pump chamber through said fluid inlet port and from said pump chamber through said fluid outlet port into said fluid circulation passage, said fluid coupling further comprising:

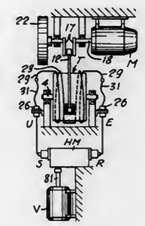
a fluid lock means including a cylinder bore provided in said housing, the axis of said cylinder bore being in the radial direction of said coupling, a governor-weight sealingly and slidingly disposed in said cylinder bore, a spring means for urging said governor-weight in the radially inward direction, a first opening provided at the radially inward portion of said cylinder bore, and a second opening provided at the side wall portion of said cylinder bore, said first and second openings of said fluid lock means being provided in said fluid circulation passage which communicates said fluid inlet port with said fluid outlet port, and the governor-weight sealing communication between said first and second openings for rotational speeds of the housing below a predetermined value and opening communication therebetween at rotational speeds of the housing equal to or greater than said value.

4,188,786

HYDRAULIC MACHINE

Gino Franch, 10, Via G. Avezzana, Milan, Italy

Filed May 9, 1978, Ser. No. 904,263
Claims priority, application Italy, May 13, 1977, 4829 A/77
Int. Cl.² F15B *15/18*
U.S. Cl. 60—325 **9 Claims**



1. A hydraulic machine, which can be used at will as a pump or as a torque transducer, comprising: (a) an oscillating rotor rotatably mounted on a machine frame around a rotational axis, and which can be driven with reciprocating movement; (b) an active pipe circuit filled with fluid secured onto the oscillating rotor, said pipe circuit being curved in such a manner that the projection of its longitudinal axis onto a plane which is perpendicular to the rotational axis of the oscillating rotor defines a surface which increases with the length of the longitudinal axis of said active pipe circuit; and

(c) means for sealingly connecting the extremities of said active pipe circuit with a fixed inlet and a fixed outlet,

whereby the fluid contained in said active pipe circuit is subjected to a linear alternating acceleration which corresponds to the product of the alternating angular acceleration of the rotary oscillation of the rotor and the distance of the fluid from the rotational axis of said oscillating rotor, and which produces between the ends of said active pipe circuit and more particularly between said fixed inlet and said fixed outlet, a pressure difference in the fluid, said pressure difference correspondingly varying in an almost sinusoidal manner.

4,188,787

HYDRAULIC CONTROL APPARATUS

Raymond J. Bromell, Dallas, Tex., and George Homanick, Lathrup Village, Mich., assignors to National Advanced Drilling Machines, Inc., Houston, Tex.

Filed Jun. 5, 1978, Ser. No. 912,340
Int. Cl.² F16H *39/46;* F15B *1/02*
U.S. Cl. 60—327 **28 Claims**

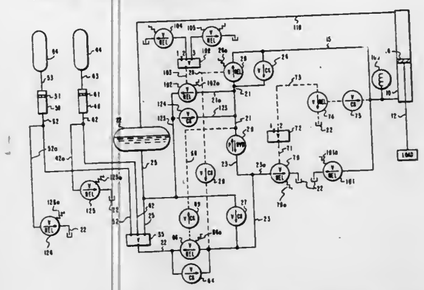
1. Apparatus for controlling the flow of fluid to and from a work cylinder comprising:

(a) reversible pump means for selectively alternatively delivering fluid between a first port and a second port at selectively variable rates,

(b) first conduit means connected between said first port of said pump means and said work cylinder,

(c) second conduit means connectable between a fluid reservoir and the second port of said pump means,

(d) first control means in said first conduit means permitting unrestricted fluid flow from said work cylinder to said first port but maintaining the pressure in said first conduit means between said first port and said first control means greater than the pressure at said second port when said pump means is operated to deliver fluid from said second port to said first port, and



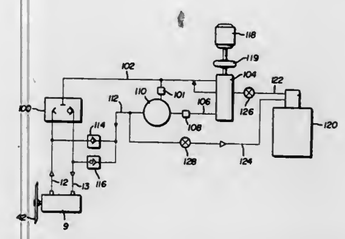
(e) second control means in said second conduit means permitting unrestricted fluid flow from said fluid reservoir to said second port but maintaining the pressure in said second conduit means between said second port and said second control means greater than the pressure at said first port when said pump means is operated to deliver fluid from said first port to said second port.

4,188,788

HYDRAULIC TURBINE SYSTEM

James D. Eller, 281 SE. 18th Ave., Deerfield Beach, Fla. 33441

Filed Jun. 14, 1978, Ser. No. 915,504
Int. Cl.² F03B *13/10;* F15B *15/18*
U.S. Cl. 60—398 **5 Claims**



1. A hydraulic hydroelectric turbine system comprising:

an electric generator;

rotary turbine blades;

hydraulic pump means for operation by rotation of said turbine blades;

hydraulic motor means operatively mechanically coupled to said generator for driving the same and having an inlet and an outlet;

a hydraulic fluid reservoir hydraulically coupled to said outlet of said motor means;

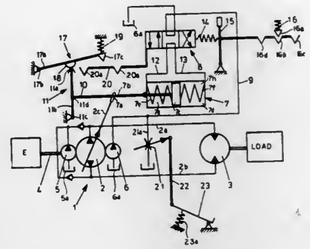
and connecting means including hydraulic lines connecting said pump means respectively to said inlet of said hydraulic motor means and, to said reservoir in a closed hydraulic loop for operating said motor means by hydraulic fluid pumped by said pump means in response to rotation of said turbine blades by water flow.

4,188,789

HYDRAULIC SERVOCONTROLLER FOR A HYDROSTATIC TRANSMISSION

Karlmann Hamma, Tettnang, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,223
Int. Cl.² F16H *39/46*
U.S. Cl. 60—444 **7 Claims**



1. A hydrostatic transmission comprising:

a hydrostatic pump driven by a prime mover and constituting a first hydraulic machine, a hydrostatic motor connected to a load and constituting a second hydrostatic machine, and hydraulic lines connecting said motor and said load in a main working network, one of said machines having a control element shiftable between extreme positions through a neutral position to control the direction of operation of said load and the transmission ratio between said machines;

a hydraulic cylinder connected to said element for displacing same;

a three-position valve having a neutral position and a pair of limiting positions;

a direction selector for selecting the positions of said valve and thereby controlling said cylinder correspondingly to displace said element;

force-generating means operated by said selector to apply a corresponding force to said valve tending to urge said valve into the selected position thereof;

locking means connected with said valve for preventing the displacement of said valve by said force-generating means unless said element is in its neutral position; and

means responsive to the position of said element for releasing said locking means in the neutral position of said element.

4,188,790

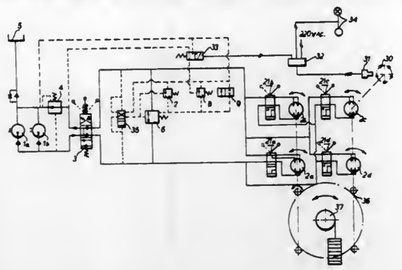
HYDRAULIC SYSTEM FOR OPERATION OF A WINCH

Håkon S. Pedersen, Bergen, Norway, assignor to A/S Bergens Mekaniske Verksteder, Bergen, Norway

Continuation of Ser. No. 837,090, Sep. 28, 1977, abandoned, which is a continuation of Ser. No. 721,416, Sep. 8, 1976, abandoned, which is a continuation of Ser. No. 550,617, Feb. 18, 1975, abandoned. This application Oct. 4, 1978, Ser. No. 948,551
Claims priority, application Norway, Feb. 21, 1974, 740589
Int. Cl.² F15B *13/06, 13/09*
U.S. Cl. 60—483 **2 Claims**

1. A hydraulic system operating in combination with a winch, comprising at least two hydraulic motors connected in parallel for operation of the winch, pump means for supplying oil to the motors, a control valve for controlling the speed and direction of rotation of the motors, one of the motors having a dual capacity and a valve for selecting the capacity of the dual capacity motor, means for selectively coupling the motors to

the oil supply to provide a plurality of speed ranges, a return connection for the oil to the pump, and means to restrict flow



in the return connection to provide a braking action on the motors when the motors are driven by the load.

4,188,791

PISTON-CENTERING SYSTEM FOR A HOT GAS MACHINE

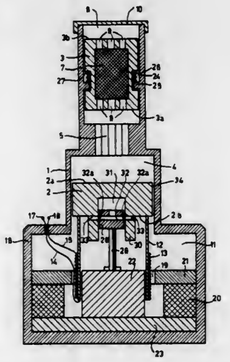
Jan Mulder, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,576

Claims priority, application Netherlands, Mar. 2, 1977, 7702207

Int. Cl.[2] F02G *1/04*

U.S. Cl. 60—520 **4 Claims**



1. A free piston hot gas machine comprising at least one working space in which a working medium performs a thermodynamic cycle, the working space including a compression space and an expansion space of mutually different mean temperatures during operation,

a buffer space which contains working medium during operation at an at least substantially constant pressure which corresponds to the mean working medium pressure in the working space,

at least one heat exchanger including a regenerator, connecting said compression and expansion spaces,

a cylinder containing at least one free piston reciprocatable therein, one surface of the piston varying the volume of the working space, and the other surface forming a part of the boundary of the buffer space, and

a control mechanism for maintaining a given central position of the free piston by instantaneous opening of a connection between the buffer space and a space in which a variable pressure prevails, said control mechanism comprising an auxiliary cylinder element and an auxiliary piston element movable within the auxiliary cylinder element, one of said elements being connected to the free piston and the other element being rigidly arranged, said auxiliary piston having at least a first duct therein having an end which opens through the auxiliary piston wall, said auxiliary cylinder having at least a second duct which communicates with said buffer space and has an end opening through the auxiliary cylinder wall, in a given position of the auxiliary piston said ends of said ducts communicating with each other,

wherein said auxiliary piston element is arranged so as to vary the volume of an auxiliary cylinder space, and said first duct is arranged to communicate between said piston wall and the auxiliary cylinder space.

4,188,792

METHOD AND APPARATUS FOR REGULATING A STEAM TURBINE INSTALLATION

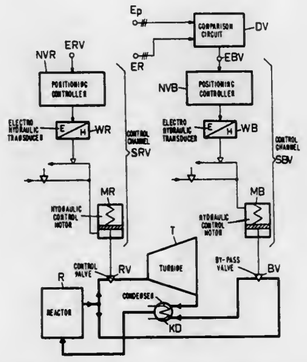
Wolfgang Schaible, Sonnenbergstrasse 773 B, 5303 Würenlingen, Switzerland

Filed Apr. 21, 1977, Ser. No. 789,570

Claims priority, application Switzerland, Jan. 31, 1977, 1125/77

Int. Cl.[2] F01K *13/02*

U.S. Cl. 60—660 **41 Claims**



1. A method of controlling a steam turbine plant, especially a steam turbine plant drawing its steam from a boiling water reactor, comprising the steps of:

providing a supply pressure control device capable of performing a supply pressure control of the steam turbine plant and delivering a controller output quantity;

providing a rpm-power output control device capable of performing a rpm control with subordinated power output control and delivering a controller output quantity;

comparing the controller output quantity of the supply pressure control device and the controller output quantity of the rpm-power output control device;

performing a minimum value selection of the smallest one, in terms of rate of steam flow, of the controller output quantities of the control devices in order to control the rate of steam flow through the turbine at least predominantly by said smallest one of the controller output quantities of said control devices;

following a change of the control of the rate of steam flow through the turbine by the rpm-power output control device to the supply pressure control device and which change is a function of the result of the comparison between the controller output quantities of the supply pressure control device and the rpm-power output control device introducing a substitute signal of predetermined magnitude in place of the controller output quantity of the rpm-power output control device into the comparison between the controller output quantities of the supply pressure control device and the rpm-power output control device; and

replacing said substitute signal by the controller output

quantity of the rpm-power output control device only in the event of a drop in the power output of the turbine.

4,188,793

CONDENSATION OF VAPOR OF ORGANIC LIQUIDS

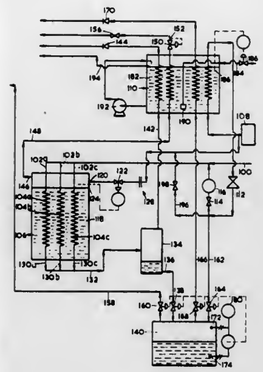
Richard W. Watson, Derby; William J. Grant, London, and David J. Graham, Loughborough, all of England, assignors to BOC Limited, England

Filed Jul. 25, 1977, Ser. No. 818,807

Claims priority, application United Kingdom, Jul. 28, 1976, 31525/76

Int. Cl.[2] F17C *7/02, 13/00;* F25D *15/00*

U.S. Cl. 62—51 **19 Claims**



1. A process for condensing the vapour of a volatile liquid comprising the steps of: taking a stream of gaseous mixture comprising the vapour of the volatile liquid and a non-flammable gas; condensing at a controlled temperature the vapour from said stream while leaving the non-flammable gas uncondensed by cooling the stream of gas mixture with refrigerant, the controlled temperature being between the boiling point of the volatile liquid at atmospheric pressure and the boiling point of the refrigerant at atmospheric pressure and also between the boiling and freezing points of the volatile liquid at the prevailing pressure at which the condensate is formed; forming the refrigerant by taking liquid nitrogen from a souce thereof; and collecting the condensate; warming the uncondensed gas to a temperature at or near to ambient temperature; and venting the uncondensed gas and vaporized nitrogen.

4,188,794

FREEZER WITH RAPID DEFROSTING

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 792,456, Apr. 29, 1977, abandoned, Ser. No. 576,447, May 12, 1975, abandoned, and Ser. No. 299,214, Oct. 4, 1972, Pat. No. 3,888,303. This application May 22, 1978, Ser. No. 908,509

Int. Cl.[2] F25D *21/12*

U.S. Cl. 62—82 **9 Claims**

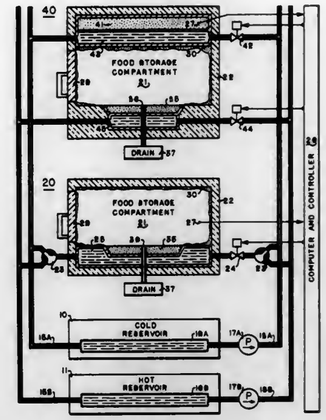
1. A method for rapidly melting frost in a freezer comprising the steps of

cooling a compartment to a low temperature below the freezing temperature of water, said compartment having an opening to ambient air whereby water vapor enters to deposit on compartment surfaces as frost,

heating a concavity communicating with the compartment and containing a water substance retained from a previous defrosting period substantially above the boiling temperature of water to generate steam,

delivering said steam to the compartment where the steam condenses upon the frost to melt the frost thereby forming a melt,

delivering at least a portion of the melt to the concavity, retaining a portion of the melt in the concavity for use in a subsequent defrosting period, and



stopping heating of said concavity thereby returning compartment temperature to the low temperature.

4,188,795

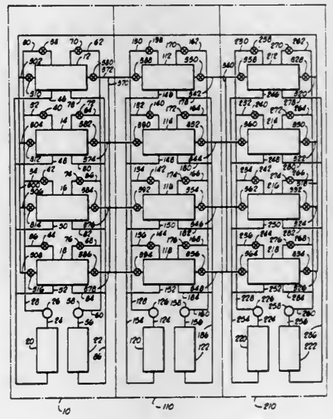
HYDROGEN-HYDRIDE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND HEAT PUMP CYCLES

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302

Continuation of Ser. No. 838,106, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,231, Aug. 18, 1976, Pat. No. 4,055,962. This application Dec. 14, 1978, Ser. No. 969,468

Int. Cl.[2] F25B *15/00;* F01K *25/10*

U.S. Cl. 62—102 **18 Claims**



1. An absorption system comprising:

a first hydride-dehydride subsystem including first reactor means;

a first hydridable material in said first reactor means for forming a first hydride by reaction with hydrogen gas;

a second hydride-dehydride subsystem including second reactor means;

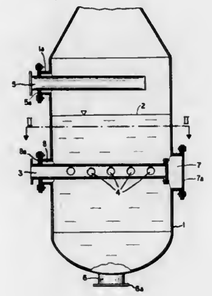
a second different hydridable material in said second reactor means for forming a second hydride by reaction with hydrogen gas;

a third hydride-dehydride subsystem including third reactor means;
a third still different hydridable material in said third reactor means for forming a third hydride by reaction with hydrogen gas;
hydrogen;
means for periodically transferring hydrogen gas in circuit among said first, second and third reactor means;
means for supplying heat to said first, second and third reactor means in alternating sequence for effecting chemical compression and dehydriding of the hydrides of said first, second and third hydridable materials; and
means for removing heat from the reactor means in each of said subsystems.

4,188,796
METHOD OF AND APPARATUS FOR THE COOLING (QUENCHING) OF CRACKING GASES

Markus Raab, Munich; Hans P. Langebach, Pullach, and Heiner Dittmann, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,290
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646691
Int. Cl.² F28C *1/00*
U.S. Cl. 62—121 **10 Claims**



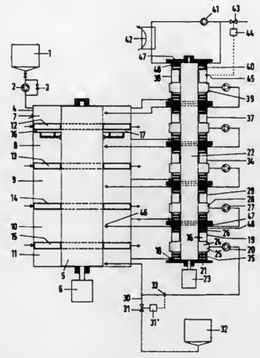
1. A method of cooling a reactive cracking gas with a cooling oil, comprising dispersing said reactive cracking gas in a cooling-oil liquid bath below the level thereof, said cracking gas being dispersed in said bath by feeding it through a plurality of orifices at a velocity such that its Froude and Weber numbers are each greater than **4**.

4,188,797
COUNTER CURRENT CRYSTALLIZER

Henricus A. C. Thijssen, Son, and Bernardus G. M. van der Malen, Hagestein, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek, Koffieliranderigen in Theehandel B.V., Utrecht, Netherlands

Filed Dec. 30, 1977, Ser. No. 866,169
Claims priority, application United Kingdom, Jan. 12, 1977, 1086/77
Int. Cl.² B01D *9/04*
U.S. Cl. 62—123 **1 Claim**

1. Apparatus for the continuous freeze concentration of aqueous solutions comprising in combination:
(a) enclosure means defining a cylindrical crystallization zone;
(b) a rotatable axle coaxial with the crystallization zone mentioned under (a);
(c) a plurality of cooling trays within the crystallization zone mentioned under (a), distributed at preselected distances along the axle mentioned under (b), and substantially perpendicular to that axle, said cooling trays extending in radial direction from the inner wall of the enclosure means mentioned under (a) to the axle, such as to divide the crystallization zone, mentioned under (a) in a number of cooling compartments;
(d) wiper means, adapted to cooperate with and wipe the surface of the cooling trays, mentioned under (c);
(e) means to separate the ice crystals of each of the cooling compartments, mentioned under (c) from liquid in that compartment;
(f) means belonging to each cooling compartment to separate the ice crystals of the second and additional cooling compartments from liquid and pass said ice crystals to the proceding compartment;

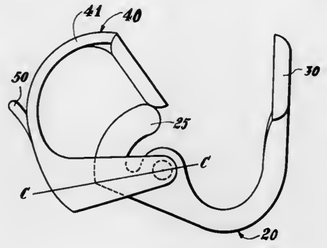


(g) means to pass liquid obtained from the second to the penultimum separating means mentioned under (f) to the succeeding cooling compartment;
(h) means to separate the ice crystals of the first cooling compartment from liquid and feed out said ice crystals;
(i) means to pass liquid obtained from the first separating means mentioned under (h) to the second cooling compartment;
(j) means to feed in the aqueous solution in the first cooling compartment;
(k) means to recover liquid obtained from the last separating means as a product.

4,188,798
EAR CLIP WITH FRICTION-RETAINED GRIPPING PORTIONS

Johannes A. W. P. Van Bergen, 109 Westward Deals, Kedington, Haverhill, Suffolk, England

Continuation of Ser. No. 724,970, Sep. 20, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,044
Claims priority, application United Kingdom, Oct. 1, 1975, 40113/75
Int. Cl.² A44B *21/00*
U.S. Cl. 63—14 C **2 Claims**

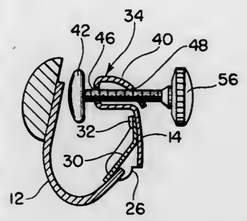


1. An ear ornament clip which comprises a front part and a back part so connected to one another as to permit angular movement of said parts relative to one another in order to grip or release the lobe of the wearer's ear,
(a) said front part having a first portion of which one face is adapted to carry the ornament and of which the other face is adapted to be placed in contact with that surface of the lobe of the wearer's ear against which said ornament is to be displayed;
(b) said front part having a second portion which is integral with said first portion and which includes elements which are so joined to one another at corresponding one ends thereof as to form resilient elements in the form of a V;
(c) said back part comprising a generally C-shaped back part which has a first portion which includes a face which is adapted to be placed in contact with that surface of the lobe of the wearer's ear which is remote from said surface thereof against which said ornament is to be displayed;
(d) said back part having a second portion which is integral with the first portion thereof and which comprises substantially parallel legs;
(e) said front part having first means located near said resilient elements and said back part having second means located near the free ends of said legs, said first means and said second means being complementary and coacting to form a pivotal connection between the front and back parts;
(f) angular movement of the front and back parts relative to one another to a condition in which the lobe of an ear becomes gripped between the first portion of the front part and the first portion of the back part causing the lobe-gripping portions of said front and back parts of the clip to become disposed directly opposite to one another and causing the inside surfaces of said legs to smoothly slide with linearly-increasing friction along the outside surfaces of said resilient elements towards said free ends of said resilient elements and to force the divergent resilient elements together to establish and to maintain the desired lobe-gripping condition of said front and back parts;
(g) said elements of said second portion of said front part which are so joined to one another at corresponding one ends thereof as to form resilient elements in the form of a V having corresponding other and free ends which are directed towards said first portion of the front part; and
(h) said generally C-shaped configuration of said back part is such that in the fully open condition of the ear ornament clip, that end portion of said back part which is remote from said free ends of said legs is in contact with at least one of said resilient elements.

4,188,799
EAR CLIP

Nazareno J. Saccoccio, East Greenwich, R.I., assignor to Aro-Sac Inc., Providence, R.I.

Filed May 8, 1978, Ser. No. 905,094
Int. Cl.² A44C *7/00*
U.S. Cl. 63—14 D **8 Claims**

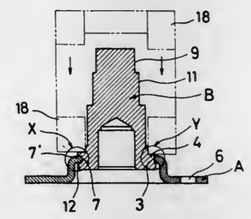


1. A clip for earrings and the like comprising first and second jaw members pivotally connected to each other at respective ends thereof, said members movable between open and closed positions thereof and including spring means for urging said members to said closed position, said first jaw members having means at the other end thereof for contacting outer lobe portions of a wearer's ear, said second jaw member terminating at its other end in a generally C-shaped loop having in sequence, base, root and terminal segments, a pair of spaced aligned smooth bore openings respectively provided through said root and said terminal segments a screw carried by said loop received through said aligned openings, said screw provided at one end thereof with contact means adapted to cooperate with said contact means on said first jaw member and for engaging the opposite side of said ear lobe and at the other end thereof with means for manually rotating said screw for movement relative to said first jaw member for adjusting the spacing between both of said contact means and accordingly the amount of pressure exerted by said clip upon the ear, the terminal segment of said loop passing across and beneath said screw in a non-perpendicular angular position relative to the axis of said screw such that the screw receiving opening therein is similarly inclined with respect to said screw so that edge portions of said terminal segment defining said opening contact thread surfaces of said screw at axially spaced positions along said screw, whereby said screw is firmly threadably engaged by said terminal segment, said terminal segment being deflectable in the direction toward said root segment towards a more normal disposition with said screw axis by advancing movement of said screw wherein the effective diameter of said terminal segment opening is increased so as to accomodate increased screw thicknesses without binding.

4,188,800
DRIVE SHAFT OF FAN COUPLING ASSEMBLY FOR MOTOR VEHICLES

Saburo Fujita; Hiroaki Toyoda, both of Anjo; Junichi Ito, Handa, and Masaharu Hayashi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed Jun. 7, 1977, Ser. No. 804,346
Claims priority, application Japan, Jun. 10, 1976, 51-75462
Int. Cl.² F16C *1/06, 1/26;* F16G *11/00*
U.S. Cl. 64—4 **2 Claims**



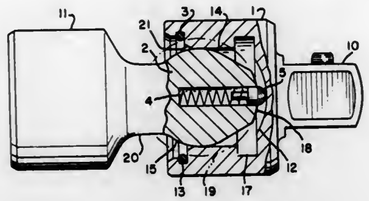
1. A drive shaft of a fan coupling assembly which comprises:
a shaft member fixedly connected with a fan drive rotor, and
a flange member fixedly connected with a fan pulley, said shaft and said flange member being separately formed and being secured to each other so as to form an integral flange shaft, said integral flange shaft including first means preventing said two members from moving axially, respectively, and second means preventing said two members from moving in a rotational direction, respectively, wherein said integral flange shaft is provided with a securing portion for securing said flange member, and a flange portion coaxially formed at one end thereof for supporting said flange member thereon and said flange member having a central bore including a plurality of radially outwardly recessed portions and wherein said first means includes a portion of said integral flanged shaft fixedly enclosing said flange portion along the outer periphery of said central bore, said second means including a portion of said integral flanged shaft disposed within said recessed portions without forming a gap therebetween.

4,188,801

UNIVERSAL JOINT

Melvin D. Hugh, Wilmington, and Chauncey H. Moore, Huntington Park, both of Calif., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 3, 1978, Ser. No. 921,327
Int. Cl.[2] F16D *3/02, 3/16, 3/50*
U.S. Cl. 64—7 **11 Claims**



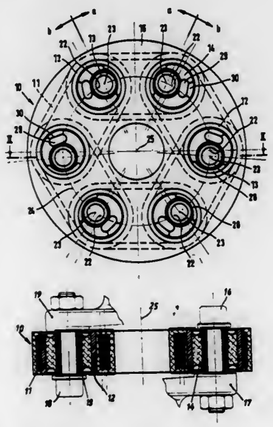
1. A universal joint which comprises:
an interacting socket and spherical ball member, said socket member having equispaced straight sides and a spherical bottom portion;
said ball member having an equal number of sides each of which are both radiused and sloped and which do not intersect each other and which co-act with said straight sides of said socket member; and
said ball member having a spherical head for coacting with said spherical bottom of said socket member.

4,188,802

ELASTIC SHAFT PLATE FOR SHAFT COUPLINGS

Gerhard Zeidler, and Günther Ziegler, both of Waldkraiburg, Fed. Rep. of Germany, assignors to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG, Waldkraiburg, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,800
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705598
Int. Cl.[2] F16D *3/58, 3/62*
U.S. Cl. 64—12 **11 Claims**



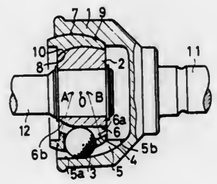
1. An elastic shaft plate for shaft couplings, comprising sleeves disposed angularly spaced around a shaft plate axis, said sleeves being wrapped in pairs by string coils and embedded together with the coils in an elastomeric material, wherein at least one sleeve of each pair of sleeves wrapped by a common string coil is an external sleeve receiving an internal body adapted to be fixed to one of two shafts to be coupled, a spacing being provided between said external sleeve and said internal body, said spacing likewise containing an elastomeric material, the width of said spacing in circumferential direction of said shaft plate at least at one side of said internal body being smaller than the width of said spacing at either side of said internal body in radial direction of said shaft plate.

4,188,803

CONSTANT VELOCITY UNIVERSAL JOINT

Nobuyuki Otsuka, Kawagoe, and Seiichi Hiral, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,604
Claims priority, application Japan, Dec. 16, 1977, 52-168321[U]
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 **4 Claims**



1. A constant velocity universal joint comprising inner and outer members having interengaged free ends, and a ball cage with a plurality of balls interposed between said inner and outer members, said inner and outer members having respective outer and inner surfaces facing one another, said outer and inner surfaces having axial grooves therein in which said balls are engaged, said inner and outer surfaces being of spherical shape with offset centers, said ball cage having inner and outer surfaces of spherical shape in respective rocking engagement with the outer and inner surfaces of the inner and outer members, said grooves extending from the free ends of the inner and outer members axially and rectilinearly along about one-half the length of the grooves and then extending along a curved path for the remaining one-half of the length of the grooves, the curved paths of the two grooves having a common center disposed between said offset centers.

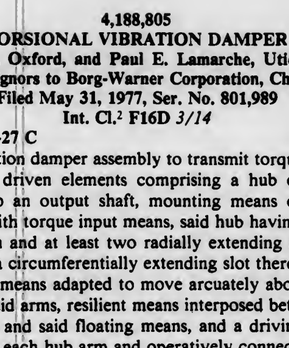
4,188,804

DIAL AND CYLINDER KNITTING MACHINE

Nicole Hoffmann, 58 rue de Bellechasse, Paris, France

Filed Jun. 9, 1978, Ser. No. 914,017
Claims priority, application Italy, Jun. 16, 1977, 49856 A/77
Int. Cl.[2] D04B *9/20, 9/22*
U.S. Cl. 66—24 **10 Claims**

1. Circular machine for stockings and other knitted articles, equipped for the formation of pouches with reciprocating motion, including cylinder needles, a cylinder with grooves for said cylinder needles and selection jacks, a cam shell for the control of raising and lowering of said needles and said selection jacks, said needles including butts, a plurality of yarn feeds, and inclusion and exclusion pickers, and further including in combination:
first descent cams for said needle butts and second descent cams for said selection jacks, in correspondence with each of said yarn feeds,
cam means for raising said selection jacks together with said needles for each said yarn feeds, said cam means being at different levels to act on a same number of rows of butts at different levels in said selection jacks and remaining fixed during the forming of the pouches;
said needles being arranged along a needle arc for forming the pouch;
said selection jacks including, for the forming of the pouches with a reciprocating motion with several feeds, at a first level butts present on said entire cylinder needle arc arranged for the forming of the pouch and at additional levels butts on smaller arcs, offset from one another and in the whole included in said arc arranged for the forming of the pouch;



means to exclude by lowering the needles of the instep which do not work during the pouch forming; and,
exclusion and inclusion pickers which act on the first level of said selection jack butts.

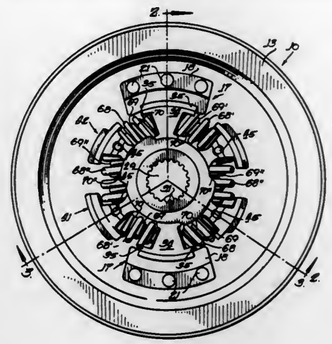
4,188,805

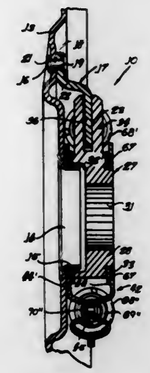
TORSIONAL VIBRATION DAMPER

Don R. Fall, Oxford, and Paul E. Lamarche, Utica, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,989
Int. Cl.[2] F16D *3/14*
U.S. Cl. 64—27 C **35 Claims**

1. A vibration damper assembly to transmit torque between driving and driven elements comprising a hub operatively connected to an output shaft, mounting means operatively associated with torque input means, said hub having a central body portion and at least two radially extending arms, each arm having a circumferentially extending slot therein, at least one floating means adapted to move arcuately about the hub relative to said arms, resilient means interposed between each of said arms and said floating means, and a driving member aligned with each hub arm and operatively connected to said mounting means, each driving member including a base portion on said mounting means and an offset tang received in said hub arm slot and extending inwardly into the path of and adapted to engage said resilient means, each floating member having an annular body portion and at least one radial arm extending therefrom and terminating in circumferentially extending lips having a notch at at least one end adapted to receive a portion of a driving tang.



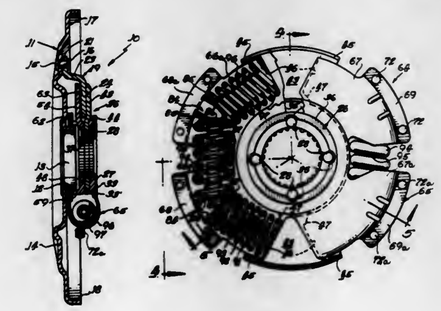


4,188,806

TORSIONAL VIBRATION DAMPER ASSEMBLY

Don R. Fall, Oxford, and Paul E. Lamarche, Utica, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,348
Int. Cl.[2] F16D *3/14*
U.S. Cl. 64—27 C **23 Claims**



1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member operatively associated with torque input means, a hub opera-

tively connected to torque output means and having at least two radial arms, at least one floating equalizer journalled on said hub, resilient means interposed between said hub arms and said equalizer, and drive tangs secured to said input member and having offset inward projections extending into the path of and engaging said resilient means, each hub arm having a circumferentially extending slot therein receiving said drive tang projection, said equalizer providing substantially enclosed pockets for said resilient means.

4,188,807

AUTOMATIC WASHING MACHINE FOR TEXTILES HAVING SEPARATE CONTAINERS FOR WASHING SUBSTANCES, METERS AND COMMON PRE-MIX CHANNEL FOR METERED SUBSTANCES

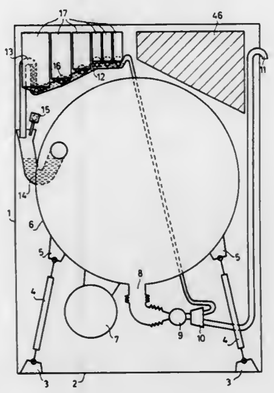
Richard Graf; Lieselotte Brodzina, both of Berlin; Rudolf Strobele, and Helmut Stache, both of Marl, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 747,420, Dec. 6, 1976, Pat. No. 4,110,075. This application Jun. 9, 1978, Ser. No. 914,174

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1975, 2554592

Int. Cl.[2] D06F *39/02*

U.S. Cl. 68—17 R **6 Claims**



1. In apparatus for a washing process for textiles in an automatic washing machine having a housing, a washing tank, a fresh-water inlet line to the tank, a valve to control the flow of fresh-water, a drain tube connected to the washing tank, a drain pump for discharging liquid from the tank through the drain tube, a discharge line connected to the pump for the discharge of liquid from the tank, the combination therewith of a plurality of separate containers each containing an active substance for the washing process, a number of metering devices with a metering device connected to each separate container, each metering device having a discharge tube for the discharge of a metered amount active substance from the separate container, a common pre-mix channel in which the discharge tubes of the metering devices terminate, a water seal connected to the washing tank, and conduit means for flowing liquid from the common pre-mix channel to the water seal from which the liquid flows into the washing tank.

4,188,808

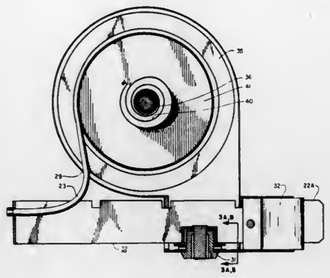
BICYCLE LOCK

Albert H. Valdez, 526 N. Kenwood, Apt. #6, Glendale, Calif. 91206

Continuation-in-part of Ser. No. 756,814, Jan. 5, 1977, abandoned. This application Nov. 14, 1977, Ser. No. 851,474

Int. Cl.[2] B62H *5/00*

U.S. Cl. 70—233 **13 Claims**



1. A bicycle lock comprising a lock body means for securing the lock body to the frame of the bicycle;

a "U" shaped member including a pair of legs of sufficient length to embrace a wheel of the bicycle and portions of the frame thereof and to extend into locking engagement with said lock body;

a flexible restraining device secured at one end to said lock body and at the opposite end to said "U" shaped member; and

means securing said "U" shaped member to said lock body for removal only by authorized disengagement therewith;

wherein said flexible restraining device is of sufficient length to encircle a structure and secure the frame of the bicycle to the structure when said "U" shaped member is secured to said lock body;

wherein said flexible restraining device is retractable into storage engagement with said lock body when not in use;

wherein said "U" shaped member is movable into storage engagement with said lock body when not in use thereby securing the opposite end of said restraining device.

4,188,809

APPARATUS FOR DETECTING THE SHAPE OF A STRIP

Masaki Ishimoto, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,208

Claims priority, application Japan, Mar. 30, 1977, 52-34439

Int. Cl.[2] B21B *37/00;* **G01L** *5/04, 5/10*

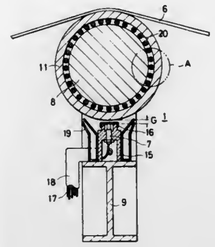
U.S. Cl. 72—17 **6 Claims**

1. Apparatus for detecting the relaxed shape of a running strip while it is under tension, comprising:

(a) a plurality of rings axially aligned adjacent each other to be arranged across the width of the strip with the outer peripheries of the rings in direct contact with a surface of the strip;

(b) a shaft extending axially through said rings and having means supporting opposite ends of said shaft for rotation about an axis;

(c) separate spring means fixed in and aligned over a space defined between the inner periphery of each of said rings and the outer periphery of said shaft for resiliently supporting said rings relative to said shaft, so that said rings may independently bodily move relative to said shaft



radially in the direction perpendicular away from the strip so as to bodily rotate eccentrically with respect to said shaft by an amount proportional to the tension in respective portions of the strip contacting the rings; and

(d) a corresponding plurality of gap sensing means, all fixedly mounted outside of said rings, at positions respectively opposed to the outer periphery of said rings, and for detecting the amount of the bodily eccentric movement of said rings, and said gap sensing means producing signals corresponding to said amount proportional to the tension in the strip.

4,188,810

Patent Not Issued For This Number

4,188,811

METAL FORMING METHODS

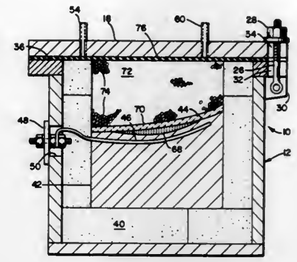
Daniel J. Brimm, La Jolla, Calif., assignor to Chem-tronics, Inc., El Cajon, Calif.

Filed Jul. 26, 1978, Ser. No. 928,315

Int. Cl.[2] B21D *22/12*

U.S. Cl. 72—63 **17 Claims**

1. A process for altering the shape of a metallic workpiece which comprises the steps of: placing the workpiece on the face of a die which face has a configuration wanted in the workpiece and concurrently heating said workpiece and applying pressure thereto via a compliant body composed of discrete pieces of a heat resistant, pressure transmitting material and located on that side of the workpiece opposite the die, the temperature to which the workpiece is heated and the pressure applied thereto being so correlated as to cause the workpiece metal to flow plastically at a stress below its yield



strength into contact with the face of said die to thereby impart the wanted configuration to the workpiece.

4,188,812

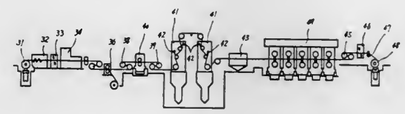
INSTALLATION FOR PRODUCTION OF CONTINUOUSLY COLD ROLLED SHEET METAL OR STRIP

Susumu Nomura; Hiromasa Hirata, both of Yokohama; Hisashi Takahashi; Takao Kawanami, both of Tokai, and Takashi Furuya, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Steel Corporation, both ofTokyo, Japan

Filed Jan. 3, 1979, Ser. No. 685

Int. Cl.[2] B21B *1/28, 45/04*

U.S. Cl. 72—227 **4 Claims**



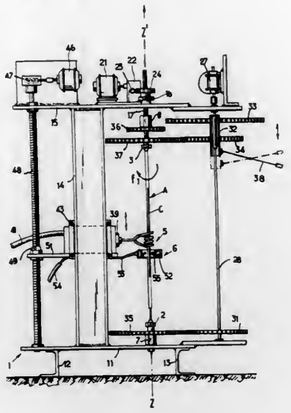
1. An installation for the production of continuously cold rolled sheet metal or strip comprising means for uncoiling a coil of hot-rolled sheet metal or strip, means for edging the leading and trailing ends of the preceding sheet metal or strip in such a way that the trailing end of the preceding sheet metal or strip may be correctly registered with the leading end of the succeeding sheet metal or strip, means for welding the uncoiled sheet metal or strip, means for trimming the side edges of the sheet metal or strip thus welded together so that the sheet metal or strip may have a predetermined width, means disposed at the downstream of said trimming means for mechanically descaling the surfaces of the sheet metal or strip, means for cleaning the surfaces of the sheet metal or strip emerging from said mechanical descaling means, means for shearing off the sheet metal or strip into a predetermined length, and means for recoiling the sheet metal or strip thus sheared off, all of said means being arranged in the order named.

4,188,813

METHOD AND MACHINE FOR THE MANUFACTURE OF LONG CONCRETE DRILLS PROVIDED WITH HELICAL SPLINES OVER PART OF THEIR LENGTH

Claude Bournicon, Lerpt, and James Mansion, St. Etienne, both of France, assignors to Centre Technique des Industries Mecaniques, Senlis, France

Filed Apr. 20, 1978, Ser. No. 898,287
Claims priority, application France, Apr. 26, 1977, 77 12500
Int. Cl.[2] B21K *5/04*
U.S. Cl. 72—299 **8 Claims**



1. A method for manufacture of a long concrete drill having helical splines extending over part of the length of the drill or any similar part of slender shape which comprises providing a workpiece having rectilinear splines, successively heating at least certain portions of the workpiece and subjecting said workpiece to elongation of controlled value by means of a controlled increase in the distance between the two extremities of the workpiece in order to subject said workpiece to plastic elongation while driving it in rotation at both ends about its own longitudinal axis, subjecting the two ends of the workpiece to different speeds of rotation during treatment of the splined portion of said workpiece in order to subject said splined portion to a twisting effort and thus to convert said rectilinear splines to helical splines, and subjecting the two ends of the workpiece to the same rotational speed during treatment of the non-splined portion of said workpiece.

4,188,814

SELF CLEANING ANIMAL FLOOR ASSEMBLY AND METHOD OF FABRICATING SAME

Gordon L. Dodge, Ankeny; Lewis D. Comstock, Oskaloosa; David J. Richards, Cedar, and Donald L. Brackett, Oskaloosa, all of Iowa, assignors to Mahaska Industries, Inc., Oskaloosa, Iowa

Filed Oct. 30, 1978, Ser. No. 956,571
Int. Cl.[2] B21D *28/26*
U.S. Cl. 72—324 **1 Claim**

1. The method of forming a self-cleaning animal floor assembly including floor members having alternating slots and ridges with said ridges including substantially flat surfaces extending from adjacent slot edges and merging into upwardly sloping surfaces converging to form ridges, said method including the steps of,

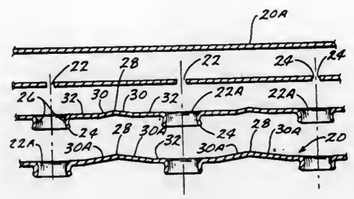
providing a flat piece of sheet metal,

removing a length of metal on the centerline of the slot being formed,

applying downward flaring pressure to the side edges of said slot to provide downwardly extending rounded slot side edges,

applying upward pressure to said sheet metal along a line immediately between said slots to form upwardly sloping surfaces converging to provide a rounded ridge, and

maintaining flat surfaces between said slots and said upwardly sloping surfaces including fixing the width of said



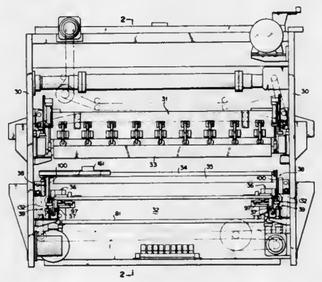
flat surfaces sufficiently narrow that said animals' feet will continue moving across said flat surfaces to said slots once said feet have started sliding down said upwardly sloping surfaces.

4,188,815

DIE CHANGING APPARATUS FOR A BENDING BRAKE

Akira Mizushima, Komatsu, Japan, assignor to Kabushiki Kiasha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 943,967
Claims priority, application Japan, Oct. 14, 1977, 52-123272
Int. Cl.[2] B21D *37/14*
U.S. Cl. 72—446 **11 Claims**



1. In a bending brake, apparatus for making selective use of a preselected number of interchangeable dies, comprising:

(a) frame means;

(b) a die bed fixedly mounted on the frame means for supporting thereon any selected one of the dies for bending operation;

(c) rack means movably mounted on the frame means and adapted to hold the preselected number of dies in respective preassigned storage locations therefor;

(d) die carrier means disposed opposite to the rack means for movement toward and away from same, the die carrier means being adapted to carry a desired one of the dies out of the rack means;

(e) die changer means for transporting a die to be replaced from the die bed on to the die carrier means and for transporting the desired die which has been carried out of the rack means by the die carrier means from the latter on to the die bed; and

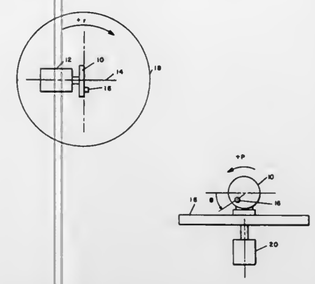
(f) die identifier means for ascertaining the identity of the replaced die and for causing the rack means to receive the replaced die in its preassigned storage location as the replaced die is carried back into the rack means by the die carrier means.

4,188,816

APPARATUS AND METHOD FOR PERFORMING INERTIAL MEASUREMENTS USING TRANSLATIONAL ACCELERATION TRANSDUCERS AND FOR CALIBRATING TRANSLATIONAL ACCELERATION TRANSDUCERS

Theodore Mairson, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 528,243, Nov. 29, 1974, abandoned.
This application Aug. 5, 1976, Ser. No. 711,770
Int. Cl.[2] G01L *25/00*
U.S. Cl. 73—1 D **39 Claims**



1. Apparatus for generating precise translational accelerations (a) at a point by means of simultaneous rotations about two orthogonal axes, comprising:

a first support;

first means for rotating said support about a first axis at a constant angular velocity (r');

a second support;

second means for rotating said second support about a second axis orthogonal to said first axis at a constant angular velocity (p);

a translational acceleration transducer mounted at a point lying on an axis separated from said second axis by a distance (z) parallel to said second axis but not coincident therewith, said transducer outputting a signal, representing translational acceleration (a), which is a sinusoid the amplitude of which is $2pr'z$ and the frequency of which is $p/2\pi$ when said first and second rotating means are rotated at r' and p, respectively; and

means for mounting said second rotation means on said first support.

4,188,817

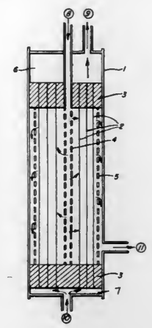
METHOD FOR DETECTING MEMBRANE LEAKAGE

Edward F. Steigelmann, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 4, 1978, Ser. No. 948,334
Int. Cl.[2] G01M *3/22*
U.S. Cl. 73—40.7 **4 Claims**

1. A method for the detection of leaking hollow fibers, said fibers exhibiting salt rejection, said method comprising:

contacting one side of one or more fibers with an aqueous salt solution so that purified water will pass across non-leaking fibers to the second side of such fibers and a salt enriched aqueous solution will pass to the second side of leaking fibers; and



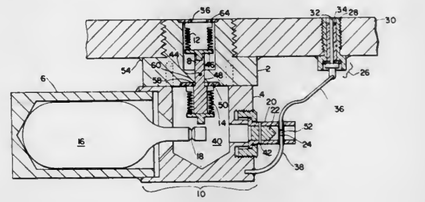
measuring the salt content of the aqueous solution on the second side of the fiber or fibers so that leaking fibers can be detected.

4,188,818

MECHANISM FOR LEAK TESTING OF HERMETICALLY SEALED VESSELS

Charles G. Garrison, San Jose, Calif., assignor to Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.), Hollister, Calif.

Filed Oct. 4, 1978, Ser. No. 948,455
Int. Cl.[2] G01M *3/20*
U.S. Cl. 73—40.7 **10 Claims**

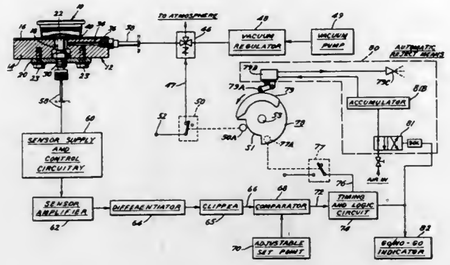


1. A mechanism to enable leak testing of a hermetically sealed vessel after said vessel has been sealed comprising, in combination:

A. a housing operable to be mounted interiorly and from an interior wall surface of a vessel before said vessel is hermetically sealed, said housing including there within a source of gas pressure and a means for selectively communicating said gas pressure outwardly therefrom, and into the hermetically sealed interior of said vessel; and

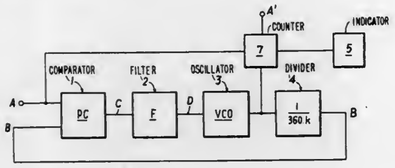
B. an actuator means for releasing said source of gas pressure while maintaining a hermetic seal between the interior and exterior of said vessel, said actuator means further comprising an actuator member which is movable by application of an externally applied force and a continuous wall structure which is connected between said movable member and said housing to maintain said hermetic seal, whereby gas pressure may be selectively released into the interior of said vessel to enable the vessel to be externally checked for leakage.

4,188,819
METHOD AND APPARATUS FOR SENSING GAS PRESSURE IN A CONTAINER
Walter W. Egee, Wallingford, Pa., and George R. Weaver, Maple Shade, N.J., assignors to Campbell Soup Company, Camden, N.J.
Filed Dec. 15, 1978, Ser. No. 969,728
Int. Cl.[2] G01M *3/36*
U.S. Cl. 73—52 **15 Claims**



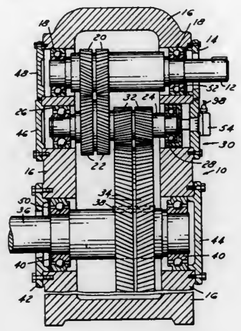
1. A method of testing the vacuum level in a closed container having a snap-action wall portion which assumes a more inward position when said vacuum level is sufficiently great, assumes a more outward position when said vacuum level is of a lesser value, and normally exhibits a rapid snap action in moving between said positions, comprising:
applying an outwardly-directed force to said wall portion sufficient to assure that it is in said more outward position, and thereafter discontinuing said applying of said force and detecting whether said wall portion then snaps into said more inward position.

4,188,820
DEVICE FOR MEASURING ROTATIONAL ANGLES OF A ROTATING SHAFT
Werner Moser, and Peter Mantsch, both of Graz, Austria, assignors to Hans List, Graz, Austria
Filed Jul. 5, 1978, Ser. No. 922,215
Claims priority, application Austria, Jul. 15, 1977, 5143/77
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **3 Claims**



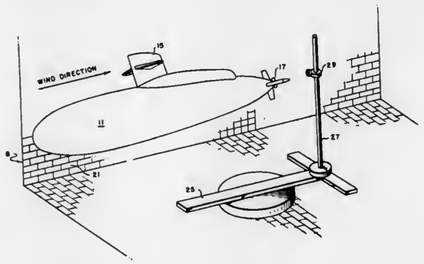
1. Apparatus for measuring angular rotation of a shaft between a reference position and an angular position removed therefrom, comprising:
a voltage-controlled oscillator for generating an output having a frequency dependent upon the angle between said reference position and a second reference position;
means for counting the oscillations in the output signal from said voltage-controlled oscillator and initiating counting upon receipt of a signal with detection of said reference position and terminating counting upon receipt of a signal associated with the angular rotation being measured; and
means for controlling said voltage-controlled oscillator and including a phase comparator having a first input responsive to a signal representing the count in said means for counting and a second input responsive to the output from said voltage divider, and means responsive to the output of said phase comparator for generating an analog signal controlling said voltage-controlled oscillator.

4,188,821
LOAD MEASUREMENT DEVICE
Charles R. Elias, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Mar. 2, 1978, Ser. No. 882,838
Int. Cl.[2] G01L *3/14*
U.S. Cl. 73—136 R **14 Claims**



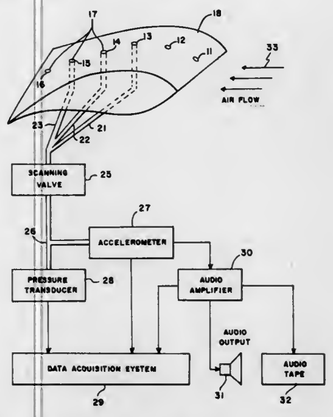
1. An apparatus for detecting and measuring the torque of a gear speed reducer means comprising a housing means, a load transmitting rotating shaft means within said housing means, said shaft means having plural bearing means connecting said shaft means to said housing means wherein the improvement comprises:
a transducer means located inside said speed reducer housing means and operatively connected between one of said bearing means and said housing means,
said transducer means having a member bending in proportion to the tangential force on said rotating shaft means,
said bending member 1 being positioned in line with said shaft means and said transducer means connected to an indicating means whereby said tangential force imparted to said load transmitting shaft means is measured.

4,188,822
METHOD AND APPARATUS OF TESTING A MODEL
Karl L. Schoenherr, Washington, D.C.; Strasberg, Murray, and Charles Devin, both of Montgomery County, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 31, 1964, Ser. No. 394,387
Int. Cl.[2] G01M *9/00*
U.S. Cl. 73—147 **6 Claims**



1. A method for determining the sound generated by a submarine propeller by testing a model submarine in a wind tunnel comprising the steps of:
placing said model submarine containing a propeller in an air stream;
rotating the propeller of said submarine model,
measuring the sound generated by the model submarine.

4,188,823
DETECTION OF THE TRANSITIONAL LAYER BETWEEN LAMINAR AND TURBULENT FLOW AREAS ON A WING SURFACE
William R. Hood, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Nov. 27, 1978, Ser. No. 964,009
Int. Cl.[2] G01M *9/00*
U.S. Cl. 73—147 **7 Claims**



1. A device for determining the laminar to turbulent boundary layer transition on a surface the combination comprising:
a wing surface having orifices positioned along its surface and subjected to an airflow;
noise detecting means for producing audio frequency electrical signals proportional to the noise levels at said orifices along said wing surface caused by said airflow;
pressure detecting means for producing electrical signals proportional to the pressures at said orifices upon the wing surface; and
acquisition means for automatically collecting and storing the signals produced by said noise detecting means and said pressure detecting means.

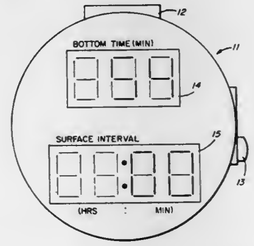
4,188,824
COATING ADHERENCE PROSPENSITY TESTING OF METAL SUBSTRATES
Edward P. McCarthy, Lansing, Ill., assignor to Youngstown Sheet and Tube Company, Pittsburgh, Pa.
Filed Jun. 2, 1978, Ser. No. 911,936
Int. Cl.[2] G01N *17/00*
U.S. Cl. 73—150 A **9 Claims**

1. A method for testing and assessing the propensity of a metal substrate having thereon a chemical bonding base coating to receive and adherently retain a finish coat, which method comprises:
applying a strip of pressure sensitive tape onto a completely unscribed area of the chemical bonding base coating of a test specimen of said substrate in the absence thereon of a finish coat;
stripping said strip of tape together with any of said chemical coating which adheres thereto; and
comparing the amount of the chemical coating and other soil adhered to said tape with an established characterizing base standard which standard is a measure of adherence about a scribing of a similar finish coat received on a



similar chemical bonding base coating on a similar metal substrate.

4,188,825
MONITOR FOR DIVERS TO AVOID DECOMPRESSION
James G. Farrar, 2691 NW. 106th Ave., Coral Springs, Fla. 33065
Filed Dec. 14, 1978, Ser. No. 969,537
Int. Cl.[2] G06G *7/60*; G04B *47/06*
U.S. Cl. 73—291 **7 Claims**



1. A monitor device to be worn by a diver and characterized as automatically providing and maintaining information in display form of the submerged time and elapsed surface interval time, comprising:
(a) switch means;
(b) means for activating said switch means (a) at a predetermined depth;
(c) means for accumulating and displaying submerged time;
(d) means for accumulating and displaying surface interval time;
(e) means for resetting submerged time (c) and surface interval time (d) displays to zero;
(f) means for stopping accumulation but maintaining display in said submerged time means (c) while starting accumulation and display in said surface interval time means (d) when the diver rises above said predetermined depth;
(g) means for maintaining the accumulation and display of the surface interval time (d) until the diver descends again to said predetermined depth; and
(h) means for preventing actuation of said resetting means (e) until there has been a minimum predetermined surface interval time.

4,188,826

DEVICE FOR MEASURING THE LIQUID LEVEL OF AN ELECTRICALLY CONDUCTIVE LIQUID

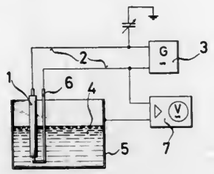
Ralf Kankura, Aachen, and Jürgen Keck, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,397

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723999; Oct. 22, 1977, 2747479

Int. Cl.[2] G01F *23/24*

U.S. Cl. 73—304 R **15 Claims**



1. A device for measuring the height of a body of electrically conductive liquid, comprising:
an elongated electrode forming an electrical resistance and partly immersed in said liquid;
respective conductive leads connected to opposite ends of said electrode and insulated from said liquid;
an alternating-current cource connected to said leads whereby said source, said leads and said electrode form an electric circuit;
a conductive member in contact with said liquid and spaced from said electrode by the liquid; and
measuring means for determining the potential difference between the potential of said liquid at a location outside of a stray current surrounding the electrode and the potential at a point in said circuit outside said electrode whereby said potential difference is a measurement of the height of the body of liquid, the frequency of said source being such that the resistance of said electrode and the capacitive reactance of any barrier layer formed at the interface between said electrode and the liquid is small relative to the contact resistance between the electrode and the liquid, said measuring means having one terminal connected to said member and another terminal connected to said point in said circuit.

4,188,827

BI-METALLIC INDICATOR

Arthur Skopil, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

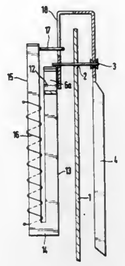
Filed Jun. 9, 1978, Ser. No. 914,275

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726224

Int. Cl.[2] G01K *5/70*

U.S. Cl. 73—363.5 **10 Claims**

4. A bi-metallic indicator comprising
a scale plate,
a pointer being rotatably mounted on said scale plate on one side thereof constituting a front side, so as to move in front of said front side of said scale plate,
a bi-metallic element being arranged spaced apart from the other side of said scale plate, said other side constituting a rear side thereof,
said bi-metallic element having two end sections, one of said sections being operatively coupled to said pointer,
a tab forming an integral part of said scale plate and extending rearwardly from the front side of said scale plate,



the other end section of said bi-metallic element being attached to said tab.

4,188,828

SELF-CENTERING DEVICE FOR GENERALLY LOCKING MOTOR VEHICLE WHEELS ON TO BALANCING MACHINE SHAFTS

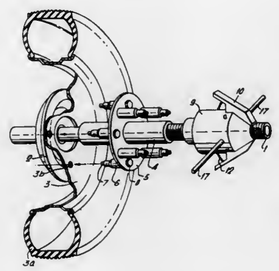
Maria Cuccolini, Correggio, Italy, assignor to Corghi Elettromeccanica S.p.A., Correggio, Italy

Filed Feb. 17, 1978, Ser. No. 878,996

Claims priority, application Italy, Feb. 21, 1977, 46821 A/77

Int. Cl.[2] G01M *1/06*

U.S. Cl. 73—460 **5 Claims**



1. A self-centering device for generally locking motor vehicle wheels on to balancing machine shafts, of the type comprising a drive flange rigid with a balancing shaft, the free end of which is provided with a thread, wherein a sleeve and collar are slip-mounted on said threaded part above the drive flange, said sleeve being provided with a flange which projects from the central region thereof and which comprises telescopic means for centering and locking the rim of a wheel to be balanced which are designed to come into alignment and make contact with the through holes with which said rim is provided; at the rear end of said collar there being provided swivel means for axially engaging and disengaging the collar with and from the balancing shaft, and means extending from the outer surface of said collar for the operation thereof, and which are orthogonal to the swivel plane of said swivel means.

4,188,829

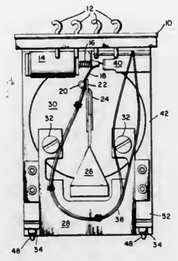
FLEXURE PIVOT ACCELEROMETER

Milton R. Brown, Jr., Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Oct. 25, 1978, Ser. No. 954,504

Int. Cl.[2] G01P *5/12*

U.S. Cl. 73—517 R **1 Claim**



1. A pendulous linear accelerometer comprising:
a pendulous mass assembly;
a pair of flexure pivot bearings supporting said pendulous mass assembly;
flexure pivot bearing retaining bracket means to secure said pair of flexure pivot bearings in a casing structure;
a linear resistance element, linear both electrically and mechanically, attached to said pendulous mass assembly;
a wiper contact attached to said casing structure so as to be operable along the linear dimension of said resistance element;
a wiper arm and spring supporting said wiper contact for regulating and maintaining design contact pressure between the wiper contact and the resistance element;
a solenoid and wiper lift-off mechanism for preventing contact between the wiper and the resistance element during periods of nonuse, itself comprising;
a solenoid coil;
a solenoid armature and spring mounted in operational relationship to said solenoid coil; and
a wiper restraining bracket arranged to lift said wiper contact from said resistance element during a predetermined state of excitation of said solenoid coil.

4,188,830

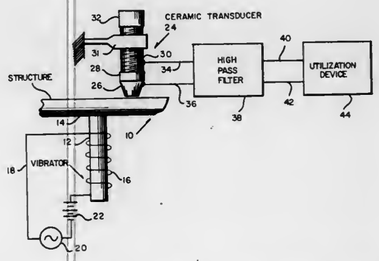
APPARATUS FOR EXAMINING STRUCTURES USING STIMULATED ACOUSTIC EMISSION

Warren P. Mason, West Orange; Daniel N. Beshers, Tenafly, both of N.J., and John T. Kuo, Blauvelt, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,264

Int. Cl.[2] G01N *3/38*

U.S. Cl. 73—801 **6 Claims**



1. A system for detecting structural flaws comprising:
vibrating means engaging a structure for causing acoustic emissions produced by alternating stresses at a structural flaw;
means for contacting the structure;
a transducing member attached to the contacting means for converting the emissions to electrical signals;
means for mounting the transducing member and the contacting means thereto thus enabling position adjustment of the contacting means relative to the structure; and
connecting means connected in circuit with the transducing member for feeding the converted electrical signals to a utilization device.

4,188,831

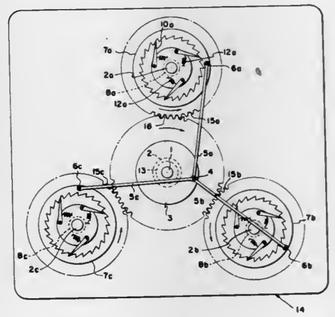
AUTOMATIC TRANSMISSION

Ahmad Amjadi, P.O. Box 3406, Tehran, Iran

Filed May 30, 1978, Ser. No. 910,275

Int. Cl.[2] F16H *37/12*

U.S. Cl. 74—52 **6 Claims**



1. In an automatic transmission having a drive shaft and a driven output shaft mounted for rotation about an axis parallel to that of the axis of the drive shaft, and transmission means for transmitting rotation of said drive shaft to said driven shaft; the improvement wherein said transmission means comprises an elongate coupling means mounted at one end on said drive shaft for pivotal movement relative to said drive shaft about a first axis parallel to and radially offset from the axis of rotation of said drive shaft, disk means mounted upon said driven shaft for free coaxial rotation about the axis of said driven shaft, pivot means coupling the other end of said coupling means to said disk means for pivotal movement relative to said disk means about a second axis parallel to and radially offset from the axis of rotation of said driven shaft, said coupling means being operable upon rotation of said drive shaft to drive said disk means in oscillating rotary motion about the axis of said driven shaft, and one way clutch means coupling said disk means to said driven shaft to drive said driven shaft in step by step unidirectional rotation upon rotation of said drive shaft.

4,188,832

ENDLESS POWER TRANSMISSION BELT

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

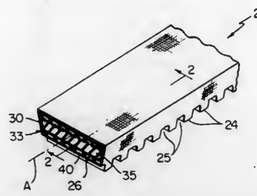
Filed Dec. 29, 1978, Ser. No. 974,452

Int. Cl.[2] F16G *5/16, 1/00*

U.S. Cl. 74—233 **10 Claims**

1. An endless power transmission belt having a tension section, a load-carrying section comprising a continuous, helically wound load-carrying cord and a toothed compression section; wherein said compression section has a first part adjacent to said load-carrying section and a second part adjacent to said first part and remote from said load-carrying section, said second part having a plurality of alternating projections and recesses, wherein said projections define the teeth of said belt;

and wherein said belt has an inside fabric cover surrounding said tension section, said load-carrying section and said first part of said compression section, and an outside fabric cover surrounding said belt and including said second part of said compression section having said alternating projections and



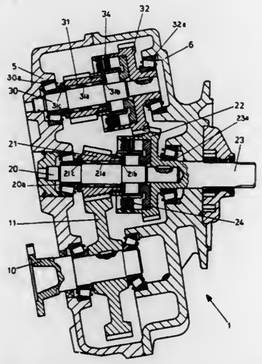
recesses and including the portion of said inside cover not disposed between said first and second parts; and wherein the portion of said inside cover disposed between said first and said second part of said compression section defines a crack barrier layer.

4,188,833

SHIP TRANSMISSION

Siegfried Krauss, and Gerhard Maurer, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 28, 1977, Ser. No. 865,300
Int. Cl.[2] F16H *3/14;* B63H *23/02*
U.S. Cl. 74—417 **9 Claims**



1. A reversing gear transmission for use in ship-propulsion system comprising:

a transmission housing;

an output shaft journalled in said housing said output shaft having a fixedly mounted output gear;

an input shaft journalled in said housing, said input shaft having a first input gear and a second input gear and coupling means for coupling said first input gear and said second input gear, said second input gear being coupled with said output gear; and

an intermediate shaft journalled in said housing, said intermediate shaft having a first intermediate gear meshing with said first input gear and a second intermediate gear coupled with said output gear, one of said input and intermediate shafts lying parallel to said output shaft and the other being inclined to said outer shaft; and

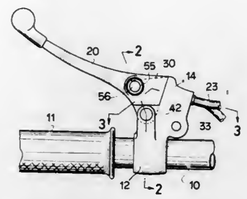
means including said coupling means for selectively forming a gear train from said input gear through said intermediate gears to said output gear and from said first input gear to said second input gear and said output gear.

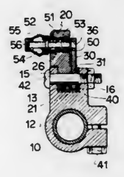
4,188,834

OPERATING DEVICE

Goroei Wakatsuki, Saitama, and Takeshi Hashimoto, Tachikawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1977, Ser. No. 817,964
Claims priority, application Japan, Jun. 8, 1976, 51-105204[U]
Int. Cl.[2] F02N *35/18;* G05G *11/00;* F16D *23/00*
U.S. Cl. 74—489 **3 Claims**





1. An operating device comprising:

a first operating system including a manually operable lever pivotably connected to a bracket;

a second operating system including a pivotably movable member disposed adjacent to said lever and coaxial with said lever;

said first and second operating systems being pivotably connected with a common shaft;

a switching means for selectively connecting and disconnecting said first and second operating systems with each other;

said switching means including a slidable engager disposed across one of said operating systems and a part to be engaged provided on the other of said operating systems;

said engager being resiliently pressed so that said engager and said part to be engaged are normally disengaged from each other;

both said first and second operating systems being selectively connected with each other by said switching means to permit said first and second operating systems to be selectively operated simultaneously with each other by said manually operable lever, and normally disconnected from each other by said switching means to permit said first operating system to be selectively operated by said manually operable lever while said second operating system remains inoperable;

said switching means further including a sliding member partly exposed so as to be operable from outside;

said engager comprising a pin adapted to slide across said pivotably movable member under the cam action of said member and to be resiliently pressed by a cam part of said sliding member; and

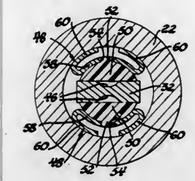
said engaged part being provided on said lever and opposed to said pin.

4,188,835

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

John C. Ion, Doylestown, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Sep. 19, 1974, Ser. No. 507,391
Int. Cl.[2] F16C *1/10, 1/02*
U.S. Cl. 74—501 R **14 Claims**



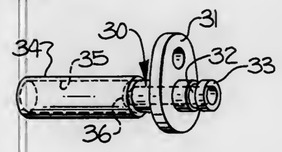
1. A flexible motion transmitting remote control assembly comprising: flexible conduit means, a motion transmitting core element supported for axial movement within said conduit means, antifriction means for engaging said core element for facilitating movement thereof, retainer means for retaining said antifriction means, and a race member disposed between said antifriction means and said conduit means; said race member including a race portion engaging said antifriction means and spring-acting resilient means reacting between said conduit and said race portion for urging said race portion transversely with respect to the direction of movement of said core element toward said antifriction means thereby urging said antifriction means toward said core element.

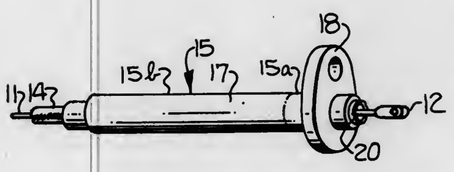
4,188,836

REPAIR PART AND METHOD FOR REPAIRING TRANSMISSION DETENT CABLE

Richard B. Muller, 5415 Providence Rd., Charlotte, N.C. 28211

Filed May 4, 1978, Ser. No. 902,808
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 R **2 Claims**





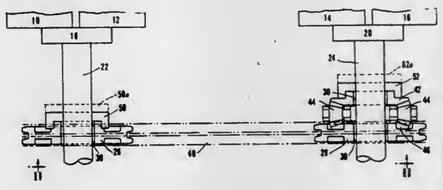
1. A repaired original equipment detent cable for an automatic transmission, said detent cable having an elongate interior cable member and a sheathlike cable housing surrounding the elongate cable member and having an integrally formed end fitting at one end of the cable housing adapted for extending into the transmission housing, and wherein the integrally formed end fitting of the detent cable normally includes a circumferential external groove adapted for receiving a sealing member, but wherein the seal-receiving groove of the end fitting has been damaged and the detent cable has thus been rendered unserviceable and would normally require replacement of the entire detent cable, and in combination with said damaged detent cable, a replacement end portion replacing the damaged portion of the end fitting and thereby permitting reuse of the otherwise serviceable portions of the original equipment detent cable, said replacement end portion comprising an elongate hollow tubular body of one piece molded plastic construction having a circumferential external groove formed therein at one end thereof located closely adjacent the endmost axial portion of the tubular body, said groove being of dimensions closely approximating the dimensions of the undamaged seal-receiving groove on the original cable housing end fitting, said elongate tubular body having an integrally formed outwardly extending mounting flange adjacent to said groove, and said elongate tubular body having an axially extending socket formed therein at the end of the tubular body opposite said groove, said socket being of an inside diameter closely approximating the outside diameter of the integrally formed end fitting of the detent cable, and said socket receiving therein the portion of the end fitting which remains after the damaged end portion has been severed and removed, and said socket including an interior abutment located a predetermined distance axially inwardly from the open end thereof for limiting how far the remaining portion of the original end fitting is received within the socket and for facilitating proper positioning of the replacement end portion on the end fitting, thereby permitting replacement of only the damaged portion of the end fitting and facilitating reuse of the otherwise serviceable portions of the detent cable, and means securing the remaining portion of the original end fitting to the replacement end portion.

4,188,837

FUEL ECONOMIZING DRIVE SYSTEM FOR NAVAL AND MERCHANT SHIPS

Wilfrid H. Bendall, 48-18 43rd St., Woodside, N.Y. 11377

Continuation-in-part of Ser. No. 944,265, Sep. 21, 1978. This application Nov. 20, 1978, Ser. No. 961,883
Int. Cl.[2] F16H *37/06, 11/00;* B63H *5/08*
U.S. Cl. 74—665 M **7 Claims**



1. A ship drive system for connecting any of a plurality of selectively controllable prime movers to a plurality of propeller shafts, said system comprising selectively controllable drive means connecting the prime movers to parallel, oppositely rotating propeller shafts each having a drive sprocket mounted thereon, said sprockets being interconnected by a drive chain extending transversely therebetween, one of said shafts having coaxial sprocket rotation reversing means mounted thereon for rotating its sprocket in a direction opposite from that of the propeller shaft on which it is mounted.

4,188,838

CONTROL APPARATUS OF A TRANSFER MECHANISM

Toshiyuki Nakao, Toyota, and Kikuo Kato, Chita, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

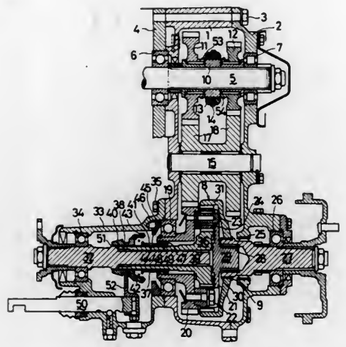
Filed May 13, 1977, Ser. No. 796,598
Claims priority, application Japan, May 13, 1976, 51/60515[U]
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—701 **4 Claims**

1. A control apparatus of a transfer mechanism comprising:

a case member;

an intermediate axle arranged parallel with said input axle;

an output axle on the rear wheel side arranged parallel with said input axle and said intermediate axle;
an output axle on the front wheel side coaxially arranged with said output axle on said rear wheel side;
an input gear mounted on said input axle;
a fixing member secured to said case member;
an intermediate gear mounted on said intermediate axle and engaged with said input gear;
an output gear coaxially arranged with said output axle on the front wheel axle and engaged with said intermediate gear;



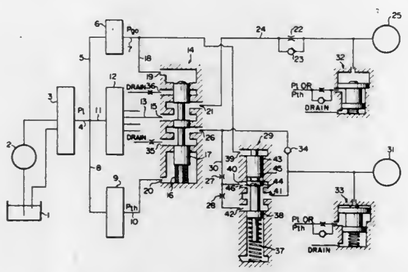
a simple planetary gear set including a carrier integrally connected to said output gear, a ring gear integrally connected to said output axle on the rear wheel side, and a sun gear selectively engaged with said output axle on the front wheel side or said fixing member or said output axle on the front wheel side and said output gear;
said mechanism further comprising a tubular axle integrally provided with said sun gear, a first sleeve always engaged with said tubular axle and selectively engageable with said fixing member or said output axle on the front wheel side, and a second sleeve always engaged with said tubular axle for following the sliding movement of said first sleeve.

4,188,839

THROTTLING CONTROL VALVE AND A SYSTEM FOR CONTROLLING DOWNSHIFT TIMING OF AN AUTOMATIC TRANSMISSION FOR VEHICLES

Seitoku Kubo, and Kunio Morisawa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 12, 1978, Ser. No. 914,945
Claims priority, application Japan, Feb. 17, 1978, 53/17180
Int. Cl.[2] B60K *17/00*
U.S. Cl. 74—869 **4 Claims**



1. A throttling control valve comprising a valve housing having a control fluid pressure port, and a series of first, second, and third ports, a spool-like valve element having a drive land which receives the fluid pressure supplied to said control fluid pressure port so as to generate a force for driving said valve element, a first land which interrupts either the connection between said first and second ports or the connection between said second and third ports in accordance with the shift position of said valve element, a second land which opens or closes said first port, and a throttled passage which connects opposite sides of said first land, and a spring which acts on said valve element, wherein said valve element is movable against the action of said spring in accordance with increase of said driving force from a first shift position where said first land does not interrupt the connection between said first, second and third ports and said second land opens said first port, through a second shift position where said first land interrupts the connection between said first and second ports and said second land opens said first port, through a third shift position where said first land does not interrupt the connection between said second and third ports and said second land closes said first port, to a fourth shift position where said first land interrupts the connection between said second and third ports and said second land closes said first port.

4. In an automatic transmission for vehicles which comprises a source of line pressure, a source of governor pressure which increases in accordance with increase of the vehicle speed, a first friction engaging means which sets the transmission to a lower speed stage when it is engaged, a second friction engaging means which sets the transmission to a higher speed stage when it is engaged, and a speed shift valve which changes over the supply of said line pressure to said first or second friction engaging means, a system for controlling downshift timing of said transmission comprising a line pressure passage for conducting the line pressure from said speed shift valve to said first friction engaging means and a throttling control valve provided in said passage, said throttling control valve comprising a valve housing having a governor pressure port and a series of first, second, and third ports, a spool-like valve element having a drive land which receives the governor pressure supplied to said governor pressure port so as to generate a force for driving said valve element, a first land which interrupts either the connection between said first and second ports or the connection between said second and third ports in accordance with the shift position of said valve element, a second land which opens or closes said first port, a passage which connects opposite sides of said first land, and a spring which acts on said valve element, wherein said valve element is movable against the action of said spring in accordance with increase of said driving force from a first shift position where said first land does not interrupt the connection between said first, second, and third ports and said second land opens said first port, through a second shift position where said first land interrupts the connection between said first and second ports and said second land opens said first port, through a third shift position where said first land does not interrupt the connection between said second and third ports and said second land closes said first port, to a fourth shift position where said first land interrupts the connection between said second and third ports and said second land closes said first port, wherein said line pressure passage includes a portion composed of first and second passages connected in parallel with each other and connected individually to said first and third ports of said throttling control valve, said second passage including an additional throttling element.

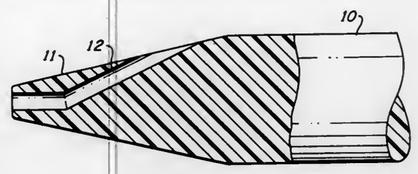
4,188,840

CONDUCTOR CABLE UNTWISTING TOOL

Charles E. Martschinke, Bolingbrook, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1978, Ser. No. 908,283
Int. Cl.[2] B25B *9/00*
U.S. Cl. 81—3 R **4 Claims**

1. A tool for untwisting the conductors of a twisted conductor cable comprising an elongated rod having a taper at one end, said rod being bored at said tapered end for a short distance along its longitudinal axis to present a first opening and a portion of a conductor channel, said rod being bored at an angle to said axis to present a second opening on the surface of



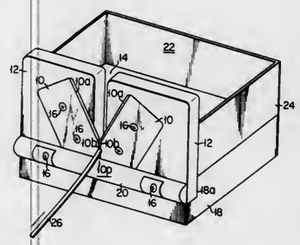
said tapered end and a completing portion of a conductor channel, said channel being dimensioned to receive the diameter of a conductor of said cable.

4,188,841

APPARATUS FOR STRIPPING THE COATINGS OF OPTICAL FIBERS

Masaru Nakamura, and Takao Itoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 23, 1978, Ser. No. 871,350
Claims priority, application Japan, Jan. 24, 1977, 52-5802
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **15 Claims**



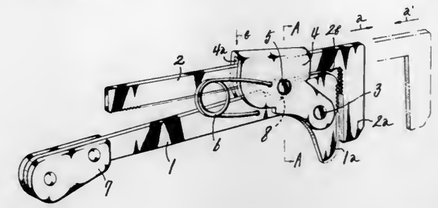
1. An apparatus for stripping off a coating of a coated optical fiber, comprising:
a frame (**12**) having a first gap (**14**) formed at one side thereof and extending toward the other side thereof and through which a coated optical fiber (**26**) is passable; and
a pair of opposing blades (**10**) each having sharp cutting edges (**10***a*) mounted on said frame (**12**) with said sharp cutting edges generally opposing each other with a second gap therebetween, said sharp cutting edges being in communication with said first gap (**14**), said blades being mounted such that the direction in which both of said sharp cutting edges (**10***a*) is disposed defines an acute angle with the direction in which said fiber (**26**) is passable into said first gap (**14**), said sharp cutting edges (**10***a*) protruding into said first gap (**14**) non-parallel with each other so as to define a minimum spacing therebetween, said minimum spacing being larger than the diameter of the clad of said optical fiber but slightly less than a predetermined value d, said value d being equal to half of the sum (d1+d2), wherein d1 is the diameter of the fiber clad and d2 is the outer diameter of the coating of said optical fiber so that said coating is cut by said sharp cutting edges (**10***a*) from opposite sides of said coating; and said blades (**10**) having respective blunt edges (**10***b*) extending from said sharp cutting edges (**10***a*) below said minimum spacing, said blunt edges (**10***b*) of said blades being substantially parallel to each other and having a thickness larger than that of said sharp cutting edges (**10***a*).

4,188,842

MANUAL VISE FOR ARTICLES OF VARYING SHAPES

Kanzi Miyatake, 7-4, 2-chome, Honancho-Nishi, Toyonaka-shi, Osaka Prefecture, Japan

Filed Dec. 29, 1977, Ser. No. 865,721
Claims priority, application Japan, May 14, 1977, 52/61540[U]; Sep. 1, 1977, 52/118047[U]
Int. Cl.[2] B25B *13/28*
U.S. Cl. 81—103 **4 Claims**



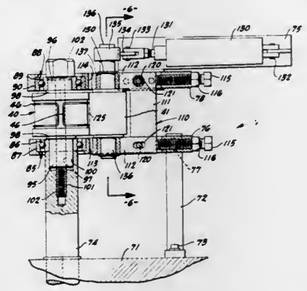
1. A manual vise for holding articles of varying shapes, said vise comprising:
a main bar and a first jaw extending from said main bar at a right angle at one end thereof;
a slide bar above and coextensive with said main bar and a second jaw extending from one end of said slide bar at a right angle thereto opposite said first jaw;
a guide holder pivotally mounted on said main bar and having a guide channel therethrough, said slide bar extending through and being slidable within said channel;
a holding pin fixed transversely through said guide holder and engagable with said slide bar when said guide holder is pivoted, whereby the sliding movement of said slide bar in said channel is halted;
spring means connected between said main bar and said guide holder for urging said holding pin through said guide holder against said slide bar; and
locking lever means pivotally connected to said main bar and engagable with said guide holder for locking said pivotable guide holder in a desired position.

4,188,843

ROTARY DIE CUTTING ASSEMBLY FOR CUTTING LABELS

Daniel M. Dickey, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Jan. 23, 1978, Ser. No. 871,554
Int. Cl.[2] B23D *25/02;* **B26F** *1/08*
U.S. Cl. 83—304 **6 Claims**



3. In apparatus including a web feed for continuous feed of a continuous web to a rotary cutter for continuously severing the web into segments, such apparatus including means for continuously receiving such segments as they are severed and transporting them away from the cutter, said apparatus includ-

ing a stationary frame and a driving shaft rotatably supported by and having an end projecting from said stationary frame, the improvement which comprises a detachable rotary die cutter-rotary anvil assembly, such assembly comprising:

(a) spaced, parallel first and second assembly frame members,

(b) said first frame member rotatably receiving the projecting end of said driving shaft, said shaft providing partial support for such first frame member, said first frame member having further detachable support on said stationary frame, whereby the first frame member may be attached to and detached from such stationary frame,

(c) a rotary die cutter having and end remote from said first frame member and rotatably carried by said second frame member,

(d) means detachably connecting the other end of said die cutter to the projecting end of said driving shaft for rotation thereby,

(e) a rotary anvil

(f) means mounting said anvil parallel to and in operative contact with said die cutter, such means detachably mounting one end of the anvil on said first frame member and the other end on said second frame member.

4,188,844

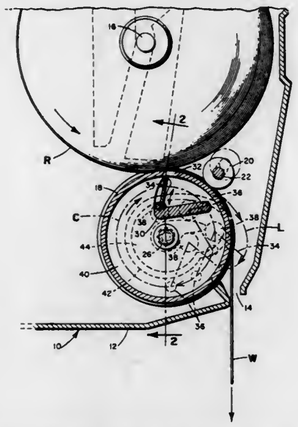
DISPENSER FOR ROLLS OF FLEXIBLE SHEET MATERIAL AND CUTTER MECHANISM FOR USE THEREIN

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Oct. 14, 1977, Ser. No. 842,533

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—337 **10 Claims**



1. In a dispenser for rolls of flexible sheet material having,

a chassis adapted to be attached to a wall,

means carried by said chassis for rotatably supporting a roll of flexible sheet material,

means operatively connected to said chassis for guiding a web of flexible sheet material from the roll to a position to be grasped by a user so that the user may pull the web out of the dispenser,

mechanism mounted on said chassis for cutting the web at intervals therealong to divide the web into individual sheets,

the improvement wherein said cutting mechanism includes:

a rotatably mounted feed roller on the chassis and over which the web of material passes,

a knife pivotally mounted in the feed roller to swing about an axis which is laterally displaced from the plane of the knife cutting edge, said knife having a radially outward portion defining said cutting edge for the web, said edge being projected outwardly through an opening in said feed roller beyond the periphery of the feed roller to cut the web as it passes over the feed roller,

cam follower means affixed to the knife at a point displaced from the pivot mounting axis of the knife so that said cam follower means is swingable along an arcuate path about said axis, and

cam means stationarily mounted on the chassis and having a first cam surface engaged with said cam follower means to swing said cam follower means along said arcuate path to positively project the knife cutting edge upon rotation of the feed roller and having a second cam surface engaging said cam follower to swing said cam follower means along said arcuate path to positively retract the knife cutting edge upon further rotation of said roller.

4,188,845

STRIP CUTTER

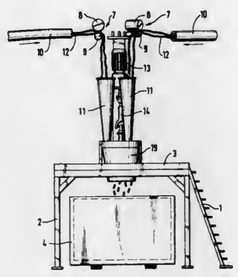
Karl-Heinz Stukenberg, Maronenweg 10, D-3100 Celle-Gross Hehlen, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,529

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2714962

Int. Cl.[2] B26D *1/28*

U.S. Cl. 83—356.1 **22 Claims**



1. Apparatus for cutting strips cut from edges of webs upon edge trimming of the webs, comprising:

means for grippingly engaging the cut strips and advancing them at the rate of strip cutting pursuant to the edge trimming, being he rate at which the strips arrive, said means for gripping, progressively releasing the cut strips so that the strips bend downwards freely under the force of gravity;

stationary means defining a horizontally oriented opening towards which the strip bends and descends;

a curved cutting edge mounted in the opening;

a cutting blade mounted for rotation about a vertical axis and for periodically passing the cutting edge for cutting the strips into small cuttings; and

means for driving the cutting blade.

4,188,846

POSITIONING APPARATUS

Graham R. S. Jones, and Edwin E. Wyatt, both of Bristol, England, assignors to Masson Scott Thrissell Engineering Limited, Bristol, England

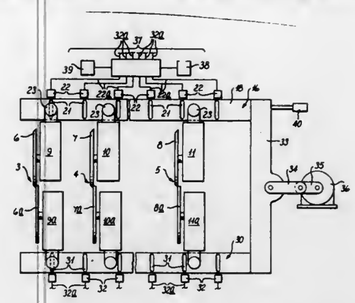
Filed Jul. 28, 1978, Ser. No. 929,047

Claims priority, application United Kingdom, Aug. 11, 1977, 33637/77

Int. Cl.[2] B23D *19/06*

U.S. Cl. 83—499 **7 Claims**

1. Apparatus for positioning a movable member at a selected position on a support, comprising support means on which said movable member is movably mounted, a driver member propelling said movable member along said support means to a selected position, said movable member being provided with a first coupling means, said driver member being provided with a plurality of second coupling means equi-spaced therealong, operating means for selectively moving said first coupling means into and out of engagement with any one of said second coupling means to provide a drive connection between said movable member and said driver member, securing means for releasably securing said movable member to said support means, means for actuating said securing means, and a control means, including means for sensing the establishment of said driving connection by engagement of said first coupling means with one of said second coupling means, said control means being connected to said sensing means for monitoring and controlling said movable member.



4,188,847

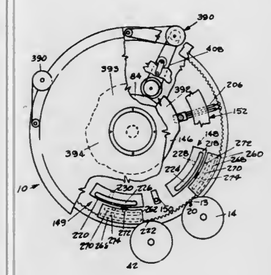
METHOD AND APPARATUS FOR PERFORATING AN ASSEMBLED FILTER USED ON A SMOKING PRODUCT

Leslie E. Payne, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 12, 1977, Ser. No. 859,615

Int. Cl.[2] A24C *5/50*

U.S. Cl. 83—868 **24 Claims**



1. An apparatus for perforating apertures in the peripheral wall of an assembled filter element used on a smoking product, comprising:

(a) a conveying means for receiving and continuously moving a plurality of assembled filter elements;

(b) means for retaining said assembled filter elements on said continuously moving conveying means;

(c) perforating means adjacent to and moving with said conveying means for piercing the assembled filter elements, said perforating means forming an aperture in the wall of said filter elements; and

(d) means for manipulating said perforating means so that said perforating means engages and disengages said assembled filter element.

4,188,848

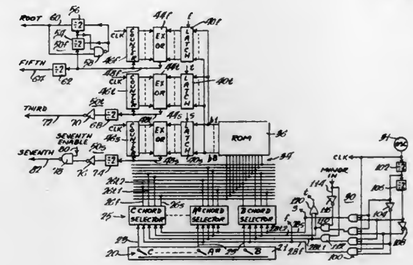
DIGITAL TONE AND CHORD GENERATORS

Patrick S. Roberts, Rolling Meadows, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Continuation of Ser. No. 555,791, Mar. 6, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,129

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **13 Claims**



1. In an electronic musical instrument having a plurality of tone selector switches, a universal tone generator for generating tone signals of different frequencies, comprising:

binary word generating means responsive to actuation of at least one of said switches for generating a binary word having a digital value proportional to the frequency of the tone signal to be generated and representing a number of pulses to be generated during a given increment of time; and

pulse generating means responsive to the binary word generating means including a counter means and a comparator means repetitively generating an output pulse when the accumulated count in said counter means equals the digital value of the binary word from said binary word generating means.

4,188,849

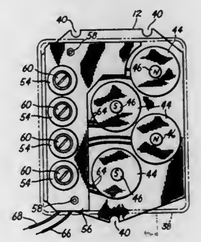
PICKUP FOR STRINGED MUSICAL INSTRUMENT

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Continuation of Ser. No. 760,734, Jan. 19, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,519

Int. Cl.[2] G10H *3/00, 3/08*

U.S. Cl. 84—1.15 **5 Claims**



1. An electromagnetic pickup for a stringed musical instrument having a set of generally parallel strings, said pickup comprising: a housing, said housing including a base adapted for attachment to said instrument and a generally cup-shaped cover attached to said base, a plurality of signal generating units mounted on said base within said housing each including a permanent bar magnet and a coil surrounding said magnet, said magnets each having an upper and a lower end face of opposite magnetic polarities, said magnets being arranged with their axes parallel to one another with said upper end faces of said magnets each underlying a respective one of said strings when said pickup is installed on said instrument, each of said

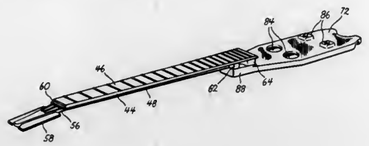
coils having two leads across which a voltage signal induced therein appears, a plurality of potentiometers in said housing each including a resistor and an associated adjustable wiper, means connecting said two leads of each of said coils across said resistor of a respective one of said potentiometers, two output conductors extending from said housing, means in said housing connecting one of said leads of each of said coils to the same one of said two output conductors, and means within said housing connecting each of said wipers of said potentiometers to the other of said two output conductors.

4,188,850

FOAMED PLASTIC GUITAR CONSTRUCTION

Charles W. Kaman, II, East Killingly, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Nov. 29, 1977, Ser. No. 855,789
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—291 **4 Claims**



1. A stringed musical instrument comprising: a body with upper and lower ends, a neck separate from said body, said means releasably fixing said neck to said body so as to extend upwardly from said upper end of said body, said body comprising a metal body frame and a unitary body mass of plastic substantially surrounding said body frame so as to embed and permanently fix said body frame therein; said body mass of plastic having a solid external skin and a foamed interior with said external skin defining in general the external shape of said body, said skin of said body mass of plastic defining for said body a broad forward body surface and a broad rear body surface generally parallel to one another, said body frame being in the nature of a broad plate spaced from and located intermediate and generally parallel to said forward and rear body surfaces so that portions of said body mass of plastic are located both behind and in front of said frame, said neck comprising an elongated neck frame and a unitary neck mass of plastic fixed to said neck frame and surrounding at least a rear portion thereof, said neck mass of plastic having a foamed interior and a rear external skin providing a rounded rear surface for said neck, said metal body frame being exposed of said body mass of plastic over a portion of said upper end of said body to define a metallic bearing surface, said neck having a lower end portion over part of which said neck frame is exposed of said neck mass of plastic to define a metallic bearing surface complementary to that of said body and directly engaged therewith, said means for releasably fixing said neck to said body including a plurality of headed fasteners passing loosely through one of said frames and threadably received by the other of said frames in the vicinity of and generally perpendicular to said bearing surfaces to releasably hold said bearing surfaces in tight engagement with one another and to thereby provide a rigid joint between said body and said neck.

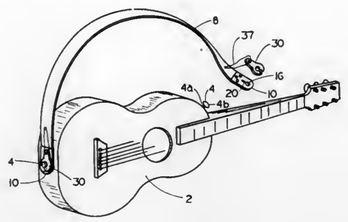
4,188,851

STRAP LATCHING DEVICE

Eric N. Wolf, 3000 Biloxi Ct., Louisville, Ky. 40205

Filed Aug. 17, 1978, Ser. No. 934,605
Int. Cl.[2] G10G *5/00*
U.S. Cl. 84—327 **6 Claims**

1. In an arrangement for latching a strap to a button of an object, the strap having an opening therein engageable with the button, the button having a base portion and a knob portion wherein the base portion is smaller in diameter than the knob portion a latching device comprising a flat plate member with a slotted opening therein, the opening being of preselected size smaller than the knob of the button and engageable with the base of the button with the strap being disposed between the latching device and the object and attached to said button, said slotted opening includes a slit terminating in a first enlarged



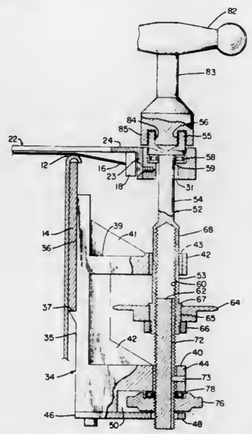
opening, the slit being at least at one point narrower in width than the base of the button, the opening being of preselected size sufficient to receive the base of the button and smaller than the knob of the button.

4,188,852

TUNING SYSTEM FOR TIMPANI

Walter J. Light, P.O. Box 4403, Sante Fe Station, Denver, Colo. 80204

Filed Sep. 21, 1977, Ser. No. 835,365
Int. Cl.[2] G10D *13/02, 13/04*
U.S. Cl. 84—411 A **14 Claims**



1. In a percussion instrument of the type having an upper removable head stretched across the upper end of the outer wall of said percussion instrument defining a sound chamber in which the pitch of said percussion instrument is determined by the degree of tightening of said head with respect to said sound chamber, said head having its outer peripheral edge attached to an outer ring-like member, the improvement comprising:

hold-down means associated with said outer ring-like member adjustable to control the extent of tightening of said head, said hold-down means including slotted post-receiving openings at spaced circumferential intervals around said ring-like member;

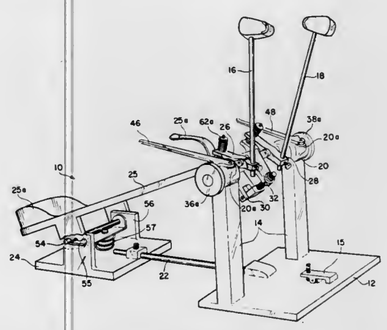
a tuning system including a plurality of tuning units corresponding to the spacing and location of said post-receiving openings, each tuning unit having a stationary frame including post-supporting means thereon and a tuning post assembly adjustably mounted on said post support means and having an enlarged cap portion thereon, said assembly having a plurality of upper and lower post members, each upper post member operatively engaged by a respective lower post member, each said upper post being laterally insertable into a post-receiving opening with said cap received in an enlarged slot communicating with said post-receiving opening and being independently rotatable with respect to said lower post, said tuning post support assembly including drive means being operative in response to rotation of one of said upper posts to effect simultaneous vertical adjustment of the other of said upper posts with respect to said hold-down means whereby to regulate the degree of tightening of said head with respect to the sound chamber, and each said lower post including vertical adjustment means beneath said respective upper post operative to vertically adjust said respective upper post member independently of said other upper and lower post members to individually adjust the degree of tightening of said head in an area adjacent to said respective upper post member.

4,188,853

MULTIPURPOSE DOUBLE ACTING DRUM PEDAL

John E. Bills, 7914 Shoals Dr., Apt. C, Orlando, Fla. 32807

Filed Dec. 8, 1977, Ser. No. 858,608
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—422 R **33 Claims**



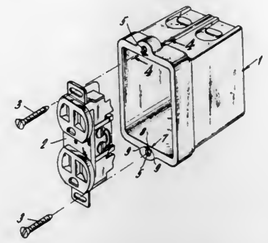
1. A drum beater device having a beater adapted to strike an adjacent drumhead in response to movements of a foot-operated pedal, said drum beater device comprising a spring mounted beater arm supporting a beater head, said beater arm being mounted to swing in an arc about a shaft arranged to undertake oscillatory type rotational movements, an elongate arm attached to said shaft in an offset relation thereto, a foot pedal having a pivotal support about which it is rockable so as to bring about up and down movements of a toe portion of said pedal, connecting link means of rigid construction pivotally connecting said toe portion of said foot pedal to said elongate arm, such that up and down movements of said toe portion cause said connecting link and said elongate arm to move responsively and thus cause said shaft to oscillate rotationally, and means interconnecting said shaft and said beater arm such that said beater head is caused by such shaft oscillations to strike an adjacent drumhead, said pedal being shiftable longitudinally by foot pressure toward or away from said rotatable shaft at the behest of the drummer, so as to accomplish an actual relocation of the pivotal connection at said toe portion, thus to change beater excursion and affording the drummer direct control over the force and speed of the drumbeat.

4,188,854

SCREW MOUNTING MEANS

Rudolph H. Hoehn, Queens, N.Y., assignor to Slater Electric, Inc., Glen Cove, N.Y.

Division of Ser. No. 603,928, Aug. 12, 1975, which is a division of Ser. No. 384,012, Jul. 30, 1973, Pat. No. 3,955,463, which is a continuation-in-part of Ser. No. 170,052, Aug. 9, 1971, abandoned. This application Dec. 6, 1977, Ser. No. 857,985
Int. Cl.[2] F16B *17/00*
U.S. Cl. 85—36 **9 Claims**



1. Threaded screw mounting means, comprising:

a screw mounting member;

a screw-receiving unthreaded borehole formed in said mounting member;

a first axially extending slot formed in the wall of said borehole;

a second slot formed in said mounting member adjacent said borehole and extending generally parallel thereto,

said first slot communicating said borehole with said second slot; and

a clip member slidably receivable in said second slot, said clip member including

first detent means projecting through said first slot into said borehole,

said detent means permitting inward axial movement of a threaded screw into said borehole and preventing outward axial movement of a threaded screw therefrom; and

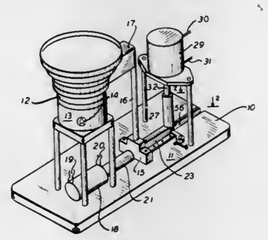
means slidably fixedly locking said clip member in said second slot.

4,188,855

METHOD OF AND APPARATUS FOR AUTOMATICALLY RESIZING AND DECAPPING FIRED CARTRIDGE CASES

Melvin R. Alberts, Upper Saddle River, N.J., assignor to Alberts Corporation, Franklin Lakes, N.J.

Filed May 12, 1978, Ser. No. 905,212
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—36 **26 Claims**



1. The method of automatically resizing spent cartridge cases having apertured caps, at a case resizing station, comprising:

(a) feeding a case to the case resizing station,

(b) swaging the case exteriorly thereof, and
(c) concurrently reinforcing the case interiorly thereof while so swaging the case exteriorly thereof.

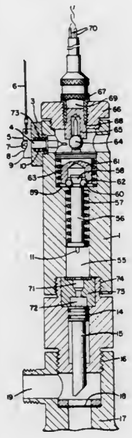
9. An apparatus for automatically resizing spent cartridge cases having primer caps, comprising:
(a) means for feeding a case to a case resizing station,
(b) means for resizing and swaging the case exteriorly thereof,
(c) means for reinforcing the case interiorly thereof while so swaging the case exteriorly, and
(d) means for centering the case in said swaging and resizing means.

4,188,856

COMPRESSED-GAS-ACTUATED SWITCHING DEVICE

Hellmut Bendler, and Gerrit Scheiderer, both of Fürth, Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,489
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701935
Int. Cl.[2] F42C *15/00;* **A62C** *35/02*
U.S. Cl. 89—1 B **25 Claims**



1. A compressed-gas-actuated switching device comprising housing means, at least one primer element for generating compressed gas, an actuating element within said housing means and being displaceable in response to generated compressed gas for actuating a device to be actuated, and triggering means for triggering the initiation of said at least one primer element, said triggering means including mechanical triggering means and at least one of an electrical and thermal triggering means.

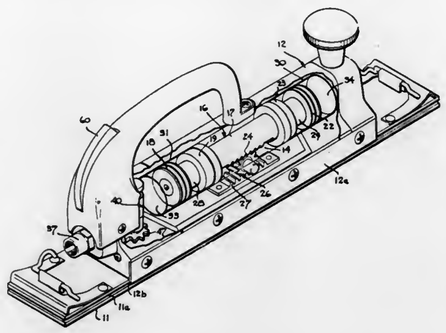
4,188,857

RECIPROCATING PNEUMATIC SANDING AND RUBBING MACHINE

Robert S. Goodrich, 27901 S. Golden Meadow Dr., Ranchos Palos Verdes, Calif. 90274

Filed May 8, 1978, Ser. No. 903,938
Int. Cl.[2] F01L *31/18;* **F15B** *11/16;* **F01B** *9/00, 7/00*
U.S. Cl. 91—352 **4 Claims**

1. A reciprocating sanding and rubbing machine comprising
a carriage block having an elongated compartment formed therein,
a piston assembly slidably mounted in said compartment, said piston assembly being greater in length than half the overall length of said machine and including a central shaft, gear means at the central portion of said shaft, first and second pistons positioned in symmetrical relationship on said shaft on opposite sides of said gear means, and a pair of sleeve bearings having substantially the same outer diameter as said pistons fixedly and tightly mounted in said carriage block in symmetrical relationship on opposing sides of said gear means between said pistons and said gear means, whereby pneumatic compression chambers are formed between one face of each of the pistons and the sleeve bearing on each side of the gear means and between the other face of each of said pistons and a corresponding end wall of said compartment,
valve means for alternately feeding a pneumatic stream to a



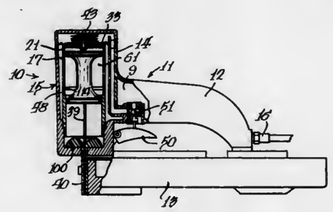
first pair of said compression chambers to drive pistons in a first direction and to a second pair of said compression chambers to drive the pistons in an opposite direction,
a shoe member slidably mounted on said carriage block,
gear means mounted on said shoe member and coupled to said first gear means whereby said shoe member is driven along said carriage in reciprocal relationship to the motion of the pistons, and
gear means for coupling the shoe member to the valve means to retatably oscillate said valve means whereby an air stream is alternately fed first to one face of each of the pistons and then to the other face of each of the pistons.

4,188,858

BUMPER DETERIORATION WARNING SYSTEM FOR FASTENER DRIVING TOOLS

Larry D. Plunkett, Crystal Lake, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed May 11, 1978, Ser. No. 904,774
Int. Cl.[2] F15B *15/20;* **F01B** *11/02*
U.S. Cl. 91—392 **24 Claims**



1. In a driving tool having a cylinder and a piston in said cylinder movable relative to said cylinder between an upper rest position and lower positions therein and wherein said piston carries at least one sealing ring sealingly engaging said cylinder, and a shock absorbing bumper against which said piston moves to progressively lower positions as said bumper deteriorates, means for impairing the effectiveness of said sealing ring when allowable bumper deterioration has been exceeded by engaging and dislodging said sealing ring when said piston reaches a predetermined lower position, whereby

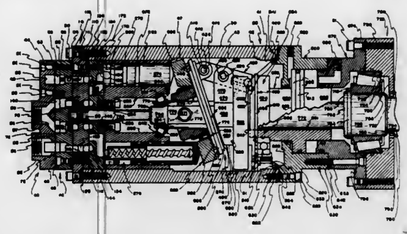
the effectiveness of the tool will be seriously reduced and signal that the bumper should be replaced.

4,188,859

FLUID DRIVE MECHANISMS AND METHODS

Norman L. VanWagenen, 378 Truman Ave., Salt Lake City, Utah 84115, and A. Norman Lamph, 540 N. 200 E., Bountiful, Utah 84010

Filed Sep. 21, 1978, Ser. No. 944,484
Int. Cl.[2] F01B *3/00, 13/04*
U.S. Cl. 91—499 **28 Claims**



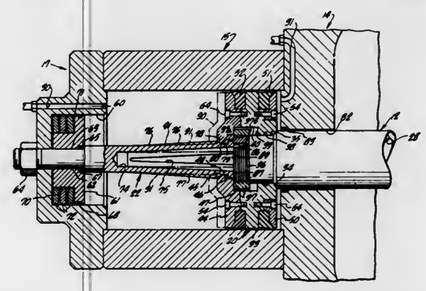
17. A fluid mechanism comprising:
a plurality of associated non-rotating power means selectively in communication with ingress and egress fluid;
rotating distribution means defining continually moving opposed distribution ingress and distribution egress fluid passageway means sequentially accommodating displacement of ingress and egress fluid to and from the non-rotating power means on a timed basis without substantial change in fluid pressure and without substantial restriction of fluid flow;
stationary means comprising separate ingress and egress passageway means respectively at all times communicating fluid to and from the distribution ingress and egress fluid passageway means without substantial change in pressure and without substantial restriction in flow.

4,188,860

LOCKING MECHANISM

Ivan O. Miller, Fullerton, Calif., assignor to Shafco Industries, Inc., Buena Park, Calif.

Filed Jan. 3, 1978, Ser. No. 866,295
Int. Cl.[2] F15B *15/26*
U.S. Cl. 92—15 **11 Claims**



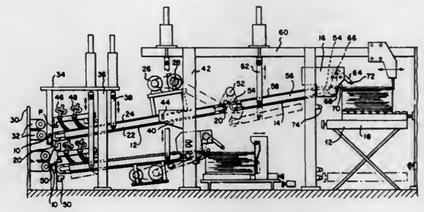
1. A locking mechanism for a piston and cylinder assembly for locking a ram shaft associated with the piston into a predetermined locked position, wherein the piston is moved with respect to the cylinder by the application of fluid pressure and the cylinder has an end cap, comprising
lock shaft means substantially fixed with respect to the cylinder and the end cap of the cylinder, said lock shaft means including elongated resilient finger means having a predetermined configuration at the end thereof, the ram shaft having a bore therein for receiving said finger means of said lock shaft means, and
said piston is movable axially with respect to the ram shaft, said piston including end cap means for compressing said finger means of said lock shaft means to allow said finger means to enter and ride within the bore of the ram shaft when the piston is in a first range of positions with respect to the cylinder, and to allow said finger means to expand and the end thereof to engage a locking surface of the ram shaft to lock said ram shaft in the locked position.

4,188,861

APPARATUS FOR THE CONTINUOUS STACKING OF PAPERBOARD BLANKS

Hendrik J. Kroeze, Albergen, and Johan H. Hemel, Almelo, both of Netherlands, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 16, 1978, Ser. No. 869,680
Int. Cl.[2] B31B *1/98*
U.S. Cl. 93—93 C **2 Claims**



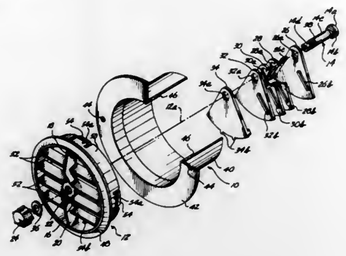
1. In an apparatus for continuous stacking of paperboard blanks issuing from a continuously running corrugator, including counter means for counting the number of blanks issuing from said corrugator a first shingling conveyor adapted to receive said blanks from (each of the) sandwich conveyors (cut-off knives) of said corrugator, means for lowering said first shingling conveyor to maintain near constant fall height for said blanks issuing onto said first conveyor, second shingling conveyor means adapted to receive said blanks from said first conveyor and gate means operably positioned with respect to said second conveyor adapted to retard the flow of said blanks from said second conveyor to stacking means adapted to receive said blanks from said second conveyor, said stacking means adapted to raise and lower to maintain a constant fall height for said blanks, the improvement comprising:
(a) control means operably positioned between said sandwich conveyors (cut-off knives) of said corrugator and said first shingling conveyor, said control means adapted to retard the flow of said blanks onto said first shingling conveyor upon a preset signal, (from said counter means,)
(b) switch means adapted to be operably engaged when said first conveyor means reaches its lowermost height for accepting blanks from said sandwich conveyors of the corrugator, said switch means adapted to activate said gate means to retard the flow of any blanks on said second conveyor means,
(c) relief means for deactivating said control means, said relief means adapted to be operably engaged when said first conveyor means reaches its lowermost height for accepting blanks from said corrugators,
(d) second switch means operably connected to said second conveyor means for deactivating said second conveyor means, said second switch means adapted to be activated when said gate means is activated; and
(e) third switch means operably connected to said second conveyor means and said gate means, said third switch means adapted to activate said second conveyor and deactivate said gate means when said stacking means is in its uppermost position.

4,188,862

REGISTER ASSEMBLY

Edwin S. Douglas, III, South Pasadena, Calif., assignor to Circle K Company, City of Industry, Calif.

Filed May 1, 1978, Ser. No. 901,818
Int. Cl.[2] F24F 7/00; F16K 3/314
U.S. Cl. 98—41 SV **1 Claim**



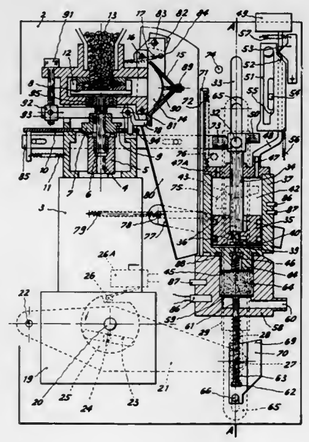
1. A register assembly comprising:
a register frame having a peripheral portion defining an air passage that is substantially circular in cross section,
a support hub located substantially coaxially with said air passage and means for supporting said hub in said air passage, said hub having a substantially axially oriented bore therethrough,
a shaft rotatably mounted for rotation in said bore, and means attached to said shaft for manually rotating said shaft,
at least three closure segments mounted on said shaft for rotational movement relative to each other about the axis of said shaft, said closure segments being arranged on said shaft in serially overlapping relationship relative to the axis of said shaft, said closure segments each extending outwardly from said shaft and having side portions that diverge outwardly from said shaft toward the peripheral portion of said frame and having outer arcuate edge portions terminating in close proximity to the peripheral portion of said frame, said closure segments each being sized to block airflow through a portion of said air passage, said closure segments further being sized so that, when each of said segments is overlapping only the edge portions of adjacent segments, said segments cooperate to block airflow through the entirety of said air passage, a first of said closure segments being affixed to said shaft for rotation therewith, a second of said closure segments being affixed to said frame, said shaft being capable of rotating relative to said second closure segment, the remaining ones of said closure segments mounted on said shaft for rotation relative thereto, said remaining ones of said closure segments being interposed between said first and second closure segments,
a tab on said first closure segment and on each of said remaining ones of said closure segments, said tabs extending toward the next adjacent one of said closure segments, said tabs being located adjacent first side portions of each of said closure segments; said second closure segment and said remaining ones of said closure segments each having a stop surface cooperable with the tab on the next adjacent closure segment, said stop surfaces being located adjacent the other side portions of said closure segments opposite from said first side portions, said tabs and said stop surfaces cooperating so that the first side portions of adjacent ones of said closure segments having cooperating tab and adjacent stop surfaces can rotate in a first direction relative to the axis of said shaft toward the other side portion of the next adjacent closure segment until a respective tab and stop surface engage, whereby as said first closure segment is rotated by said shaft, said remaining ones of said closure segments will first remain stationary relative to said shaft and thereafter be sequentially rotated with said shaft as the respective tabs and stop surfaces are engaged,
a flange mounted on said first closure segment adjacent the other side portion thereof, said flange extending in an axial direction toward said second closure segment and past the other side portions of said remaining ones of said closure segments, and
a stop tab on said second closure segment extending in a generally axial direction relative to said shaft, said stop tab being located adjacent the first side portion of said second closure segment and extending past the first side portion of at least one of said remaining ones of said closure segments, said stop tab functioning to limit the rotational movement of said first and said remaining closure segments in said second direction when said first side portion of at least one of said remaining closure segments engages said stop tab, said stop tab further serving to limit rotational movement of said first and remaining closure segments in said first direction when said flange engages said stop tab.

4,188,863

AUTOMATIC MACHINE FOR THE PRODUCTION OF COFFEE FROM ROASTED COFFEE BEANS

Lucio Grossi, Via Mazzini, 29, Bergamo, Italy

Filed Oct. 19, 1978, Ser. No. 952,819
Claims priority, application Italy, Oct. 28, 1977, 29124 A/77
Int. Cl.[2] A47J 31/42
U.S. Cl. 99—286 **18 Claims**



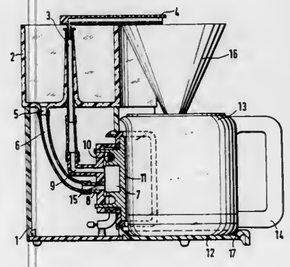
1. An automatic machine for the production of coffee from coffee beams comprising a support frame, a grinder supported by said frame, a metering device associated with said grinder to receive ground coffee and displaceable between an open and a closed position, a motor operable to drive said grinder, clutch plates interposed between said motor and said grinder to transmit drive, lever means associated with said metering device and operable by said metering device to control the engagement of said clutch plates to interrupt the drive from the motor to the grinder, a displaceable water dispensing piston and cylinder arrangement operable to heat and dispense water and including an upper filter, a source of water, the piston having a rod and means associated with the rod of the piston operable to raise said cylinder and to control the flow of water from said source to said cylinder while said cylinder is being raised from a lower to an upper position, spring means connected to said piston rod and operable to apply through said piston at the end of the return stroke thereof a pressure upon water in said cylinder, deflecting means operable to displace the cylinder at the end of the upward stroke of the piston, a pallet connected to and displaceable with said cylinder, a fixed filter carrier into which said cylinder extends in the lower position and free of said cylinder in the upper position thereof, a lower filter within said fixed filter carrier for the support of ground coffee, rod and spring means operable to displace said lower filter within said fixed filter carrier in preparation for the ejection by said pallet of a pellet of used ground coffee supported thereon, a chute displaceable between an inoperative position and an operative position above said fixed filter carrier for the supply of ground coffee thereto and operatively associated with said metering device to open and close said metering device by such displacement and receive a metered quantity of coffee therefrom and program means driven by said motor and operable in timed sequential relationship to raise said piston and cylinder arrangement, supply water to said cylinder from said source, raise said lower filter, expel a pellet of used ground coffee therefrom, return said lower filter, deliver ground coffee thereto, return said piston and cylinder arrangement and supply water to said fixed filter carrier.

4,188,864

ELECTRIC COFFEE OR TEA MAKER

Kurt Fischer, Bad Durrheim, Fed. Rep. of Germany, assignor to WIGO Gottlob Widmann & Sohne GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,030
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739834
Int. Cl.[2] A47J 31/32, 31/54
U.S. Cl. 99—307 **9 Claims**



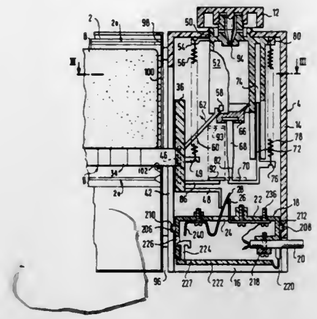
1. Electric coffee or tea maker having
a base plate (**12**) having means (**17**) to locate a coffee or tea pot (**13**) thereon;
a boiler (**7, 10**);
duct means (**9, 3, 4**) guiding water and/or steam from the boiler to the top of the pot;
water supply duct means (**5, 6**) conducting water to the boiler;
and wherein, in accordance with the invention,
the boiler (**7, 10**) is located upwardly from the base plate and laterally adjacent the pot, when the pot is in position on said locating means, and includes an inner wall surrounding a portion of the lateral circumference thereof and at least a portion (**9**) of the duct means guiding water or steam from the boiler to the top of the pot.

4,188,865

ELECTRIC TOASTER

Otto Bjarsch, Traunreut, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,440
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1976, 2624541; Jun. 1, 1976, 2624563; Jun. 1, 1976, 2624578; Jun. 1, 1976, 7617475[U]
Int. Cl.[2] A47J 37/08
U.S. Cl. 99—327 **28 Claims**



1. In an electric toaster comprising a housing, a toasting chamber in said housing, an opening in the top of said housing for insertion of bread in said toasting chamber, a bread carrier movable down and up in said toasting chamber, heating elements in said toasting chamber for toasting the bread when said bread is moved down on said bread carrier in said toasting chamber, the combination therewith of a control chamber adjacent said toasting chamber, a pneumatic timer switch in said control chamber having a cylinder and piston movable relative to one another and a spring urging upward movement of said cylinder and piston relative to one another, and a throttle opening through which fluid escapes from the cylinder during said upward movement to retard said upward spring urging, wind-up means for lowering said bread carrier and cocking said pneumatic timer switch extending through said control chamber engaging said bread carrier and the movable portion of said cylinder and piston, said wind-up means including a guide element which operates a set of electrical contacts for switching-on heater elements, a stop in said housing on which said bread carrier in the lowered position rests, said guide element relative to said bread carrier having a free stroke sufficient to actuate said set of contacts, and guide means for guiding said moement of said bread carrier and said movement of said wind-up element and said relative movement of said cylinder and piston.

4,188,866

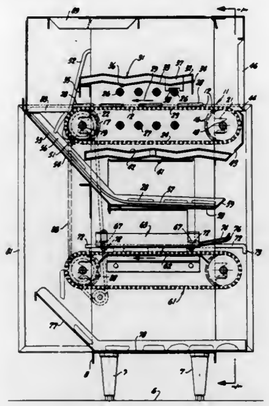
PATTY BROILER

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Jun. 16, 1977, Ser. No. 807,001
Int. Cl.[2] A47J 37/06
U.S. Cl. 99—339 **1 Claim**

1. A patty broiler comprising a frame, an openwork conveyor, means for mounting said conveyor on said frame for movement in a closed path with an upper horizontal run and a lower horizontal run connected by a substantially semi-circularly curved feeding end at the forward portion of said frame and a substantially semi-circularly curved discharge end at the rearward portion of said frame, an upper set of heaters on said frame above said upper run and directing heat downwardly onto said upper run, a lower set of heaters on said frame between said upper run and said lower run and directing heat

upwardly onto said upper run, a transversely extending doctor blade relatively sharp on its leading edge, rods on said frame and engaging the ends of said doctor blade for supporting said doctor blade on said frame disposed in approximate contact with said conveyor at a location substantially vertically beneath the lower portion of said curved discharge end and adjacent the end of said lower run for separating patties from said conveyor for free fall in inverted position, and sloping guide means on said frame directly below said curved discharge end for intercepting inverted patties falling freely from said curved discharge end, said slopping means including a



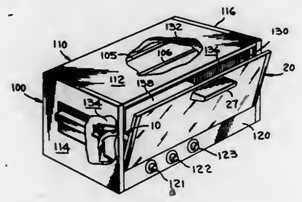
guide receiver beginning at a high point outwardly of said discharge end and extending downwardly and forwardly beneath said curved discharge end across the path of a patty falling from said curved discharge end and ending at a low point substantially beneath said curved feeding end to position said patties near said feeding end with that side uppermost which was in contact with said upper run, and reflectors on said frame above and below said conveyor runs, each of said reflectors including a pair of dihedrally configured parallel sheets spaced apart in the direction of radiation from said heaters.

4,188,867

DOOR MECHANISM FOR APPLIANCES

Harold A. DeRemer, Allentown, Pa., assignor to General Electric Company, New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,647
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—385 **18 Claims**



1. A toaster/oven comprising:

a housing and a cooking chamber defined within the housing by a cooking chamber bottom panel, cooking chamber side panels, a cooking chamber top panel and a back panel, the panels being mounted to the housing and forming a part thereof, and the cooking chamber having an opening at the front of the housing for inserting and removing food items;

a removable door, the door having an outside surface, an inside surface, top, bottom and sides, and having a first hinge pin protruding from one side near the bottom thereof, and a second hinge pin protruding from the opposite second side, the hinge pins being aligned and defining a pivot axis of the door, each hinge pin located from the bottom of the door and at a greater distance from the corner of the door where the inside surface, bottom and side of the door intersect; and

a door jam and door frame surrounding the cooking chamber opening and sized to receive the door within the door frame adjacent the door frame, the door frame including opposed side surfaces, one of the door frame side surfaces defining an opening receiving the first hinge pin, and the other door frame side surface defining a slot for receiving the second hinge pin, the slot having an elongated upper portion separated from the door jam and an outwardly angled bottom portion terminating at a slot bottom separated from the door jam,

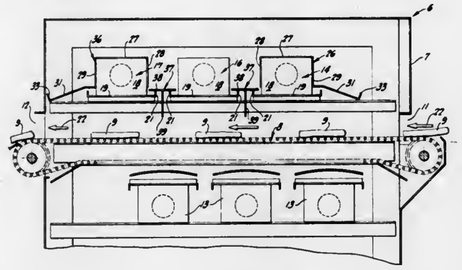
wherein the second hinge pin normally rests in the slot bottom whereby the door can pivot from a closed position to a horizontal open position with the door corners clearing the door jam, and wherein the door can be removed by positioning it in its horizontal open position and sliding the second hinge pin upwardly through the outwardly angled bottom portion of the slot and the upper portion of the slot until the second hinge pin clears the slot, the door being replaceable by reversing the aforesaid procedure.

4,188,868

ENERGY CONSERVER FOR BROILERS

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Sep. 18, 1978, Ser. No. 942,922
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—386 **5 Claims**



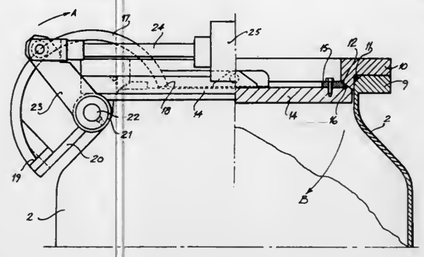
1. For use in a broiler having a conveyor running in a predetermined direction between an entrance opening to the broiler and an exit opening from the broiler; a plurality of burner housings above the conveyor, said burner housings having transverse, upright, side walls and a connecting, horizontal top wall; one of said burner housings being spaced in said predetermined direction from one of said openings to leave an end gap; and said burner housings being spaced apart in said predetermined direction from each other to leave a central gap between them; an array of heat reflecting baffles comprising an end shield having a top sheet and transverse, upright side sheets defining a channel adapted frictionally to engage and slide on said side walls of said housing and having a baffle sheet extending substantially in said predetermined direction across said end gap; and an intermediate shield having a horizontal sheet resting upon said burner housings and extending across said central gap, and including a vertical sheet depending centrally from said horizontal sheet.

4,188,869

DOOR FOR A STEAM PEELER

Cornelis Komen, Newtown, Ireland, assignor to Van Den Bergh Engineering Limited, Blackrock, Ireland

Filed Feb. 14, 1978, Ser. No. 877,644
Claims priority, application Ireland, Feb. 23, 1977, 381/77
Int. Cl.[2] A23N *7/00;* **E05F** *15/02;* **F16J** *13/02*
U.S. Cl. 99—584 **5 Claims**



1. In a steam peeler of the type comprising a pressurized steam vessel rotatably mounted on trunnions in a framework and having a rim which defines an opening forming a combined product inlet and outlet of the vessel and also having an interior door mounted within the vessel for closure of the combined product inlet and outlet, a door closing device comprising:

first support means mounted externally of the vessel and defining a first axis which extends externally of the vessel and adjacent the rim thereof;

second support means mounted on said first means to rotate with respect to the vessel about said first axis;

a rigid pivot arm which has first and second opposite ends and is connected rigidly at its first end to said second support means and extends substantially radially of said first axis;

a rigid arcuate cranked arm which has first and second opposite ends and is connected rigidly at its first end to the second end of the pivot arm, is curved from its first end to its second end through an angle of at least 90° about an axis which substantially coincides with said first axis, passing with clearance about the rim of the vessel, and is connected rigidly at its second end to the door, whereby upon rotation of the second support means about said first axis the door is moved within the vessel towards or away from the product inlet and outlet along a path which is curved about said first axis; and

drive means external of the vessel and connected to rotate the second support means about said first axis and thereby move the door within the vessel along said path to open or close the product inlet and outlet.

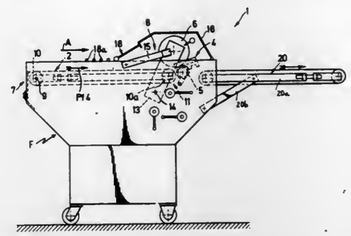
4,188,870

SKINNING MACHINE FOR BACON OR THE LIKE

Hermann Schill, Kehl, Fed. Rep. of Germany, assignor to Maja-Maschinenfabrik Hermann Schill GmbH, Kehl-Goldscheuer, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,247
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715546
Int. Cl.[2] A22C *17/12*
U.S. Cl. 99—589 **21 Claims**

1. A skinning machine for bacon or like products, comprising a frame; a knife mounted in said frame; means for transporting the products toward said knife; a traction wheel rotatably mounted in said frame intermediate said knife and said transporting means and having a peripheral surface arranged to advance the products against said knife, said transporting means being mounted in said frame and having an end portion adjacent to said wheel; a hold-down device movably supported by said frame and defining with said end portion a passage for movement of products toward said wheel; and means for movably supporting at least said end portion of said transporting means for movement in directions to change the



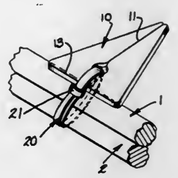
position of said passage relative to said wheel and to thereby expose different portions of said peripheral surface for engagement by the oncoming products.

4,188,871

BAND AND CLIP METHOD

Donald O. Teachout, 1721 Bradford, N.E., Grand Rapids, Mich. 49505

Filed Oct. 23, 1978, Ser. No. 953,909
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—2 **13 Claims**



1. A method for banding objects together comprising: providing a clip and a closed loop rubber band, said clip having means for releasably securing it to said rubber band and including at least a portion wider than the width of said rubber band; securing said clip to said rubber band; wrapping the rubber band around objects to be banded and slipping said clip through the loop of the rubber band allowing the loop to come to rest against said clip whereby said rubber band securely bands together the objects around which it is wrapped.

4,188,872

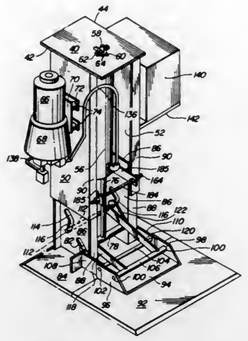
COMPACTOR

Marshall H. Chrablow, Mundelein, Ill., assignor to Krossfield Inc., Mundelien, Ill.

Filed Nov. 24, 1978, Ser. No. 963,304
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—53 **8 Claims**

1. In a compactor, a pair of downwardly movable compacting platens hingedly secured together end-to-end, means to

position one platen vertically in noncompacting position and shift it to the horizontal position in compacting positions,



means to lock said one platen in compacting position, and means to actuate said platens.

4,188,873

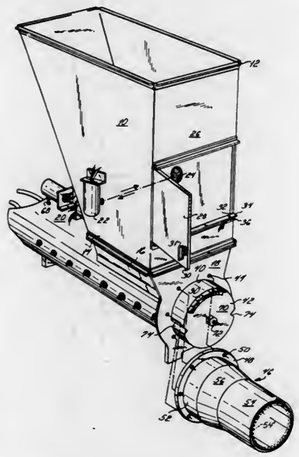
PISTON/CYLINDER TYPE ELEMENTS AND COMPACTORS EMBODYING THOSE ELEMENTS

Andor Gattyan, 242 Nelson Rd., Scarsdale, N.Y. 10583

Division of Ser. No. 766,405, Feb. 7, 1977. This application Nov. 14, 1977, Ser. No. 851,017

Int. Cl.[2] B30B *15/08*

U.S. Cl. 100—98 R **5 Claims**



1. A garbage compactor comprising a ram mechanism including horizontally operable ram and cylinder elements and hopper means for directing garbage delivered to said hopper means vertically downwardly to the interior of the cylinder element, said cylinder element having a discharge end, a discharge tube secured to said discharge end of the cylinder, said ram element being movable with said cylinder element against the garbage at the upper portions of said ram and of said cylinder at its junction with said hopper means and towards said discharge tube to cause garbage delivered to the interior of the cylinder element to be compacted and to thereby transmit forces effected by said ram moving against the garbage and by the compacting of the garbage to lower portions of said cylinder element and said tube, said tube being of generally circular cross section and substantially coaxial with said cylinder element, and releasable means for disassembling said tube from said cylinder and for securing said tube in a selected one of a plurality of radial angular positions relative to said cylinder, said securing means being thus constituted as means for changing the position of wear about the inner periphery of said tube.

4,188,874

PRESS WITH TWO PRESSURE ROLLERS

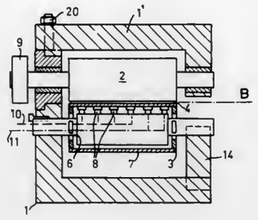
Valentin Heuss, Uitikon-Waldegg, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Dec. 9, 1977, Ser. No. 859,270

Claims priority, application Switzerland, Dec. 16, 1976, 015808/76

Int. Cl.[2] B30B *3/04*; B21B *13/02*

U.S. Cl. 100—170 **10 Claims**



1. A press comprising a pair of pressure rollers mounted in a stand and defining a press gap for the pressure treatment of a web of material,

a. the stand being open to the space surrounding the press at one side of the rollers, at least along a plane which passes through the press gap and is normal to the pressing plane containing the axes of the rollers, and being deflectable by the pressing forces acting on the rollers to thereby cause the axes of the rollers to diverge during pressing operations, and

b. at least one of the rollers being of the pressure equalization type and including a non-rotatable axial bracket mounted in the stand, a shell which rotates about the bracket, and a group of hydrostatic supporting elements which support the shell on the bracket and are arranged in said pressing plane,

c. the hydrostatic supporting elements serving to adjust the shell so as to compensate variations in the press gap attributable to flexure of the rolls as well as to divergence of the roller axes caused by deformation of the stand, whereby the thickness of the press gap and the pressure applied to the web material by the rollers are maintained contstant across the width of that material.

4,188,875

ALUMINUM CAN CRUSHING DEVICE

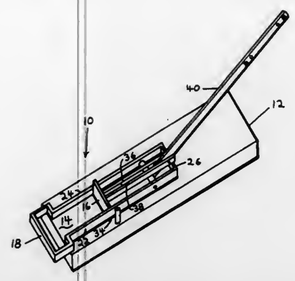
Charles Fabbri, 34632 Greenstone Common, Fremont, Calif. 94536; Lauren Dowiot, 1968 Swift Ct., Hayward, Calif. 94545; William Schleis, 34632 Greenstone Common, Fremont, Calif. 94536; Daniel Winterholler, 27530 Bahama Ave., Hayward, Calif. 94545, and Debra Quintell, 623 Grove Wy., Hayward, Calif. 94541

Filed Aug. 11, 1978, Ser. No. 933,067

Int. Cl.[2] B30B *15/32*

U.S. Cl. 100—218 **1 Claim**

1. A manually operated press for crushing aluminum cans comprising a base member, three mounting elements on said base member, a rectangular frame fastened to said elements and being held in a spaced position above said base member, one end of said frame having an enlarged area which extends past one edge of said base member, a reciprocal crushing member mounted within said frame, a guide fastened to the bottom of said crushing member and extending in the space between said base member and said frame so as to guide the crushing member during its movement, the crushing member being confined within said frame during its movement, two rods attached to one side of said crushing member, a lever pivotally attached to said rods and said frame so as to provide manual means to reciprocate the crushing member, a drop stop element attached between said crushing member and said rods so as to prevent said crushing member from dropping when it reaches said



enlarged area of said frame, whereby a can to be crushed is laid on said base member between said crushing member and said enlarged area of said frame, said crushing member crushing the can in said enlarged area and the crushed can being allowed to fall by gravity when said crushing member is reciprocated back from said enlarged area.

4,188,876

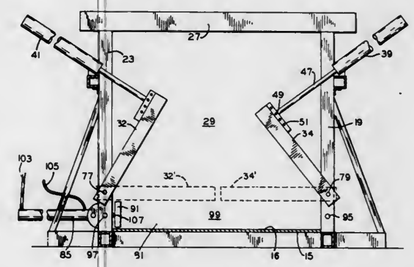
JUNK METAL COMPRESSOR

Donald J. Graves, Rte. 1, Spencerville, Ind. 46788

Continuation-in-part of Ser. No. 649,051, Jan. 14, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,447

Int. Cl.[2] B30B *9/32*

U.S. Cl. 100—232 **5 Claims**



1. A crushing machine for compressing junk vehicle bodies and the like comprising:

a frame having a generally flat, generally horizontally disposed bed for supporting a vehicle body at each of a plurality of sequential body crushing positions, a plurality of upright supports upstanding from the bed, and a pair of generally horizontally disposed beams connecting ends of upright supports remote from the bed, the bed, upright supports and beams connected together to form a generally rectangular framework with a longitudinal vehicle accepting opening therethrough through which a vehicle body may be passed with the rectangular framework completely encircling the vehicle, the length of the crushing machine in the direction of the opening being less than the length of the vehicle body to be compressed and the horizontal width of the opening being close to and somewhat greater than the width of the body of the vehicle to be compressed;

a pair of arms hinged to the frame near the bed and pivotable between generally vertical positions close to respective upright supports toward one another and the bed, and into generally horizontal positions; and

fluid actuated means for pivotally moving each of the arms whereby a body may be placed on the bed, fluid supplied to actuate the arms to pivot toward one another and the bed to compress a portion only of the body with the compressing forces being applied to the body initially primarily in a horizontal direction and becoming more vertical as the compressing continues.

4,188,877

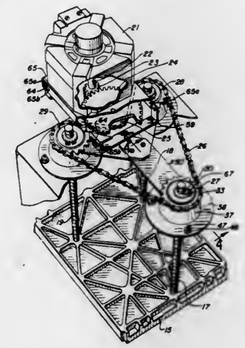
DRIVE MECHANISM FOR A COMPACTOR

Aman U. Khan, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 7, 1978, Ser. No. 922,671

Int. Cl.[2] B30B *1/18*

U.S. Cl. 100—290 **12 Claims**



1. In a refuse compactor including support means and a ram, an improved means for movably mounting the ram to the support means for forcible compaction of refuse in the compactor, comprising:

drive means including a drive motor, a driver sprocket driven by said drive motor, and a drive chain driven by said driver sprocket;

a plurality of driven sprockets;

a corresponding plurality of parallel threaded force transfer elements fixed to the ram;

a corresponding plurality of connecting means fixedly associated one each with said driven sprockets and threadedly associated one each with said force transfer elements; and

mounting means for mounting said connecting means to said support means to dispose said driven sprockets in spaced center-to-center relationship corresponding accurately to the center-to-center relationship of said force transfer elements and in driven relationship with said drive chain to provide a binding-free drive of said force transfer elements by said drive means, said mounting means including means for accurately adjusting the center-to-center relationship between said driver sprocket and said driven sprockets.

4,188,878

RESTRAINING DEVICE FOR USE IN DRYING LUMBER

Bruce L. Kuhnau, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 3, 1978, Ser. No. 957,603

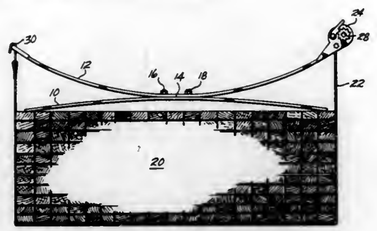
Int. Cl.[2] B30B *1/30*

U.S. Cl. 100—212 **7 Claims**

1. A restraining device for maintaining a substantially uniform compressive force over a load, comprising:

a first pair of inverted leaf springs joined together approximately at their centers, with the bottom spring adapted to extend across a portion of the width of the load and with

the top spring adapted to extend over a portion of the length of the bottom spring, and



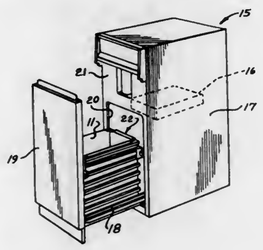
first means extending from one end of the top leaf spring about the load to the other end for drawing down the leaf springs whereby the compressive force over the load is established.

4,188,879

REFUSE DISPOSAL SYSTEM

Robert L. Judd, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 30, 1978, Ser. No. 938,314
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—229 A **6 Claims**



1. In a refuse disposal system having a plurality of weatherproof refuse containers each formed of a synthetic resin material and including an upwardly open refuse-receiving receptacle and a removable cover closing the receptacle, the improvement comprising:

a refuse compactor having compacting means and a support complementary to and removably receiving selectively said receptacles in a compacting disposition adjacent said compacting means, said compacting means being arranged to selectively compact refuse disposed in said container on said support in said compacting disposition, said drawer effectively fully supporting said container during the refuse compacting operation, thereby permitting alternate selective use of each container as a removable holder within the compactor and a disposal storage container remotely of said compactor.

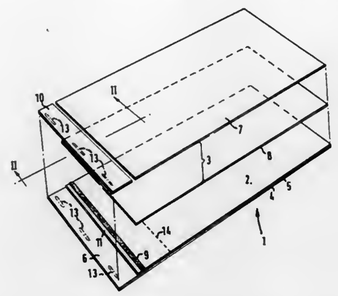
4,188,880

BLANK FOR CONVERSION INTO A PERFORATED STENCIL BY SPARK EROSION

Murray Figov, Ilford, and Iain E. Whitlam, Orpington, both of England, assignors to Vickers Limited, London, England

Filed Jan. 23, 1979, Ser. No. 5,813
Claims priority, application United Kingdom, Jan. 25, 1978, 3064/78
Int. Cl.[2] B05C *17/06*
U.S. Cl. 101—128.21 **8 Claims**

1. A stencil blank comprising a first sheet, a second sheet, said sheets being located face to face and substantially coextensive with one another, means securing an edge portion at one end of said first sheet to an adjacent edge portion at one end of said second sheet, said sheets being separable from one another over all areas thereof remote from said edge portions, said first sheet including a layer of electrically conductive material substantially extending over one face of said first sheet and located against said second sheet, and said second sheet comprising a layer of material capable of being perforated by spark erosion to form a stencil and said second sheet further comprising a supporting backing peelably attached over one face of said layer to be perforated for preventing shrinkage thereof prior to perforation, whereby said supporting backing can be peeled away to expose said layer to be perforated, whereby



said last mentioned layer can be perforated by spark discharge therethrough to said layer of electrically conductive material to form a perforated stencil.

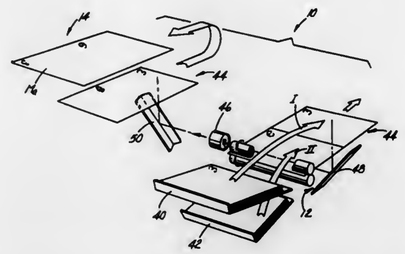
8. A method of forming a perforated stencil using a layer of a material capable of perforation by spark erosion having attached to one face thereof a supporting flexible peelable backing material, said layer being in face to face relationship with an electrically conductive face removably attached to said layer along an edge portion of said layer, comprising the steps of peeling the flexible supporting backing material from the spark perforable layer, perforating said layer by generating electrical discharges from a stylus through said layer of material to said electrically conductive face and removing said electrically conductive face from said layer.

4,188,881

AUGMENTING DUPLICATOR PRODUCTION

Edwin C. Bruning, Palantine, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jul. 28, 1977, Ser. No. 819,720
Int. Cl.[2] B41F *5/02*
U.S. Cl. 101—141 **13 Claims**



1. The method of duplicating using a duplicator having a master cylinder to produce copy in booklet form in which the pages have a desired predetermined order corresponding to the order of a group of a predetermined even number of preselected originals, each original having longer and shorter side edges, said duplicating method comprising the steps of:

(a) arranging the originals in the group in a desired page order to have a desired page order characterization;

(b) separating at least a portion of the arranged group into two equal size stacks by dividing in the middle of the page order;

(c) taking pairs of originals from the stacks by taking one original from one stack and then one from the other stack in rotation;

(d) preparing a master having a vertical dimension and a longer dimension from each of said pairs in turn by presenting the first withdrawn original of the pair, with its longer side edge leading, to a master imager having original feed means, and then presenting the second original of the pair in similar orientation and in substantially contiguous relationship to the trailing edge of said first withdrawn original to generate two side-by-side page images on a double page size sheet of master material;

(e) applying each thus prepared master in its turn to the master cylinder of the duplicator with the longer dimension of the master running peripherally of the cylinder, and the vertical dimension of the side-by-side page images thereon running axially of the cylinder;

(f) supplying the duplicator with double page size copy sheets;

(g) operating the duplicator to print upon the double page size copy sheets side-by-side images corresponding to those of each master;

(h) cutting the printed copy sheets to form single page size sheets; and

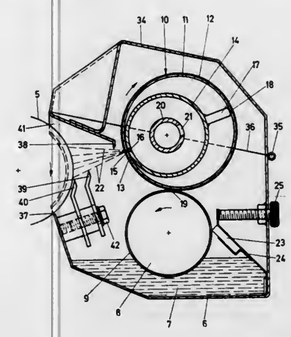
(i) merging the single page size sheets resulting from said sheet cutting operation by placing those of lower numbered characterization on top of those higher numbered characterization.

4,188,882

DAMPENING UNIT FOR OFFSET PRINTING MACHINES

Willi Jeschke, Heidelberg; Paul Schilling, Neckargemünd, and Anton Breunig, Neckargemünd-Dilsberg, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,742
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716929
Int. Cl.[2] B41F *7/26, 7/30, 7/32;* **B41L** *25/06*
U.S. Cl. 101—148 **12 Claims**



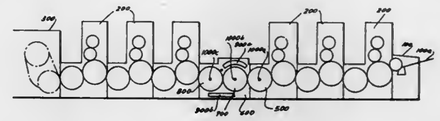
1. In a dampening unit for offset printing machines having a dampening-medium tank, a rotating screen cylinder formed of a perforated support member covered by a blanket for conveying dampening medium supplied thereto from the tank, and a blow tube located adjacent the blanket and formed with nozzle openings for spraying the dampening medium by means of blowing air from the blanket onto a dampening-unit roller, the improvement therein which comprises means for freely rotatingly guiding the screen cylinder, and a driven dampening-medium conveying roller immersed in the dampening medium received in the tank and being in frictional engagement with the screen cylinder so as to feed the dampening medium from the tank to the blanket.

4,188,883

ROTARY PRINTING MACHINE

Helmut Schone; Hans Johne; Alfred Schott, all of Radebeul; Horst Schulz, and Otfried Rudolh, both of Dresden, all of German Democratic Rep., assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, German Democratic Rep.

Continuation of Ser. No. 753,482, Dec. 22, 1976, abandoned.
This application May 18, 1978, Ser. No. 907,392
Int. Cl.[2] B41F *5/02, 21/00*
U.S. Cl. 101—183 **6 Claims**



1. In a rotary sheet-printing machine, a combination comprising at least two successive printing stations which are identical with one another and which each have a sheet input roller and a sheet output roller; a detachable self-contained aggregate comprising a sheet transfer roller adapted to receive sheets from said output roller of the upstream one of said printing stations and to transfer such sheets to the input roller of the downstream one of said printing stations, and a sheet reversing roller downstream of said transfer roller for selectively reversing the sheets during transfer, said aggregate being installable and removable from between said printing stations as a unit so that when said aggregate is removed said output roller of the upstream printing station supplies the sheets directly to said input roller of the downstream printing station, and thereby the machine is turned into an operable observe-printing machine without requiring any modifications to said printing stations and with maintaining the stations identical, whereas when said aggregate is installed, the operation of said two successive printing stations is again not influenced but said output roller of the upstream printing station supplies the sheets to said transfer roller of the aggregate for transfer to and reversing by said reversing roller which then supplies the reversed sheets to said input roller of the downstream printing station, and thereby the machine is turned into an operable perfection-printing machine also without requiring any modifications to said printing stations and with maintaining both stations identical; and drying means for drying the sheets prior to transfer thereof to said input roller of the downstream printing station.

4,188,884

WATER REACTIVE UNDERWATER WARHEAD

William D. White, Pasadena; James H. Green, Sierra Madre, and Neri E. Cornford, Pasadena, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

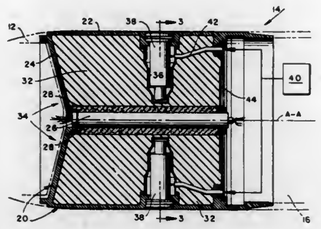
Filed Jul. 27, 1964, Ser. No. 385,561
Int. Cl.[2] F42B *15/20*
U.S. Cl. 102—54 **1 Claim**

1. Apparatus for inflicting explosive damage upon an underwater object, comprising;

(a) an encapsulated charge of a first material which is highly reactive with water, said first charge being for explosively reacting with the water to produce a gas bubble which

sequentially expands to a predetermined peak size and then contracts,

(b) explosive means for bursting the encapsulated charge in a manner in which the bursted particles of said first materials are dispersed in directions symmetrically outward from the center of the charge to cause the bursted particles of said bursted material to penetrate the ambient water with a symmetric and uniformly dense pattern of penetration, and thereby obtain effective and complete explosive reaction



between said first material and the water medium and produce said peak size of bubble, and

(c) means for initiating said explosive means for bursting the encapsulated charge when said charge is sufficiently close to the object that a material portion of the bubble front is in contact with the surface of the object when the bubble reaches its peak size,

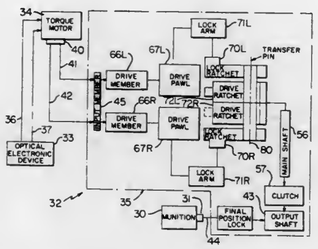
whereby upon contraction of the gas bubble a re-entrant jet of ambient water enters the bubble in a direction normal to the surface of the object to exert a punch-like force thereagainst.

4,188,885

FAIL-SAFE MECHANICAL CODE CONVERTOR, MUNITION ARMING DEVICE USING SAME, AND METHOD OF TRANSMITTING CODED MECHANICAL INPUTS

Murray E. Wolf, and Vincent Suozzo, both of Andover, Mass., assignors to Avco Corporation, Wilmington, Mass.

Filed Nov. 16, 1977, Ser. No. 851,920
Int. Cl.[2] F42C *17/00*
U.S. Cl. 102—221 **18 Claims**



14. A fail-safe method of transmitting a coded mechanical input comprising the steps of:

providing two sets of binary drive pulses;

utilizing said binary drive pulses to generate a rotary drive pulse in one direction in response to one set of drive pulses and another set of rotary drive pulses in the opposite direction in response to the other set of drive pulses;

converting said rotary drive pulses to a pair of unidirectional rotary drive pulses; and

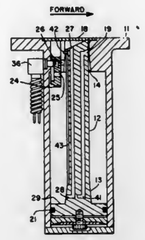
using said pair of unidirectional rotary drive pulses to operate a pair of coded discs which produce indexing rotary motion in a shaft coupled to an output means in response to correctly coded unidirectional drive pulses and to block indexing rotary motion to said shaft in response to incorrect coded unidirectional rotary drive pulses.

4,188,886

PRESSURE PROBE FOR SAFETY-ARMING DEVICE

Larry F. Brauer, and Jefferson O. Eaton, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1978, Ser. No. 910,544
Int. Cl.[2] F42C *15/00*
U.S. Cl. 102—223 **10 Claims**



1. An erectable pressure probe for sensing static and dynamic pressure in a fluid, comprising:

a housing having an opening;

a probe having a tip and a base, said base being slidably retained within said housing, said tip being extensible through said opening, and said probe having conduit means for separately transmitting fluid static and dynamic pressure from said tip to said base;

probe erection means attached to said housing and responsive to an external signal for extending said tip through said opening to define an extended tip; and

fluid pressure distribution means positioned to cooperate with said base and extended tip for conducting static and dynamic fluid pressure from said tip through said conduit means to a remote operator.

4,188,887

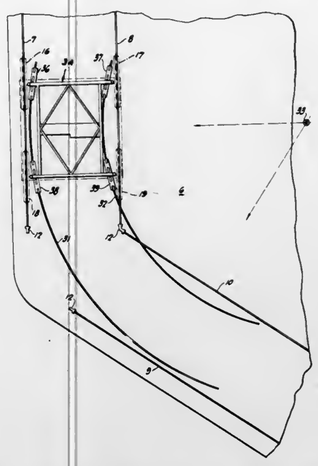
MULTI-DIRECTIONAL CRANE TRUCK

Kenneth F. Dewing; Donald C. Harlander, both of Benicia, and Ralph O. Hughes, Walnut Creek, all of Calif., assignors to McKay International Engineers, Benicia, Calif.

Filed Mar. 31, 1978, Ser. No. 892,205
Int. Cl.[2] B61D *15/02*; B61F *7/00, 13/00*; B66C *9/06*
U.S. Cl. 105—163 R **7 Claims**

1. A crane mover for use with a crane movable on rails having an individual, separate crane frame having legs supported on transversely spaced, parallel sets of rail-engaging crane wheels comprising an individual, separate mover frame operably positioned between said legs, rail engaging mover wheels shiftable into and out of a position on said rails; said mover wheels being transversely spaced and connected to and supporting said mover frame at a set elevation below said crane and above said mover wheels; lifting pads on said crane frame overlying and spaced vertically above said mover frame; a plurality of jacks on said mover frame and movable vertically into and out of lifting engagement with said lifting pads to change the position and track engagement of said crane wheels and movers wheels; means on said mover frame for operating all of said jacks in unison; and means on said mover frame for driving said mover wheels.

7. A crane mover for use with an individual, separate crane adapted to run on a pair of transversely spaced apart straight crane rails, said crane having a pair of longitudinally spaced trucks running on each of said crane rails and having a crane frame with longitudinally and transversely spaced legs each supported on one of said trucks comprising longitudinally and transversely spaced mover frame wheels running on transversely spaced apart and curved mover frame rails at least in part disposed between said straight crane rails; an individual and separate mover frame supported on said mover frame wheels and with said mover frame wheels movable on said mover frame rails between a first position under said crane and



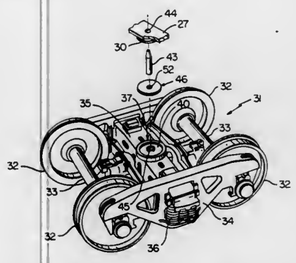
a second position away from under said crane; lifting pads on said crane legs extending toward and above said mover frame; and jacks on said mover frame in position adapted to be disposed beneath said lifting pads and vertically movable into and out of crane raising and lowering engagement therewith.

4,188,888

REINFORCED CENTER BEARING LINER

Jerry W. Cooper, Waynesville; Homer N. Holden, Sylva; Doyle V. Haren, Clyde, all of N.C.; John S. Haley, Centerville, and M. John Somers, Dayton, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 11, 1977, Ser. No. 841,175
Int. Cl.[2] B61F *5/16*; F16C *17/04, 17/10*
U.S. Cl. 105—199 C **10 Claims**



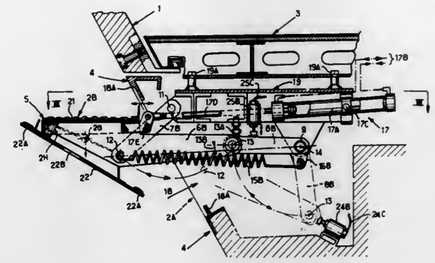
1. In a wear-resistant liner for center plate structure of a railway vehicle, said liner being defined by an ultra high molecular weight polymeric material, the improvement comprising reinforcing means embedded in said polymeric material which serves as a matrix for and substantially completely surrounds said reinforcing means, said reinforcing means comprising a structure having openings therein for receiving said polymeric material completely therethrough and enabling better embedment of said structure, said structure providing reinforcement and preventing cold flow of said polymeric material.

4,188,889

RETRACTABLE RUNNING-BOARD, ESPECIALLY FOR A RAILWAY CAR DOOR

Michel Favrel, Le Perreux sur Marne, France, assignor to Faiveley S.A., Saint Ouen, France

Filed May 8, 1978, Ser. No. 903,950
Claims priority, application France, Oct. 13, 1977, 77 30871
Int. Cl.[2] B60R *3/02*
U.S. Cl. 105—445 **10 Claims**



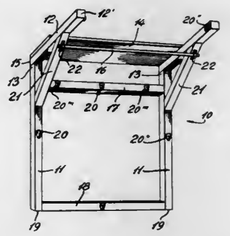
1. A retractable running-board especially for the door of a railroad car, and comprising a substantially rectangular movable step connected to the car floor by means of an articulated quadrilateral linkage comprising two pairs of link-arms connecting said floor to two transverse arms forming part of said movable step, said quadrilateral linkage being deformable in such a manner that, in respective positions of service position and withdrawal position, it becomes respectively concave and convex, so as to provide an abutting force in service position resulting from its concave form, springs for locking said service position by maintaining said abutting force, said springs (**15A**, **15B**) being connected by one end to the movable step and by the other end to a lever (**16A**, **16B**) that swings about an axis coaxial with the connection points of the rear link-arms (**8A**, **8B**) with said floor of the car, said levers being pivotally connected to said rear link-arms.

4,188,890

SPORTS EQUIPMENT RACK

Bill de Villers, 5110 Jeanne D'Arc, Montreal, Quebec, Canada

Continuation of Ser. No. 729,206, Oct. 4, 1976. This application Nov. 4, 1977, Ser. No. 848,750
Int. Cl.[2] A47B *81/00*
U.S. Cl. 108—30 **3 Claims**



1. A storage rack for attachment and support of sports equipment and apparel, said rack comprising two parallel vertical support members, a transverse forwardly extending top support member immovably secured to a top end of each of said two parallel vertical support members, a shelf above said top supports and extending therebetween over a rear portion thereof, support bar means extending between said top supports and spaced forwardly of said shelf for hanging depending articles of said sports equipment for ventilation, a first trans-

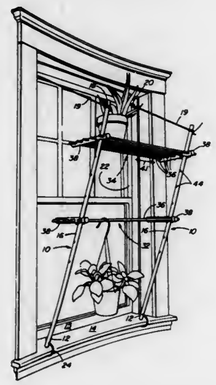
verse member between said vertical support members adjacent a top end thereof, a second transverse member extending across said vertical support members at a bottom end thereof; said vertical support members, said two transverse members and said top support members are of identical rectangular cross-section and of equal lengths; a bridge member extending and immovably secured between each of said vertical support members and an associated top support member, and attachment members secured to a forward face of said vertical support members and said first and second transverse members and projecting outwardly thereof, a further attachment member secured near a forward end of each said forwardly extending top support members forwardly of said support bar means and on an inward face thereof; all of said attachment members being predeterminately spaced and oriented relative to one another whereby to support individual articles of said sports equipment in an open area for ventilation of same and in a manner to correlate said sports equipment normally including paired articles.

4,188,891

PLANT SUPPORT

William M. Boyajian, 269 Huron Ave., Cambridge, Mass. 02138

Filed Jul. 17, 1978, Ser. No. 924,930
Int. Cl.[2] A47B *23/00*
U.S. Cl. 108—42 **7 Claims**



1. An easily assembled and disassembled support structure for holding house plants or the like in position to receive optimal sunlight at a window, said structure comprising:

A. at least two support members, each of which has a load bearing end for resting on a point on the sill of a window, an elongate intermediate section extending upwardly and angled away from the plane of the window, and means for receiving a cable located upwardly of said intermediate section;

B. cables for connection with the frame of the window and said cable receiving means for maintaining the position of said support members;

C. a rail holding bracket having a longitudinal axis extending from each of said support members, said bracket defining a plurality of parallel openings normal to said axis and a hole dimensioned to interfit with said intermediate section, perpendicular to said openings, and passing through the bracket at an angle to said axis less than 90°; and

D. an array of parallel elongate support rails extending between the brackets and held in said openings to form a shelf,

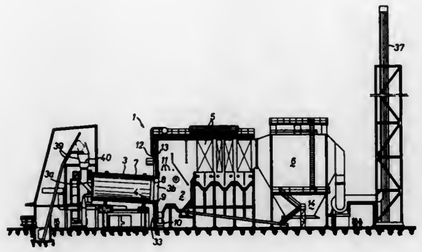
the shelf being vertically adjustable as the brackets are slid along said support members, and the location of said support members relative to the rails being adjustable as said rails are slid horizontally through said openings.

4,188,892

METHOD AND APPARATUS FOR REMOVAL OF FLY ASH FROM A WASTE INCINERATOR WITH LIQUID SLAG DISCHARGE

Gerhard Kiefer, Adliswil, and Pierre Kurt, Langnau, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Mar. 28, 1978, Ser. No. 890,927
Claims priority, application Switzerland, Apr. 6, 1977, 4397/77
Int. Cl.[2] F23G *7/00*
U.S. Cl. 110—238 **20 Claims**



1. A method of treating fly ash in a liquid slag discharge waste incinerating system of the type including a revolving cylindrical furnace with charging equipment for solid, pasty, and liquid waste materials as well as sludge, and which at its end has a slag melting bath followed by a secondary combustion chamber and a flue gas dust separator, wherein the improvement comprises the steps of:

separating the fly ash from the flue gases by means of the dust separator;

discharging the separated fly ash, together with the slag, by means of an incinerator slag discharge system;

conveying the separated fly ash initially into a storage tank and from that tank to a combustion chamber with a molten slag bath;

burning in the combustion chamber the combustible constituents still contained in the fly ash;

melting the remaining constituents of the fly ash in the molten slag bath;

solidifying the slag by feeding the molten slag into a wet slag removal system, and

removing the solidified slag from the wet removal system.

10. A waste incinerator comprising:

a revolving cylindrical furnace having a molten slag bath at its output end;

a charging system for charging the furnace with fuel in the form of solid, pasty, and liquid waste materials and sludge;

a secondary combustion chamber connected to the output of said furnace;

a fly ash separator connected between said secondary combustion chamber and the final output of the flue gases from said incinerator to the atmosphere; and

a fly ash conveying mechanism connected to the discharge side of said separator with a fly ash storage tank and at least one charging mechanism which also serves to feed the fly ash into said revolving cylindrical furnace;

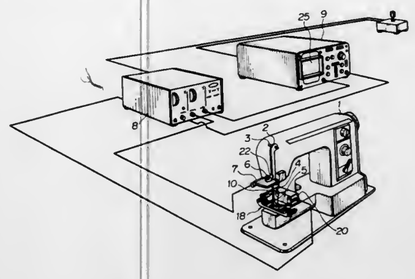
wherein said charging system comprises a charging lance for the fly ash, said lance extending into said revolving cylindrical furnace and directed onto the molten bath located therein.

4,188,893

DEVICE OF DETECTING CLOTH FEEDING AMOUNT IN SEWING MACHINES

Fumio Shimazaki, No. 96, Mizubashiri, Higashiosaka-shi, Osaka-fu, Japan

Filed Aug. 28, 1978, Ser. No. 937,277
Int. Cl.[2] D05B *19/00, 27/22*
U.S. Cl. 112—121.11 **9 Claims**



1. For use with a sewing machine of the type comprising a cloth-feeder unit provided with a feed dog and a presser foot between which a cloth workpiece to be sewn would be clamped and incrementally advanced forwards and backwards by the feed dog, a transducer system operative for generating information concerning the amounts of the forwards and backwards cloth-feed increments, the transducer system comprising, in combination, at least one cloth-simulating element serving to simulate the presence of a cloth workpiece; mounting means mounting the cloth-simulating element such that the cloth-simulating element be incrementally fed forwards and backwards by the feed dog of such sewing machine; and means operative for converting the incremental motions performed by the cloth-simulating element into corresponding electrical signals.

4,188,894

HAIR ROOTING APPARATUS WITH ITS HOOKED NEEDLE MOVING ALSO TRANSVERSELY

Yoshitsugu Matsumura, Nara, Japan, assignor to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan, a part interest

Filed Dec. 10, 1976, Ser. No. 749,613
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—156 **6 Claims**

1. A device for knotting specific lengths of fibers onto a base material, said device comprising:

at least one double-hooked needle with a smaller hook at the lowest portion thereof and a larger hook on said needle above said smaller hook;

holding means for holding said needle, said holding means being comprised of:

a support frame, and

a needle bar slidably fitted within said support frame with said needle connected to the bottom thereof,

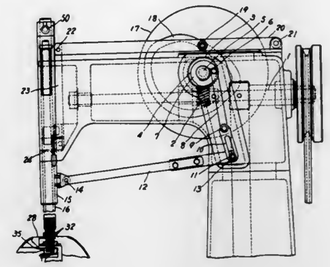
a rotatable drive shaft;

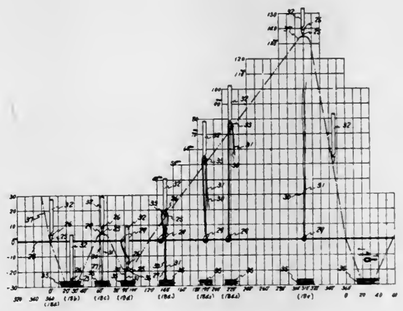
a first cam means operatively connected to said drive shaft and said needle bar for moving said needle bar vertically to varying predetermined heights and depths during the formation of each knot;

a second cam means operatively connected to said drive shaft and said support frame for moving said support frame and said needle therein transversely in the open direction of said smaller hook in a timed relationship with the movement of said first cam means; and

a frame on which said holding means, said drive shaft and said two cam means are mounted;

whereby rotating said drive shaft simultaneously operates said first and second cam means so that said needle is moved to a lowest position beneath said base material and then raised to a first intermediate position above said material by said first cam means followed by said second cam means moving said support frame and said needle bar connected thereto transverse to the vertical movement of said needle when said needle is in said first intermediate position, then said first cam means at least one time lowers said needle beneath said





base material a distance less than said lowest position followed by returning said needle vertically above said base material, and finally said support frame is returned by said second cam means to its original position by a reverse transverse movement when said needle is in its highest position above said base material.

4,188,895

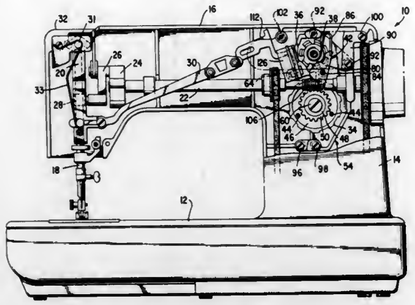
NEEDLE BIGHT CONTROL MECHANISM

Ralph E. Johnson, Convent Station, N.J., and John A. Urciola, Sarasota, Fla., assignors to The Singer Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,963
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 D **9 Claims**

1. Mechanism operable to produce needle bight controlling movements for use in positioning the needle bar gate of a sewing machine including a plurality of rotatable cams, a cam engageable follower for each of the said cams pivotally and translationally movable, a movable member operably connected with the cam followers, a drum having an interposer thereon for each cam follower, means for turning the drum to selectively dispose an interposer opposite its associated cam follower so that such cam follower is caused to interact with its associated cam and the selected interposer during rotation of

the cams and to impart movements to said member for controlling the position of the gate, and indexing means for the inter-



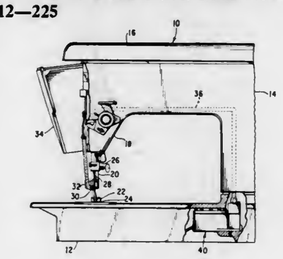
poser drum adapted to embrace and hold the cams, thhe interposers and cam followers in alignment.

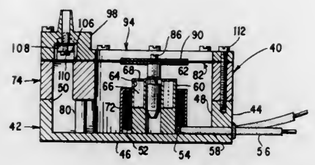
4,188,896

DIAPHRAGM PUMP FOR NEEDLE THREADING

Jack Brown, Union; John A. Herr, Garwood; Wolfgang Jaffe, Roselle Park, and Wesley R. Peterson, Bound Brook, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 22, 1978, Ser. No. 907,654
Int. Cl.[2] D05B *87/00*; F04B *17/04*
U.S. Cl. 112—225 **7 Claims**





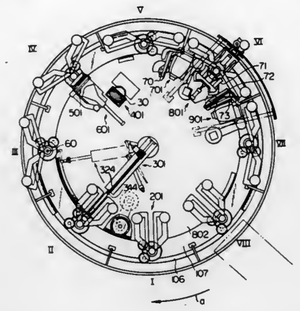
6. In a sewing machine having a needle bar arranged for reciprocatory motion, a sewing needle, having a thread bearing eye, attached to the end of said needle bar, and a pneumatic needle threader assist, a diaphragm pump housed within said sewing machine for providing an air vacuum to said threader assist, said pump comprising a housing having a recess therein, an elastomeric diaphragm spanning said housing recess defining a pump cavity, inlet and outlet valves communicating with said pump cavity, an electromechanical linear actuator supported and arranged within said pump cavity and attached to said diaphragm, an electronic control circuit for driving said linear actuator, and means for connecting said pneumatic needle threader assist to said inlet valve of said diaphragm pump.

4,188,897

SEAMING METHOD FOR GORED PANTY-HOSE

Osho Takatori, Nara, Japan, assignor to Takatori Machinery Works, Ltd., Yamatotakada, Japan

Filed Mar. 16, 1978, Ser. No. 887,133
Claims priority, application Japan, Mar. 25, 1977, 52-33797; Mar. 11, 1978, 53-28078
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—262.2 **11 Claims**



1. A method of seaming panty-hose having gores of a diamond shape, which method comprises following steps a through e in sequence:

step a in which, after a pair of stocking materials formed in a cylindrical shape is held so as to align the sides of said stocking materials with each other, the overlapped central portions of said stocking materials are cut from one end to the thigh portion of said stocking materials to form cut edges with cut flaps;

step b in which the cut edges of said stocking materials are spread out until said cut edges are aligned in a reverse V-shape condition while said cut edges are held and the cut flaps of said stocking materials at said cut edges are vertically separated from each other;

step c in which, after a folded gore which has a diamond shape is provided and inserted into a clearance formed between said separated cut flaps, said folded gore is held with said stocking materials, and a first pair of a gore flap and the cut flaps of one of said stocking materials is folded outward, and the held gore edges and the held edges of said stocking materials are aligned in a substantially straight line condition;

step d in which a second pair of a gore flap and cut flaps of the other stocking material is seamed by means of a first sewing machine while said gore and stocking materials are held, and;

step e in which said seamed second pair of gore flap and flaps of the other stocking materials is folded outward, and said first pair of the gore flap and the flaps of said first stocking material is seamed by means of a second sewing machine while said gore and stocking materials are held.

4,188,898

SYSTEM FOR COMBINING STOCKING MATERIALS AND GUSSETS TO FORM PANTY HOSE GARMENTS

Cecil R. Bell, Jr., Pinnacle; George D. Nakhle, Winston-Salem; Arthur R. Edwards, Winston-Salem, and Walter R. Sizemore, Winston-Salem, all of N.C., assignors to Takatori Machinery Mfg. Co., Ltd., Asahi Minami, Japan

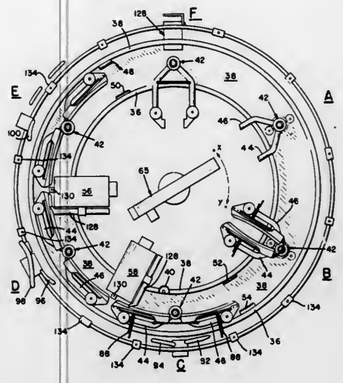
Filed Sep. 6, 1977, Ser. No. 830,421
Int. Cl.[2] D05B *1/00*
U.S. Cl. 112—262.1 **21 Claims**

1. Apparatus for sewing a gusset in a pantyhose garment comprising:

means for supporting and clamping a pair of stockings, each of said pair of stockings having severed edges, with the

severed edges of said pair of stockings being aligned in generally superposed relation, said means including a compound clamp having first and second pairs of gripping elements, each pair of elements adapted for receiving therebetween and gripping a single stocking, and means mounting the gripping elements of one pair of said first and second pairs of elements for displacement relative to the other pair of gripping elements;

means for displacing at least portions of the severed edges of



one stocking, of said pair of stockings, in a preselected direction relative to the severed edges of the other stocking;

first and second sewing means; and

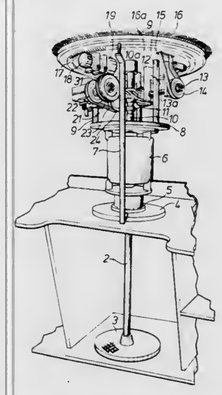
means for conveying said pair of stockings to said first sewing means for sewing a portion of a gusset to the severed edges of one said stocking of said pair of stockings, and to said second sewing means for sewing a portion of the gusset to the severed edges of the other stocking of said pair of stockings.

4,188,899

SEWING MACHINES AND METHOD FOR JOINING PIECES OF FABRIC

Denis Matthews, Sutton-in-Ashfield, England, assignor to Mathbirk Limited, Sutton-in-Ashfield, England

Filed May 12, 1978, Ser. No. 905,195
Claims priority, application United Kingdom, May 14, 1977, 20387/77
Int. Cl.[2] D05B *1/00, 97/00*
U.S. Cl. 112—262.1 **11 Claims**



1. A sewing machine of the kind hereinbefore referred to having a dial provided with a plurality of radially extending points, a needle for sewing together fabric impaled on to said radially extending points by a single chain stitch, said dial and said needle being rotatable about a common axis, means for advancing the dial rotatably to a selected position after fabric has been impaled on some of the points to present bare points to a machine operator for impalement of new fabric while the dial is stationary, drive means for rotating the needle relative to the dial, whereby the first fabric impaled on the points is being sewn by the needle while the points are stationary for impalement of the said new fabric

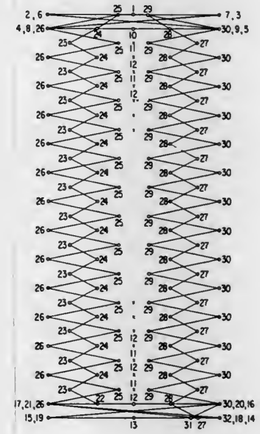
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4,188,900

METHOD OF BUTTONHOLE FORMATION

Stephen A. Garron, Elizabeth, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 4, 1979, Ser. No. 36,209
Int. Cl.[2] D05B *3/06*
U.S. Cl. 112—264.1 **3 Claims**



1. A method of operating a zig zag sewing machine to produce a buttonhole pattern on a work material, the buttonhole pattern including two spaced apart rows of zig zag stitches, each row having a width less than one half the total width of the two parallel rows side by side, there being a separation between the two parallel rows to define the cutting space of the buttonhole pattern, said method comprising the steps of:

a. sewing a first plurality of zig zag barring stitches having a width equal to the total width of the buttonhole and with the last stitch located in the center of the total width;

b. feeding the work material in a forward direction to the opposite end of the buttonhole;

c. sewing a first row of narrow zig zag cording stitches in a reverse direction and extending the length of the buttonhole, said cording stitches having a width less than the width of one of said parallel rows;

d. sewing one of said parallel rows of zig zag stitches in a forward direction extending the length of said buttonhole pattern and overlying said first row of cording stitches;

e. sewing a second row of narrow zig zag cording stitches in said reverse direction extending the length of the buttonhole, said cording stitches having a width less than the width of one of said parallel rows, said second row of cording stitches being parallel to said first row of cording stitches; and,

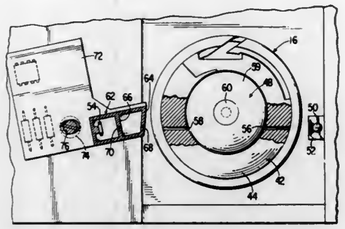
f. sewing the second of said parallel rows of zig zag stitches in a forward direction extending the length of said buttonhole and overlying said second row of cording stitches.

4,188,901

LOW BOBBIN THREAD DETECTION SYSTEM

Howard L. Beckerman, Red Bank, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 25, 1979, Ser. No. 6,396
Int. Cl.[2] D05B *69/00*; G01B *7/12*
U.S. Cl. 112—278 **9 Claims**



1. In a sewing machine having a bed, a needle reciprocatorily driven toward and away from said bed, said needle carrying a needle thread, a cavity formed in said bed, a loop taker having a vertical axis rotatably journalled in said cavity, said loop taker supporting a bobbin case having a wall, a bobbin contained within said bobbin case and having a central core arranged between a pair of end flanges for accomodating a quantity of bobbin thread for concatenation with the thread carried by said needle, a low bobbin thread detection system characterized by a first passageway and a second passageway formed in said wall of said bobbin case, said first and said second passageways spaced apart one from the other on opposite sides of said bobbin and having axes coincident one to the other, a light source positioned in said cavity in said bed to direct light toward the first of said passageways in said bobbin case, a photodetector means positioned in said cavity with said loop taker intermediate said light source and said photodetector means, said second passageway being between said bobbin and said photodetector means, means for shielding said photodetector means from light other than that transmitted through said first and said second passageways in said bobbin case, a photodetector analyzing means for sensing when light is impinging on said photodetector means, and a signalling means operated by said analyzing means for informing a sewing machine operator of the impending depletion of bobbin thread, said photodetector means, said light source, and said first and said second passageways in said bobbin case being arranged in optical alignment which traverses between said bobbin flanges and exteriorly of said bobbin core, whereby light from the light source can traverse said passageways and impinge on said photodetector means before the bobbin is depleted of bobbin thread.

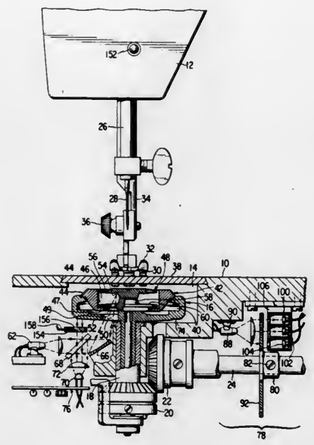
4,188,902

BOBBIN THREAD RUN-OUT DETECTORS

William Kahan, New York, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 18, 1979, Ser. No. 40,022
Int. Cl.[2] B65H *63/02*; D05B *69/00*
U.S. Cl. 112—278 **11 Claims**

1. In a sewing machine having a bed, a thread carrying needle reciprocatorily driven toward and away from said bed, a cavity formed in said bed, a loop taker having an axis rotatably journalled in said cavity, said loop taker having a first surface formed with an aperture, a bobbin case contained within said loop taker, said bobbin case having a first surface formed with an aperture, said first surface of said bobbin case abutting said first surface of said loop taker, a bobbin supported within said bobbin case, said bobbin having a circular flange distant from said first surface of said bobbin case, a near circular flange adjoining said first surface of said bobbin case and adapted to transmit light therethrough, and a central axial core, means carried on said distant flange for reflecting light transmitted through said near flange, said bobbin adapted to contain a supply of bobbin thread wrapped on said core and occluding said light reflecting means, a bobbin thread run-out detector comprising a source of light, means for directing light from said source through said apertures on the first surfaces of said loop taker and said bobbin case and through said near flange of said bobbin toward said reflecting means on said distant flange of said bobbin, a reference reflecting spot partaking of periodic motion in timed synchronization to the rotation of said loop taker, said spot being out of phase with said aperture on said first surface of said loop taker, means for reflecting light from said source toward said reference reflecting spot, photodetector means responsive to light reflected from said reference reflecting spot and from said reflecting means on said distant flange of said bobbin, electronic circuit means connected to said photodetector means for comparing the output of said photodetector means and signalling when the quantity of light reflected from said reflecting means carried on said bobbin changes relative to the quantity of light reflected from said reference reflecting spot.

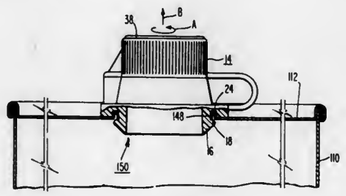


4,188,903

CLOSURE-CONTAINER COMBINATION AND METHOD FOR MAKING THE COMBINATION

John C. Eissler, Drexel Hill, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Division of Ser. No. 704,322, Jul. 12, 1976, Pat. No. 4,065,035, which is a continuation of Ser. No. 475,981, Jun. 3, 1974, abandoned. This application Nov. 21, 1977, Ser. No. 853,754
Int. Cl.[2] B63B *19/00*
U.S. Cl. 113—120 XY **2 Claims**



1. A method of making a closure-container combination, said closure being adapted to resist relative movement between said closure and said container upon the application of a given first torque to said closure, said closure comprising a stationary portion having a groove adapted to receive a bead surrounding an opening in a metallic portion of said container, said closure including a protuberance spaced from the base of said groove and extending radially outwardly from a radially inwardly located side of said groove, and a portion rotatable with respect to said stationary portion upon application of a given second torque lesser than said first torque thereto, said method comprising the following steps:

piercing an initial opening in said metallic portion from one side to the other side thereof so as to form a burr at the edge of said initial opening at the other side of said metallic portion;

forming said bead while simultaneously forming the edge of said metallic portion adjacent said opening so as to form a closure receiving opening surrounded by said bead with said burr located at the radially innermost portion of said bead, said innermost portion extending generally downwardly; and

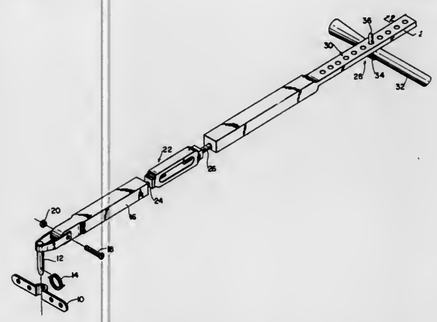
inserting said bead into said groove such that said burr bitingly engages said closure at the radially innermost side of said groove adjacent said protuberance, to a degree such that said stationary portion of said closure does not rotate with respect to said container when said second torque is applied to said rotatable portion of said closure.

4,188,904

TILLER MINDER

Jon P. Childress, 1742 Corcoran St., Washington, D.C. 20009

Filed Feb. 17, 1978, Ser. No. 878,877
Int. Cl.[2] B63H *25/10*
U.S. Cl. 114—172 **8 Claims**



1. A tiller minder for selectively locking a boat tiller in position so as to adjust the angle of the rudder comprising:

(a) a vertical pin mounted near the end of a tiller handle;

(b) articulating means mounted to one inside vertical surface of a boat;

(c) a longitudinal assembly having a first end connected to said articulating means and a second end secured over said vertical pin so as to allow said longitudinal assembly to be lifted up off said vertical pin for instant disconnection of said longitudinal assembly from said vertical pin, said articulating means allowing said longitudinal assembly to rotate fore or aft and up or down in the boat, said longitudinal assembly comprising first and second longitudinal portions connected by a turnbuckle, said turnbuckle adjusting the length of said longitudinal assembly; and

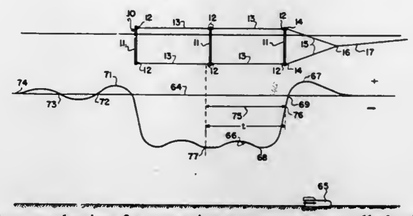
(d) a plurality of holes aligned along said second longitudinal portion and extending vertically therethrough for mating with said vertical pin such that when it is desired to lock the tiller, said longitudinal assembly is rotated over said vertical pin whereby the appropriate hole is placed thereover with said turnbuckle providing for fine adjust of the rudder angle.

4,188,905

MINE SWEEPING MEANS

Royal Weller, Pullman, Wash., and Harry S. Jones, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1943, Ser. No. 482,855
Int. Cl.[2] B63G *8/42*; B63B *21/56*
U.S. Cl. 114—253 **2 Claims**



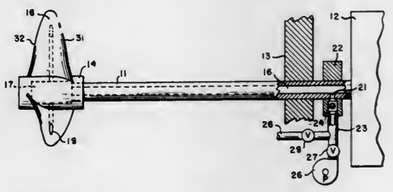
1. In a mechanism for sweeping a pressure controlled mine arranged within a body of water comprising a plurality of water entraining devices, each of said devices comprising a pair of pressure plates, a plurality of bracing members for maintaining the pressure plates of each pair in predetermined fixed space relation with respect to each other, a plurality of flexible tension members interconnecting said pairs of pressure plates whereby the plates are adapted to cause the water entrained between said plates to be moved sufficiently to reduce the pressure of the water adjacent the mine to a predetermined value as the mechanism travels over the mine, and means for causing movement of said mechanism above the mine.

4,188,906

SUPERCAVITATING PROPELLER WITH AIR VENTILATION

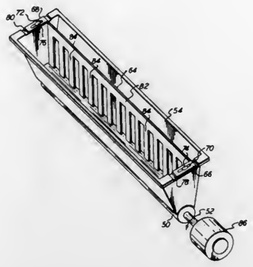
Alexander J. Tachmindji, 4000 Cathedral Ave., N.W.; Marlin L. Miller, 4404 Albemarle St., N.W., both of Washington, D.C. 20016, and William B. Morgan, 410 Anderson Ave., Rockville, Md. 20850

Filed Aug. 25, 1959, Ser. No. 836,039
Int. Cl.[2] B63H *1/18*
U.S. Cl. 115—34 R **6 Claims**



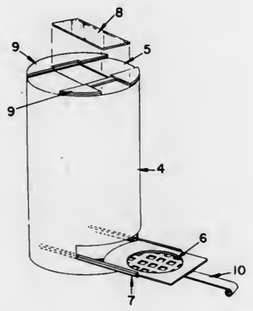
1. A method of decreasing the deleterious effects of cavitation on a ship propeller comprising providing a propeller having supercavitating blade sections, rotating said propeller to drive said ship, and ejecting air from the suction side of each said blade when said ship speed and propeller speed reach a predetermined point to thereby produce a cavity which extends from the leading edge to a point in the water beyond the trailing edge of said blade and envelops the entire suction side of said blade.

4,188,907
PARTICLE DISPENSER WITH A MAGNETICALLY DRIVEN AGITATOR
Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 11, 1977, Ser. No. 823,567
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—657 **14 Claims**



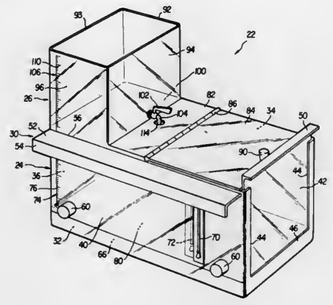
6. An apparatus for developing a latent image recorded on a member, including:
means, defining an open ended chamber, for storing a supply of particles therein;
a magnetic member mounted movably in the chamber of said storing means and having a portion thereof engaging the particles;
a roller having at least a pair of magnetic poles of opposed polarity impressed on the circumferential surface thereof, said roller being positioned closely adjacent to the latent image for depositing particles thereon; and
means for rotating said roller to produce an oscillatory magnetic field for vibrating said magnetic member to prevent bridging and caking of the particles flowing from the open end of the chamber of said storing means.

4,188,908
NOVEL MICROSCOPE SLIDE SMOKER
Robert A. Miller, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 15, 1979, Ser. No. 3,149
Int. Cl.[2] B05C *19/02;* **C23C** *11/00*
U.S. Cl. 118—715 **4 Claims**



1. A smoker device for providing a layer of magnesium oxide smoke on a microscope slide comprising a tubular base section having a flat upper surface with an aperture therein for receiving a microscope slide, fixture means mounted on said upper surface for holding and aligning a slide over said aperture, means for holding a burning magnesium ribbon within the base section at a point below said aperture, wherein the means for holding the burning magnesium ribbon comprises in combination slide rail means mounted within an aperture on the lower circumferential surface of the base section for slidably receiving a burner screen holder and a burner screen holder having a burner screen mounted thereon for supporting the said burning magnesium ribbon, and a detachable hollow tubular chimney section which is fittedly mounted on the upper surface of said base section.

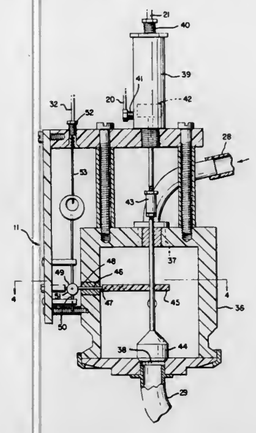
4,188,909
INTRODUCTION AND ACCLIMATION DEVICE FOR MARINE AQUARIUMS
Marvin J. Spivak, 8212 Inverness Hollow Ter., Potomac, Md. 20854
Filed Sep. 22, 1978, Ser. No. 945,010
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—5 **7 Claims**



1. A device for the introduction and acclimation of a marine inhabitant in an aquarium, comprising:
a first container having side and bottom walls which are partially submerged in said aquarium and into which a controlled quantity of transportation water containing said marine inhabitant is introduced;
means for attaching said first container to an edge of said aquarium such that said partial submerging is realized;
a second container connected to said first container and into which a second controlled quantity of water is introduced; and
valving means for producing a flow of said second controlled quantity of water from said second container into said first container at a controlled rate, whereby said second container is isolated from said aquarium such that water flow from said first container into said second container is prevented and water flow from said second container directly into said aquarium is prevented, whereby said marine inhabitant is automatically and accurately acclimated to the temperature and water conditions in said aquarium.

4,188,910
COMBINED MILK FLOW SENSING AND VACUUM SHUT-OFF DEVICE
Van G. Hocker, R.D. #4, Box 300, Carlisle, Pa. 17013
Filed Apr. 3, 1978, Ser. No. 892,840
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **6 Claims**

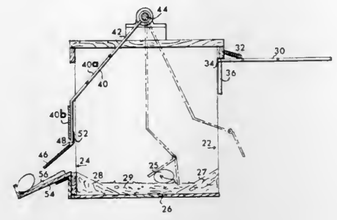
1. In an apparatus for detaching milking teat cups and associated milk line from the udder of an animal after the animal has substantially stopped providing milk, the improvement of a combined milk flow sensing and vacuum shut-off device comprising:
(A) a housing defining a milk flow cavity with an inlet port through which milk can flow freely as it comes from the teat cups and an outlet port of sufficient size that milk can flow freely out of the milk flow cavity and not accumulate therein;
(B) a plunger within the milk flow cavity suspended by means of a stem extending out of the cavity and attached to and operated by a milking vacuum cylinder piston unit in such a relationship that the piston unit drives the stem and plunger vertically within the milk flow outlet port to cut-off milking vacuum and disengage the seat of the port to admit said vacuum;
(C) a milk sensor pedal provided within said cavity and suspended directly beneath the inlet port by means of a rocker shaft assembly;
(D) said rocker shaft assembly comprising:
(i) a pivotally mounted pedal shaft attached to said pedal and extending through the wall of said cavity;
(ii) a counter weight assembly attached to the end of the pedal shaft outside of the cavity to pivot with the motion of the pedal shaft as it moves with said sensor pedal, as said sensor pedal is activated by milk flow from said inlet port;



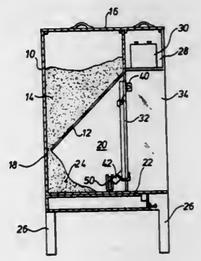
(E) a valve closure member attached by means of a flexible member to the top of the pivotally mounted rocker shaft assembly so that deflections of said milk sensor pedal transfer a resulting pivotal rocking motion through said rocker shaft assembly, and said flexible member to cause said valve closure member to activate and deactivate by opening and closing;
(F) pneumatic control means and control valve adapted to respond to said valve closure member and to control said plunger whereby upon continued activation of said valve closure member, said plunger is maintained in an open position and upon diminishing activation of said closure valve, said plunger is caused to be driven vertically within the milk flow cavity to engage the seat of the milk flow outlet port to cut-off the flow of milking vacuum.

4,188,911
ENCLOSURE DEVICE FOR ENCOURAGING THE LAYING OF EGGS BY DOMESTIC FOWLS PARTICULARLY TURKEYS
Gilad Rafaely, Givat Chaim-Ihud, Israel
Filed May 22, 1978, Ser. No. 908,009
Claims priority, application Israel, Jun. 1, 1977, 52211
Int. Cl.[2] A01K *31/14*
U.S. Cl. 119—48 **10 Claims**

1. An enclosure device for encouraging the laying of eggs by domestic fowls particularly turkeys, comprising:
a cage open at opposite ends, one end constituting the fowl-entry end for permitting the entry and exit of the domestic fowl, and the opposite end constituting the egg-removal end for removing the egg layed by the fowl when in the cage; an ejector member movable within said cage to force the fowl to exit from said fowl-entry end; an egg-removing member coupled to said ejector member within said cage to remove any eggs therein through said egg-removal end; and a drive for driving said ejector member and said egg-removal member first to force the fowl out of the cage from said fowl-entry end, and then to remove any egg therein from said egg-removal end.



4,188,912
ANIMAL FEEDING APPARATUS
Benjamin M. Smalley, Causeway Farm, Hoghton, Near Preston, Lancashire, England
Filed May 2, 1977, Ser. No. 792,886
Claims priority, application United Kingdom, May 15, 1976, 20172/76; Oct. 7, 1976, 41629/76
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51 R **12 Claims**



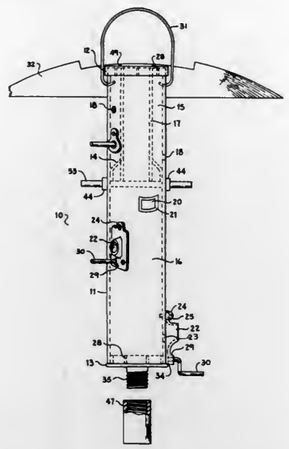
1. An animal feeding appliance comprising a food container having a movable barrier biased into a closed position, but capable of opening movement when pushed by the head of an animal away from said closed position to give access to feed in the container; releasable locking means normally locking said barrier in said closed position; battery operated electrical release means for releasing said locking means, and an electrical control circuit for controlling said release means, said control circuit including a distinguishing switch adapted to be operated by a distinguishing device carried by an animal, and arranged when so operated to operate said electrical release means, said electrical control circuit further including a battery protection switch arranged so that it only allows current to be drawn from said battery between the instant when said distinguishing switch is operated and an instant when said barrier is moved away from said closed position out of engagement with said locking means.

4,188,913

BIRD FEEDERS

Norman M. Earl, R.D. #1, Crystal Lake Rd., Stafford Springs, Conn. 06076, and Alexander M. Brown, 53 Twin Coach Ct., Daytona Beach, Fla. 32014

Filed Dec. 29, 1977, Ser. No. 865,423
Int. Cl.[2] A01K *39/01*
U.S. Cl. 119—51 R 11 Claims



1. A bird feeder comprising a hollow cylindrical container with a transparent wall, hanging means above said container and mounting means below, a removable cap at the top of said container, a bottom cap, dispensing units spaced peripherally and vertically around said wall of said container and adapted for the retaining and dispensing of bird food, wherein the improvement comprises:

a divider within the container forming upper and lower feed compartments, said divider preventing food in said upper compartment from mixing with food in said lower compartment, and means including a tube concentrically arranged within said container and passing through said upper compartment and opening into said lower compartment for replenishing the supply of food in said lower compartment.

4,188,914

WATERING DEVICE FOR SMALL PIGS AND THE LIKE

Lyle W. Lage, Gladbrook, Iowa, assignor to Lage Products, Inc., Montezuma, Iowa

Filed Jan. 13, 1978, Ser. No. 869,376
Int. Cl.[2] A01K *7/06*
U.S. Cl. 119—71 4 Claims

1. In combination,

an elongated partition disposed in a vertical plane for separating small animals,

first and second liquid containers mounted on opposite sides of said vertical partition and having an outer wall, an inner wall, and opposite side walls, said walls forming a liquid compartment having an upper portion and a lower portion,

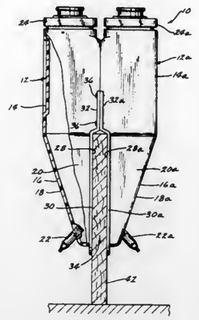
a liquid access opening being provided in said upper portions,

said outer wall tapering inwardly towards said inner wall adjacent the lower end thereof,

said side walls tapering inwardly towards one another adjacent the lower ends thereof,

a liquid outlet means on said lower portion adjacent said lower ends of said walls and providing communication with the interior of said liquid compartment to provide a source of liquid,

a flange extending exteriorly from said side walls adjacent said inner wall of said container, at least a portion of said flange being in a vertical plane parallel to and in facing engagement with said partition,



said first and second containers being identical in construction and having identical flanges in facing engagement with the opposite sides of said partition, and

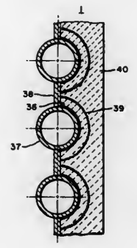
said flanges being secured together and cooperating to support said containers on said vertical partition.

4,188,915

WATER-COOLED, HIGH-TEMPERATURE GASIFIER

Joachim Kummel, Kaarst; Heinz Dressen, Willich; Wilhelm Danguillier; Paul Gernhardt, both of Bochum; Wolfgang Grams, Herne, and Siegfried Pohl, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum and Saarbergwerke A.G., Saarbrucken, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 746,400, Dec. 1, 1976, Pat. No. 4,098,324. This application Mar. 14, 1978, Ser. No. 886,386
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554666
Int. Cl.[2] F22B *37/00*
U.S. Cl. 122—6 A 7 Claims



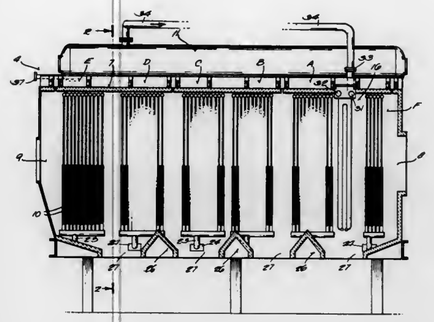
1. In a high-temperature gasifier, a slag bath generator including a plurality of cooling tubes extending vertically and joined together to form a gas-tight cylindrical wall, said tubes being connected in a closed-water circulating loop, the surfaces of the tubes on the inside of said wall being coated with a ceramic coating, and a ramming compound covering the inside of said wall and embedding said tubes and said ceramic coating thereon.

4,188,916

WASTE HEAT BOILER FOR ABSTRACTION OF HEAT ENERGY FROM GASEOUS EFFLUENT CONTAINING CORROSIVE CHEMICAL CONTAMINANTS

Denis G. Csathy, and Wendell L. Y. Hung, both of Minneapolis, Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Filed May 15, 1978, Ser. No. 905,598
Int. Cl.[2] F22B *31/00*
U.S. Cl. 122—7R 8 Claims



1. A waste heat recovery boiler by which heat energy contained in a hot gaseous medium emanating from any source thereof is utilized in the production of steam, said boiler having:

(1) an elongated gas pass through which the hot gaseous medium flows,

(2) a steam drum, and

(3) heating surfaces comprising water tubes connected with the steam drum and distributed within the gas pass to indirectly transfer heat energy from the hot gaseous medium flowing through the gas pass to boiler fluid circulating through said tubes from and back to the steam drum,

said heat recovery boiler being characterized in that:

A. the gas pass is substantially horizontally oriented and has side walls, a roof and an essentially open bottom;

B. the steam drum is wholly outside the gas pass in a parallel relation to and at an elevation near the top of the gas pass, but not thereabove, so that the steam drum does not interfere with access to and from the gas pass from thereabove;

C. the heating surfaces have a minimum of upwardly facing areas upon which solid particles entrained in the gaseous medium flowing through the gas pass can accumulate to be thereby kept from dropping through the essentially open bottom of the gas pass;

D. the water tubes are divided into groups, each of which groups has a distributing header at its bottom paralleling the gas pass with a connection pipe for receiving fluid from said steam drum, the distributing headers of the groups being aligned along a side of said gas pass, and each group also having a receiving header at its top paralleling the gas pass with a connection pipe for delivering fluid to said steam drum, the receiving headers being aligned along a side of said gas pass, whereby said groups are individually separably connected with the steam drum; and

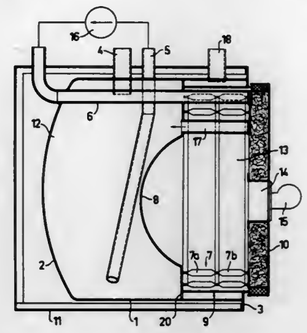
E. the roof of the gas pass has separately removable sections, removal of that one or those of which that lie above a selected group of tubes provides an opening through which the selected group of tubes can be lifted from the gas pass without disturbing the remainder of the tubes, upon disconnection of the selected group from the steam drum.

4,188,917

METHOD AND DEVICE FOR IMPROVING THE EFFICIENCY OF HEAT GENERATORS

Elof V. Åsman, Terrassvägen 4 A, 891 00 Örnsköldsvik, Sweden

Filed Apr. 19, 1978, Ser. No. 897,827
Claims priority, application Sweden, Apr. 28, 1977, 7704942
Int. Cl.[2] F22B *11/04*
U.S. Cl. 122—134 7 Claims



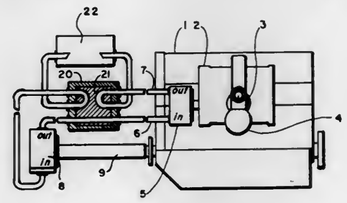
1. An apparatus for heating a first fluid by moving said first fluid in heat exchange relationship with a heated second fluid comprising boiler means having a first chamber for receiving said first fluid and a second chamber for receiving said second fluid, an imperforate spiral wall defining a heating area and a spiral passageway within said second chamber, means for heating said second fluid within said heating area and moving said heated second fluid along said passageway in a first direction, said spiral wall including at least one conduit having an inlet and an outlet communicating with said first chamber, pump means for pumping fluid from said first chamber through said conduit in a direction opposite to the direction of movement of said heated second fluid, said heating area and said spiral passageway normally being closed by an end wall which is selectively removable to expose said heating area and said spiral passageway.

4,188,918

INTERNAL COMBUSTION ENGINE HAVING INDUCTED CHARGE CONTROL MEANS DRIVEN BY ENGINE THROUGH VARIABLE SPEED HYDRAULIC TRANSMISSION

Urban G. Robbins, Jr., 402 Chambers St., Sp. 62, El Cajon, Calif. 92020

Filed Jun. 26, 1978, Ser. No. 919,144
Int. Cl.[2] F02B *33/44*
U.S. Cl. 123—25 R 8 Claims



1. In a spark ignition piston-type internal combustion engine:

means to variably control the quantity of air induced into the engine, said means comprising a positive displacement air blower;

means to mechanically drive said air blower by a positive displacement hydraulic motor-pump;

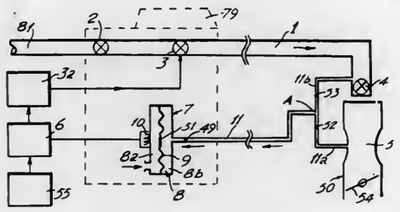
means to hydraulically drive said positive displacement motor-pump by a variable positive displacement hydraulic pump-motor;
means to mechanically drive said variable displacement pump-motor by power obtained from the engine;
means to control the variable displacement of said hydraulic pump-motor in accordance with the position of an acceleration control,
whereby the quantity of air inducted into the engine is controlled by the position of said acceleration control.

4,188,919

FLUID REGULATING SYSTEMS

Howard D. Bruce, Dublin, Ireland, assignor to Laser-Grade (Ireland) Limited, Dublin, Ireland

Filed Dec. 16, 1976, Ser. No. 751,370
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **17 Claims**



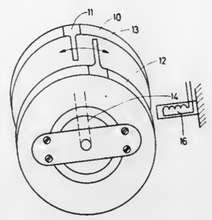
1. A regulating system for regulating the flow rate of a gaseous fluid along a supply line for meeting a variable demand, especially for regulating the supply of gaseous fuel to the carburation system of an internal combustion engine, comprising:
(a) a regulating device connected to said supply line;
(b) a first feed-back line leading from said supply line and providing a first, positive pressure indicative of the actual flow rate of said fluid in said supply line;
(c) a second feed-back line connected to a demand detecting device and providing a second, negative pressure indicative of the demanded flow rate;
(d) a junction between said first and second feed-back lines at which said first and second pressures are summed to provide a resultant control pressure in a third line leading from said junction; and,
(e) a control arrangement having
(i) a control chamber divided into sub-chambers by a diaphragm means, said third line leading to one of said sub-chambers so that said control pressure acts on one side of said diaphragm in opposition to a bias pressure acting on the other side of said diaphragm, and
(ii) a diaphragm position senser comprising a proximity device carried by said diaphragm, and an electric senser whose output controls said regulating device, the output of said electric senser varying in dependence upon the proximity of said device to it to vary the setting of said regulating device.

4,188,920

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Hochdorf, and Reinhard Latsch, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 597,383, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 564,073, Apr. 1, 1975.
This application Jul. 5, 1977, Ser. No. 813,053
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1974, 2434742
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **10 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:
coupling a reference system to a rotating member of the engine, the reference system deriving its rotation from the rotating member of the engine, said reference system having a low natural characteristic frequency in comparison with the frequency of fluctuations of the internal combustion engine;
determining the changes in the relative angular phase of the rotating member of the engine with respect to the uniformly rotating reference system in rpm synchronized time intervals which correspond to the angular region of the crankshaft rotation relates to at least one stroke of a piston of the engine;
generating an electrical control signal characteristic of said changes in the angular phase; and
using said electric control signal in a control loop to change the composition of the fuel-air mixture of the engine;
whereby the operational characteristics of the engine are made dependent of the cyclic fluctuations of the combustion chamber pressure.

4,188,921

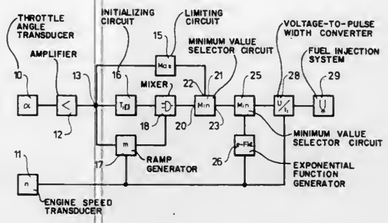
METHOD AND APPARATUS FOR DEFINING DURATION OF FUEL INJECTION CONTROL PULSES

Franz Grimmer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,170
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735595
Int. Cl.[2] F02B *3/00*; F02P *3/00*
U.S. Cl. 123—32 EA **6 Claims**

1. An apparatus for defining the duration of fuel injection control pulses in the fuel injection system of an internal combustion engine, said system including an engine speed transducer and a throttle plate opening angle transducer comprising, in combination, an initial value generator connected to said throttle plate opening angle transducer and to said engine speed transducer for defining the initial duration of said fuel injection control pulses, a ramp generator connected to said engine speed transducer for generating the increasing portion of the function defining the duration of said fuel injection control pulses, a limiter circuit connected to said throttle plate opening angle transducer and to said engine speed transducer for limiting the duration of said fuel injection control pulses in

dependence on the signals from said transducer wherein th signal from said throttle plate opening angle transducer is fed to said limiter circuit, to said initial value generator and to said



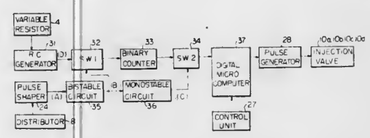
ramp generator and a first minimum value selector for selecting the smaller one of the signals from said limiter circuit and the sum of the signals from said initial value generator and said ramp generator.

4,188,922

DIGITAL CONTROL DEVICE FOR A FUEL INJECTION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 28, 1977, Ser. No. 846,359
Claims priority, application Japan, Nov. 16, 1976, 51/136937
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **7 Claims**



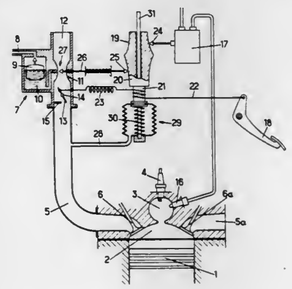
1. A digital control device of an internal combustion engine for controlling at least one solenoid of the fuel injection valves in accordance with the amount of air introduced into said engine and with the rotational speed of said engine, said digital control device comprising:
a first pulse generating means for generating pulse signals having a frequency which is proportional to the rotational speed of said engine, said first pulse generating means having an output terminal;
a bistable circuit connected to the output terminal of said first pulse generating means and triggered by said pulse signals provided from said first pulse generating means, said bistable circuit having an output terminal;
a second pulse generating means for generating pulse signals having a frequency which is proportional to the amount of air introduced into said engine, said second pulse generating means having an output terminal and directly converting the resistance value corresponding to the amount of air introduced into the engine into the frequency value of the pulse signals, said second pulse generating means comprising a variable resistor and a pulse generator comprising an RC generator having a feed back circuit to which the variable resistor is connected;
a first switching element having a first input terminal connected to the output terminal of said second pulse generating means and having a second input terminal connected to the output terminal of said bistable circuit, said first switching element being actuated by pulse signals provided from said bistable circuit and having an output terminal;
a binary counter having an input terminal connected to the output terminal of said first switching element for counting the number of pulse signals passing through said first switching element during one operation period of said first switching element, said binary counter having an output terminal;
a second switching element having a first input terminal connected to the output terminal of the binary counter for receiving binary output signals therefrom, a second input terminal, and an output terminal;
a monostable circuit having an input terminal which is also connected to the output terminal of the bistable circuit and an output terminal which is connected to the second input terminal of the second switching element, said monostable circuit being triggered by the trailing edge of each of the pulse signals from the bistable circuit and supplying pulse signals of a certain duration to the second input terminal of the second switching element to close it during those times; and
a digital computer comprising an input terminal connected to the output terminal of the second switching element for receiving the binary output signals of said binary counter, an output terminal for providing control signals so as to control at least one of said solenoids of said fuel injection valves, an arithmetic unit for multiplying the values of input signals which are responsive to said output signals of said binary counter with information corresponding to the operating characteristics of said engine, and a storage unit for storing said information.

4,188,923

INTERNAL COMBUSTION ENGINE FUEL FEED

Pierre Cochard, Saint Germain les Arpajon, and Christian Guicherd, Le Pecq, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 29, 1977, Ser. No. 865,651
Claims priority, application France, Feb. 24, 1977, 77 05481
Int. Cl.[2] F02B *3/04, 23/10*
U.S. Cl. 123—32 ST **8 Claims**



1. A method of regulating the feed to a stratified charge internal combustion engine having a combustion chamber, including a main chamber, with means for feeding a combustible mixture of fuel and air thereto and a throttle valve for controlling the flow of air, and an auxiliary chamber, with means for injecting fuel thereto and igniting means, the method comprising:
(a) while increasing the load on the engine, acting on the throttle valve to increase the flow of air from that at idle to the maximum flow of air and simultaneously varying the flow of fuel in the combustible mixture of fuel and air fed to the main chamber and the flow of fuel injected to the auxiliary chamber to decrease the overall richness of the mixture of fuel and air in the combustion chamber from that at idle to a minimum value corresponding to the maximum flow of air; and
(b) while further increasing the load on the engine, maintaining the throttle valve to provide the maximum flow of air and simultaneously varying the flow of fuel in the combustible mixture of fuel and air fed to the main chamber and

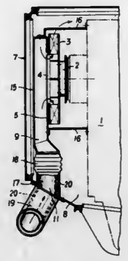
the flow of fuel injected to the auxiliary chamber to increase the overall richness of the mixture of fuel and air in the combustion chamber from the minimum value to 1.

4,188,924

INTERNAL COMBUSTION ENGINE VENTILATION

Karl Kirchweger; Bernd Pfeifer, both of Graz, Austria; Hans List, 126, Heinrichstrasse, Graz, Austria, and Josef Greier, Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 18, 1977, Ser. No. 825,778
Claims priority, application Austria, Aug. 27, 1976, 6373/76
Int. Cl.[2] F01P *5/02, 5/06*
U.S. Cl. 123—41.65 **2 Claims**



1. An internal combustion engine which is encapsulated to suppress noise emission therefrom and which is ventilated in the space between the engine and the encapsulation which includes

an internal combustion engine,

means forming a noise-suppressing encapsulation around and in spaced-apart relationship to said engine, said encapsulation means including an intake orifice,

means for ventilating the space between the engine and the encapsulation, said means including

a rotatable shaft connected to said engine so as to be rotated thereby,

a radial fan rotor mounted on said shaft and positioned within said encapsulation

means forming an air duct for delivering air from said intake orifice of said encapsulation to the side of said radial fan rotor opposite the side facing said engine,

a plate means having an aspiration orifice therein rigidly connected to said engine to be positioned very close to the side of said radial fan rotor opposite the side facing said engine, and

a highly elastic, body-resonance absorbing intermediate piece positioned between said air intake orifice of said encapsulation means and said aspiration orifice of said plate means.

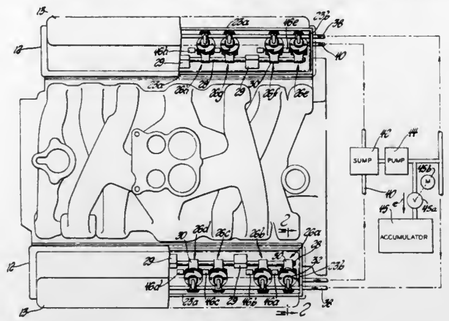
4,188,925

ENGINE CYLINDER VALVE CONTROL MECHANISM AND CYLINDER HEAD AND ENGINE INCORPORATING SAME

Edgar R. Jordan, 32260 W. 12 Mile Rd., Farmington, Mich. 48018

Continuation-in-part of Ser. No. 805,198, Jun. 9, 1977, abandoned. This application Jan. 27, 1978, Ser. No. 872,983
Int. Cl.[2] F01L *9/02*
U.S. Cl. 123—90.12 **64 Claims**

1. Engine valve operating mechanism for moving an engine poppet valve in opening and closing directions relative to the port controlled thereby, said mechanism comprising: an extendable and retractable fluid actuator; said actuator including first and second members telescopically engaged with each other; said first member having an end wall with a cylindrical side wall projecting therefrom, said second member being slidably and rotatably received in the cylindrical side wall of said first member and defining an expansible and contractable fluid chamber with said first member; said members being movable between extended and retracted positions with respect to each other in response to expansion and contraction, respectively, of said fluid chamber; and supply and exhaust ports in said members operable to control the flow of fluid into and out of said chamber in accordance with the angular position of said members with respect to each other; said members being rotatable with respect to each other between (1) a supply position in which said chamber is in fluid communication with



said supply port and in which fluid communication between said chamber and said exhaust port is blocked at least in the contracted condition of said chamber to thereby cause said chamber to expand from the contracted condition when fluid flows into said chamber from said supply port, and (2) an exhaust position in which said fluid chamber is in fluid communication with said exhaust port to permit said chamber to contract from an expanded condition and to prevent said chamber from being expanded from the contracted condition.

4,188,926

AUTOMOTIVE INTERNAL COMBUSTION ENGINE SERVO CONTROL SYSTEM, PARTICULARLY FOR AUTOMATIC SPEED CONTROL ARRANGEMENT

Helmut Fleischer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 770,594, Feb. 22, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,293
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1976, 2609842
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—102 **4 Claims**

1. In an automotive vehicular internal combustion engine speed servo control system having

an engine speed control loop under control of a command input including

an actual speed signal generator (**20**) coupled to the engine and providing an actual speed signal;

a command speed generator (**30**) subject to said command and providing a command speed signal;

comparator means (**40**) comparing said speed signals and providing a speed error signal;

motor means (**61**) coupled to the throttle (**70**) of the engine, controlling its position;

a control amplifier and power means (**50, 60**) responsive to the speed error signal and connected to the motor means (**61**) to control its operation and thereby the position of the throttle (**70**);

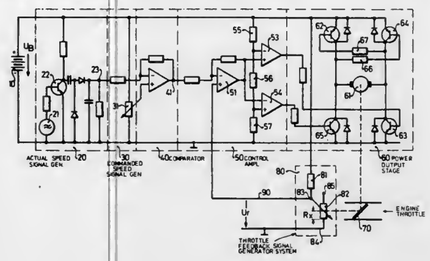
a throttle feedback signal generator system (**80**) coupled to the throttle (**70**) and having an electrical output coupled to and fed back to the control amplifier power means (**50, 60**) and providing an actual throttle position signal thereto

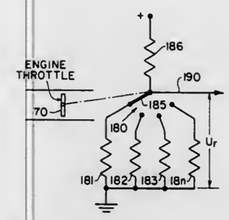
and means to compensate for non-linearities in throttle deflection vs. engine speed change characteristics over the range of operating speed of the engine;

comprising

a source of voltage (**10**) and

a nonlinear variable resistance means (**81, 82, 83, 181, 182, 183 . . . 18n, 185, 186**) electrically coupled to the source (**10**) and mechanically coupled to the throttle (**70**) and linearly displaced in accordance with the movement of the throttle, said nonlinear variable resistance means having a nonlinear throttle displacement variation versus





resistance variation relationship in which a given throttle displacement results in a resistance variation which, at small throttle openings, is greater than at larger throttle openings, and providing a feedback output voltage which thus is nonlinearly degressive with respect to linearly increasing opening position of the throttle (**70**) and to provide for linear response of the control loop throughout the range of operating speed of the engine

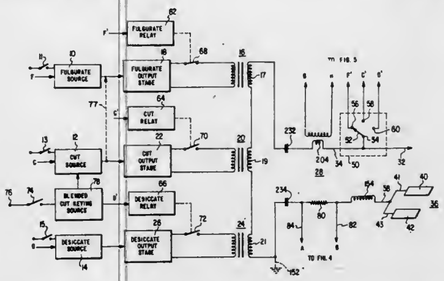
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4,188,927

MULTIPLE SOURCE ELECTROSURGICAL GENERATOR

Frank W. Harris, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Jan. 12, 1978, Ser. No. 869,008
Int. Cl.[2] A61B *17/36;* **A61N** *3/02*
U.S. Cl. 128—303.14 **59 Claims**



1. An electrosurgical generator for use with a patient comprising

first and second electrical power generating means;

a common output circuit connected to said first and second electrical power generating means, said common output circuit including (a) an active lead and an active electrode connected thereto and (b) a patient lead and a patient electrode connected thereto;

said first electrical power generating means (a) producing a voltage on said active electrode, the magnitude of which is sufficiently high to permit arcing from the active electrode to said patient and (b) including current limiting means for limiting the current through said patient to an arcing only value at which desiccation of the patient's tissue is not likely when said active electrode contacts the patient's tissue; and

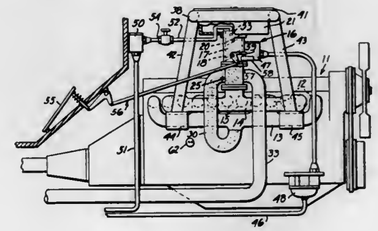
said second electrical power generating means (a) producing a current through said patient, the magnitude of which is sufficiently high to permit desiccation of the patient's tissue when said active electrode contacts the patient's tissue and (b) including voltage limiting means for limiting the voltage on said active electrode to a desiccate only value at which arcing from the active electrode to said patient is not likely.

4,188,928

FUEL VAPORIZING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Carlos Q. Faustinos, 539½ Heliotrope St., Los Angeles, Calif. 90004

Filed Feb. 23, 1977, Ser. No. 771,394
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AA **2 Claims**



1. A gaseous fuel generating apparatus for an internal combustion engine having an intake passage for a gaseous fuel,

a carburetor having an inlet,

said carburetor being connected to said intake passage for vaporizing a liquid fuel and mixing said fuel with air passing through said air inlet and said carburetor, and

means forming an exhaust passage for conveying exhaust gases from said engine to the atmosphere,

which comprises;

means forming a water vaporizing device adjacent said inlet;

means for admitting water to said vaporizing device whereby to mix said vaporized water with said air passing into said air inlet,

a heat exchanger heated by said exhaust gases for heating air,

means for conveying said heated air to said inlet whereby to heat said vaporized water, and

a second heat exchanger in said exhaust passage,

said second heat exchanger extending between said carburetor and said intake passage to further heat said air and vaporized water and fuel mixture,

Said carburetor further including a throttle valve, means for adjusting said valve to control the amount of said mixture passing through said carburetor,

means for sensing the temperature of said engine, and

control means controlled jointly by said adjusting means and by said temperature sensing means for controlling said means for admitting water.

4,188,929

INTERNAL COMBUSTION ENGINE MAGNETO-TYPE IGNITION SYSTEM WITH ELECTRONICALLY CONTROLLED SPARK ADVANCE

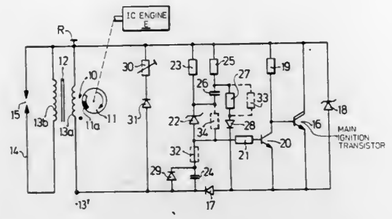
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,832

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636945

Int. Cl.[2] **F02P** *3/06;* **H05B** *37/02*

U.S. Cl. 123—148 E **16 Claims**



1. Internal combustion engine ignition system having
a magneto generator (**10**) having a driven magnetic pole system (**11**);
a primary ignition coil (**13***a*) in flux linking relation to the magnetic system;
a secondary coil (**13***b*) inductively coupled to the primary coil (**13***a*) and a spark gap (**15**) connected to the secondary coil;
a semiconductor controlled switch (**16**) in the primary circuit of the primary ignition coil (**13***a*);
a control circuit connected to and controlling said controlled switch (**16**) to become conductive and store magnetic energy in the primary coil and to open at an ignition instant to cause an inductive voltage to arise at the secondary for generation of a spark at the spark gap to cause an ignition event in the internal combustion engine;
said control circuit including
a threshold circuit (**23, 22, 24, 29**) connected in the primary circuit and responsive to a predetermined voltage level therein and, when said voltage level is reached, providing a conduction control signal to the controlled switch (**16**),
and comprising, in accordance with the invention,
means to continuously vary the occurrence of the ignition instant (Zzp) as a function of speed of the internal combustion engine (E) including
a main timing circuit (**23, 24**) having a timing capacitor (**24**) connected in circuit with the threshold circuit (**23, 22, 24, 29**), said main timing circuit including impedance means having a variable and controllable impedance value;
circuit means coupled to the magneto generator and the impedance means to control the impedance value of said impedance means as a function of engine speed;
and a semiconductor switch (**20**) connected to control conduction of said controlled switch (**16**) and having its control path connected to said timing capacitor and thereby its conduction controlled by the voltage across said timing capacitor (**24**).

4,188,930

BREAKERLESS FLYWHEEL MAGNETO IGNITION SYSTEM

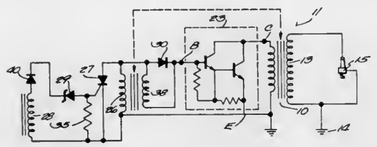
John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Filed Jul. 31, 1978, Ser. No. 929,855

Int. Cl.[2] **F02P** *1/00*

U.S. Cl. 123—148 E **9 Claims**

1. In an ignition system for a cyclically operating internal combustion engine, whereby a high voltage output is produced in timed relation to the engine cycle and which comprises a primary winding and a secondary winding, both inductively coupled with a core, and magnet means carried for orbital motion in timed relation to the engine cycle and cooperating with the core to induce a voltage across the primary winding during a period in each engine cycle that begins prior to the time when said output is to be produced,
switching means for enabling current to flow in the primary winding during said period and for abruptly terminating such current flow at said time, said switching means comprising:
A. transistor means having collector, emitter and base terminals and having said collector terminal and said emitter terminal respectively connected with terminals of the primary winding so that current can flow in the primary winding and through the transistor means when the transistor means is conducting;
B. a biasing coil inductively coupled with said core and having one of its terminals connected with the base terminal of the transistor means and its other terminal connected with said emitter terminal, said biasing coil



being so arranged that current induced therein by the magnet means during said period biases the transistor means on;
C. a controlled rectifier having a gate terminal and having an anode and a cathode which are respectively so connected with the terminals of the biasing coil as to short circuit the biasing coil when the controlled rectifier is conducting and thus terminate supply of biasing current to the transistor means;
D. a zener diode connected with the gate terminal of the controlled rectifier; and
E. a trigger coil mounted adjacent to the orbit of the magnet means and having one of its terminals connected with the gate terminal of the controlled rectifier through said zener diode and its other terminal connected with the cathode of the controlled rectifier, said trigger coil being arranged to have a voltage induced across it by the magnet means, which voltage rises above a predetermined value at said time in the engine cycle to cause the controlled rectifier to conduct.

4,188,931

AUTOMOTIVE SELF-STARTING DEVICE

Richard E. Waterhouse, 16 Angell Ter., South Portland, Me. 04106

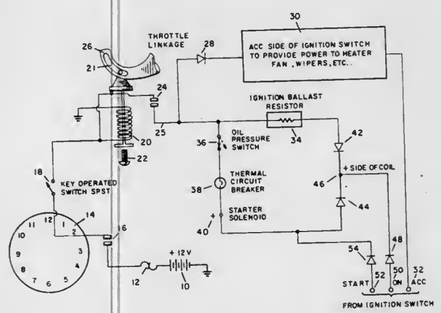
Filed Aug. 11, 1978, Ser. No. 933,099

Int. Cl.[2] **F02N** *11/08*

U.S. Cl. 123—179 B **2 Claims**

1. An apparatus for automatically starting a motor vehicle internal combustion engine having throttle linkage on the carburetor thereof, a power source, a starter motor with a starter solenoid associated therewith being interconnected to a coil, an ignition ballast resistor, an ignition switch having an "on", "start", and "accessory" pole positions, said "on" position pole connected by a line to said coil and "start" position pole connected by a line to said starter solenoid, comprising:
a first pair of contact points, the first of which is connected to said power source;
a clock timer adapted to be preset to close said contact points for a discrete period of time;
a key-operated switch having a first and second pole, the first pole of which is connected to the second of said first pair of contact points;

a solenoid connected to the second pole of said key-operated switch and adapted to activate said throttle linkage;
a second pair of contact points, the first of which is connected to the line running from said key-operated switch to said solenoid, said second pair of contact points adapted to be closed when said solenoid is activated;
an oil pressure sensor controlled switch having a first and second pole, the first pole of which is connected with the second contact of said second pair of contact points, said oil pressure switch being adapted to open due to the increase in oil pressure when said engine starts;
a thermal circuit breaker having a first and second pole, the first pole of which is connected to the second pole of said oil pressure switch, said thermal circuit breaker being adapted that when current passes therethrough for a first preselected time to open and then to close after a second preselected time, the second pole of said thermal circuit breaker being connected to the starter solenoid;
a first diode interposed along the line between said starter solenoid and said coil, adapted to prevent the flow of current from said coil to said starter solenoid;



a first line running from said second contact of said second pair of contact points through said ignition ballast resistor to said coil;
a second diode interposed along said first line between said ignition ballast resistor and said coil, adapted to prevent current from traveling from said coil to said ignition ballast resistor;
a second line running from said second contact of said second pair of contact points to said ignition switch accessory pole;
a third diode interposed along said second line between said second contact point of said solenoid and said ignition switch accessory pole, adapted to prevent current flow from said ignition switch accessory pole to said second contact point of said second pair of contact points;
a fourth diode interposed on said line running from said ignition "on" pole to said coil, adapted to prevent current from flowing from said coil to said ignition switch "on" pole; and
a fifth diode interposed on said line from said ignition switch "start" pole to said starter solenoid, adapted to prevent current from flowing from said starter solenoid to said ignition switch "start" pole.

4,188,932

INTERNAL COMBUSTION ENGINE WITH A SECONDARY COMBUSTION CHAMBER

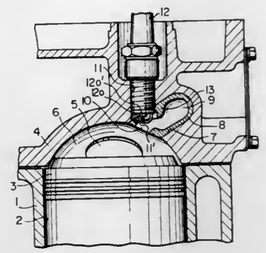
Masami Konishi, Toyota; Norihiko Nakamura, Mishima, and Shogo Sanda, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 616,996, Sep. 26, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,260

Claims priority, application Japan, Jul. 3, 1975, 50-81400

Int. Cl.[2] **F02B** *19/12*

U.S. Cl. 123—191 S **2 Claims**



1. An internal combustion engine comprising a head defining a primary combustion chamber, a secondary combustion chamber connected to the primary combustion chamber through a substantially straight passage at one end of the secondary chamber and extending in a direction substantially parallel thereto, and a spark plug with an electrode extending into the passage, the mixture in the secondary combustion chamber being supplied thereto only through the passage and being first ignited and burnt by a spark from the spark plug, the mixture in the primary combustion chamber being then ignited and burnt by the burnt gas which is produced in the secondary combustion chamber and is injected into the primary combustion chamber through said passage, a projection, immediately adjacent said one end of the secondary chamber, projecting into the passage and extending in a direction transverse to the passage, and structurally distinct from the spark plug, for striking the flow of the mixture pressed out of the primary combustion chamber into the secondary combustion chamber through said passage against the electrode and for shielding the electrode from direct exposure to the flow of the burnt gas injected into the primary combustion chamber from the secondary combustion chamber, said projection being substantially coextensive with the portion of the spark plug which extends into the passage in a direction transverse to said passage.

4,188,933

APPARATUS FOR CONTROLLING OPERATION OF INLET AND EXHAUST VALVES AND SUPPLY OF FUEL TO SELECTED CYLINDERS OF ALL OF MULTI-CYLINDER I. C. ENGINE

Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 30, 1978, Ser. No. 937,997

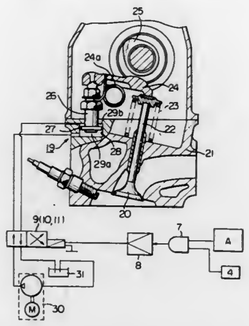
Claims priority, application Japan, Oct. 26, 1977, 52/143660

Int. Cl.[2] **F02D** *13/06*

U.S. Cl. 123—198 F **1 Claim**

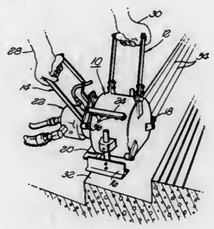
1. In combination, a multi-cylinder internal combustion engine including a plurality of cylinders, each being provided with an inlet valve and an exhaust valve, the plurality of cylinders consisting of a first group of cylinders and a second group of cylinders;
electrically energizable fuel injectors for said plurality of cylinders, respectively, and adapted when energized to discharge fuel adjacent said inlet valves, respectively, for induction into said plurality of cylinders;
an engine load detection means for detecting a first predeter-

mined control event in which said engine is to run on said first group of cylinders;
means for disabling the fuel injectors adapted to discharge fuel adjacent the inlet valves, respectively, as long as said engine load detection means detects said first predetermined control event;
means for detecting a second predetermined control event in which said engine is to be decelerated;
first valve operating means for causing said inlet and exhaust valves to perform induction and exhaust of said first group of cylinders;
second valve operating means for causing said inlet and



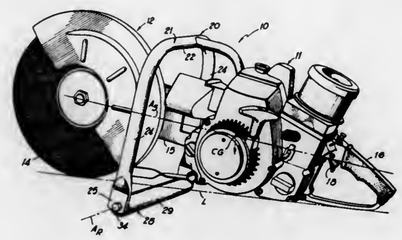
exhaust valves to perform induction and exhaust of said second group of cylinders;
valve disabling means for disabling said second valve operating means so that said inlet and exhaust valves for said second group of cylinders are maintained in their closed positions; and
valve operation restoring means for causing said valve disabling means to restore normal operation of said inlet and exhaust valves for induction and exhaust of said second group of cylinders to allow said second group of cylinders to pump air when said detecting means detects said second control event while said engine load detection means detects said first predetermined control event.

4,188,934
STEP SAFETY GROOVER APPARATUS
Frederick N. Reinhardt, and William A. Fouts, both of Gardena, Calif., assignors to Cushion Cut, Inc., Harbor City, Calif.
Filed Oct. 20, 1978, Ser. No. 953,068
Int. Cl.[2] B28D *1/18*
U.S. Cl. 125—4 **7 Claims**



1. A stair grooving apparatus for cutting longitudinal grooves along the top of a stair step comprising:
a housing which comprises:
a peripheral member having a first end and a second end, the peripheral member having an opening through one portion thereof and a plurality of housing orifices through a second portion thereof,
a first end plate fixed to the first end, the first end plate having an orifice therethrough, and
a second end plate removably attached to the second end, the peripheral member and end plates defining an interior region;
an axially mounted drive means attached to the first end plate, the drive means having a rotatable shaft positioned to extend through the orifice in the first end plate;
grooving means which comprises:
a plurality of grooving blades attached to the shaft in the interior region of the housing, a portion of the blades extending through the opening in the peripheral member of the housing, the cutting blades positioned for being spaced apart from each other;
positioning means which comprises:
a front skid plate vertically adjustably mounted to a front region of the housing,
a rear skid plate vertically adjustably mounted to a rear region of the housing, the front and rear skids adapted for supporting the stair grooving apparatus on the top of the stair step, with the opening in the peripheral member adapted for being positioned immediately above the stair step, and
a face guide means connected to the housing for being positioned next to the vertical face of the stair step for guiding the stair grooving apparatus;
grasping means which comprises:
a radially extending handle attached to the housing for pressing a selected one of the front and rear skids against the top of the stair step when a downward force is applied to the radially extending handle, and
a laterally extending handle attached to the housing for simultaneously pressing the other of the front and rear skids against the top of the stair step and the face guide against the face of the stair step; and
means for cooling and lubricating which comprises a plurality of nozzles attached to the housing, each nozzle for directing a liquid through the housing orifices for spraying the liquid on the grooving means and on the stair step surface.

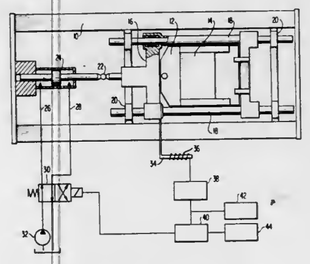
4,188,935
ROLLER HANDLE FOR SAW
William W. Tubesing, 1000 Montreal Rd., Clarkston, Ga. 30021
Filed May 31, 1978, Ser. No. 911,288
Int. Cl.[2] B24B *23/02;* **B28D** *1/04*
U.S. Cl. 125—13 R **5 Claims**



1. A saw construction including:
a prime mover having a front end and a rear end with the center of gravity acting through a common axial plane;
a sawing assembly drivingly connected to and mounted on said prime mover, said sawing assembly including a cutting element having an effective cutting portion extending forwardly of the front end of said prime mover and adapted to cut in a cutting plane generally parallel to said common axial plane;
a rear handle connected to said prime mover and extending rearwardly of the prime mover along the common axial plane; and

a front handle assembly connected to said prime mover and located between the front end of said prime mover and the effective cutting portion of the cutting element of said sawing assembly, said front handle assembly including an inverted, generally U-shaped tubular handle comprising a central upper portion and depending legs at opposite ends thereof, said upper central portion located over said prime mover and said legs oriented on opposite sides of said prime mover and extending generally parallel to the common axial plane, a roller rotatably mounted between the depending ends of said legs about an axis of rotation oriented generally perpendicular to the common axial plane and the cutting plane to act as a guide and support for the saw construction, an upper brace connecting said upper central portion of said tubular handle to said prime mover, and a lower brace assembly connecting both of said depending legs of said tubular handle to said prime mover.

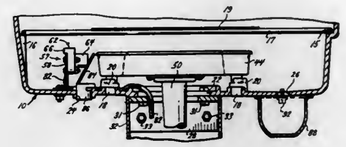
4,188,936
METHOD FOR INCREASING THE CUTTING PERFORMANCE OF RECIPROCATING SLURRY SAWS AND A RECIPROCATING SLURRY SAW FOR CARRYING OUT THIS METHOD
Alfred Stauffer, Steffisburg, Switzerland, assignor to Maschinenfabrik Meyer & Burger AG, Steffisburg-Station, Switzerland
Filed Dec. 27, 1977, Ser. No. 865,031
Claims priority, application Switzerland, Dec. 27, 1976, 16334/76
Int. Cl.[2] B28D *1/02*
U.S. Cl. 125—16 R **9 Claims**



1. A method for increasing the cutting performance of a reciprocating slurry saw of the type including a plurality of spaced blades held in a clamping frame, which frame is reciprocated with respect to a work-piece in order to allow the blades, with the aid of an abrasive slurry, to cut the work-piece, the improvement comprising: displacing the reciprocating clamping frame and blades transversely to a work-piece in a single oscillatory mode at a frequency between 3 and 100 cycles per second, utilizing a short stroke between 10 and 75 millimeters.

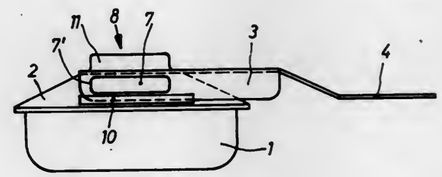
4,188,937
GRILL FOR COOKING
William R. Baynes, DuQuoin, Ill., assignor to Turco Manufacturing Co., DuQuoin, Ill.
Filed Oct. 3, 1977, Ser. No. 838,545
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **9 Claims**

1. An igniter for a burner of a gas-fired grill which comprises a support that is adjacent said burner, a heat-resistant member which is held by said support so it is intermediate said support and said burner, and a plurality of arcing contacts that are secured to said heat-resistant member and that are spaced apart to define an arc gap therebetween, said arcing contacts being secured to said heat-resistant member at points which are remote from said burner, said heat-resistant member having a closed-top passage which is formed and disposed to permit admixed air and gas from said burner to reach said arcing contacts but not to cause any fat, meat juices or other drippings from food on said grill to move into proximity to said arcing contacts, said heat-resistant member having a shielding portion



that projects axially rearwardly of said closed-top passage to overlie the confronting ends of said arcing contacts to keep fat, meat juices and other drippings from food on said grill from dripping onto said confronting ends of said arcing contacts.

4,188,938
BURNER DEVICE, ESPECIALLY FOR A BRAZIER OR THE LIKE
Rene Hasenfratz, Eschlikon, Switzerland, assignor to Gebr. Spring, Metallwarenfabrik G.m.b.H., Eschlikon, Switzerland
Filed Feb. 22, 1978, Ser. No. 880,124
Claims priority, application Switzerland, Feb. 22, 1977, 2199/77
Int. Cl.[2] F24C *5/00*
U.S. Cl. 126—43 **3 Claims**



1. A burner device, especially for a brazier or other small cooking stove or the like, comprising:
a housing;
an upper portion provided for said housing;
said upper portion having at least one flame opening and separate air infeed openings;
a regulation slide for regulating the air infeed;
a cover for the flame opening and forming a flame extinguishing device;
said regulation slide and cover comprising a one-piece common element,
said regulation slide and said cover being in the form of slide means provided with a handgrip; and
guide means on said upper portion for guiding said slide means,
said common element being provided with openings which in size and arrangement essentially correspond to the openings provided at the upper portion,
said separate air infeed openings at the upper portion includ-

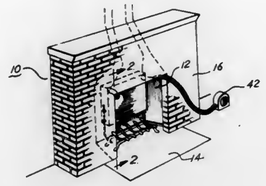
ing a plurality of respective air infeed openings arranged at opposite sides of the flame opening.

4,188,939

SPACE HEATER FOR USE WITH FIREPLACE

Robert Gamso, and Robert A. Gamso, both of 1112 Regent St., Niles, Mich. 49120

Filed Oct. 28, 1977, Ser. No. 846,409
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—121 **4 Claims**



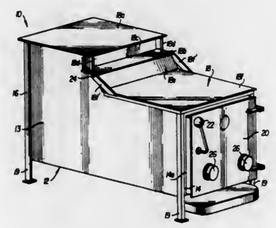
1. A space heater for use with a fireplace having a firebox with a rear wall, comprising a generally rectangularly shaped unit having metal walls forming a heat exchanger section with the front-to-rear thickness substantially less than the horizontal length, and defining an air flow chamber therein, leg means for supporting said heat exchanger section at a position above the normal height of the fuel in the firebox, means for holding said heat exchanger section in spaced relation to the back wall of the fireplace to provide a passageway for hot gases and smoke on the rear side of the heat exchanger, said last mentioned means having two side walls joined to said heat exchanger section and a rear wall connecting said two side walls to form a rear section having a vertical passageway therein adjacent the rear wall of the heat exchanger section, and a plurality of baffles disposed in said passageway for directing the hot gases into contact with the rear wall of the heat exchanger section, an air inlet to said chamber adjacent one of the upper front corners of said unit, a flexible tubular conduit extending forwardly from said inlet to the front of the fireplace, an air outlet from said chamber adjacent the other upper front corner of said unit, a flexible tubular conduit extending forwardly from said outlet to the front of the fireplace for connecting said air outlet with the space to be heated, and a means for circulating the air from said air inlet conduit, through said chamber and to and through the air outlet conduit.

4,188,940

WOOD OR COAL BURNING STOVE HAVING A TOP WITH A PIVOTABLE LID FOR TOP LOADING OF WOOD OR COAL INTO THE STOVE

Foster Matherly, 137 Franklin St., Rocky Mount, Va. 24151

Filed Jan. 23, 1978, Ser. No. 871,593
Int. Cl.[2] F24C *15/10*
U.S. Cl. 126—217 **1 Claim**



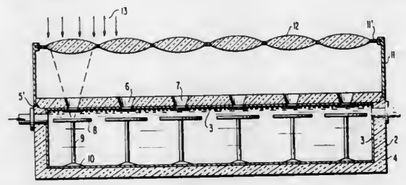
1. A wood or coal burning stove comprising:
a bottom;
sidewalls;
front and rear end walls; said front end wall having a wood or coal loading opening therein;
a door normally closing said opening but being openable for loading of wood or coal into said stove through said opening;
a top comprising:
a stationary substantially horizontally extending tier remote from said front end wall;
a further wall extending from said tier in a direction downward and toward said front end wall and defining a horizontally extending recess at the lower end thereof which opens in a direction toward said front end wall;
said further wall comprises:
a first plate directly connected to and extending from said tier in a direction downwardly and toward said front end wall;
a second plate directly connected to the lower end of the face of said first plate most remote from the front end wall and extending therefrom in said last-mentioned direction; and
said recess being defined by the lower edge of said first plate and the face of said second plate closest to said front end wall;
a lid pivotable about a stationary horizontal hinge axis, immediately adjacent the upper end of said further wall, from a normally closed substantially horizontally extending position in which the lid extends into and transversely across the recess to effectively close off the stove from outside air to an open position, in which the lid swings out of the recess initially in a direction upwardly and toward the front end wall, for loading of wood or coal into the stove from the top; and
first and second substantially straight rigid arms, one end of said first arm being fixedly connected to one side of said lid adjacent the end thereof closest to said recess and the other end thereof being pivotable about said stationary hinge axis, one end of said second arm being fixedly connected to the other side of said lid adjacent the end thereof closest to said recess and the other end thereof being pivotable about said stationary hinge axis.

4,188,941

SOLAR HEATING SYSTEM

James R. Hopkins, 9702 Dublin Dr., Manassas, Va. 22110

Filed Jul. 14, 1978, Ser. No. 908,838
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—440 **6 Claims**



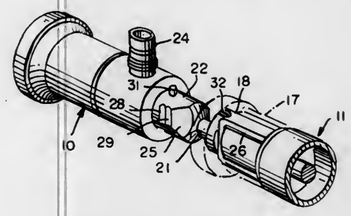
1. A solar heating system for converting the rays of the sun into heat, comprising,
a sealed solar heating unit having a tank lined with a heat reflective metal and containing a fluid heat transfer medium completely filling the tank, insulating material encasing the tank,
a removable cover of insulating material having a heat reflective metal lining, said cover enclosing the top of said tank,
a series of conical shaped apertures in said cover extending through the insulated cover and the metal lining thereof, the bottoms of the apertures being closed with transparent plates sealed to the inner surface of the heat reflective metal lining of the cover, flat heat absorbing metal units positioned directly below said apertures and immersed in the fluid heat transfer medium,
means for supporting the flat heat absorbing metal units below the apertures in said cover,
a framework located above the apertured cover of said tank, and
a series of magnifying lenses located directly over the apertures in the tank cover focused on the upper surface of the flat heat absorbing metal units immersed in the fluid heat transfer medium.

4,188,942

ENDOSCOPE AND UROLOGICAL INSTRUMENT LOCK

David J. Fehlberg, Glendale Heights, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 27, 1978, Ser. No. 881,723
Int. Cl.[2] A61B *1/00;* **B25G** *3/00*
U.S. Cl. 128—6 **18 Claims**



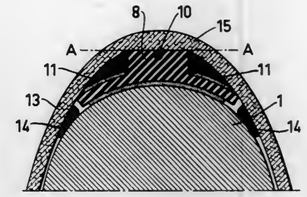
1. A latching mechanism for releasably connecting an endoscope and a urological instrument in operative relation; said latching mechanism including a generally cylindrical body and a tube separate from said body defining a socket; said socket being sized such that it will receive said body; wherein the improvement comprises said socket having at least one opening through a wall portion thereof; a spring mounted externally of said socket and being biased such that a section thereof projects into said socket through said opening; said section being movable out of said socket upon outward flexure of said spring; said body having a first recess positioned and sized such that it will receive said section of said spring when said body is fully inserted into said socket, defining a fully latched position of said body; first cam means for camming said spring section out of said first recess upon the application of a force of predetermined magnitude urging said body axially away from said socket; said body also having a second recess spaced axially from said first recess, said second recess being positioned and sized such that when said body is moved out of said fully latched position and axially away from said socket, said second recess will receive said spring section, defining a partially latched position of said body; means for preventing axial movement of said body away from said socket when said body is in said partially latched position; said body and said socket being further sized such that said body is rotatable with respect to said socket when said body is in said partially latched position; second cam means for camming said spring section out of said second recess when said body is rotated with respect to said socket while said body is in said partially latched position, thereby releasing said body for axial separation from said socket; and locking means provided by said body and said socket for locking said body against rotation in said socket when said body is in its fully latched position.

4,188,943

METHOD OF PRODUCING A DISMOUNTABLE, REINFORCED PLASTER MOLD OR PLASTER CAST AND MEANS THEREFOR

Gunnar Sjöstrand, Box 268 A, Åtvidaberg, Sweden (S-597 00)

Filed Sep. 20, 1977, Ser. No. 835,028
Claims priority, application Sweden, Sep. 23, 1976, 7610530
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—91 A **6 Claims**



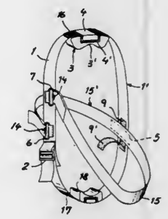
6. A method of producing a dismountable web reinforced plaster cast for supporting an interior mold, comprising covering the mold with an elastic stocking, covering said stocking with a rubber layer in the form of thin latex rubber strips, treated with talcum, by winding said strips around said stocking, placing at least two longitudinally extending border lists each with an inserted wire along the highest contours of the mold by means of self-adhesive tape which adheres to the underlying rubber winding, applying plaster reinforced with fabric around said rubber winding and said border lists, allowing the plaster to solidify, cutting the plaster along chords at the lists using said wires as guides for the cutting tool so that the latter does not cut too deeply into the plaster, removing the resulting plaster segments, separating the remaining parts of plaster from the mold, drying said parts in an oven so that the excess water is removed, restoring said parts with intermediate border lists around the mold, and fixing said parts relative to each other by winding with a bandage.

4,188,944

ACROMIO-CLAVICULAR RESTORATION BRACE

Marian Z. Augustyniak, 251 W. 81st St., New York, N.Y. 10024

Continuation-in-part of Ser. No. 775,180, Mar. 7, 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,340
Int. Cl.[2] A61F *5/40*
U.S. Cl. 128—94 **9 Claims**



1. An acromic-clavicular joint-restoration brace comprising:
a resilient shape-retentive shoulder block having an arcuate concavity conforming to and engaging with the body of a patient in the vicinity of the clavicle;
strap means passing over the top of said shoulder block for securing said block in position on the joint to be restored and applying a downward force thereto; and
fastening means for adjustably mounting said shoulder block on said strap means intermediate the ends thereof;
said top of said shoulder block extending beyond the ends of

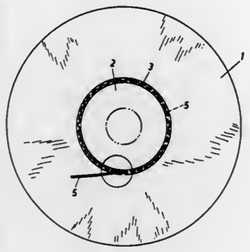
said arcuate concavity for keeping said strap means spaced apart from the shoulder of the patient.

4,188,945

SURGICAL CLOTH

Björn Wenander, Nötegång, Sweden, assignor to Triplus Sjukvårdsprodukter AB, Sweden

Filed Aug. 14, 1978, Ser. No. 933,587
Claims priority, application Sweden, Aug. 26, 1977, 7709587
Int. Cl.² A61B *19/06*
U.S. Cl. 128—132 D **1 Claim**



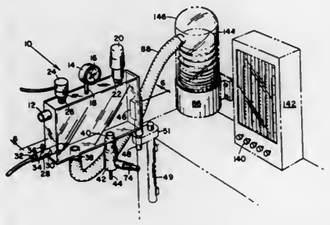
1. A surgical cloth provided with a central hole, which uncovers the operation area, said cloth being intended as a protection of the wound edges around an incision, wherein the cloth is provided with a hem surrounding the hole, the hem being provided with an opening through which a rigid, flexible thread is intended to be introduced, one of the ends of the thread being provided with a loop through which the opposite end of the thread is passed, said thread having a length exceeding that of the hem surrounding the hole and the thread being displaceable in the hem for adjusting the size of the hole.

4,188,946

CONTROLLABLE PARTIAL REBREATHING ANESTHESIA CIRCUIT AND RESPIRATORY ASSIST DEVICE

Robert L. Watson, 4019 Bentway, San Antonio, Tex. 78217, and Robert L. Rayburn, 12522 La Manana, San Antonio, Tex. 78233

Filed Oct. 7, 1977, Ser. No. 840,400
Int. Cl.² A61M *16/00*
U.S. Cl. 128—204.22 **8 Claims**



1. In an anesthesia rebreathing system including means for administering a mixture of fresh gases and patient expired gases to a patient wherein said fresh gases are comprised of anesthesia gas and/or oxygen and are delivered via a fresh gas supply line, the system comprising:

a first tube having a first end connected to said fresh gas supply line and a second end;

a second tube having an unobstructed flow path and having first and second ends and being concentric with said first tube, said first and second tubes having said second ends terminating immediately adjacent each other;

adapter means for connecting said second ends of said first and second tubes to a first end thereof, a second end of said adapter means being constructed and arranged to connect to either an endotracheal tube or breathing mask of said patient, said second tube mixing said fresh gases from said first tube with expired gases from said patient;

module means connected to said first end of said second tube for receiving said mixture of fresh and expired gases therein;

means for removing a predetermined portion of said mixture of said gases from said module means and away from said anesthesia rebreathing system;

means for transferring said mixture of gases from said module to said patient via said second tube;

measuring means in said module means for determining carbon dioxide tension of said mixture of fresh and expired gases; and

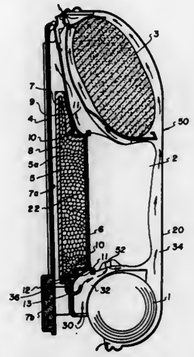
control means for proportionate adjustment of fresh gases fed to said patient as a function of said carbon dioxide tension measured in said mixture of said fresh and expired gases.

4,188,947

BREATHING DEVICE HAVING A COOLANT CHAMBER

Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,238
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700492
Int. Cl.² A62B *7/00*
U.S. Cl. 128—202.26 **8 Claims**



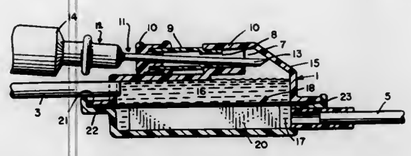
1. A breathing device for carrying by a person comprising a support frame having a flexible back-frame wall for engaging against the person's back, a flat container for a coolant mounted on said frame and having a coolant therein and including a container rear wall substantially parallel to and spaced from said frame rear wall and having respective opposite top and bottom walls at each end and a front contact wall of a good heat-conducting material in engagement on its interior side with the coolant and having an exterior exposed side, a breathing bag having one side overlying and contacting said front contact wall and secured to said support frame and a remaining portion extending outwardly from said front contact wall, a cartridge having a canister with an exothermic reacting CO_2 absorbing and oxygen-liberating substance for supplying oxygen mounted on said frame above said breathing bag, a cover connected to said frame and overlying and being spaced from said cartridge and said breathing bag, said frame and said cover defining an air inlet below said breathing bag and a breathing passage means from said air inlet to and into and out of said bag and around the exterior portion of said bag which is not overlying said contact wall and around the exterior of said cartridge to a person for respiration and acting to cool said cartridge.

4,188,948

FILTER DEVICE

John A. Swinton, Anaheim, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 20, 1977, Ser. No. 844,020
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 R **7 Claims**



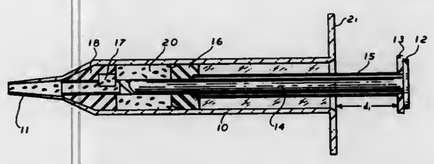
1. A filter device for separating gas from a medical fluid or the like in which a housing has a filter element and a gas collection chamber, wherein the improvement comprises a tubular sleeve guide means in parallel relationship with the filter element, having a passage which is substantially longer than its cross-sectional dimension and which extends substantially the length of the housing, in communication with the gas collection chamber and having an extraction supporting a puncturable diaphragm at the end of said tubular sleeve opposite the gas collection chamber, said tubular sleeve providing means for aligning a gas extraction tool with the interior of the gas collection chamber while simultaneously preventing any contact between the extraction tool and the filter member.

4,188,949

SEQUENTIAL INJECTION SYRINGE

William T. Antoshkiw, Clifton, N.J., assignor to Becton, Dickinson & Company, Rutherford, N.J.

Filed Jul. 5, 1977, Ser. No. 812,765
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 M **11 Claims**



1. A syringe capable of sequentially injecting at least two volumes of liquid with a minimum amount of intermixing prior to and during injection comprising:

a. a barrel having a forward end and rear end;

b. at least two plungers in the barrel including a first plunger between the forward and rear ends of the barrel, and a second plunger between said first plunger and the forward end;

c. an opening to permit the passage of liquid at the forward end of the barrel;

d. a passage for directing a first liquid between the first and second plungers upon withdrawal of the first plunger towards the rear end of the barrel, and in flow communication with the opening in the barrel; and

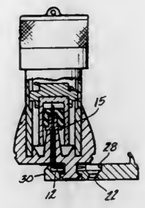
e. plunger actuating means, allowing a first liquid to be drawn between the first and second plungers upon withdrawal of the first plunger towards the rear end of the barrel, and a second liquid to be drawn between the forward end of the barrel and the second plunger upon withdrawal of the second plunger towards the rear end of the barrel.

4,188,950

DISPOSABLE SYRINGE

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Oct. 30, 1978, Ser. No. 955,774
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 F **11 Claims**



1. An improved automatic disposable syringe adapted to be used but once, said syringe comprising:

(a) a housing containing an ampoule and hypodermic needle, said needle being disposed in a retracted position completely within the confines of said housing;

(b) means in said housing for driving said needle to an injecting position wherein said needle protrudes from said housing; and

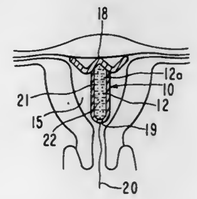
(c) retracting means movably mounted on said housing, said retracting means being operable to engage said needle and bend the latter to pull said needle from its protruding position to a safe position wherein said needle is covered over by a portion of said syringe.

4,188,951

INTRAUTERINE SYSTEM EMBRACING SELECTED COPOLYMERIC MEMBRANES FOR ADMINISTERING BENEFICIAL AGENT

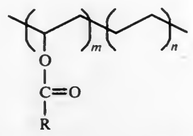
Takeru Higuchi, Lawrence, Kans., and Anwar A. Hussain, Lexington, Ky., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 705,470, Jul. 7, 1976, Pat. No. 4,052,505, which is a continuation-in-part of Ser. No. 591,712, Jun. 30, 1975, abandoned, and a continuation-in-part of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application Aug. 22, 1977, Ser. No. 826,928
The portion of the term of this patent subsequent to Sep. 9, 1992, has been disclaimed.
Int. Cl.² A61M *7/00*
U.S. Cl. 128—260 **12 Claims**



1. An intrauterine system for the controlled administration of an anti-fertility agent in an effective amount to the uterus of a warm blooded mammal, said system comprising a flexible body of a copolymeric material containing a progestational steroid capable of diffusing through said copolymeric material, said body sized, shaped and adapted for comfortable insertion

and retention in the uterine lumen, and wherein said material comprises a copolymer of the following formula:



wherein R is a member selected from the group consisting of a lower alkyl group of 2 to 7 carbons and phenyl, m is (4 to 80)% by weight, n is (100-n)% by weight, and which copolymer has a melt index of about 0.1 to 1000 grams per ten minutes.

4,188,952

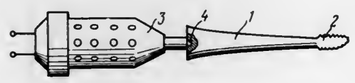
SURGICAL INSTRUMENT FOR ULTRASONIC SEPARATION OF BIOLOGICAL TISSUE

Vladimir I. Loschilov, ulitsa Kibalchicha, 11, kv. 83; Vadim V. Zasypkin, Uralskaya ulitsa, 6, kv. 209, and Vladimir I. Petrov, Novodevichy proezd, 2, kv. 14, all of Moscow, U.S.S.R.

Continuation of Ser. No. 752,972, Dec. 21, 1976, abandoned, which is a continuation of Ser. No. 617,690, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 524,308, Nov. 15, 1974, abandoned, which is a continuation of Ser. No. 429,393, Dec. 28, 1973, abandoned. This application Sep. 12, 1978, Ser. No. 941,796

Int. Cl.[2] **A61B** *17/32*

U.S. Cl. 128—305 **4 Claims**



1. A surgical instrument for the ultrasonic separation of biological tissue comprising a cutting means having a longitudinally extending axis, opposite end portions, and a pentagonal cross-section, said pentagonal cross-section defining a rectangular first portion attached to a triangular second portion; and an ultrasonic oscillation means secured to said cutting means at one end portion thereof providing longitudinal mechanical oscillations of said cutting means in the direction of said axis at an ultrasonic frequency, the other end portion of said cutting means being rounded having a curvature radius, said first portion of said cutting means having triangular-shaped teeth for cutting osseous tissue and said second portion of said cutting means having arch-like shaped teeth for cutting cartilaginous tissue; said triangular-shaped teeth having front edges and back edges, said front edges being the edge of each tooth closest to said rounded end portion of said cutting means, said back edge being the edge of each tooth closest to said end portion of said cutting means secured to said ultrasonic oscillations means; a first angle defined between said front edge of each tooth and a vertical line passing through the tooth perpendicular to said axis; a second angle defined between said front edge and said back edge of each tooth; a height; and a pitch; said front edge is flat and said first angle has a positive value of from 0° to 10°, said pitch is from 0.9 to 1.0 mm, and said second angle is from 35° to 40°.

4,188,953

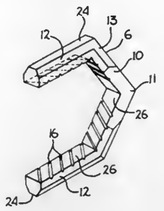
HEMOSTATIC CLIP

Charles H. Klieman, 3737 Century Blvd., Lynwood, Calif. 90262, and Richard M. Densmore, South Gate, Calif., assignors to Charles H. Klieman, M.D., Los Angeles, Calif.

Filed Aug. 5, 1977, Ser. No. 822,095

Int. Cl.[2] **A61B** *17/12*

U.S. Cl. 128—325 **2 Claims**



1. A hemostatic clip formed of elongate deformable material for use in the strangulation of tubular members by means of a hemostatic clip applicator, the clip applicator of the type having jaw portions adapted to receive and maintain hemostatic clips via grooves in said jaws, said jaws further having stop portions at the extremity thereof adapted to maintain said hemostatic clips within said grooves, the hemostatic clip being generally U-shaped and comprising:

(i) a bail portion forming the base of said U-shape;

(ii) a pair of arms extending from said bail portion and forming the extremities of said U-shape, said arms being separated in a substantially opposed relationship and having opposing substantially flat surfaces, each arm being substantially longer than said bail portion, whereby said substantial length of said arm portions results in stability of said clip in said clip applicator, each arm having a generally trapezoidal cross-section with a narrower outer portion adapted to be received in a respective groove of said clip applicator; and

(iii) a plurality of spaced parallel diagonally disposed grooves extending downwardly into each of said clip arm opposing surfaces, said grooves extending below each clip arm flat surface and being spaced apart sufficiently so that substantial portions of said flat surface remain between adjacent grooves, the grooves on one arm extending solely in one direction, the grooves on the other arm extending solely in an opposite direction such that the grooves in opposing surfaces are angularly displaced with respect to one another, whereby said grooves form a generally cross-hatched pattern when said opposing substantially flat surfaces are brought into facing contact with one another.

4,188,954

CATHETER WITH IMPROVED BALLOON ASSEMBLY

Bhupendra C. Patel, Elgin; William J. Binard, Cary, and Daniel M. McWhorter, Arlington Heights, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 817,770, Jul. 21, 1977, Pat. No. 4,154,243, which is a division of Ser. No. 711,948, Aug. 5, 1976, Pat. No. 4,055,187. This application Oct. 19, 1978, Ser. No. 952,878

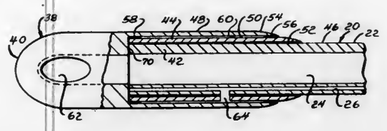
Int. Cl.[2] **A61M** *25/00*

U.S. Cl. 128—349 B **6 Claims**

1. A catheter, comprising:

an elongated shaft having a main lumen and an inflation lumen extending along a wall of the shaft; and

a balloon assembly comprising a tip secured to a distal end of the shaft, a first sleeve being secured to an outer surface of the shaft adjacent the distal end thereof, an expansible second sleeve extending proximally from the tip, said second sleeve being of one-piece construction with said tip, said second sleeve overlying and being joined to the first sleeve at a proximal zone extending circumferentially around the assembly and defining a fluid receiving cavity intermediate the first and second sleeves, an opening communicating between the main lumen of the shaft and an



outer surface of the assembly at a location distal said cavity, and opening means communicating between the cavity and the inflation lumen for inflation of the second sleeve.

4,188,955

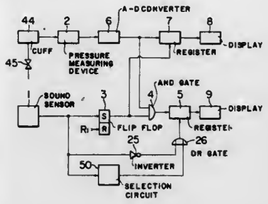
BLOOD PRESSURE MEASURING PROCESS AND APPARATUS

Tamaki Sakamoto, Nagaokakyo, and Yoshio Kinefuchi, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 12, 1977, Ser. No. 832,475

Int. Cl.[2] **A61B** *5/02*

U.S. Cl. 128—680 **7 Claims**



1. A blood pressure measuring apparatus comprising:

an inflatable cuff;

means for pressurizing said cuff to a predetermining pressure level;

means attached to said cuff for detecting Korotkov sounds;

means for gradually deflating said cuff from said predetermined pressure level;

means for measuring pressure in said cuff;

systolic pressure detecting means connected with said means for measuring and said means for detecting and responsive to a first detected Korotkov sound signal occurring during cuff deflation for storing a cuff pressure existing at the time of said first Korotkov sound signal as a systolic pressure signal;

diastolic pressure detecting means connected with said means for measuring and means for detecting and responsive to a last detected Korotkov sound signal occurring during cuff deflation for storing a cuff pressure existing at the time of said last detected Korotkov sound signal as a diastolic pressure signal, said diastolic pressure detecting means comprising:

means initiated upon detection of a systolic pressure level for storing the cuff pressure existing at the time of a detected Korotkov sound as a possible true diastolic pressure level;

means responsive to the continued detection of Korotkov sounds as the cuff pressure falls through a first predetermined pressure range beginning at the systolic pressure level and thereafter to the disappearance of Korotkov sounds as the cuff pressure falls through a third predetermined pressure range beginning at the cuff pressure existing at a last detected Korotkov sound for verifying that the stored cuff pressure existing at a last detected Korotkov sound is a true diastolic pressure; and

means responsive to the disappearance of Korotkov sounds as the cuff pressure falls through said first predetermined pressure range and thereafter to the disappearance of Korotkov sounds as the cuff pressure falls through a second predetermined pressure range for verifying that the stored cuff pressure existing at a last detected Korotkov sound is a true diastolic pressure.

4,188,956

METHOD FOR THE ANALYSIS, DISPLAY AND CLASSIFICATION OF MULTIVARIATE INDICES OF BRAIN FUNCTION—A FUNCTIONAL ELECTROPHYSIOLOGICAL BRAIN SCAN

E. Roy John, 930 Greacen La., Mamaroneck, N.Y. 10546

Filed Jun. 26, 1978, Ser. No. 918,730

Int. Cl.[2] **A61B** *5/04*

U.S. Cl. 128—731 **9 Claims**

1. A method for the acquisition, compression, analysis and display of neurometric test data which comprises

connecting a plurality of electrically responsive terminals to the subject's scalp,

exposing the subject to a specified set of conditions to evoke the subject's brain wave responses reflecting a variety of types of brain functions,

sensing the subject's brain electrical responses,

statistically analyzing said responses using a digital computer based system,

representing the results of said statistical analysis as hard copy display according to a locational sign character convention in which the representation occurs at locations on the copy corresponding in format to the locations of said electrodes on the subject's head, and the deviations of said results above a statistically predetermined normal range of values are plotted as plus signs and values below the predetermined range of values are plotted as minus signs, with the size and density of the plotted symbols proportional to the statistical significance of such deviations.

4,188,957

ROD-BREAKING DEVICE FOR CIGARETTE-MAKING MACHINES

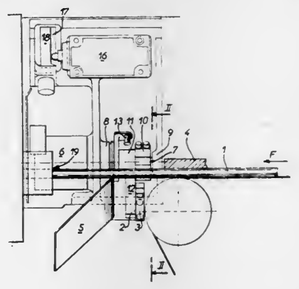
Andre Legardinier, Le Plessis Bouchard, France, assignor to Arenco-Decoufle, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,223

Claims priority, application France, Feb. 3, 1977, 77 02983

Int. Cl.[2] **A24C** *1/04*

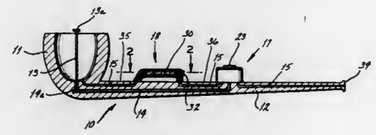
U.S. Cl. 131—96 **3 Claims**



1. A device for breaking and deflecting a cigarette-rod between the cigarette making section and the cutting section of a cigarette-making machine comprising a cutting blade rotatably movable in a plane perpendicular to the rod about a fixed horizontal axis parallel to that of the rod through an angle of about 90° between two end positions, one end position being a normal position during operation of the machine, in which the blade is below the cigarette-rod, and the other end position being attained upon stopping of the machine, in which the

blade is above said rod after having broken it, a fixed counter-cutter blade disposed below the rod, recessed with respect to said movable cutting blade, and a bearing piece, such as a drying iron peen, above the cigarette rod recessed with respect to the fixed counter-blade, both cooperating with the movable cutting blade to break the cigarette rod during the rising movement of the cutting blade and to cut it during its descending movement, a deflector flap rotatable about the same axis as the movable cutting blade normally disposed below the cigarette rod to permit the latter to freely pass towards the cutting section and rotated upwardly by the movable blade with an angular lag determining its coming into operation only after breaking the cigarette rod for deflecting the cigarette rod and preventing it from reaching the cutting section, and means for controlling the upward and downward rotation of the cutting blade and the deflector.

4,188,958
SMOKING PIPE
Leon Whitford, 1015 S. 5th St., Greenville, Ill. 62246
Filed Nov. 3, 1978, Ser. No. 957,526
Int. Cl.[2] A24F *1/08*
U.S. Cl. 131—194 **5 Claims**



1. Smoking pipe comprising:
A. a bowl;
B. a stem connected to said bowl;
C. a smoke passageway beginning at the base of said bowl and running through said stem to a first compartment means, said smoke passageway exiting said first compartment means and running through the stem to a bit;
D. an open second compartment means situated within said first compartment means for containing fluid;
E. a removable plug to seal said second compartment means, said plug having at least one passageway running from said second compartment means to said first compartment means so that fluid from said second compartment means can travel to said first compartment means;
F. a heating pin located within said bowl, said heating pin connected to a heating rod, said heating rod running through said stem and projecting into said second compartment means.

4,188,959
PIPE CLEANER
Edward J. Karalius, 18158 Hartland St., Reseda, Calif. 91335
Filed Sep. 30, 1977, Ser. No. 838,240
Int. Cl.[2] A24F *9/06, 9/10*
U.S. Cl. 131—245 **2 Claims**

1. A pipe cleaner comprising:
an elongated member constructed of a bendable rigid material said member being arcuate at an at rest position, said member having a fore end and an aft end, said fore end being substantially similar to said aft end;
a handle section attached to said member intermediate said fore end and said aft end; and
when said member is at rest the said member is located in an initial elongated position for cleaning straight or curved passageways of the pipe, said member having an outermost tip, said member being bendable to assure a substantially U-shaped configuration, with said member in said U-shaped configuration the said outermost tip is engaged within a securing means in said handle to thereby maintain said member in said U-shaped position for cleaning the bowl of said pipe, upon disengagement of said outermost tip from said securing means and upon release of said



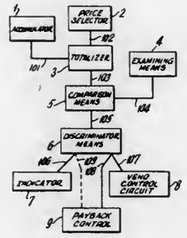
member from the bending force the said member substantially returns to said initial position

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4,188,960
FIBERS FILTER RODS AND OTHER NONWOVEN ARTICLES MADE FROM POLY(1,2-PROPYLENE TEREPHTHALATE) COPOLYESTERS OF TEREPHTHALIC ACID, 1,2-PROPYLENE GLYCOL AND ETHYLENE GLYCOL
Gerald P. Morie; Cephas H. Sloan; Winston J. Jackson, Jr., and Herbert F. Kuhfuss, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 748,037, Dec. 6, 1976, Pat. No. 4,145,518. This application Dec. 8, 1978, Ser. No. 967,558
Int. Cl.[2] A24O *1/00;* C08G *63/18*
U.S. Cl. 131—267 **14 Claims**

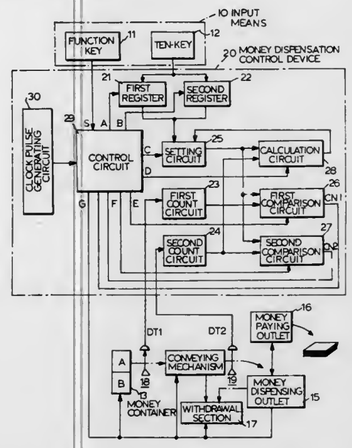
1. A tobacco smoke filter rod of a continuous melt blown web of a fiber of a polyester of terephthalic acid or an ester forming derivative thereof and a glycol of from about 60 mole percent to 100 mole percent 1,2-propylene glycol and from 0 to about 40 mole percent ethylene glycol; said polyester having an inherent viscosity of at least about 0.35 in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.5 gram of polyester in 100 ml. of said solvent, and a Tg of at least 80° C.

4,188,961
COIN MECHANISM EXACT CHANGE INDICATOR APPARATUS
Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.
Filed Oct. 18, 1977, Ser. No. 843,286
Int. Cl.[2] G07D *1/06;* G07F *5/24*
U.S. Cl. 133—2 **8 Claims**



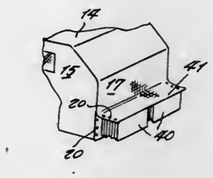
1. A circuit for communicating the inability of a multi-denomination coin change making mechanism to return correct change comprising an accumulator for determining the value of coins deposited, a totalizer for determining the value of required change from the value of the deposited coins and a vend price, examining means for determining the availability of coin denominations for returning change with respect to two or more denominations, comparison means connected to receive the outputs of said examining means and said totalizer to determine therefrom the inability of said coin change making mechanism to return correct change and produce an output signal having a characteristic indicative of said inability, and a discriminator means responsive to two or more characteristics of said signal, said discriminator means producing one or more signals at its output indicative of the inability or ability to return correct change.

4,188,962
MONEY DISPENSATION CONTROL DEVICE
Katsuhiko Onoe, and Toshihisa Kosaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan
Continuation-in-part of Ser. No. 759,360, Jan. 14, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,744
Int. Cl.[2] G07D *1/00*
U.S. Cl. 133—4 R **2 Claims**



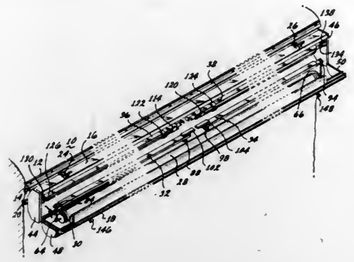
1. In a money dispensing machine operating to dispense money in a plurality of monetary denominations to a required total money amount through a money conveying mechanism out of a money container section, a money dispensation control device comprising:
(a) a plurality of registers for storing data representative of amounts in the respective monetary denominations which are selectively specified to be dispensed;
(b) a first money passage detecting device for detecting pieces of money which are delivered to the money conveying mechanism from the money container section and for generating detection signals;
(c) a second money passage detecting device for detecting pieces of money which are dispensed into the money dispensing outlet from the money conveying mechanism and for generating detection signals;
(d) a first count circuit connected to said first money passage detecting device for counting the detection signals generated by said first money passage detecting device;
(e) a second count circuit connected to said second money passage detecting device for counting the detection signals generated by said second money passage detecting device;
(f) a setting circuit connected to said plurality of registers for temporarily storing data representative of the amount stored in each of said plurality of registers;
(g) a first comparison circuit connected to said setting circuit and said first count circuit for comparing the data stored in said setting circuit with the count value of said first count circuit, and for generating a first coincidence signal upon coincidence;
(h) a second comparison circuit connected to said setting circuit and said second count circuit for comparing the data stored in said setting circuit with the count value of said second count circuit, and for generating a second coincidence signal upon coincidence;
(i) a calculation circuit connected to said setting circuit and said second count circuit for calculating the difference value between the data stored in said setting circuit and the count value of said second count circuit; and
(j) a control circuit connected to said plurality of registers, said setting circuit, said first and second comparison circuits and said calculation circuit for storing in turn according to a predetermined priority order with respect to the plurality of monetary denominations the data representative of the selected amounts of the respective monetary denominations stored in said plurality of registers in said setting circuit, for initiating the money dispensing operation, for suspending the monetary dispensing operation upon generation of said first coincidence signal, for storing the difference value of said calculation circuit when said first coincidence signal is generated and said second coincidence signal is not generated in the respective register of said plurality of registers according to the monetary denomination, for storing the data representative of the selected amount of the next monetary denomination in said predetermined priority order stored in the respective one of said plurality of registers in said setting circuit, and after dispensing money in each of the monetary denomination for storing in said setting circuit the difference value of said calculation circuit stored in said respective register for initiating an additional monetary dispensing operation of the corresponding monetary denomination, whereby a shortage in any monetary dispensing operation is corrected after dispensing money in each of said plurality of monetary denominations.

4,188,963
PORTABLE TENT/CANOPY FOR JEEPS
Charles E. Janoe, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Oct. 18, 1978, Ser. No. 952,482
Int. Cl.[2] B60P *3/34*
U.S. Cl. 135—1 A **4 Claims**



1. A tent/canopy for a jeep automotive vehicle comprising in combination, a tent made of canvas and a framework made of metal pipe and bars for supporting said tent, said framework being removably mounted upon brackets screwed upon said jeep, said framework including sidewardly extendable sideboards with accordian pleated, extendable boxes, and said tent having opposite sidewardly extendable portions.

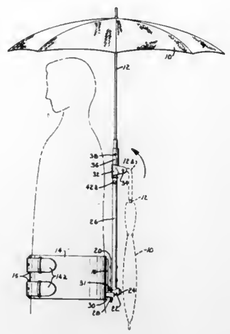
4,188,964
TRAVEL AWNING
Bradley G. Greer, Long Beach, Calif., assignor to A & E Plastik Pak Co. Inc., Industry, Calif.
Filed Jun. 5, 1978, Ser. No. 912,758
Int. Cl.[2] E04F *10/06*
U.S. Cl. 135—5 AT **33 Claims**



1. A travel awning for attachment to the side of a vehicle, including
an elongated housing for receiving and storing the travel awning,
component members in the travel awning for supporting the travel awning to the side of the vehicle in an extended position of the travel awning,
the elongated housing being formed from a main housing and a cover housing, at least some of the component members of the travel awning being received at least partially within the main housing and others of the component members of the travel awning being received at least partially within the cover housing when the main and cover housings are closed to a storage position,
the cover housing being hinged along a bottom portion of the main housing to rotate downwardly when the housings are separated to an open position and some of the component members of the travel awning being received within the main housing and at least some of the other ones of the component members of the travel awning being supported by the cover housing when the housings are in the open position, and
the main and cover housings when in the open position providing unrestricted access to all of the component members of the travel awning.

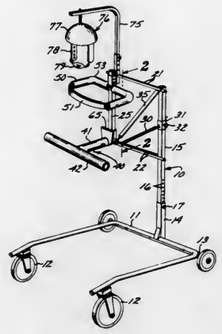
4,188,965
BODY MOUNTED UMBRELLA
John W. Morman, 1622 E. 75th Ter., Kansas City, Mo. 64131
Filed Jun. 19, 1978, Ser. No. 916,965
Int. Cl.[2] A45B *11/02*
U.S. Cl. 135—5 C **4 Claims**

1. In combination with a collapsible umbrella shade mounted on a shaft, the improvement comprising:
a substantially straight post;
means for attaching said post to the body of the user at a substantially centered position on the back;
first means coupling said shaft with said post for pivotal movement about a substantially horizontal axis between an extended position wherein said shaft forms an upward extension of said post to locate said umbrella shade above the head, and a folded position wherein said shaft is folded generally alongside said post;
releasable means for maintaining said shaft in the extended position;
second means mounting said post for pivotal movement about a second horizontal axis from a normally upright orientation to an orientation projecting to one side of the body of said user;
resilient means urging said post toward said upright orientation; and



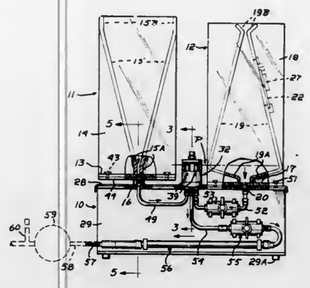
an arm member projecting laterally from said post and providing a handle for displacing said post from its upright orientation to facilitate access to said releasable means.

4,188,966
WALKING SUPPORT DEVICE
Oakley B. Palmer, 8733 Nada St., Downey, Calif. 90242, and Russell M. Lett, 790 Wellesley Dr., Claremont, Calif. 91711
Filed Oct. 4, 1978, Ser. No. 948,396
Int. Cl.[2] F16M *13/08;* **A61H** *3/04*
U.S. Cl. 135—67 **6 Claims**



1. A walking support device for restraining the body of a person in an upright position comprising:
a U-shaped support frame mounted on casters for horizontal translation on ground;
an adjustable frame member connected to said frame proximate the center of the middle element thereof;
a pivotally joined parallelogram structure connected to said frame member for pivotal articulation over the opening in said U-shaped frame;
spring biasing means connected between said parallelogram structure and said frame member for biasing thereof to a preselected deployment;
seat support means connected to said parallelogram structure and deployed to extend in cantilever therefrom; and
a U-shaped torso brace connected to said parallelogram structure above said seat support means, said brace being conformed to surround the upper torso of said person.

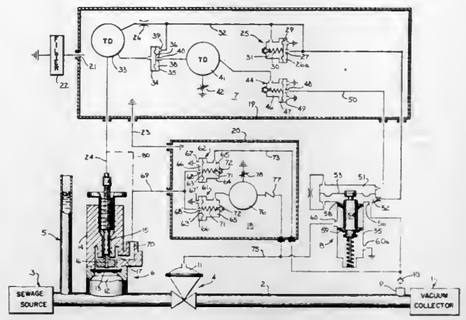
4,188,967
METHOD OF GENERATING LIQUID CONCENTRATION GRADIENTS HYDROSTATICALLY
John E. Joyce, 22 Nelson Rd., South Weymouth, Mass. 02190
Division of Ser. No. 701,173, Jun. 30, 1976, Pat. No. 4,074,687.
This application Jan. 12, 1978, Ser. No. 868,850
Int. Cl.[2] B01F *5/00*
U.S. Cl. 137—1 **8 Claims**



1. The method of forming a liquid concentration gradient that includes the steps of confining volumes of a first liquid and a second liquid in separate chambers of similar sizes and shapes, the cross sectional area of that portion of each that is to contain a gradient forming liquid increasing from a minimum at one end to a maximum at the other end with the minimum cross sectional area of the first liquid and the maximum cross sectional area of the second liquid at the bottoms of said portions, maintaining the two volumes open to the atmosphere, arranging the levels of the two volumes relative to a plane to establish that ratio between the product of the height of the first liquid and its density to the product of the height and density of the second liquid that establishes a predetermined order of flow, placing the bottom of the first chamber volume in communication with the interior of an air tight chamber in a manner to provide an upward discharge therein to establish a pressure reference plane, said plane inclusive of the maximum cross sectional area of the second liquid, then placing the bottom of the second chamber volume in separate communication with the interior of the closed chamber in a manner effecting upward discharge therein at said plane, and draining the closed chamber from below said plane without affecting the pressure.

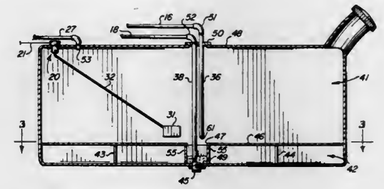
4,188,968
FLOW SYSTEM WITH PRESSURE LEVEL RESPONSIVE AIR ADMISSION CONTROL
Arnold G. Trobaugh, Milwaukee, and George J. Janu, Brookfield, both of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.
Filed Oct. 28, 1977, Ser. No. 846,405
Int. Cl.[2] F16K *31/126*
U.S. Cl. 137—236 R **15 Claims**

1. In a sewage flow system employing a vacuum source means connected to the downstream end of a sewer line buried in the ground for conducting sewage through the line as a result of pressure and which line may include low accumulating portions, a fluid activated sewer line valve means having an operator means for opening and closing said sewer line, a fluid controller means having a triggered input means for actuating said operator means of said valve means, fluid supply means for supplying fluid to said controller and said operator means, a fluid admission control means connecting said fluid supply means to said controller and including set means coupled to said sewer line downstream of said valve means and responsive to a selected line pressure to actuate the control means and



including reset means for resetting the admission control means in response to the opening of the line valve means.

4,188,969
RESERVE FUEL TANK SYSTEM
Wilson H. Lotton, and Delbert R. Sears, both of Cottonwood, Ariz., assignors to Gladys Mayden, Citrus Heights, Calif.
Filed Dec. 30, 1977, Ser. No. 865,954
Int. Cl.[2] F23K *5/00*
U.S. Cl. 137—264 **8 Claims**

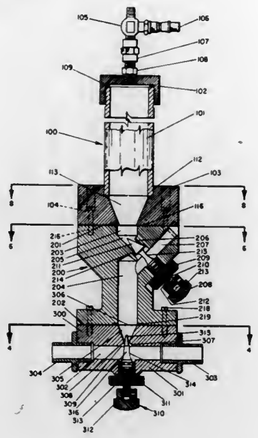


1. A fuel tank for providing fuel reliably when said fuel tank is relatively empty and when a vehicle wherein said fuel tank is installed operates on inclines, said fuel tank comprising, in combination:
(a) an upper compartment;
(b) a lower compartment;
(c) a dividing member bounding said upper compartment and said lower compartment and separating said upper and lower compartment, said dividing member having therein an approximately centrally located opening for permitting fuel introduced into said upper compartment to fill said lower compartment, said dividing member being attached to the inner walls of said fuel tank so that said lower compartment is sealed from said upper compartment except for said approximately centrally located opening, wherein said approximately centrally located opening is sufficiently large to accommodate a first fuel tube and to permit filling of said lower compartment at a predetermined rate; and
(d) said first fuel tube extending through said approximately centrally located opening into said lower compartment to a point sufficiently distant from the bottom of said fuel tank to avoid any residue or debris at the bottom of said fuel tank from being sucked into said fuel tube when fuel is removed from said fuel tank through said fuel tube.

4,188,970
APPARATUS FOR CONTROLLABLY INJECTING CONTAMINANT MATERIAL INTO A LIQUID FLOW SYSTEM

Peter E. Maidment, #301-155 Toronto Rd., Port Hope, Ontario, and Marcel Thouin, 334 de Letoile, H7N4T9, Laval, Quebec, both of Canada

Filed May 30, 1978, Ser. No. 910,729
Claims priority, application Canada, May 31, 1977, 279489
Int. Cl.² F17D *1/00*
U.S. Cl. 137—268 **9 Claims**



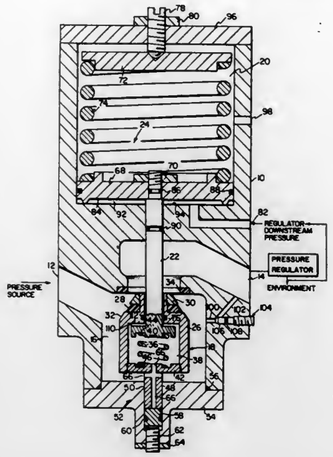
1. An apparatus for use in controllably injecting contaminant into liquid flowing through a conduit in a liquid flow system, said apparatus comprising an injection section having a first body member with a first fluid flow path therethrough adapted to be connected in series with said conduit, a second passage in said body member reducing in cross-sectional area in a direction toward said first passage and having a restricted discharge outlet opening into said first passage, the flow path through said second passage being substantially transverse to the flow path through said first passage, an adjustable valve mounted on said body member for varying the rate of flow through said restricted discharge outlet, a thrid passage in said body member for supplying pressurized fluid to said second passage along a flow path substantially transverse to the flow path through said second passage, and a reservoir section having a second body member detachably mounted on said first body member, said reservoir section having an elongate reservoir chamber coaxial with said second passage and communicating therewith through an end portion of the reservoir chamber that gradually decreases in cross-sectional area in a direction toward said second passage, an adjustable pressure relief means for said reservoir chamber disposed at a position remote from said reduced end portion for operation when the reservoir is in an upright position, said reservoir chamber being openable and closable for introducing contaminant material therein.

4,188,971
FLUID CUTOUT VALVE

N. Stuart Otteson, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1978, Ser. No. 900,470
Int. Cl.² F16K *17/34*
U.S. Cl. 137—460 **13 Claims**

1. A fluid cutoff valve for stopping the flow of pressure fluid in a fluid system from a source of said fluid to an environment where said fluid is used, said system having means for regulating pressure disposed between said source and said environment, said valve comprising:
a valve housing having an inlet and an outlet;
a floating poppet body disposed in a flow chamber of said valve housing between said inlet and said outlet for stopping the flow of fluid when seated on a valve seat in said valve housing;
means disposed in said valve housing for causing said poppet

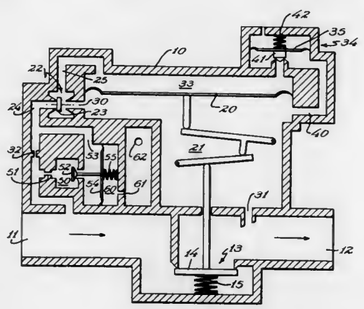


body to seat on said valve seat upon a preselected excess fluid flow rate and
means disposed in said valve housing and responsive to said fluid pressure downstream of said means for regulating pressure for causing said poppet body to seat on said valve seat upon a preselected excess fluid pressure experienced downstream of said means for regulating pressure.

4,188,972
GAS VALVE ASSEMBLY

Jan H. van der Zee, Emmen, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1978, Ser. No. 938,617
Int. Cl.² F23N *1/00*
U.S. Cl. 137—489 **9 Claims**

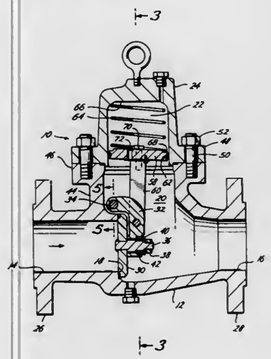


8. In an improvement in a gas valve assembly having a main valve adapted for controlling the flow of gas from a source to a combustion device with the main valve having a pressure responsive actuator means to which gas flows through an orifice and a control valve means when the control valve means is operated and exhausts through a pressure regulator valve to maintain the pressure of gas to the combustion device at a predetermined value, the improvement comprising:
flow control means connected providing an additional gas flow to said actuator means for a predetermined period of time upon the initial operation of said control valve means to initially rapidly open said main valve means to provide sufficient gas to the combustion device for ignition.

4,188,973
CHECK VALVE

Irvin B. Weise, and Oscar Dane, both of Houston, Tex., assignors to Anderson, Greenwood & Co., Houston, Tex.

Filed Dec. 6, 1977, Ser. No. 858,080
Int. Cl.² F16K *15/03, 47/02*
U.S. Cl. 137—514 **3 Claims**

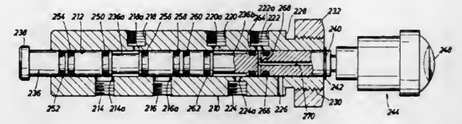


1. A check valve comprising
a body having an inlet, an outlet, a seat surrounding communication through said body between said inlet and said outlet, and a valve chamber communicating with said outlet downstream of said valve seat and open to the exterior of said body,
a valve disc,
means for pivotally mounting said valve disc within said chamber for movement into and from engagement with said valve seat to control flow therethrough,
a bonnet having a cylinder defined therein,
means for securing said bonnet to said body with said cylinder in communication with said valve chamber,
a piston positioned within said cylinder for reciprocation therein,
means connecting said piston to said valve disc, the valve disc, its mounting means, the piston and the means connecting the piston to the valve disc being totally enclosed within said body chamber and said bonnet cylinder, and
means associated with said piston for allowing relatively free movement of said piston responsive to the opening movement of said valve and to restrain the movement of said piston responsive to closing movement of said valve by controlling the flow of fluids from opposite sides of said piston which fluids are the fluids flowing through said valve, said piston is positioned within said cylinder so that fluid pressure downstream of said valve seat is exerted on said piston to urge it in the direction of its movement during opening of said valve disc, the diameter of said piston is substantially the same as the diameter of said valve disc, whereby the movements due to back surge are substantially cancelled.

4,188,974
BYPASS VALVE ASSEMBLY AND SYSTEM

Harry Roger, 124 Banks Ave., Lafayette, La. 70506

Continuation-in-part of Ser. No. 734,603, Oct. 21, 1976, abandoned. This application Apr. 7, 1978, Ser. No. 894,415
Int. Cl.² F16K *11/07*
U.S. Cl. 137—557 **17 Claims**

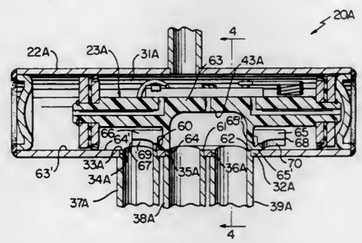


1. A valve assembly comprising:
a valve body having a hollow therein, said valve assembly having at least two longitudinally spaced inlets and at least one outlet in pressure communication relation to said hollow;
a valve element longitudinally movable within said hollow between first and second positions with respect to said valve body, said valve element blocking pressure communication between said one of said inlets and said one outlet and permitting pressure communication between the other of said inlets and said one outlet via said hollow in said first position, and permitting pressure communication between said one inlet and said one outlet via said hollow and blocking pressure communication between said other inlet and said one outlet in said second position;
pressure sensitive indicator means operatively associated with said valve element and operative upon communication therewith of pressure greater than or equal to a given magnitude to provide a first indication and upon communication therewith of pressure less than said magnitude to provide a second indication;
means providing pressure communication between said one inlet and said indicator means when said valve element is in said first position;
and means blocking pressure communication between said one inlet and said indicator means when said valve element is in said second position.

4,188,975
REVERSING VALVE CONSTRUCTION AND VALVE MEMBER THEREFOR AND METHODS OF MAKING THE SAME

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 19, 1977, Ser. No. 825,958
Int. Cl.² F16K *31/363*
U.S. Cl. 137—625.66 **32 Claims**



1. In a reversing valve construction having a housing means provided with a chamber carrying a movable piston-like valve member therein that controls port means of a valve seat means of said housing means through the relative position of passage means of said valve member relative to said port means, the improvement comprising a one-piece flexible sealing skirt

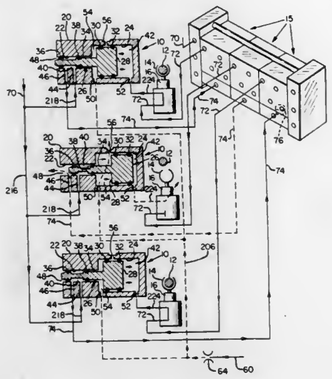
carried by said valve member and extending outwardly therefrom in a cantilevered manner adjacent said valve seat means so as to be exposed to fluid pressure in said chamber that will act directly thereon and cause said flexible skirt to flex and engage said valve seat means in a manner to tend to sealingly conform to the contour of said valve seat means and thereby seal said passage means to said valve seat means while permitting sliding movement therebetween.

4,188,976

MULTIPLE DENTAL HANDPIECE CONTROL SYSTEM

George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Filed Feb. 15, 1978, Ser. No. 878,026
Int. Cl.² F15B *11/20, 13/08*
U.S. Cl. 137—637.1 **5 Claims**



1. In a multiple tool control system,
a plurality of cylinder drives each including a cylinder having a head end and a rod end and a piston having a head and rod movable in the cylinder,
each cylinder having a first port in the head end, a second port in the rod end and an exhaust port intermediate the ends of the cylinder and connected to the second port when the piston is at the head end and blocked by the piston from the second port when the piston is at the rod end,
a plurality of valve means, one for each cylinder drive, normally individually supplying fluid under pressure to the first ports to pressurize the head ends of the cylinders to urge the pistons toward the rod ends and each valve means operable when actuated to exhaust the head end of the cylinder associated therewith,
and limited flow low fluid pressure supply means connected in common to the second ports for driving the pistons from the rod ends to the head ends whenever the head ends are exhausted, whereby when one of the head ends is exhausted, the piston in that cylinder is moved to the head end to exhaust the rod end and thereby exhaust the rod ends of all the other cylinders.

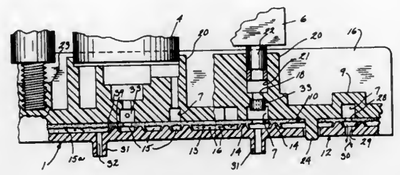
4,188,977

FLUID SYSTEM CIRCUIT BOARD

Richard N. Laakaniemi; Leon C. Ploszaj, and Bruce R. Schultz, all of Milwaukee, Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Division of Ser. No. 750,650, Dec. 15, 1976, Pat. No. 4,110,140.
This application Apr. 12, 1978, Ser. No. 895,594
Int. Cl.² F15C *5/00;* **B32B** *31/04*
U.S. Cl. 137—833 **9 Claims**

1. A fluid circuit board comprising at least first and second plate-like members secured to each other with opposed surfaces, said one plate-like member having fluid circuit recesses formed in a first of the opposed surfaces, said second plate-like member forming a closure for said recesses in said first member and having encircling ribs projecting outwardly from the second of the opposed surfaces, said ribs defining separation wall means extending generally parallel to and around the recesses, and an adhesive film interposed between said members and intimately bonded to said members to form an integral



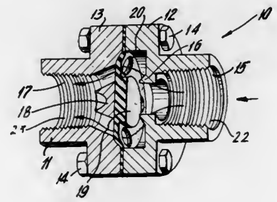
board, said encircling ribs defining chambers aligned with the recesses and located on the opposite side of the adhesive member from said recesses, said adhesive film extending over said recesses between the opposite sides of said encircling ribs forming fluid-fight passageways in said first of the opposed surfaces and fluid-tight chambers in said second member.

4,188,978

VALVE MECHANISM

Bruce L. De Lorenzo, Clifton, N.J., assignor to Plasto-Matic Valves, Inc., Totowa, N.J.

Continuation of Ser. No. 309,729, Nov. 27, 1972, abandoned.
This application Feb. 24, 1976, Ser. No. 660,904
Int. Cl.² F16K *15/14*
U.S. Cl. 137—859 **9 Claims**



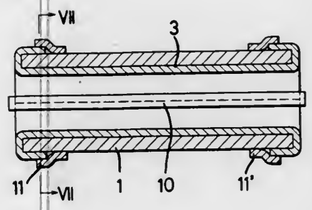
1. Valve mechanism comprising:
a housing having an inlet member and an outlet member between which fluids are adapted to pass,
a self-centering flexible diaphragm disposed within said housing and operatively peripherally fixedly mounted and maintained against lateral movement between said inlet and outlet members and extending substantially transverse to said members in an intermediate reference plane,
said diaphragm having orifices interiorly of its perimeter to permit the passage of fluid from the inlet member to the outlet member and a central solid sealing portion,
a valve support seat in the outlet member adjacent to yet spaced from one side of the intermediate reference plane for abutting the central portion of the diaphragm during normal flow of the fluids through the housing and a sealable passage in the inlet member adjacent to yet spaced from the other side of the intermediate reference plane for abutting the central portion of the diaphragm to prevent the flow of fluid through the housing,
said diaphragm being peripherally arranged for independent flexible self-movement in any position of spatial orientation of the housing between an opening position wherein the central portion thereof abuts the valve support seat on said one side of the intermediate reference plane and a closing position wherein the central portion thereof abuts the sealable passage on said other side of the intermediate reference plane, and said diaphragm being normally independently self-disposed in one of said position for independently flexibly self-moving through the intermediate reference plane and while being maintained against lateral movement to the other of said positions in any said position of spatial orientation upon a change in the flow condition through housing.

4,188,979

PROTECTIVE COVER FOR A THERMORESPONSIVE TUBE

Syuichi Nakamura; Satoshi Ogawa, both of Osaka; Yasuhiro Moriyama, Ibaraki; Tomihisa Ueno, Ibaraki, and Minoru Komura, Ibaraki, all of Japan, assignors to Nitto Denki Kogyo Kabushiki Kaisha, Ibaraki and Osaka Gasu Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 715,647, Aug. 18, 1976, abandoned.
This application Sep. 12, 1978, Ser. No. 941,634
Claims priority, application Japan, Aug. 26, 1975, 50-104795; Aug. 26, 1975, 50-118875[U]; Oct. 9, 1975, 50-138956[U]; Oct. 9, 1975, 50-138957[U]; Oct. 9, 1975, 50-138958[U]
Int. Cl.² F16L *58/02*
U.S. Cl. 138—109 **5 Claims**



1. In a thermoshrinkable tube designed to be wrapped around and to heat-seal pipes to protect the pipes from corrosion, said thermoshrinkable tube having the whole inner wall thereof covered with a protective cover to keep it clean of any foreign matter, the improvement wherein said protective cover located inside said tube has ends projecting beyond the ends of said tube, with said cover ends folded back to the outer wall of the tube at both ends thereof and removably fastened to said outer wall with its ends apart from each other, said protective cover being made of such a material selected from the group consisting of paper and a plastic sheet so that it can be peeled off the tube before the application of heat to the thermoshrinkable tube by unfastening both ends of such protective cover from the outer wall of the tube, fastening one unfastened end of the protective cover to a pipe at a location near the portion of the pipe to be heat-sealed with the thermoshrinkable tube and then moving the thermoshrinkable tube away from the location toward to the portion of the pipe to be sealed so that the protective cover will be turned inside out during and after such movement, thus making it possible to peel off the protective cover from the thermoshrinkable tube just prior to the heat sealing thereof.

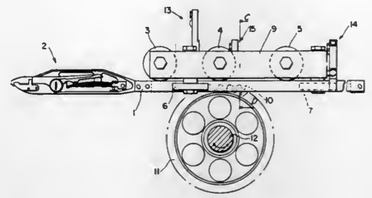
4,188,980

LUBRICATING MEANS FOR RECIPROCATING FILLING-YARN INSERTERS

Kurt Muller, Friedrichshafen, Del.X, assignor to Lindauer Dornier Gesellschaft mbH., Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 934,273
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743303
Int. Cl.² D03J *1/00*
U.S. Cl. 139—1 R **14 Claims**

1. In a weaving machine with filling-yarn insertion by means of inserters adapted to be alternatingly advanced into and retracted from the shed and being composed of long support devices having gripper systems at the ends thereof, said support devices being adapted to be driven and both supported and guided outside the shed in their rectilinear motion, and being supported between guide rollers,



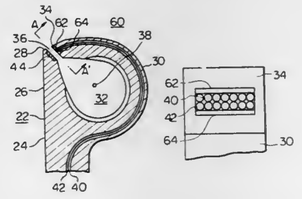
the improvement comprising solid lubricating means fixed with respect to the machine and in sliding contact with said advanced and retracted support devices in an unstressed part of bearing means for said support devices.

4,188,981

WEFT YARN SENSOR

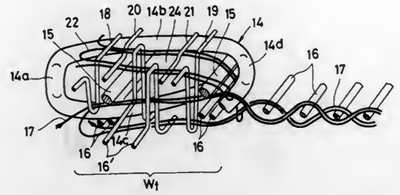
Junnosuke Suekane, Musashi-murayama, and Shuichi Kojima, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 14, 1977, Ser. No. 806,299
Claims priority, application Japan, Jun. 17, 1976, 51/70384
Int. Cl.² G01N *21/30;* **D03D** *47/36*
U.S. Cl. 139—370.2 **21 Claims**



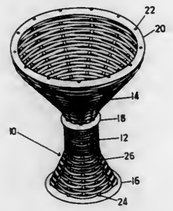
1. A weft yarn sensor in combination with a weaving loom, comprising
a sensor body formed with an aperture through which an inserted weft yarn is passed during insertion, said sensor body having
first and second portions confronting each other and defining therebetween a gap providing communication between said aperture and the outside thereof for allowing the weft yarn to be passed from said aperture to the outside thereof prior to beat-up,
light projecting means located at said first portion for projecting light to said second portion,
light reflecting means located at said second portion for producing a reflected light from the light projected from said light projecting means, and
light receiving means located at said first portion for receiving said reflected light, said light receiving means being offset from a line which passes through said light projecting means and which is parallel with the center line of said aperture, at least one of said light projecting means and said light receiving means having a length which is elongate in the longitudinal direction of the weft yarn passed from said aperture to the outside thereof through said gap and a width which is fairly short in the direction of the diameter of the weft yarn passed through said gap.

4,188,982
WOVEN FASTENER STRINGER
Hiroshi Yoshida, and Noritaka Tsubata, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed Dec. 21, 1978, Ser. No. 971,992
Claims priority, application Japan, Dec. 29, 1977, 52-5387
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—384 B **4 Claims**



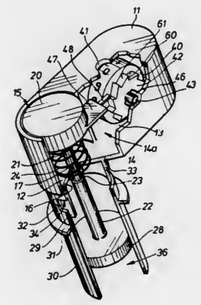
1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction and a heel portion at the opposite end remote from said head connected to a next adjacent one of said successive loops; a plurality of reinforcing cores extending longitudinally through said row of elongated loops; a binding weft thread extending substantially the full length of said leg between each adjacent pair of said loops; a first group of binding warp threads and a second group of binding warp threads both being interlaced with said binding weft thread substantially in a common plane defined by the upper surfaces of said upper legs, said first group of threads being further interlaced with said foundation weft thread underlying said lower legs of said loops, and one or more of said foundation warp threads in said woven filament section passing upwardly towards said upper legs and being interlaced with said binding weft thread.

4,188,983
WOVEN CONSTRUCTION SYSTEM
William T. Graham, Verona; Jean L. Petrick, Helenville, and Harold E. Swingley, Jr., Monona, all of Wis., assignors to W. T. Rogers Co., Madison, Wis.
Filed Jul. 12, 1978, Ser. No. 924,045
Int. Cl.[2] B27J *1/00*
U.S. Cl. 139—424. **15 Claims**



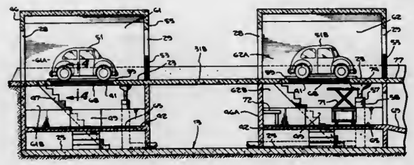
1. A woven construction of a generally tubular shape comprising:
a. at least two spaced, closed shaping bands each having an odd number of holes formed in it;
b. a plurality of struts extending between and being received within the corresponding holes in each of the shaping bands, each of the struts being formed from thermoplastic material into a generally circular cross-sectional shape and each of the struts having a plurality of longitudinally extending ribs provided on its surface about its periphery;
c. at least one elongated weaving strip woven continuously in and among the struts, the weaving strip being formed from thermoplastic material into a generally flattened shape and having a plurality of longitudinally extending ribs provided on its surface about its periphery, the ribs on the weaving strip and the ribs on the struts serving to add stiffness to the woven construction; and
d. the spaced shaping bands determining the relative orientation and spacing of the struts to thus determine the size and shape of the woven construction.

4,188,984
BABY-MILK POWDER DISPENSER
Rodney Lyall, 42 Emerson Ave. Linthorpe, Middlesbrough,, Cleveland, United Kingdom
Filed Jul. 27, 1978, Ser. No. 928,518
Claims priority, application United Kingdom, Aug. 16, 1978, 34363/77
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—12 **12 Claims**



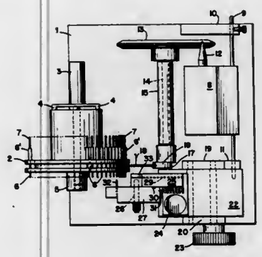
1. A method of dispensing a measured quantity of baby-milk powder (as hereinbefore defined) comprising the steps of inserting into the powder an end of a tubular member housing a plunger which is capable of being retracted away from the end of the tubular member to a given position defining with the tubular member an open-ended measuring chamber, inserting the end of the tubular member into the powder to a depth greater than the length of the measuring chamber and sufficient to compact the powder in the tubular member and against the plunger to substantially maximum compaction, withdrawing the tubular member from the powder so that a measured quantity of compacted powder is contained in the measuring chamber and actuating the plunger to dispense the powder from the tubular member.

4,188,985
STRUCTURE FOR SERVICING A PLURALITY OF MOTOR VEHICLES SIMULTANEOUSLY
Evan J. Osterman, 6920 Foothill Blvd., Tujunga, Calif. 91042
Filed Nov. 28, 1977, Ser. No. 855,398
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—98 **6 Claims**



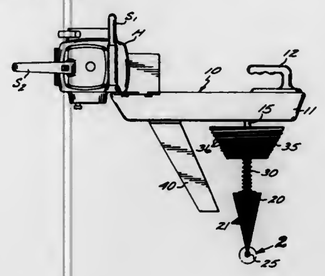
1. In a motor vehicle service structure having a plurality of service bays defined by end and side walls the combination comprising for each bay a front entry, a rear entry, a rear entry closure; a first support floor, an access well in the first support floor, horizontally movable closure gates for the access well; a second support floor vertically spaced from the first support floor, personnel access means between floors, supply access means between floors, means selectively precluding personnel access to said second support floor, and access drives for vehicles to and from said plurality of service bays.

4,188,986
MICROSAMPLER
Leif Sune V. Wetterlin, Edvard Ols vag 4, 230 42 Tygelsjo, and Bertil G. Frank, V. Karaby (pl 289), 240 23 Dosjebro, both of Sweden
Filed Apr. 28, 1978, Ser. No. 901,066
Claims priority, application Sweden, May 6, 1977, 7705278
Int. Cl.[2] B65B *43/50*
U.S. Cl. 141—130 **5 Claims**



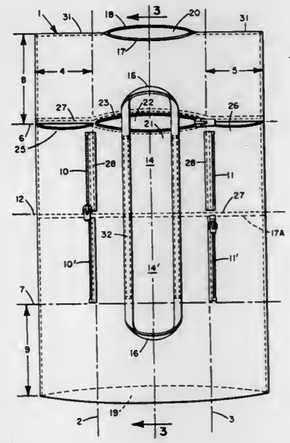
1. A microsampler device for transfer of small volume samples by capillary action, comprising in combination, presentation means presenting at least one measuring tube of microsampling capacity of the order of 20ml in volume and having an open ended capillary tube precisely in position past a transfer station, means presenting at the transfer station in registration with the open ended measuring capillary tube when moved therepast, a catheter coupled to a fluid source terminating in a capillary sampling tube open end presenting fluid from the source and located to register at a distance in the order of less than one mm from the measuring tube open end, and means moving the presentation means and measuring tube rapidly past the transfer station to transfer liquid from the capillary tube open end into the measuring tube open end by capillary flow.

4,188,987
LOG SPLITTING ATTACHMENT
Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306
Filed Sep. 22, 1978, Ser. No. 944,752
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 R **6 Claims**



1. A log splitting attachment adapted to be secured to the power head of a chain saw said power head including an output sprocket comprising:
an elongate hollow housing attachable to said power head and receiving said output sprocket at one end thereof;
reduction means deployed in said housing and connected to said output sprocket for producing a reduced angular output rate;
an output shaft mounted for rotation in said housing and engaged to said reduction means, said output shaft extending transversely to the exterior of said housing and including splines formed on the exterior surfaces thereof;
a tapered screw attached at the base thereof to the free end of said output shaft, said screw including a first thread formed on the exterior thereof;
a tapered frustum slidably mounted on said splines of said output shaft and including a second thread formed on the exterior thereof, said second thread having a pitch of greater advance than said first thread; and
spring means deployed between said screw and said frustum for urging said frustum away from said screw.

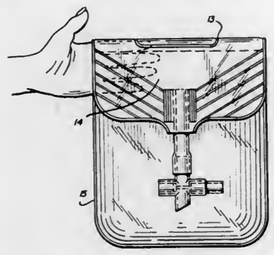
4,188,988
SHEET ASSEMBLY FOR USE AS A MULTIPURPOSE TOTE BAG
Ferenc I. Agyagos, Sangin Bldg., 3-21-5 Akasaka, Minato-ku, Tokyo, Japan
Filed Jun. 12, 1978, Ser. No. 914,772
Claims priority, application Japan, Jun. 13, 1977, 52-77073[U]; Jun. 26, 1977, 52-99548[U]
Int. Cl.[2] A45C *3/04*
U.S. Cl. 150—1.7 **10 Claims**



1. A sheet assembly for use as a multipurpose tote bag, comprising:
two layers of waterproof material partially sewn together to form a two-piece sheet formation with an unsewn opening at a top portion, wherein said two-piece sheet formation is adapted to be folded, in a first folding operation in an overlapping manner along vertical and horizontal axes, from predetermined folding points, to form a folded sheet formation in which the folded portions form a top opening and two inside portions of said tote bag, and wherein the folded sheet formation is further foldable in a second folding operation along a center folding axis forming the bottom of said tote bag and is adaptable for forming the tote bag by means of two pairs of fastener attachments sewn in parallel along the vertical axes, with the mating parts of each fastener attachment sewn in parallel and extending from the bottom to the top opening of said tote

bag, said two-piece sheet formation having unsewn openings at top and bottom portions.

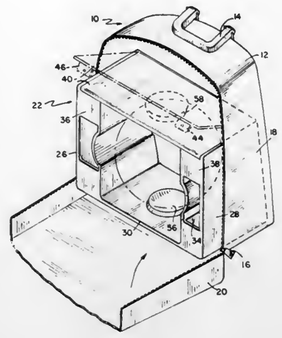
4,188,989
FLUID COLLECTION RECEPTACLE
Erik Andersen, Haarley, Denmark, assignor to G. D. Searle & Co., Skokie, Ill.
Continuation of Ser. No. 716,308, Aug. 20, 1976, abandoned.
This application Aug. 21, 1978, Ser. No. 935,229
Int. Cl.[2] B65D *31/14*
U.S. Cl. 150—9 **9 Claims**



1. In a flexible bag for collection of liquid therein and delivery therefrom of a predetermined volume of collected liquid and having opposing walls of heat-sealable material sealed about their peripheral side, top and bottom edges and a valved port at or near said top edge for flow of liquid into said bag and delivery of a predetermined volume of collected liquid from said bag, said port providing the only opening for flow of liquid into and out of said bag, the improvement which comprises a first seal between said walls extending substantially but not coextensively the width of the bag, said first seal at a predetermined position to create an upper compartment of a predetermined volume in communication with said port and a lower compartment in said bag and to define a passageway between the peripheral side edges of said bag and said first seal whereby liquid can flow thourgh said port and upper compartment to said lower compartment when said bag is in an upright position and said port is open, to collect liquid in said lower compartment and a predetermined volume of collected liquid can flow from said lower compartment to said upper compartment when said bag is in an inverted position and said port is closed, and to define a strip at which said bag can thereafter be folded with said upper compartment inverted and said lower compartment upright and said port closed, to effectively seal said upper and lower compartments, to thereby prevent further flow of collected liquid therebetween and to retain a predetermined volume of collected liquid in said upper compartment for subsequent delivery through said port, and a pair of second seals extending diagonally from the side peripheral edges of said bag at a point below said port and interiorly of said bag to said port whereby said second seals facilitate emptying of said upper compartment when said upper compartment is in an inverted position.

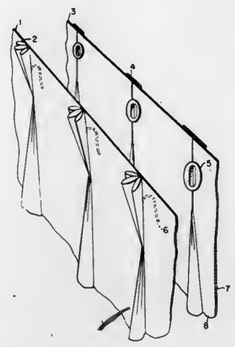
4,188,990
BOWLING BALL CARRIER INSERT
Josef A. Ross, 24 Sergent Ct., Bergenfield, N.J. 07621
Filed Mar. 13, 1978, Ser. No. 885,779
Int. Cl.[2] A45C *11/00*
U.S. Cl. 150—52 A **5 Claims**

1. A bowling ball carrier insert for use with an article of luggage comprising a housing having opposite side walls interconnected by a top and a bottom, retaining means secured to said top and said bottom, and upper and lower article-receiving



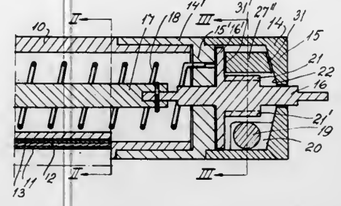
compartments at the junctures of said top and said bottom with said side walls.

4,188,991
WIND-AND-SUN SHIELD
Carol J. Boyle, 464 N. Harbor City Blvd., P.O. Box 1434, Melbourne, Fla. 32935
Filed Nov. 15, 1977, Ser. No. 851,723
Int. Cl.[2] A47H *1/00*
U.S. Cl. 160—124 **13 Claims**



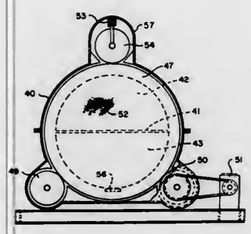
1. An energy conservation apparatus cooperating with draperies, comprising:
a drapery including a plurality of pinch pleats spaced along the top edge of said drapery;
a drapery liner incorporating a plurality of equally spaced flat, box-pleats along a top edge of said drapery liner, said box-pleats extending down said drapery liner for a distance approximately equal to the distance of said pinch pleats in said drapery;
means to hang said drapery; and
a grommet set in each of said flat, box-pleats in alignment with said means to hang said drapery when said drapery and said drapery liner are superimposed.

4,188,992
BRAKE DEVICE FOR ROTATABLE AND SPRING LOADED RODS, FOIL OR CLOTH MATERIAL BEING ATTACHABLE TO SAID RODS
Bo V. Segerljung, Karlbergsvägen 10, Vallentuna, Sweden (18600)
Filed Dec. 7, 1977, Ser. No. 858,432
Int. Cl.[2] E06B *9/208*
U.S. Cl. 160—296 **5 Claims**



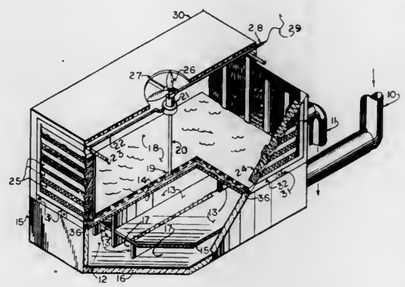
1. A brake device for rotatable and spring loaded rods or pipes (**10**), to which rods or pipes being attached a flexible foil or cloth material (**11**), each rod or pipe (**10**) being provided with at least one latch device (**19,20,21**) for locking and releasing the rotation of the rod or pipe (**10**), and furtheron, each rod or pipe (**10**) being rotatably movable around at least one shaft (**16,16'**) extending from one end portion thereof, said shaft being unrotatably mountable in a fixedly attachable support, characterized in that the brake device comprises a sleeve (**14,14',23**) fixedly mounted to the end portion of the rod or pipe (**10**) being provided with said shaft, in which sleeve being arranged at least one radially movable weight segment (**27,27',27'',24,28,28'**) which by the action of the centrifugal force at the rotation of the rod or pipe (**10**) is moved radially to act against at least one braking element (**16',22,29,29'**) arranged non rotably on the shaft (**16,16''**) whereby braking of the rotation speed of the rod or pipe (**10**) is provided by friction action being established between said at least one segment and said at least one element.

4,188,993
HEAT RECOVERY SYSTEMS
Fred M. Heyn, Export; Ching-Feng Yin, Pittsburgh; Gordon L. Hanson, Bethel Park, and Robert C. Schreck, Monroeville, all of Pa., assignors to Thermal Transfer Division of Kleinewefers, Monroeville, Pa.
Division of Ser. No. 805,187, Jun. 9, 1977, Pat. No. 4,129,176.
This application Aug. 4, 1978, Ser. No. 931,257
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—8 **7 Claims**



1. A ceramic regenerator comprising a generally cylindrical housing, a transverse central generally cylindrical well in said housing of slightly larger diameter coaxial therewith and being divided into two substantially half sections by a removable upper section, a ceramic regenerator wheel removably insertable in said well, a pair of spaced apart rotating support means on parallel axes in the same horizontal plane in the housing in said well beneath and supporting said ceramic regenerator wheel in direct frictional contact with the periphery of the ceramic wheel, drive means driving at least one of said support means, said wheel being of axial matrix construction, a divider means in the housing on each side of the well on the diameter of the housing dividing the housing into two passages said well and divider means being in general sealing relation to said wheel and a pair of ducts at each end of said housing connected to said housing and said divider means to form a pair of generally parallel passages through the housing and ceramic wheel.

4,188,994
COOLING AND HEATING APPARATUSES
Louis W. Hinshaw, Box 111, Hays, Kans. 67601
Filed Aug. 16, 1976, Ser. No. 714,914
Int. Cl.[2] F28B *29/00*
U.S. Cl. 165—61 **7 Claims**

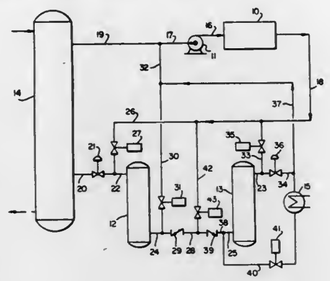


1. Air conditioning apparatus comprising an open-topped heat exchange housing formed of walls of heat insulating character, interchangeable means selectively positionable atop the housing for respectively admitting and withdrawing energy from the interior of the housing through the top of the latter, each of said interchangeable means including a horizontal wall disposed to close the open top of the housing when positioned atop the housing, with each of said interchangeable means also including means engageable with coacting means carried by the housing for detachably securing such means to the housing, said housing including a side wall having upper and lower openings therethrough, whereby air can be introduced and removed from the interior of the housing, baffle means within the housing for defining jointly with the horizontal wall of the interchangeable means positioned atop the housing an air path between said openings within the housing that extends horizontally from the upper opening along the underside of the horizontal wall to a second side wall of the housing opposite said side wall, thence downwardly along said second side wall, and finally horizontally to the lower opening.

4,188,995
APPARATUS FOR THE CYCLIC HEATING AND COOLING OF PROCESSING EQUIPMENT
Richard E. Hinkle, Bayshore, N.Y., assignor to American Hydrotherm Corporation, New York, N.Y.
Division of Ser. No. 690,166, May 26, 1977, Pat. No. 4,071,075.
This application Sep. 16, 1977, Ser. No. 833,721
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—64 **4 Claims**

1. An apparatus for heating and cooling user equipment utilizing pressurized water as a heat transfer fluid in a closed system wherein said system includes heating and cooling means for heating and cooling said heat transfer fluid and wherein said apparatus includes at least two storage vessels for storing heat transfer fluid at intermediate temperature levels which comprises:
(a) pump means for passing said heat transfer fluid through said apparatus;
(b) conduit means for introducing heat transfer fluid from an

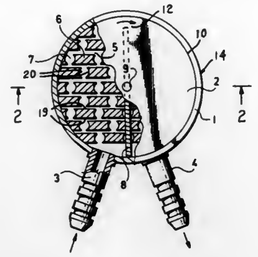
upper portion of a first stage vessel into said user equipment during a first stage of a heating cycle;
(c) conduit means for introducing heat transfer fluid withdrawn from said user equipment into a lower portion of said first storage vessel;
(d) conduit means for introducing heat transfer fluid from said heating means into said user equipment during a second stage of said heating cycle;
(e) conduit means for introducing heat transfer fluid withdrawn from said user equipment during said second stage of said heating cycle into a lower portion of a second stage storage vessel;
(f) conduit means for passing heat transfer fluid from said second storage vessel to said heating means;
(g) conduit means for passing heat transfer fluid withdrawn from said user equipment to said heating means during a final stage of said heating cycle;



(h) conduit means for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said second storage vessel during a first stage of a cooling cycle;
(i) conduit means for passing heat transfer fluid from said second storage vessel to said user equipment;
(j) conduit means for introducing heat transfer fluid from said cooling means into said user equipment during a second stage of said cooling cycle;
(k) conduit means for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said first storage vessel;
(l) conduit means for passing heat transfer fluid from said first storage vessel to said cooling vessel; and
(m) conduit means for passing heat transfer fluid withdrawn from said user equipment to said cooling means.

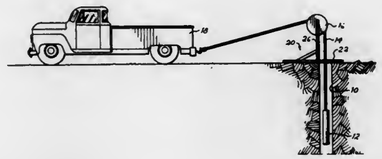
4,188,996
LIQUID COOLER FOR SEMICONDUCTOR POWER ELEMENTS
Michal Pellant; Jaroslav Zůna; Petr Novák; Zdeněk Zavázal; Jindřich Kratina; Pavel Reichel, and Pavel Kafuněk, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia
Filed May 3, 1978, Ser. No. 902,382
Claims priority, application Czechoslovakia, May 4, 1977, 2035/77
Int. Cl.² F28F *9/26, 13/12*
U.S. Cl. 165—80C **7 Claims**

1. A liquid cooler adapted for use with semiconductor power elements, comprising round cup-shaped case, having an annular side wall and a bottom, a cooler body inserted in the case, the side of the body facing the bottom of the case being formed as a number of extensions in the shape of studs creating a cooling space between them, a partition wall dividing the cooling space into an inlet space and an outlet space and providing communication there-between, and radially extending conduit means for supplying a cooling medium to the inlet space and exhausting the cooling medium from the outlet space, the ends of the studs facing the bottom of the case being connected to said bottom, the external surface of the body



being essentially planar and forming a bearing surface for a cooled semiconductor element.

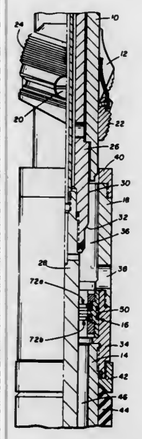
4,188,997
WELL PUMP SERVICE
Ross N. Ainsworth, Ranch Route, Milnesand, N. Mex. 88125
Filed Dec. 4, 1978, Ser. No. 966,095
Int. Cl.² E21B *19/08*
U.S. Cl. 166—77 **1 Claim**



1. In a well having
a. a bore deep within the earth, and
b. a flexible tension element extending from above the surface of the earth to deep within the bore,
the improved structure for raising and lowering the flexible tension element comprising:
c. a pair of well side members each including:
(i) a ground runner resting on the surface of the earth,
(ii) an elongated tube,
(iii) frame means innerconnecting the runner and tube for supporting the tube above the ground at right angles to the runner,
d. a sheave,
e. a well axle journalled through both of the tubes, and
f. the sheave on the axle between the side members,
g. the flexible tension element extended over the sheave,
h. so that one side of the sheave is located over the bore and the flexible tension element extends straight into the bore,
j. two windlass side members, similar to the well side members,
k. a windlass drum,
m. a windlass axle connected to the windlass drum and journalled through the tubes of the additional side members, and
n. crank means detachably connected to the windlass axle for rotating the windlass drum,
o. said additional side members adjacent said well side members with the well axle and windlass axle parallel, and
p. said flexible tension element extending from the sheave to the windlass drum,
q. a hinge between one of the well side members and one of the windlass side members,
r. said hinge attached to each of the side members it is between,
s. a pedal arm attached to the hinge at one end with
t. a pedal on the other end,

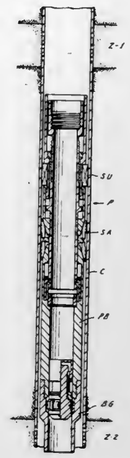
u. a pull rod attached to the pedal arm between the hinge and hinge, and
v. a channel on top of the pull rod over the flexible tension element,
w. so that depression of the pedal depresses the flexible tension element between the sheave and windlass drum.

4,188,998
WELL PACKER BYPASS VALVE SEAL ASSEMBLY
Thomas E. Upton, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Apr. 12, 1978, Ser. No. 895,423
Int. Cl.² E21B *33/12;* **B65D** *53/02*
U.S. Cl. 166—129 **6 Claims**



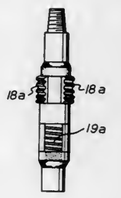
1. In a well packer having a mandrel mountable with a tubular support for the packer; a slip mounted on a tubular slip carrier around the mandrel; a tubular packer body mounted around and operably connected to said mandrel; a tubular bypass valve housing mounted with the packer body having a bypass valve seat assembly therein; and a tubular bypass valve member on the outer periphery of said mandrel engageable with said bypass valve seat assembly when said well packer is in a set condition; an improved bypass valve seat assembly comprising:
a tubular seal carrier mounted within an end portion of said bypass valve housing;
a pair of independent annular seal elements mounted in a longitudinally spaced relation around the inner periphery of said seal carrier, said seal elements being anchored in opposite end portions of said seal carrier in separate grooves each of which are formed by a radially outer groove portion having a greater longitudinal dimension, relative to the longitudinal axis of the tubular seal carrier, than a connecting radially inner groove portion which opens toward the bypass valve member, and said seal elements being shaped in conformance with their associated groove;
said seal carrier has an annular seal retainer secured thereto and mounted in each end thereof to retain the respective seal element in the associated groove; and
said seal carrier having an outer seal element mounted around the outer periphery thereof to seal between said seal carrier and said bypass valve housing.

4,188,999
EXPENDABLE PLUG AND PACKER ASSEMBLY
Amareswar Amancharla, League City, Tex., assignor to Baker International Corporation, Orange, Calif.
Filed Sep. 27, 1978, Ser. No. 946,228
Int. Cl.² E21B *33/12*
U.S. Cl. 166—133 **24 Claims**



1. A well tool assembly adapted to be set in a well bore, comprising: a main body having a passage; means on said main body for securing said main body in the well bore; an expendable plug in said passage to prevent flow of fluid therethrough, said plug comprising; a top sub; a longitudinally extending mandrel; piston means adjacent at least one of said top sub and said mandrel; first disengaging means for selectively securing said top sub to one of said piston means and said mandrel; second disengaging means for selectively securing said top sub to each of said piston means and said mandrel; seal means to prevent fluid transmission across said plug assembly; first and second no-go means on at least one of said main body and said expendable plug; and third disengaging means initially housed within said main body and between said no-go means, said third disengaging means being exterior of at least one of said piston means and said mandrel, said no-go means resisting upper and lower longitudinal movement of said third disengaging means.

4,189,000
CASING SCRAPER
David M. Best, P.O. Box 14273, Houston, Tex. 77021
Filed Jun. 26, 1978, Ser. No. 918,922
Int. Cl.² E21B *37/02*
U.S. Cl. 166—173 **6 Claims**



1. A casing scraper for well pipe including:
a. an elongated hollow mandrel having longitudinally and circumferentially extending upper and lower recesses;

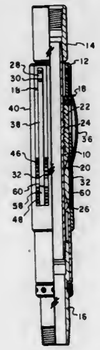
b. an annular shoulder on said mandrel separating said recesses;
c. circumferentially spaced longitudinally extending spacers mounted on said mandrel in each said upper and lower recess to form longitudinally extending receptacles in each said upper and lower recesses with the receptacles in one of the recesses being longitudinally aligned with the spacers in the other recess;
d. scraper blade means positioned in each of said receptacles, said scraper blade means being split longitudinally to provide a plurality of longitudinally extending scraper blades in each receptacle;
e. each of said scraper blades having annular recessed end portions;
f. each of said blades having spring seating surface means on their nether side;
g. spring means abutting said mandrel and said seating surface means to tend to urge each of said blades radially outward from said mandrel; and
h. means to retain each of said blades in said receptacles, said means including:
1. end hold down ring means secured to said mandrel adjacent one end of each said upper and lower recesses and overlapping one of said annular recessed end portions on said blades; and
2. ring means engaging said annular shoulder and overlapping the other annular recessed end portions on said blades.

4,189,001

FRICTION SPRING AND SLIP RETAINER FOR A MECHANICAL SETTING TUBING ANCHOR

Donald R. Greenlee, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 27, 1978, Ser. No. 928,753
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—216 **7 Claims**



1. A slip retaining means for a retrievable mechanical setting tubing anchor, comprising:
(a) a plurality of slip elements mounted around a lower portion of the tubing anchor each having separate gripping elements to secure the tubing anchor within a casing against vertically up and down motion, each of said slip elements being movable between an extended position and a retracted position and said slip elements each having an elongated recess extending longitudinally across the gripping face thereof and residing in a substantially parallel relationship to the longitudinal axis of said tubing anchor;
(b) a plurality of friction springs having an upper end portion rigidly secured at an upper end portion of said tubing hanger and extending downward with the lower end portion of each spring contacting an associated slip element in the elongated recess thereof and wherein said friction springs each have a radially outwardly extending mid-portion to in use rub on the interior wall of a casing in which said tubing hanger is located in order to create frictional resistance to motion of the tubing hanger within the casing and to continually bias said friction springs to urge the associated slip elements toward said retracted position thereby insuring motion of the slip elements to said retracted position when said tubing hanger is released for removal from a well; and
(c) said slip elements each have a friction spring resting area on a mid-portion of said elongated recess with a fastener extending through said friction spring and secured in said slip element at said resting area to loosely connect said slip element to said spring such that said slip element can move between the retracted and extended positions and said springs can move longitudinally relative to said anchor cage as said springs flex while said tubing anchor is in use.

4,189,002

METHOD FOR RIGLESS ZONE ABANDONMENT USING INTERNALLY CATALYZED RESIN SYSTEM

Robert C. Martin, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1978, Ser. No. 922,614
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—295 **12 Claims**

1. A method for permanently plugging a zone of a subterranean formation penetrated by a wellbore comprising:
(a) injecting into the formation via the wellbore, a liquid resin system comprising in a single stage, at least one thermosetting resin and at least one curing agent or catalyst for said resin so that said resin system cures after placement in the formation, and
(b) injecting into the wellbore following said resin system, a second liquid containing an effective amount of at least one chain stopping compound to react with at least one component of the resin system to prevent portions of the resin system contacted by said second liquid from crosslinking in the wellbore to a sufficient crosslink density to form a solid in the wellbore, said injecting of said second liquid being carried out so that substantially none of said second liquid is displaced into the formation.

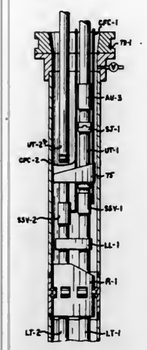
4,189,003

METHOD OF COMPLETING WELLS IN WHICH THE LOWER TUBING IS SUSPENDED FROM A TUBING HANGER BELOW THE WELLHEAD AND UPPER REMOVABLE TUBING EXTENDS BETWEEN THE WELLHEAD AND TUBING HANGER

Henry J. James, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 270,977, Jul. 12, 1972, Pat. No. 4,143,712. This application Jan. 21, 1974, Ser. No. 435,289
Int. Cl.[2] E21B *23/02, 43/14*
U.S. Cl. 166—315 **5 Claims**

4. The method of completing a well comprising:
suspending from the casing at a location below the wellhead a tubing hanger having multiple strings of lower tubing and sealing the casing-lower annulus;
latching to the tubing hanger a locator head having a subsurface safety valve in fluid communication with each lower tubing and an upper tubing extending to the surface for handling the locator head and providing for flow from one lower tubing;



and then installing an additional upper tubing between the locator head and the surface to provide for flow from another lower tubing.

4,189,004

COMPOSITION HORSESHOE

Neel W. Glass, Cuyamungue, N. Mex., assignor to Les-Kare Inc., Cuyamungue, N. Mex.

Filed Jan. 20, 1978, Ser. No. 861,276
Int. Cl.[2] A01L *3/00, 5/00*
U.S. Cl. 168—4 **1 Claim**

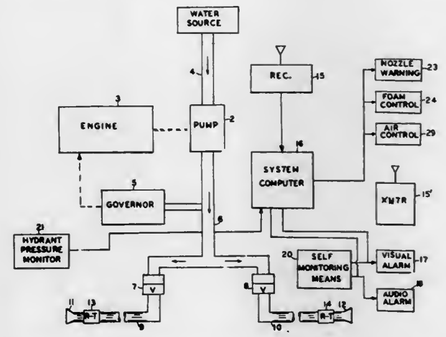
1.
(1) A polyurethane working horseshoe in slipper form comprising: a sole, front, side and rear walls;
(2) said front wall inclined rearwardly to conform with the inclination of a hoof front wall;
(3) said side walls inclined upwardly and inwardly from the junction with the sole to conform with the slope of the hoof side walls;
(4) and said rear wall consisting of rearwardly inclined material extending from the junction with the sole to conform with the slope of the hoof rear wall below the bulbs and extending in height to a point proximate to and not in contact with the soft bulbs;
(5) the front wall of the horseshoe covering a substantial area of the front wall of the hoof and extending upward from the junction with the sole a distance of not less than one-fourth the distance from the toe of the coronary band short of contact with the coronary band;
(6) the upper edges of the sidewalls incline on approximately a crosswise plane from the point of juncture with the top of the shoe front wall to the point of juncture with the top of the shoe rear wall;
(7) at least one reinforcing integral protuberance on the outside portion of each sidewall of the shoe adapted to cooperate with a self-tapping screw passing at substantially a right angle there-through for detachably affixing the shoe to the hoof by penetration into the hoof wall a distance less than the thickness of the hoof wall;
(8) a flexible self-setting polyurethane foaming mix poured into the shoe at the time of installation on a horse's hoof thereby sealing the shoe around and to the hoof against the entry of debris and forming a mechanical coupling between the sole of the shoe and the irregular sole including the frog of the hoof, said foaming mix when set having mechanical properties similar to those of the frog to obtain optimum coupling.

4,189,005

FIRE TRUCK CONTROL MEANS

John McLoughlin, 92 Mobrey La., Smithtown, N.Y. 11787

Filed Nov. 7, 1977, Ser. No. 849,039
Int. Cl.[2] A62C *27/18*
U.S. Cl. 169—24 **15 Claims**



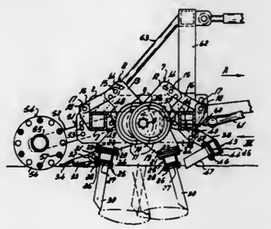
1. New and improved fire fighting communication and control means for fire trucks having tanks,
hoses connected to the hose valves,
and nozzles connected to the hoses,
and a driven pump for supplying water to hose valves, hoses and nozzles comprising,
a computer
a nozzle mounted transceiver for communication with a nozzle man located at a nozzle,
automatic clutch drive means responsive to the computer connected to operate the hose control valves,
and automatic pressure regulating means connected to the pump for maintaining pressure on the hoses.

4,189,006

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,529
Claims priority, application Netherlands, Dec. 21, 1976, 7614181
Int. Cl.[2] A01B *27/00, 11/00*
U.S. Cl. 172—68 **30 Claims**



1. A soil cultivating implement comprising a frame and soil working means mounted on at least one elongated support that

extends transverse to the direction of travel, said support being pivoted to the frame and driving means connected to move said soil working means to and fro, in directions that are substantially parallel to the direction of travel, a soil levelling and pulverising member being connected to said support, said member being displaceable with said support during operation, a forward soil levelling member having a plurality of elongate elements being mounted on the implement in front of said soil working means, each of said elongate elements extending substantially in the direction of travel.

4,189,007

REVERSIBLE PLOUGHS

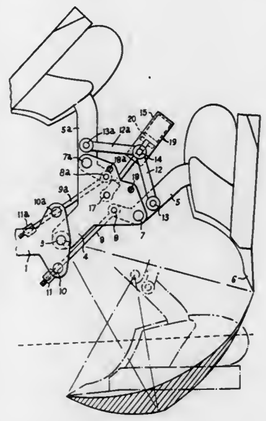
Raymond H. Revett, Ipswich, and Frederick G. Pavely, Felixstowe, both of England, assignors to Ransomes Sims & Jefferies Limited, Sufflok, England

Filed Feb. 27, 1978, Ser. No. 881,546

Claims priority, application United Kingdom, Feb. 28, 1977, 8347/77

Int. Cl.[2] A01B *3/28, 61/02*

U.S. Cl. 172—224 **10 Claims**



1. A reversible plough comprising a frame member reversible between left and right handed ploughing positions thereof; at least one support member pivoted to the frame member for rotation in a plane which is vertical at both of said ploughing positions; two plough legs each pivotally mounted on the support member for rotation in a plane parallel to said plane and for carrying respective left and right hand plough bodies; biassing means for urging, in use, the plough legs towards respective operative positions in which a different plough body is disposed for earth working operations at each ploughing position; and stabiliser means connected between the frame member and the plough legs to hold the support member against rotation relative to the frame member whilst the plough legs are in their respective operative positions, the stabiliser means permitting rotation of the support member relative to the frame member when the plough leg associated with the working plough body is deflected from its operative position through engagement of the working plough body with an obstruction in the ground.

4,189,008

AGRICULTURAL MACHINE WITH DETACHABLE AND SEPARATELY USABLE PROPELLING STRUCTURE

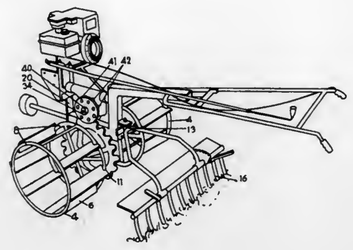
Frederick C. Porter, Auckland, New Zealand, assignor to Mason & Porter, Limited, Auckland, New Zealand

Filed Dec. 5, 1977, Ser. No. 857,620

Claims priority, application New Zealand, Dec. 13, 1976, 182874

Int. Cl.[2] A01B *3/58*

U.S. Cl. 172—253 **1 Claim**



1. In combination a wheeled frame and rotary hoe propelling means, the combination forming an agricultural machine,

said propelling means comprising an engine, a clutch, a gearbox, and a shaft, said engine driving said gearbox through said clutch, said gearbox driving said shaft;

said wheeled frame comprising mounting means for agricultural implements such as a plow, handle means on the frame for steering and controlling the combination, throttle and clutch control means on said handle means detachably connected to said engine and said clutch respectively, at least one axle rotatably mounted on said frame, ground wheels on said at least one axle whereby the frame may be run over the ground, a toothed wheel on said at least one axle operatively connected to drive said ground wheels, a mounting for said propelling means arranged so that said propelling means are readily detachably mounted on said frame at a high level relative to the ground, and a pinion wheel detachably mountable on said shaft, drivably engaging said toothed wheel, said pinion wheel and toothed wheel being sized to drive said ground wheels at a substantially reduced speed relative to the shaft speed;

said propelling means being readily detachable as a complete assembly so that said rotary hoe propelling means is usable separately for rotary hoeing, said propelling means being readily mounted on said wheeled frame to complete said agricultural machine.

4,189,009

WHEEL MOUNTED EARTH MOVING SCRAPER WITH PIVOT IN CENTER OF PIVOT AXLE

Rafael J. Welch, P.O. Box 175, St. John Welding and Mfg., Inc., St. John, Kans. 67576

Filed Mar. 15, 1978, Ser. No. 886,736

Int. Cl.[2] A01B *65/00*

U.S. Cl. 172—384 **5 Claims**

1. An earth moving scraper for towing behind a tractor or the like, the scraper comprising:

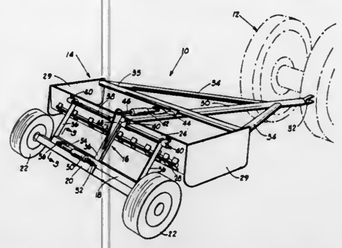
a scraper housing, the housing including a vertically disposed moldboard, a scraper blade mounted on the bottom of the moldboard, a pair of end plates attached to the ends of the moldboard, and an elongated tongue with one end attached to the top of and centered on the moldboard, the other end of the tongue attached to a swivel hitch, the hitch adapted for attachment to the rear of the tractor;

a scraper housing frame pivotally attached to the back of the moldboard and adjacent the top edge thereof, the scraper housing frame supporting the scraper housing;

a first pivot means attached to the scraper housing and the scraper housing frame and adjacent the pivotal attachment to the moldboard for raising and lowering the scraper housing above the ground surface;

a pivot axle attached to the scraper housing frame;

a wheel axle having a pair of wheels mounted at the ends thereof, the wheel axle parallel to and pivotally attached to the pivot axle, the pivot axle being pivotally attached to the wheel axle by a pivot pin secured to and extending



through the center of the pivot axle and extending through a pin sleeve disposed in the center of the wheel axle, when the pivot axle is pivoted on the wheel axle, the pin rotating in the pin sleeve; and

a second pivot means attached to the wheel axle and the pivot axle for pivoting the pivot axle, the scraper housing frame, and the scraper housing transverse to the direction of travel of the scraper.

4,189,010

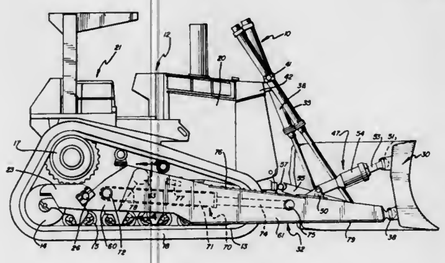
POWER ANGLING BULLDOZER ASSEMBLY

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 27, 1978, Ser. No. 873,043

Int. Cl.[2] E02F *3/76*

U.S. Cl. 172—804 **14 Claims**



1. In a vehicle having a frame and means for driving the vehicle along the ground, a bulldozer assembly comprising:

a bulldozer blade forwardly of the vehicle;

a pair of push arms one on either side of the vehicle, each push arm having first and second components pivotally interconnected and motor means connected between said first and second components in spaced relation from the pivotal connection for controlling swinging movement of said first and second components relative to each other in a common plane, said first component being pivotally connected to the frame for swinging movement about a generally horizontal axis from a position extending toward the rear of the frame to a position extending toward the front of the frame, and said second component being pivotally connected to said blade with a portion of said second component overlapping said first component when said first component extends toward the rear of the frame, each one of said push arms being independently operable relative to the other of said push arms, one of said motor means being extended to pivot said first component from the rearward overlapped position to a forward position to move said blade to an angled position oblique to the vehicle and both of said motor means being operable to extend or retract the components of both of said push arms to place said blade in a position crosswise to the vehicle; and

means interconnecting the main frame and the bulldozer assembly for resisting relative lateral movement therebetween.

4,189,011

HAMMER DRILL

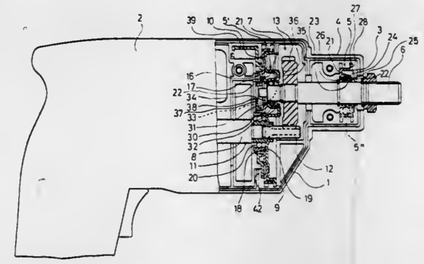
Robert Eberle, Nurtingen, Fed. Rep. of Germany, assignor to Metabowerke GmbH & Co., Nurtingen, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,356

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715682

Int. Cl.[2] B23Q *5/027;* **E02D** *7/02*

U.S. Cl. 173—13 **24 Claims**



5. A hammer-drill comprising a housing having a leading end facing a wall to be drilled, said leading end being provided with a throughgoing hole; a spindle longitudinally extended in the housing towards said hole, said spindle being mounted in said housing for rotating and for axial reciprocating movement, and having a trailing end and a leading end which is provided with an end portion extending outwardly through said hole in the housing; means in said housing for rotating said spindle, including a rotatable shaft having a first end portion and operatively connected to said spindle for rotating the latter; a supporting element of one piece mounted in said housing and having a first portion operative for supporting said trailing end of said spindle and a second portion operative for supporting said first end portion of said shaft; and means in said housing for reciprocating said spindle and including a first annulus of circumferentially spaced projections formed on said first portion of said one piece supporting element and a member fixedly connected to said spindle adjacent to said first portion of said supporting element and provided with a second annulus of circumferentially spaced projections facing towards said first annulus of projections so that when the end portion of said spindle abuts a wall to be drilled under a force applied by an operator said member moves towards said supporting element so that the projections of said first annulus engage with projections of said second annulus and alternately enter into and move out of recess between the projections of said first annulus when the spindle rotates, to thereby subject the spindle to said axial reciprocating movement.

4,189,012

EARTH BORING TOOL

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

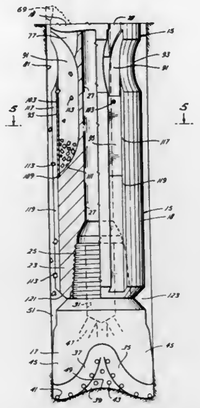
Filed Jan. 30, 1978, Ser. No. 873,246

Int. Cl.[2] E21B *7/00*

U.S. Cl. 175—312 **31 Claims**

1. Well tool comprising

body means providing support for other portions of the tool, said body means having an upper end and a lower end,
conduit means providing for the flow of drilling fluid from inside one of said ends to inside of the other of said ends,
rotary shouldered connection means at each end of the body means for securing the tool to adjacent drill string members in fluid flow relationship therewith,
reamer means mounted about the body means to reduce the earth formation thereabout, and



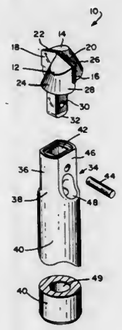
catcher means in the body means below the reamer means providing pockets to receive dense material falling out of the drilling fluid around the well tool when in use,
each of said pockets including exit means movable between open and closed positions to release such dense material from the pocket via the lower portion thereof when the exit means is in open position and to retain such material in the pocket when the exit means is in closed position.

4,189,013

ROOF DRILL BIT

Wayne F. Adams, Nortonville; Mark S. Greenfield, Henderson, and Harry L. Seibert, Madisonville, all of Ky., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 18, 1978, Ser. No. 907,095
Int. Cl.² E21B *17/00*
U.S. Cl. 175—320 **9 Claims**



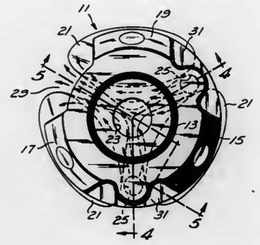
1. A roof drill bit compising:
(a) a generally cylindrical body portion comprising two symmetrical land portions including a web of substantially uniform width extending across the diameter of said cylinder and containing a refractory metal carbide cutting portion, said web forming a first vertical surface of each land portion substantially in the form of a vertical plane, two cutting edges at the upper extremity of said first vertical surface of each land, each edge having a length approximately equal to the radius of said cylinder, one edge on one side of said web and at the end of said web, the other edge on the opposite side of said web and at the opposite end of said web, said web forming a point angle of about 135° to about 145°, a chisel edge angle of from about 145° to about 155° and a chisel edge connecting the inner end of said cutting edges, said land portions having a sloping upper surface forming a lip relief angle of about 8° to about 12°, a planar lower surface intersecting said first vertical surface at about 90°, a second vertical surface defining a sloping plane intersecting the planar lower surface at an angle of from about 65° to about 70° and intersecting the web portion of the opposing land along its first vertical surface and a curved third vertical surface joining said first and second vertical surfaces and having a radius of curvature approximately equal to the radius of the cylinder, said third surfaces intersects said lower planar surface at an angle of about 90°, said third surface at its upper edge forming a segment of a circle measuring about 73° to about 77° and at its lower edge forming a segment of a circle measuring about 110° to about 130°, the second vertical surface of one land portion and the first vertical surface of the opposing land portion forming a sloping flute with a rake angle of from about 20° to about 25° and
(b) a shank extending from the planar surface adapted for removably engaging a driving means for said drill bit.

4,189,014

ENHANCED CROSS-FLOW WITH TWO JET DRILLING

James H. Allen, Lakewood, and William Baker, III, Costa Mesa, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 14, 1978, Ser. No. 933,628
Int. Cl.² E21B *9/08*
U.S. Cl. 175—339 **10 Claims**



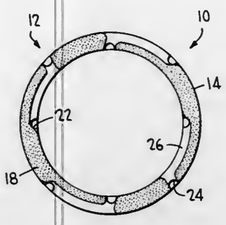
1. A drilling bit comprising:
a main bit body having an upper end for attachment to a rotatable tubular drill string, said body including a cavity for receiving high pressure drilling fluid from said drill string;
a plurality of cone shaped cutters circumferentially spaced around the lower end of said body;
nozzle means mounted on said body between two of said cutters and connected to said cavity to receive high-pressure drilling fluid and form downward flowing jets of fluid;
a plurality of means for mounting said cutters extending downward from said body, two of said mounting means along with walls of a drilled hole defining an enlarged passage spaced from said nozzle means for permitting fluid flow entering said drilled hole through said nozzle means to flow upwardly through said passage to the annular space between said drill string and said drill hole; and
flow diverter means depending from the central portion of the lower end of said body and into the central area between said cutters to divert fluid along the surface of said cutters.

4,189,015

DRILL BITS FOR OBTAINING CORE SAMPLES

III Acker, Lenoxville, Pa., and Warren T. Acker, Wilton, Conn., assignors to Acker Drill Company, Inc., Clarks Summit, Pa.

Filed Aug. 21, 1978, Ser. No. 935,357
Int. Cl.² E21B *9/63*
U.S. Cl. 175—330 **5 Claims**



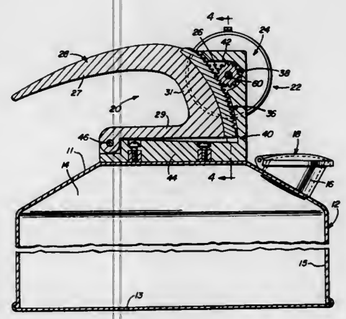
1. A core drilling bit comprising a thin-wall hollow cylindrical body having a generally annular shaped cutting surface at one end and a plurality of waterways comprising a plurality of inner channels on the interior surface of the body extending approximately to the cutting surface, a plurality of outer channels on the exterior surface of the body, and each of said outer channels extending approximately to the cutting surface at points radially offset from the points where corresponding ones of said inner channels extend to the cutting surface and a plurality of recessed portions on said cutting surface, said recessed portions extending in a substantially tangential direction along said cutting surface and connecting said inner and outer channels at the points at which said channels respectively extend to said cutting surface.

4,189,016

EXACT CUP MEASURING TEA KETTLE WITH SPIRAL SPRING

Jack C. Nicol, 900 Scott Ave., North Cape May, N.J. 08204

Continuation-in-part of Ser. No. 767,944, Feb. 11, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 894,356
Int. Cl.² G01G *19/56*
U.S. Cl. 177—149 **5 Claims**



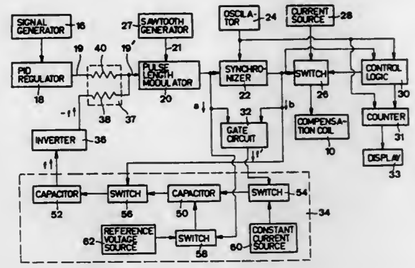
1. In combination, a hollow container including a closed top and bottom, a peripheral wall extending between said top and bottom and a pour spout opening outwardly of the interior of said container adjacent one side thereof and at an elevation generally horizontally registered with said closed top, a handle including a first lower portion pivotally supported from said container for oscillation relative thereto about a generally horizontal axis spaced inwardly of and adjacent the side of said container remote from said one side and disposed at generally right angles relative to a path extending between said one side and said remote side, said handle including an upper elongated horizontal portion generally paralleling said path and a depending portion supported from and depending downward from the end of said horizontal portion adjacent said one side, said depending portion and closed top including opposing abutment surfaces establishing a downward limit position of movement of said depending portion relative to said top, spring means operatively connected between said depending portion and said closed top yieldingly biasing said depending portion toward said limit position, indicator means connected between said handle and container operative to indicate the amount of upward movement of said depending portion from said limit position, said axis being horizontally spaced above the level of said spout, said upper horizontal portion of said handle including a hand engageable mid-portion centrally disposed above said closed top.

4,189,017

WEIGHING APPARATUS INCLUDING DIGITALIZATION ERROR CORRECTING MEANS

Felix Strobel, Greifensee; Rudolf Stocker, Azmoos, and Werner Zumbrunn, Volketswil, all of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,720
Claims priority, application Switzerland, Sep. 20, 1977, 11466/77
Int. Cl.² G01G *7/00*
U.S. Cl. 177—212 **8 Claims**



1. In a weighing system of the electromagnetic load compensation type including
(a) a load compensation coil (**12**) connected with the movable weighing member;
(b) means for periodically supplying said coil with compensation current for periods of time that correspond with the magnitude of the applied load, including
(**1**) normally open compensating current switch means (**26**) for connecting said coil with a constant current source (**26**);
(**2**) signal generator means (**16**) associated with said movable weighing member for generating a position signal;
(**3**) regulator means (**18**) for regulating said position signal to produce a regulated signal (**19**) that is a function of the load to be measured;
(**4**) sawtooth voltage generator means (**27**) for producing a sawtooth voltage (**21**);
(**5**) pulse length modulator means (**20**) responsive to said regulated load signal and said sawtooth voltage for producing a train of control signals (**25**) the lengths of which correspond with the magnitude of the regulated load signal;
(**6**) means (**24**) for producing a series of timing mark pulses (**23**); and
(**7**) synchronizer means (**22**) responsive to said timing mark pulses (**23**) and said control signals (**25**) for period-

ically closing said compensating current switch means; and

(c) load indicating means (33) including counter means (31) for counting the timing mark pulses during the periods when said switch means is in the closed condition, thereby affording an indication of the magnitude of the applied load;

the improvement which comprises

(d) correction loop means for varying said regulated load signal to correct for digitalization errors produced by said synchronizer means.

4,189,018

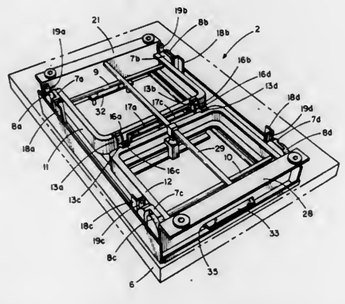
PULLEY AND TAPE MOTION LINKAGE FOR PLATFORM WEIGHING SCALE

Frans Brouwer, 410 Greenwood Ave., Glencoe, Ill. 60022

Filed Nov. 20, 1978, Ser. No. 962,326

Int. Cl.² G01G *21/02*

U.S. Cl. 177—256 **9 Claims**



1. In a platform weighing scale having a transducer with a movable element to translate weight responsive platform motion into a weight responsive reading and in which the platform is movably supported relative a scale base by one or more pulley and tape motion linkages which also actuate the transducer element, the improved pulley and tape motion linkage comprising a pulley-like element having diametrically opposite peripheral circular sectors, tape means contacting the circular sectors and connected between the platform and base, a pair of restraining elements sandwiching the pulley-like element and the tape for a composite rotary and linear motion between parallel surfaces with tape portions adjacent the circular sectors contacting the parallel surfaces.

4,189,019

PROPULSION SUPPORT UNIT

Leonard E. Zech, Rte. 2, P.O. Box 237, Reedsburg, Wis. 53959

Continuation-in-part of Ser. No. 721,114, Sep. 7, 1976, abandoned. This application Sep. 27, 1977, Ser. No. 837,025

Int. Cl.² B63G *8/00*

U.S. Cl. 180—182 **8 Claims**

1. A device for the surface propulsion of a person when used in combination with a propelling means;

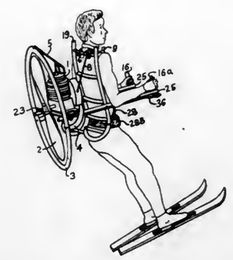
said device comprising, in combination, horizontal, verticle, and arcuate frame members, herein referred to in combination as a framework;

a means for adapting said framework to be secured to the body of a person;

said framework having attached thereto a plurality of pivotally attached arms arranged to extend frontwardly of said framework on either side of the body of said person to be gripped by the hands of said person;

said framework including said arms having pivotally mounted on the aft or rearward portion a platform herein referred to as a pivot table;

said pivot table being suitable for the acceptance of a propelling means whereby said person may turn said table by



moving said arms thus exerting a steering force on said propelling means.

4,189,020

FORK-LIFT TRUCK WITH INTERNAL-COMBUSTION ENGINE

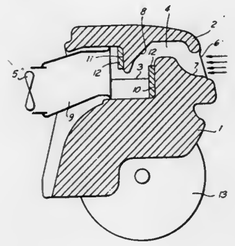
Theodor Abels, and Bernhard Gotz, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 857,192

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655441

Int. Cl.² B60K *11/08*

U.S. Cl. 180—54 A **12 Claims**



1. The combination with a fork-lift truck of a chassis, a solid cast counterweight and an engine compartment adjacent said counterweight, an internal-combustion engine in said engine compartment, means for inducing a flow of cooling air into said engine compartment and for discharging cooling air therefrom, and at least one flow passage extending generally horizontally formed in said counterweight and traversed by the cooling air, said flow passage being elongated in the direction of flow of the cooling air therethrough and having a length in said direction greater than the largest dimension of said flow passage transverse to said direction, said flow passage having an orifice open to the exterior and an orifice open to said compartment and being provided between said orifices with at least one bend preventing straight-line sound transmission from said compartment to the exterior along said passage, said flow passage being defined between said orifices with wall surfaces constituted by the materal of said counterweight, said bend constituting a sound-damping means enabling said counterweight to absorb at least part of the sound energy generated within said compartment.

4,189,021

HIGH-SPEED MOBILE WORKING MACHINE

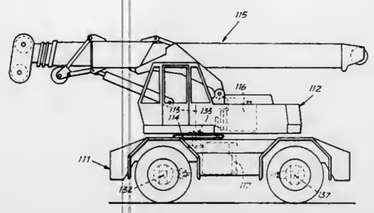
Hans Scheuerpflug, and Dieter Althoff, both of Bad Schönborn, Fed. Rep. of Germany, assignors to Firma Johannes Fuchs, Ditzingen, Fed. Rep. of Germany

Division of Ser. No. 845,667, Oct. 26, 1977, abandoned. This application Dec. 6, 1978, Ser. No. 967,061

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648414; Sep. 14, 1977, 2741300

Int. Cl.² B60K *41/28;* E02F *3/00*

U.S. Cl. 180—54 C **8 Claims**



1. A high-speed mobile working machine comprising a vehicle having a chassis and a super-structure, said chassis having at least two live axles and said super-structure being mounted on said chassis for rotation about a vertical axis, a working device carried by said super-structure, first main driving means for driving said vehicle, second main driving means for driving said working device, and controllable means connected to both said first and second main driving means for summing the power of both said first and second main driving means and for transmitting the summed power to at least one of said live axles for driving said vehicle at a high-speed;

including at least one pump means for feeding hydraulic fluid for driving said working device, said pump means being operatively connected to said second main driving means, a first and a second hydraulic motor means for driving at least one of said live axles of said vehicle, said at least one pump means and said first and second hydraulic motor means being connected by a fluid conduit means;

said first hydraulic motor means and said first main driving means being mounted in said chassis and said at least one pump means being mounted in said super-structure, said fluid conduit means comprising a first part being connected to said first hydraulic motor means and mounted in said chassis, a second part being connected to said pump means and mounted in said super-structure, and a rotary connection connecting said first and said second parts and being arranged coaxially to the vertical axis of rotation of said super-structure;

and control valve means for selectively connecting said first and said second hydraulic motors to said at least one pump means.

4,189,022

AUTOMATICALLY RELEASING SEAT BELT ANCHOR

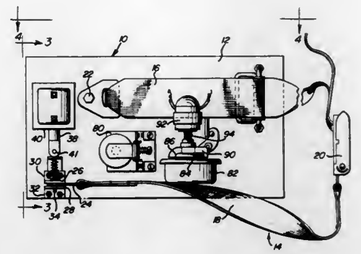
Radovan P. Lazich, 2735 Kroy Way, Sacramento, Calif. 95817, and Adolph P. Cascardo, 2233 Mission Ave., Carmichael, Calif. 95608

Filed Sep. 26, 1978, Ser. No. 946,044

Int. Cl.² A62B *35/02*

U.S. Cl. 180—268 **8 Claims**

4. In a vehicle including a seat belt assembly having opposite end portions and first and second anchor structures anchoring the opposite end portions relative to said vehicle, one of said anchor structures including latch means releasably anchoring the corresponding end portion relative to said one anchor structure and including actuator means operative, when actuated, to release said corresponding end portion from said one anchor structure, one end portion of said assembly including a flexible section thereof, control means for said actuator means yieldingly biasing said flexible section from a generally straight condition toward an increasingly laterally deflected position, said control means, responsive to tensioning of said flexible section above a predetermined minimum to return said flexible



section from said laterally deflected position toward said generally straight condition, including means operative to actuate said actuator means.

4,189,023

HYDRAULIC STEERING LIMIT CONTROL

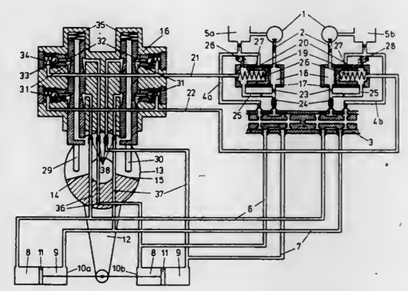
Karl-Friedrich Karcher, Lorch, and Otto Merkle, Schwabisch Gmund, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,413

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755420

Int. Cl.² B62D *5/08;* F15B *11/08*

U.S. Cl. 180—132 **6 Claims**



6. In a vehicle steering system having a source of fluid under pressure (1) connected by a control valve (3) to opposing chambers (8 and 9) of a servomotor (10) and means for limiting operation of the servomotor by a limit valve assembly (16) displaced from an inactive position when the servomotor reaches a limit position to connect one of the opposing chambers vented through the control valve to a differential pressure actuated valve (17) causing venting of the source;

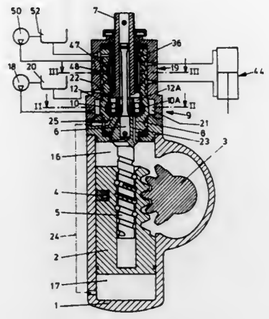
the improvement residing in means for maintaining the limit valve assembly depressurized in the inactive position thereof, comprising one-way valve means (38) for blocking flow of fluid from the opposing chambers under pressure to the valve assembly, by-pass valve means (33) for blocking flow of fluid from the differential pressure actuated valve to the limit valve assembly in the inactive position thereof, and means (31-32) responsive to displacement of the valve assembly in the limit position of the servomotor for actuating the by-pass valve means to establish fluid communication between the differential pressure actuated valve and the vented chamber.

4,189,024

AUXILIARY POWER STEERING FOR MOTOR VEHICLES

Erich Jablonsky, Boebingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Freidrichshafen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,422
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—133 **11 Claims**



1. In a dual power steering system comprising separate first and second hydraulic circuits each of which comprises a pump with a respective drive therefore, a double acting power cylinder, and a valving means for controlling pressure and exhaust flow to and from the power cylinder;

including flow communication passages in each hydraulic circuit connecting the pump, power cylinder and valving means thereof for operation in vehicle steering; the improvement of which comprises:

a housing for both said valving means, a manually operable steering spindle extending into said housing and connected to initially actuate the valving means of the first hydraulic circuit;

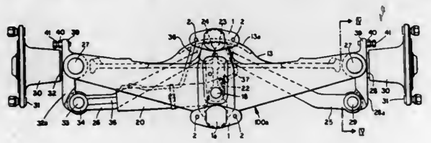
and drive means interconnecting said steering spindle with the second hydraulic circuit valving means for actuation thereof upon predetermined degree of operation of said steering spindle subsequent to actuation of said valving means of said first hydraulic circuit.

4,189,025

HYDRAULIC-ACTUATED STEERING ASSEMBLY FOR AN INDUSTRIAL VEHICLE

Theodor Abels; Bernhard Götz, both of Aschaffenburg, and Günter Honecker, Klein-Welzheim, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Höllriegelskreuth, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,851
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642905
The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.
Int. Cl.[2] B60D *5/06*
U.S. Cl. 180—159 **3 Claims**



2. A steering axle assembly for an industrial floor-type vehicle such as a fork lift truck, comprising:

an elongated axle body;

respective axle carriers pivotally connected to said body at opposite ends thereof, each of said carriers being formed with an axle adapted to receive a vehicle wheel;

a knuckle pivotally connected to said body;

respective tie bars pivotally connected at respective locations to said knuckle and each pivotally connected to a respective one of said carriers;

a hydraulic piston and cylinder pivotally connected to said body coaxial with the pivot connection of said knuckle thereon and operatively connected to one of said carriers for displacing said carriers, said tie bars and said knuckle; and

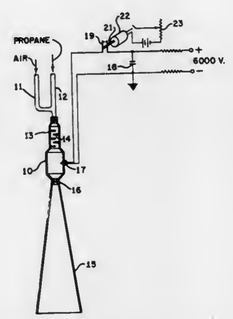
a pivot pin on said body, said cylinder and said knuckle being pivotally mounted on said pin, the axes of the pivot connections between said carriers and said body being parallel to the axis of said pin, the pivot connections between said tie bars and said knuckle and between said tie bars and the respective carrier having axes which are parallel to the axis of said pin, said body being formed as a generally C-section housing having upper and lower walls each formed with a boss reaching toward the other in a medium plane transverse to the longitudinal dimension of said housing, said pin being fitted into said bosses, said knuckle lying wholly within said housing and said tie bars and said cylinder lying at least in major part within said housing.

4,189,026

UNDERWATER GENERATION OF LOW FREQUENCY SOUND

Myron A. Elliot, Lynn Haven, and Robert H. Forbus, Panama City, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1954, Ser. No. 403,947
Int. Cl.[2] G01V *1/06, 1/38*
U.S. Cl. 181—118 **5 Claims**



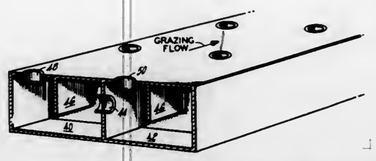
1. A device for underwater generation of low frequency sound comprising a conically shaped explosion chamber open at both ends, a firing chamber having inlet and outlet passages at opposite ends thereof, ignition means in the firing chamber, a restricted orifice between the outlet passage of the firing chamber and the small open end of the explosion chamber, a mixing chamber opening into said inlet passage, and two supply lines for introducing gases to form a combustible mixture in the mixing chamber, the combined resistance the supply lines and the mixing chamber offer to the flow of gas in the upstream direction being slightly greater than the flow resistance of said restricted orifice, the arrangement being such that when the gases in the firing chamber are ignited with the device submerged in water the flame spreads down stream through the explosion chamber and also upstream into the supply lines thereby extinguishing the flame.

4,189,027

SOUND SUPPRESSOR LINERS

Lee W. Dean, III, South Glastonbury, and Aldo A. Peracchio, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 715,816, Aug. 19, 1976. This application Dec. 12, 1977, Ser. No. 860,040
Int. Cl.[2] F01N *1/00;* **E04B** *1/99;* **G10K** *11/04*
U.S. Cl. 181—286 **2 Claims**



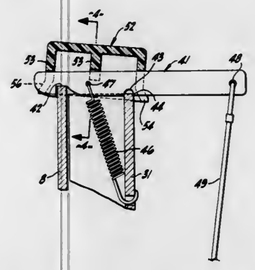
1. A sound absorbing liner having a plurality of cells each defining an enclosed cavity, each of said cavities being enclosed by side walls, top wall and bottom wall, the top wall of each of said cavities being exposed to a grazing flow which communicates with each of said cavities through an opening formed therein for defining therewith a Helmholtz resonator, means in each of said openings and extending in each of said cavities for supporting a column of air and being equally sized, a partial wall extending from one wall partway into each of said cavities for defining subchambers and each subchamber defining a different sized volume subchamber for making each adjacent cavity acoustically asymmetrical, means acoustically coupling said adjacent cavities for tuning said liner for the frequency spectrum actually encountered and said cavities being acoustically asymmetrical so that said acoustically coupling means pumps air at a given frequency for dissipating sound energy.

4,189,028

FOLDING FIRE ESCAPE LADDER

Cheyenne A. Reinhard, 29372 Providence Way, Hayward, Calif. 94544

Filed Nov. 22, 1978, Ser. No. 963,024
Int. Cl.[2] E06C *9/12*
U.S. Cl. 182—160 **4 Claims**



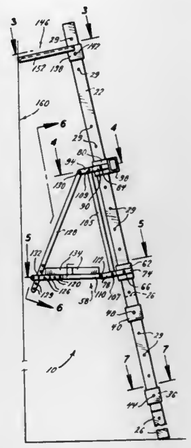
1. A folding fire-escape ladder comprising a first upright L-shaped in transverse cross-section, a second upright L-shaped in transverse cross-section, a plurality of cross rungs of flat material and offset at their opposite ends, pins for pivotally interengaging the respective offset ends of said rungs with said first upright and said second upright respectively, stops on at least one of said uprights for limiting pivotal movement between said rungs and said first and second uprights, a latch lever, means in said latch lever defining a notch corner adapted to cam against the faces of said second upright when said latch lever is in engagement with said first upright, a spring engaging said first upright and said latch lever, and a cap mounted on said latch lever and adapted to overlie the upper ends of said first and second uprights when said latch lever is in engagement therewith.

4,189,029

SCAFFOLD DEVICE

Henry W. Jordan, 4400 Robertson Pl., Bridgeton, Mo. 63042

Filed Sep. 6, 1978, Ser. No. 940,016
Int. Cl.[2] E04G *3/02, 5/06*
U.S. Cl. 182—179 **9 Claims**



1. A scaffold device for supporting humans above the ground by a walking platform, comprising:

(a) a pair of single individually supported upright longitudinal legs for leaning at various angles against a structure, each said leg having a plurality of longitudinal holes for adjustable support of the platform; and

(b) platform support means positionable on each leg for supporting the platform on the side of the legs nearest the structure, each said support means comprising an assembly, each assembly comprising:

(i) a lower member having an inner end adjustably pivotally mounted by a first lock member to a corresponding leg to be held in fixed position against linear movement relative to its corresponding leg, said first lock member extending through a selected leg hole, said lower member extending outwardly from its corresponding leg to supportingly engage the platform, and

(ii) an upper member having an inner end adjustably mounted by a second lock member to its corresponding leg to be held in fixed position against linear movement relative to its corresponding leg, said second lock member extending through a selected leg hole, and the upper member extending outwardly and downwardly from its leg to adjustably engage and hold the lower member in a selected position.

4,189,030

WEB LADDER

Frank B. Leslie, 8883 Niagara River Parkway, Niagara Falls, Ontario L2E 6S6, and Alexander S. Kiss, P.O. Box 209, Queenston, Ontario, both of Canada

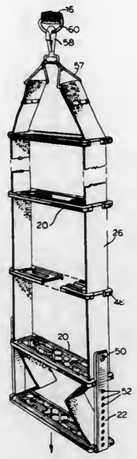
Filed Dec. 11, 1978, Ser. No. 968,310
Claims priority, application Canada, Mar. 1, 1978, 298018
Int. Cl.[2] E06C *1/56*
U.S. Cl. 182—196 **8 Claims**

1. A collapsible web ladder comprising:

a plurality of flat, elongated step members, each member having at either end a T-shaped recess, the stems of the

T-shaped recesses for each member extending away from each other,

two flexible webs adapted to be inserted into the recesses at opposite ends of the step members to lie along the cross-bars of the "T"'s, the recesses at the "T" cross-bars being sized to slidably enclose the webs, each web having affixed to it at a plurality of longitudinally spaced locations



block members having a width greater than the width of the recesses at the "T" cross-bars, whereby a block member can lodge against a step member adjacent the recess, and allow weight placed upon the step member to be transferred to the web,

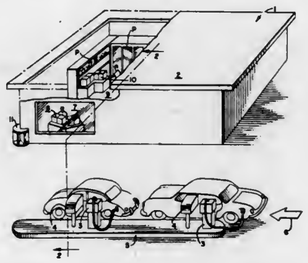
and means at the top of the webs for attachment to a securement member.

4,189,031

SINGLE-STOP SHOPPING METHOD

Michael M. Vayda, Jr., 1600 S. Joyce St., Arlington, Va. 22202

Division of Ser. No. 716,374, Aug. 23, 1976, Pat. No. 4,111,282.
This application Mar. 3, 1978, Ser. No. 882,987
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C04H *3/04*
U.S. Cl. 186—1 C **1 Claim**



1. A method of dispensing fuel and retail products to customers respectively at first and second automobiles, the method comprising the steps of:

(a) providing a facility having means for warehousing said retail products and having first and second fuel dispensing means for dispensing fuel to said first and second automobiles;

(b) directing said first and second automobiles to respective positions adjacent said first and second fuel dispensing means;

(c) providing first and second purchase selection means operable by said customers respectively at said first and second automobiles;

(d) providing first and second payment means operable by said customers respectively at said first and second automobiles;

(e) receiving a fuel and retail product selection from the customer at said first automobile with said first purchase selection means;

(f) dispensing fuel from said first fuel dispensing means to said first auto to comply with the fuel purchase selection received from the customer at said first automobile;

(g) dispensing a retail product order from said warehousing means to said first automobile to comply with the retail product selection received from the customer at said first automobile;

(h) dispensing fuel from said second fuel dispensing means to said second automobile to comply with the fuel purchase selection received from the customer at said second automobile;

(i) dispensing a retail product order from said warehousing means to said second automobile to comply with the retail product selection received from the customer at said second automobile;

(j) receiving payment from the customer at said first automobile with said first payment means;

(k) receiving payment from the customer at said second automobile with said second payment means; and

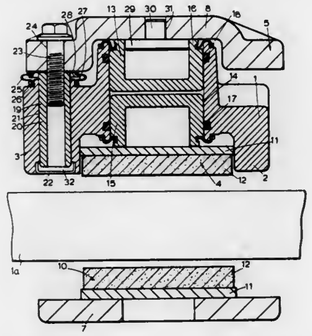
(l) carrying out steps (a) through (k) during substantially the same time frame so that both customer's respective fuel and retail product selections can be independently dispensed to the customers respectively at said first and second automobiles during the same time frame.

4,189,032

HYDRAULICALLY-OPERATED DISC BRAKES FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 739,790, Nov. 8, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,141
Claims priority, application United Kingdom, Nov. 7, 1975, 46261/75
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **14 Claims**



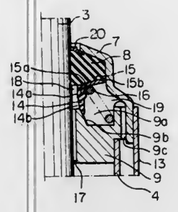
1. An hydraulically operated disc brake for a vehicle comprising a rotatable disc, a stationary drag-taking member located adjacent to said rotatable disc, a clamp member comprising a yoke extending over the peripheral edge of said disc, guide means between said clamp member and said stationary member such that said clamp member is guided for sliding movement in a direction substantially parallel to the axis of said disc, directly and indirectly actuated friction pad assemblies for engagement with opposite faces of said disc, and hydraulic actuating means in said stationary member for applying said directly actuated pad assembly directly to the adjacent first face of said disc, said indirectly actuated pad assembly being carried by said clamp member and being applied to the other second face of said disc by the reaction of said actuating means which causes said clamp member to slide with respect to said disc in a substantially axial direction, said hydraulic actuating means comprising an hydraulic cylinder carried by said stationary member, oppositely acting first and second pistons located in said cylinder, said first piston acting on said directly actuated friction pad assembly and said second piston acting on said clamp member, a first rigid mounting in said stationary member extending along-side said hydraulic cylinder, a second rigid mounting in said clamp member, said guide means consisting solely of a rigid pin received in both of said mountings, said pin being rigidly connected in one of said mountings and having a sliding engagement in the other of said mountings and being disposed wholly on one axial side of said disc adjacent to said first face, said clamp member straddling said stationary member with opposed axially extending surfaces of said members being spaced apart, said pin being constructed and arranged to transmit to said stationary member through said mounting means substantially all of the drag forces transmitted to said clamp member from said indirectly actuated pad assembly, said pin comprising the sole slidable connection between said clamp member and said stationary member, said clamp member otherwise having no direct connection with said stationary member, and anti-rotation means for preventing relative rotation between said clamp member and said pin comprising a coupling between said second piston and said clamp member.

4,189,033

SHOCK ABSORBER

Teiji Katsumori, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Mar. 23, 1978, Ser. No. 889,447
Claims priority, application Japan, Apr. 1, 1977, 52-40376[U]
Int. Cl.[2] F16F *9/06, 9/36*
U.S. Cl. 188—269 **6 Claims**



1. A dual tube type hydraulic shock absorber comprising:

an inner tube defining a cylinder chamber;

an outer tube surrounding said inner tube and defining therebetween an annular reservoir chamber;

a piston slidably disposed in said cylinder chamber;

a rod guide secured to and closing an upper end of said inner tube;

a piston rod secured to said piston and extending outwardly of said cylinder chamber through said rod guide;

working liquid filling said cylinder chamber and a lower portion of said reservoir chamber;

pressurized gas filling an upper portion of said reservoir chamber;

seal member means positioned above said rod guide for sealing the interior of said shock absorber from the exterior;

an annular space defined between said rod guide and said seal member means, said annular space being in communication with said reservoir chamber;

an annular retaining member positioned below said seal member means;

spring means for urging said retaining member against a lower surface of said seal member means;

said rod guide having an upper surface forming an annular valve seat;

an annular valve member separate from said seal member means and secured to the inner periphery of said retaining member; and

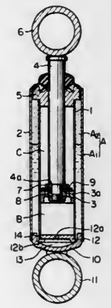
said annular valve member including a resilient annular valve portion, said valve portion being engageable with said valve seat to form means for preventing fluid flow therebetween in a radial inward direction, and said valve portion being separable from said valve seat to allow fluid flow therebetween in a radial outward direction.

4,189,034

HYDRAULIC DAMPER

Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 777,545, Mar. 14, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 922,163
Claims priority, application Japan, Mar. 19, 1976, 51-30615
Int. Cl.[2] F16F *9/06*
U.S. Cl. 188—318 **2 Claims**



1. In a hydraulic damper having a cylinder having an actuating chamber therein for containing hydraulic oil, a piston slidable in the actuating chamber and partitioning said actuating chamber into upper and lower portions, a piston rod having one end thereof being secured to the piston and the other end thereof projecting through the upper end of the cylinder to the outside, a resisting force generating means mounted on the piston for controlling oil flow across the piston for generating resisting force against the movement of the piston in both directions in the cylinder, a volume compensating chamber disposed around the actuating chamber and having hydraulic oil and gas therein for compensating for the change in volume of hydraulic oil in the actuating chamber caused by ingress or exit of the piston rod into or out of the actuating chamber, and unvalved passage means for the hydraulic oil permanently connecting only the lower end of said volume compensating chamber with the lower portion of said actuating chamber, the improvement wherein said passage means has a hydraulic oil passage therethrough with a cross-sectional size for generating a pressure in the lower portion of said actuating chamber which increases with an increase in the flow rate therethrough and which is substantially higher than that of the volume compensating chamber and than that of the upper portion of the actuating chamber when the piston moves at the maximum speed in the contraction stroke of the damper, whereby the pressure of the gas in said volume compensating chamber necessary for causing opening of said resisting force generating means can be substantially reduced.

4,189,035

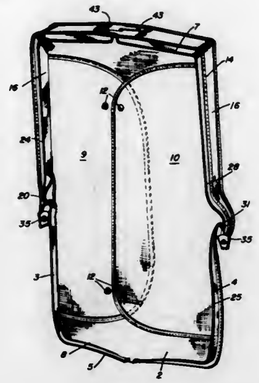
GARMENT CONTAINER, CARRIER AND HANGER

Kurt P. Herz, 12-11 43rd Ave., Long Island City, N.Y. 11101

Continuation-in-part of Ser. No. 738,341, Nov. 3, 1976, abandoned. This application May 22, 1978, Ser. No. 908,555

Int. Cl.[2] **A45C** *5/00*

U.S. Cl. 190—43 **6 Claims**



1. A garment container, carrier and hanger consisting for the most part of flexible material, and, when fully opened and in hanging position, comprising

(a) a substantially rectangular base sheet having substantially straight and parallel side edges and substantially straight top and bottom edges;

(b) a pair of substantially rectangular longitudinally disposed and cooperating parallel garment-enclosing panel members hingedly secured at their remote edges to the inner side of the base sheet from both the upper and lower portions of the aforementioned side edges;

(c) an inverted U-shaped strip secured to and extending along said top edge and approximately the upper half of each of said side edges of the base sheet and extending at right-angles with respect to the base sheet;

(d) said inverted U-shaped strip being peripherally disposed with respect to said panel members;

(e) the lower half of said base sheet and said longitudinally disposed panel members being adapted to be folded completely over the upper half thereof; and

(f) the upper mid-section of said inverted U-shaped strip being transversely divided and temporarily held together by fastener means which bridge the gap between the transversely divided section;

(g) said gap providing means for receiving the shanks of hook portions of garment hangers and permitting the same to project outwardly therefrom and away from the garment container, carrier and hanger.

4,189,036

GARMENT BAG WITH CONSTRAINED HANGERS

Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,093

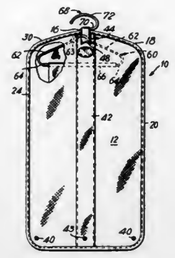
Int. Cl.[2] **A45C** *3/00*

U.S. Cl. 190—43 **16 Claims**

1. In the combination of a foldable garment bag and separable hangers, the hooks of said hangers extending through an opening from the interior of said garment bag to provide a hand-grip for transporting said garment bag, the improvement therein comprising:

a first strap, one end of said first strap being fixedly attached to said bag, the other end of said first strap being positioned over a portion of each said hook and releasably attached to said bag, whereby said first strap constrains said hooks from motion away from said bag;

a second strap, one end of said second strap being fixedly attached to said bag, the other end of said second strap



being positioned below each said portion of said hooks and having means for releasable attachment to said bag, whereby each said portion of said hooks is constrained between said first and second straps.

4,189,037

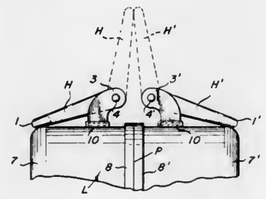
MOUNTINGS FOR DUPLEX HANDLES FOR ATTACHÉ CASES AND THE LIKE

Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.

Filed Mar. 12, 1979, Ser. No. 19,879

Int. Cl.[2] **A45C** *13/26*

U.S. Cl. 190—58 R **2 Claims**



1. In a duplex handle assembly for a luggage-case formed of a pair of symmetrically arranged relatively thin open casings adapted to have the hand-grip at the top thereof above the parting line between the juxtaposed open surfaces of said casings remote from the hinged joint therebetween at the bottom of the luggage case,

(a) a pair of mountings for a pair of coaxial pintles at longitudinally displaced points on the top of the mid-portion of each casing for pivotally supporting a U-shaped handle comprising lateral legs projecting from the opposite ends of a hand-grip with the free ends thereof having coaxial apertures for engaging said coaxial pintles on each casing,

(b) each of said mountings comprising a base-plate with a pair of spaced narrow transverse slots at the midportion thereof,

(c) a detachable U-shaped sheet metal bar having a pair of arms extending normally and upwardly from a crossbar with said crossbar fitting adjacent to the underside of said base plate and with said arms extending upwardly through said narrow slots, and

(d) coplanar curved terminal portions on each of said arms extending above and beyond the inner edge of said base-plate and terminating above said parting line and adjacent to the plane thereof, and provided with apertures for receiving the ends of the respective pintle,

(e) the close juxtaposition of the aligned pairs of pintles in close proximity to the parting line of the luggage case

permitting the alternative close juxtaposition of the two handles in substantially vertical position to provide a comfortable hand-grip for carrying, and the disposition of the handles in substantially horizontal resting position on top of and within the boundaries of said casings to permit convenient storage and packaging.

4,189,038

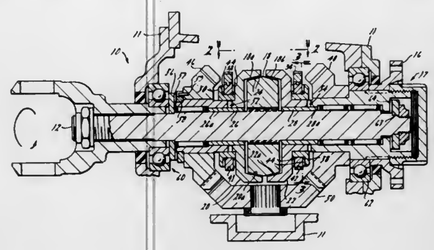
DRIVE COUPLING AND CLUTCHES

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 18, 1977, Ser. No. 816,406

Int. Cl.[2] **F16D** *43/21, 13/28*

U.S. Cl. 192—21 **19 Claims**



1. In combination

a rotatable shaft **12**;

a pair of spaced relatively rotatable gears **46**, **48** substantially axially fixed on the shaft **12** for rotation thereon;

means **50** for transferring rotation from one gear to the other;

a first pair of rotary clutch element means **20**, **22** positioned for rotation on the shaft **12** between the pair of spaced gears **46**, **48**, one of each of the clutch element means being connected to one of each of the spaced gears for rotation therewith;

a second pair of rotary clutch element means **18***a*, **18***b* positioned on the shaft **12** between the first pair of clutch element means **20**, **22** whereby one of each of the second pair of clutch element means is adjacent one of the corresponding element means of the first pair and adapted for clutching engagement therewith;

driving means **18** between the clutch elements of the second pair and secured to the shaft **12** for rotation therewith, said clutch element means **18***a*, **18***b* being located at opposite end portions of driving means **18**;

means including two paired sets of complementary helical camming surfaces **52**, **54**, one paired set each being carried between each of the spaced gears **46**, **48** and each of the first rotary clutch element means **20**, **22** adjacent thereto;

each set of helical camming surfaces of each pair being radially distributed about the shaft **12** and movable with the member carrying it, each set of each pair extending toward and overlapping in complement with the other set of the pair whereby reciprocation of one of the clutch element means carrying a set of helical surfaces causes engagement between the sets of the pair during rotation and the rotational movement is transferred between the clutch members; and

shift control means **30** interconnecting the clutch elements of the pair carrying the helical surface sets for coordinating and controlling their reciprocating movement and axial position on the shaft **12** whereby one or the other of the clutch elements of the pair may be moved along the shaft into engagement with its correspondingly adjacent clutch element of the other pair and both of the clutch elements of the pair may be simultaneously moved on the shaft **12** to a position which is spaced from the clutch element of the other pair.

4,189,039

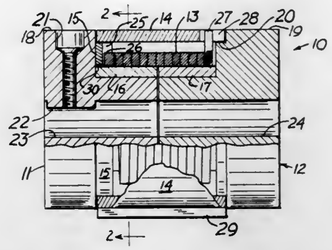
METHOD OF INDEXING A SPRING CLUTCH

Lee W. Johnson, Lake Elmo, Minn., assignor to Reell Precision Manufacturing Corporation, St. Paul, Minn.

Filed Oct. 25, 1977, Ser. No. 845,070

Int. Cl.[2] **F16D** *11/06*

U.S. Cl. 192—26 **1 Claim**



1. The method of obtaining desired permanent alignment between driven hub and control sleeve of a spring clutch mechanism, said mechanism comprising a coil spring tightly enclosing axially aligned adjacent driving and driven hubs and loosely enclosed within a tubular control sleeve, said driven hub including an outer sleeve providing a cylindrical contact surface for said spring, said driven hub being radially extended to provide an outer flange, said mechanism further comprising a radially slotted ring encircling said driven hub between said flange and said sleeve and extending radially beyond said sleeve adjacent the end turn of said spring and providing a support for said control sleeve, said end turn having an axial extension fitting into the slot in said ring; said method comprising assembling together at least said driven hub, ring, sleeve and spring with said sleeve partially forced into place on said hub, rotating said ring and spring into desired alignment relationship with said hub, and then completing the force fit to provide permanent securing of said ring.

4,189,040

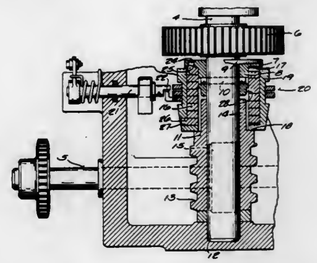
HELICAL SPRING CLUTCH

Orlen O. Braunschweig, Reeseville, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 5, 1977, Ser. No. 857,307

Int. Cl.[2] **F16D** *13/08*

U.S. Cl. 192—26 **2 Claims**



1. In a helical spring-type clutch wherein coaxial driving and driven elements have axially contiguous hubs, each of which projects from a shoulder integral therewith, wherein a helical spring encircling both hubs has its endmost coils adjacent to the shoulders on the driving and driven elements and has coils that grip the hub of the driving element and coils that normally do not contact the hub of the driven element but are grippingly engageable therewith upon contraction of said coils, and wherein a control sleeve encircling the helical spring rotates

with the driving element when unrestrained but when restrained against free rotation causes the coils of the spring to contract and tightly grip both hubs and thereby effect engagement of the clutch, the improvement which assures prompt disengagement of the clutch upon removal of the rotation restraining force from the control sleeve and which improvement comprises the combination of:

A. a radially outwardly projecting tang on the endmost of the coils of the spring that encircle the hub of the driven element, snugly received in a radially oriented hole in the control sleeve, so that said endmost coil of the spring is not only held against angular displacement with respect to the control sleeve to assure contraction of the spring into torque transmitting gripping engagement with both hubs when the control sleeve is restrained against free rotation with the driving element, but is also prevented from contacting the adjacent shoulder on the driven element;

B. a tang projecting axially from the endmost of the coils of the spring that encircle the hub of the driving element, snugly received in an axially oriented hole in the adjacent shoulder on the driving element to prevent relative rotation between the spring and the hub of the driving element and the consequent tendency for the spring to creep towards the driven element; and

C. the diameter of the outer end portion of the hub on the driving element adjacent to the hub of the driven element being equal to or slightly less than the diameter of the hub of the driven element, and the diameter of the hub portion of the driving element adjacent to the shoulder thereof being greater than the diameter of said outer end portion of the driving element, the spring having coils in engagement with both of said portions of the hub of the driving element when the clutch is engaged, so that the force with which the coils of the spring encircling the contiguous end portions of the hubs grip the same is increased during engagement of the clutch and the shape-restoring force in the spring is augmented and rendered more effective to disengage the spring from the driven element upon removal of the restraint against rotation of the control sleeve.

4,189,041

SYNCHRONIZED CHANGE-SPEED GEAR UNIT

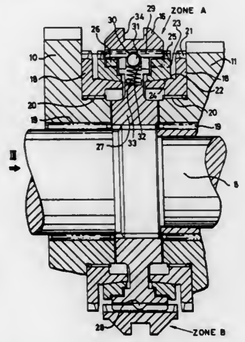
Erich Mullër, Kornwestheim, Fed. Rep. of Germany, assignor to Getrag Getriebe- und Zanhradfabrik GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,136

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659448

Int. Cl.² F16D *23/06*

U.S. Cl. 192—53 F **11 Claims**



1. In a synchronized change speed gear unit for a vehicle having a power-train, the unit including at least one pair of gear wheels, a gear-shift sleeve provided with internal teeth, means for axially shifting the sleeve to bring the gear wheels into engaging and disengaging alignment with the power train, a shaft connected in torsionally rigid fashion to said gear-shift sleeve, a clutch body having external teeth and being rigidly secured to one of said pair of gear wheels, said one of said pair of gear wheels being co-axial with the gear shift sleeve and having a synchronizing ring which in its circumferential direction is in positive connection with the gear shift sleeve and in frictional contact with the clutch body and which has lock teeth so positioned and constructed to permit meshing of the internal teeth of the sleeve with the external teeth of the clutch body at synchronous speed only, the improvement characterized by at least one zone in which certain of the teeth of the sleeve are unextended on its circumference towards the clutch body and at least two zones in which certain of the teeth of the sleeve are extended on its circumference towards the clutch body, and wherein the lock teeth of the synchronizing ring are provided on the ring only in the zone in which certain of the teeth of the sleeve are unextended on its circumference.

4,189,042

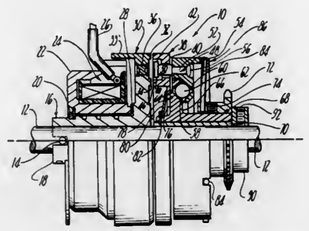
CONSTANT TORQUE FRICTION CLUTCH

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Dec. 8, 1977, Ser. No. 858,582

Int. Cl.² F16D *7/02, 27/10*

U.S. Cl. 192—84 C **6 Claims**



1. A constant torque friction clutch comprising:
a rotatable first clutch member;
a rotatable second clutch member;
means for establishing a clutching engagement between said first and second clutching members, including an axially movable member mounted for relative axial movement with respect to said first and second clutch members;
said means further including means rotatably connecting said first clutch member and said axially movable member;
said means also including clutch operator means selectively producing clutching engagement between said axially movable member and said second clutch member, said clutch operator means including means causing said axially movable member and said second clutch member to be urged axially into frictional engagement;
said means rotatably connecting said axially movable member and said first clutch member including an intermediate member and also including means connecting said intermediate member for rotation together with said axially movable member while allowing limited relative axial movement therebetween in a direction away from the direction of said axial engagement with said second clutch member before becoming axially engaged with each other;
said means rotatably connecting said axially movable and said first clutch member further including camming means drivingly interengaging said intermediate member and said first clutch member producing said relative axial movement between said intermediate member and said axially movable member in said axial direction away from said axial direction of engagement in response to the transmission of torque through said clutch; and
spring bias means creating a spring force resisting said relative axial movement between said axially movable member and said intermediate member, whereby an increase in torque beyond that corresponding to said limit of relative axial movement produces a disengaging force by the action of said camming means and said axial engagement between said axially movable member and said intermediate member to thereby set the maximum torque level at that corresponding to the force generated by said spring bias means.

4,189,043

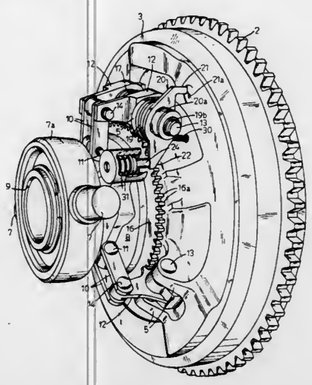
AUTOMATIC SELF-ADJUSTING PLATE TYPE CLUTCH

Horst G. Steinhagen, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Feb. 17, 1978, Ser. No. 878,816

Int. Cl.² F16D *13/42*

U.S. Cl. 192—111 A **8 Claims**



1. Automatic clutch adjusting mechanism for an over-center friction plate type clutch comprising, friction type clutch plates and a floating plate for clampingly engaging said clutch plates, a shaft in constant coefficient of friction bushings in said floating plate, lever means journalled by anti-friction bearing means on said shaft, an axially slideable sleeve for shifting said lever means, said mechanism also including a threadably adjustable ring abutting against said lever means for varying the clamp-up force applied by said lever means, a threaded worm mounted on said shaft for oscillation therewith and meshing with and for adjusting said ring to take up clutch plate wear, a one-way clutch mounted on said shaft for rotating the latter together with said worm in one direction, and a clutch clamp-up force sensing means carried on said sliding sleeve and abuttable against said one-way clutch for actuating the latter to thereby rotate said shaft and worm in a clutch wear take-up direction.

4,189,044

COAT HANGER VENDING MACHINE

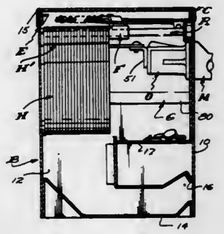
Currie Armstrong, 255 W. Torrance Blvd., Carson, Calif. 90745, and Clarence E. Christophersen, San Clemente, Calif., assignors to Currie Armstrong, Los Angeles, Calif.

Filed Sep. 14, 1978, Ser. No. 942,360

Int. Cl.² G07F *11/40*

U.S. Cl. 194—2 **9 Claims**

1. A clothes hanger vending machine comprising a cabinet having substantially flat, vertical, front rear and side walls and substantially horizontal top and bottom walls, said front wall having a discharge opening in its lower portion, a partition within the lower portion of the cabinet defining a clothes hanger discharge passage communicating with the upper portion of the cabinet and the discharge opening, structure in the upper portion of the cabinet defining a flat, vertical, forwardly disposed rear surface above said discharge passage, an elongate substantially horizontal clothes hanger supporting rod within the upper portion of the cabinet having a forward end securely mounted in the forward portion of the cabinet and a free end in spaced relationship from said surface to define a space through which clothes hangers can move, one at a time, a supply of clothes hangers with lower frame portions and with upper downwardly opening hook portions engaged over the rod, spring loaded stop means within and normally bridging said space to engage and releasably support the hook portion of a hanger in said space, follower means including a follower block slidably engaged on the rod foward of the hangers engaged thereon and spring means normally yieldingly urging the block and said hangers longitudinally rearwardly on the rod and the rearmost hanger on said rod against said surface



and to said space, ejector means including a hanger engaging ejector blade normally adjacent said surface above said space and said first hanger and operating means to selectively move the blade downwardly to engage and advance said first hanger past said stop means and through said space for free movement into and through said passage, operating means for the ejector blade including a manually operable coin mechanism mounted on and extending through a wall of the cabinet and having a manually movable drive member at the exterior of the case and a movable driven member within the cabinet and movable in response to movement of the drive member, and link and lever means between said blade and said driven member whereby said blade is moved downwardly and upwardly in response to movement of the driven member.

4,189,045

DEVICE FOR TRANSFERRING ROD-LIKE OBJECTS

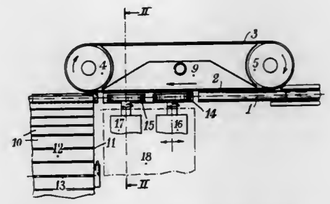
Jean Verjux, Pavillons sous Bois, France, assignor to Arenco-Decoufle, Paris, France

Filed Oct. 25, 1977, Ser. No. 845,421

Claims priority, application France, Nov. 23, 1976, 76 35179

Int. Cl.² B65G *47/26*

U.S. Cl. 198—457 **3 Claims**



1. A device for individually transferring cigarettes being fed longitudinally in abutting end-to-end relationship into successive grooves of a rotary drum conveyer comprising in combination:
said grooved rotary drum conveyer;
a perforated endless tape positioned axially to one side of said drum in the path of travel of the cigarettes, having one run in a vertical plane and traveling at a speed slightly higher than and in the direction of travel of the cigarettes;

vacuum means on the inner face of said vertical run for urging individual cigarettes against said tape;

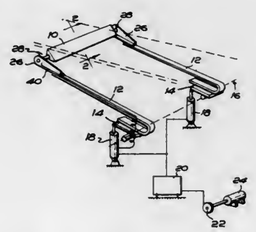
a pair of rotary cams also axially spaced from the same side of said drum in a common vertical plane which includes the longitudinal axis of the cigarettes being fed and positioned above the path of travel of cigarettes for engagement, when rotated, with individual cigarettes to impart a velocity transverse to their longitudinal axis and substantially equal to the peripheral velocity of said drum, the peripheral velocity of the cam being slightly higher than the longitudinal velocity of said tape and the horizontal spacing between said cams, being such that they contact the cigarette only during the time the center of gravity of the cigarette lies between the cams, whereby the cigarettes are individually projected outwardly of said tape and cams and into the grooves of said drum.

4,189,046

CONVEYOR BELT CLEANING APPARATUS

Charles W. Ward, deceased, late of Doncaster, England, and by Hilda Ward, administratrix, 35 Central Blvd., Wheatley Hills, Doncaster, England

Filed Oct. 13, 1977, Ser. No. 841,980
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—499 **6 Claims**



1. A conveyor belt cleaning apparatus, comprising:

at least one scraper member;

respective carrier members to which opposite ends of the scraper member are secured;

at least one fluid pressure actuated device for maintaining the scraper member with a scraper edge in engagement with a run of a conveyor belt against which it is arranged to bear with a required pressure;

a fluid pressure circuit to which the at least one fluid pressure actuated device is connected;

a fluid pump for maintaining a fluid pressure in the fluid pressure circuit whenever the conveyor is in operation;

means for driving said fluid pump at least when the conveyor is in operation; and

a cavity within the scraper member and spaced from the scraper edge, said cavity communicating with the fluid pressure circuit, the arrangement being such that when the scraper edge becomes worn down to such an extent that the scraper member needs to be replaced the cavity within the scraper member becomes ruptured whereby fluid under pressure is allowed to escape from the fluid pressure circuit so that the scraper member is allowed to move away from the conveyor belt.

4,189,047

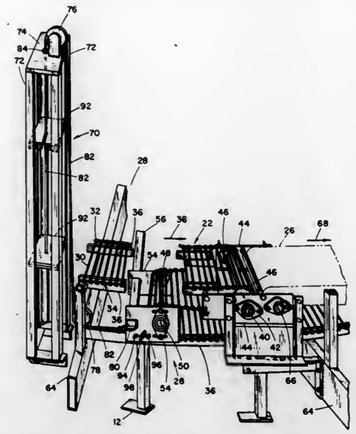
ENDLESS CONVEYOR

Herbert J. Beckius, York, Pa., assignor to Alto Corporation, York, Pa.

Filed Oct. 12, 1977, Ser. No. 841,574
Int. Cl.[2] B65G *15/30*
U.S. Cl. 198—778 **14 Claims**

11. The method of controlling the tension in the belt of a conveyor of the type having a continuous path, a movable shaft with the belt wrapped around the shaft so that movement of the shaft in a first direction tensions the belt and movement of the shaft in an opposite direction loosens the belt, and a gravity type counterweight attached to the shaft by a strand to bias the same in the first direction to tighten the belt, comprising the steps of:

A. Moving the belt around the continuous conveyor path;



B. Increasing the weight carried by the strand in response to shortening of the belt to thereby increase the belt tension and;

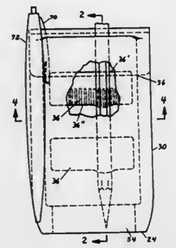
C. Decreasing the weight supported by the strand in response to the elongation of the belt to thereby decrease belt tension.

4,189,048

ARTICLE HOLDER

Raymond Gaillard, 183 Lindbergh St., Massapequa Park, N.Y. 11762

Filed Feb. 22, 1978, Ser. No. 880,207
Int. Cl.[2] B43K *25/00*; A45C *11/00*
U.S. Cl. 206—37 **30 Claims**



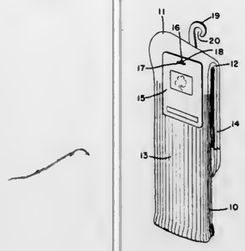
1. An article holder comprising a substantially rigid receptacle having a pair of opposed rigid side walls and a pair of opposed rigid end walls defining therebetween an open upper end for the receptacle, a bottom end opposite said open upper end, spring means mounted within said rigid recepacle for biasing articles placed in said rigid receptacle, through said open end, towards one of said side walls while resisting movement of the article transversely of the direction of insertion thereof, said spring means comprising a resilient compressible block of elastic foam material mounted on one of said side walls and having upper and lower ends and a width dimension which slopingly increases from said upper end towards said lower end thereby to hold the article in a relatively fixed position in said receptacle; a flexible film overlying said width dimension of said foam material, means in said receptacle defining a continuous slot spaced above said bottom end thereof and below said lower end of said spring means for receiving the ends of articles inserted in the receptacle while limiting the depth of insertion of articles into said receptacle and holding the inserted ends of the articles above said bottom end of the receptacle; and means for securing said receptacle to a support.

4,189,049

UNITARY HANGER DISPLAY PACKAGE

Edward S. Silver, High Point, N.C., assignor to Silver Knit Industries, Inc., High Point, N.C.

Filed Sep. 7, 1978, Ser. No. 940,459
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—216 **6 Claims**



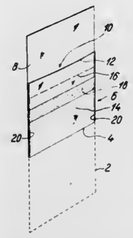
1. A unitary hanger display package comprising an article of textile manufacture having opposite sides such as a pair of socks to be displayed, a unitary freely moveable means for suspending said article in a vertical position positioned on one side of said article, a flat unfolded identification label having indicia thereon, positioned on the opposite side of said article, and a thermoplastic filament means penetrating said suspending means, said article and said label and retaining them together as a unit to form an integral package.

4,189,050

PACKING OF THE FOLDING BAG TYPE

Ole Jensen; Walther Ostmann; Erik W. Nielsen; Leif Sorensen, all of Horsens, and Erik Keldmann, Jerslev, all of Denmark, assignors to Brdr. Schur International A/S, Denmark

Continuation of Ser. No. 570,707, Apr. 23, 1975, abandoned.
This application Oct. 4, 1976, Ser. No. 729,012
Claims priority, application Denmark, Apr. 23, 1974, 2208/74
Int. Cl.[2] B65D *33/20*
U.S. Cl. 206—245 **4 Claims**



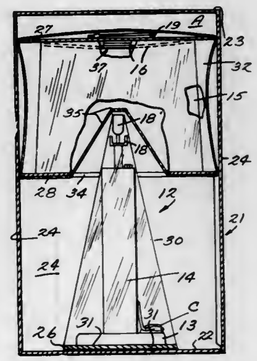
1. A folding bag type pouch, comprising a strip of sheet material which is folded about a transverse folding line offset from the middle of the strip so as to define a front panel having a free top edge and a bottom edge formed by said folding line, a rear panel extending upwardly from said bottom edge beyond the top edge of the front panel to form a flap portion, the side edges of the front and rear panels being joined so as to define a flat bag, said flap portion arranged to be folded down along the front panel of the bag together with the uppermost portion of the front panel about a second transverse folding line located below the top edge of the front panel, and said flap portion and uppermost portion of the front panel arranged to be fastened in a releasable manner to the exterior surface of said bag by fastening means constituted by a transverse zone of releasable adhesive on the exterior surface of one of the panels spaced from said top edge of the front panel such that the top edge of the front panel, when the flat portion and uppermost portion of the front panel are folded about said second transverse folding line, is situated adjacent to and approximately along a middle line of said transverse zone.

4,189,051

LAMP PACKAGING

Gene T. Fales, and Dennis V. Dollar, both c/o Dunning Industries, Inc., P.O. Box 11393, Greensboro, N.C. 27409

Filed Sep. 12, 1978, Ser. No. 941,574
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—326 **13 Claims**



1. An article-containing carton comprising

a lamp, including a base and a pedestal,

a lamp shade, including a supporting spider interior thereof and attached thereto in normal supporting relationship,

a first support panel having cross-dimensions generally larger than the cross-dimensions of said lamp base,

a heat shrinkable material for fastening said lamp to said first support panel, with said lamp base resting on said support panel,

a carton having a horizontally extending bottom and top, and vertically extending sidewalls,

means for operatively fastening said first support panel to said carton bottom, and

means for mounting said lamp shade within said carton so that said lamp and said shade are always maintained in spaced relationship in the carton horizontal dimensions, and so that said lamp shade supporting spider and said lamp are substantially always maintained in spaced relationship in the carton vertical dimension.

4,189,052

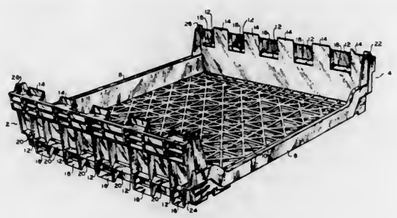
STACK AND NEST CONTAINER

James C. Carroll, and Lewis T. Johnson, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 3, 1978, Ser. No. 892,795
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 **10 Claims**

1. A generally rectangular container adapted for stacking and partially nesting with another like container comprising a generally horizontally disposed generally rectangular bottom

and opposed first and second endwalls projecting upward from first and second opposed ends of said bottom, wherein said first and second endwalls each comprise a plurality of spaced apart generally vertical columns, wherein the columns and the spaces therebetween in one of said first and second opposed endwalls are arranged with respect to the columns and spaces therebetween of the other of said first and second endwalls so that another like container when reversely oriented with respect to said container, will fit inside said container in a partial nest position, and wherein at least two columns on each endwall each contain on the upper surface thereof a stacking post and on the lower surface thereof a stacking foot adapted such that when said container is stacked upon another identically oriented identical container the stacking foot of the upper container will fit over the outer surface of the stacking post of the corresponding column of the lower container such that said stacking posts of said lower container and said stacking



feet of said upper container cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container, and wherein each endwall further comprises at least two nesting posts and at least two nesting feet located in the spaces between said columns of said endwalls in such a manner that when an identical container is reversely oriented and partially nested within said container a stacking foot of the upper container will fit over the outer surface of each nesting post of the lower container such that said stacking feet and said nesting posts cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container and each nesting foot of the upper container will fit over the outer surface of a stacking post of the lower container such that said stacking feet and said nesting posts cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container.

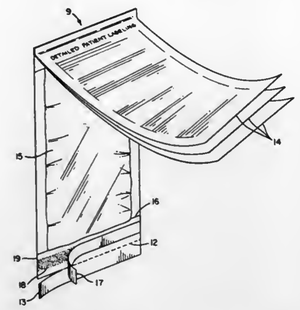
4,189,053

BULK UNIT OF USE INFORMATIONAL MEDICINAL DISPENSING SYSTEM

Frank V. Stagnitto, Denville; James McTiernan, Woodcliff Lake; Morris D. Kamo, Nutley, and Walter Antosik, Garfield, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 25, 1979, Ser. No. 6,939
Int. Cl.[2] B65D *83/04*
U.S. Cl. 206—570 **5 Claims**

1. A pharmaceutical dispensing system which comprises a kit containing:
   a. an envelope open at one side and closed at its other three sides; said envelope having;
      1. one or more flaps attached to one of its ends for the encoding of preprinted information;
      2. space on the opposite side for the encoding of label information;
      3. a removable, perforated strip at its open end; said strip having, on one side, space for encoding patient profile information and, on the other side, an adhesive;
      4. a foldable strip from which said removable, perforated strip is torn, said strip having, on one side, an adhesive;
   b. up to °divisible, multi-compartment, separately-releasing dispensing blister packages, said blister packages having:
      1. a base perforated in such a manner as to produce 50–100 individually-detachable squares;
      2. a paper foil laminate backing and;



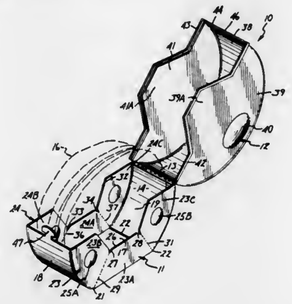
      3. a plastic bubble on each square for the containment of each individual dosage of medication.

4,189,054

PRODUCT HOLDER

Jack F. Liu, and Susan L. Liu, both of 4098 Brigadoon Dr., Shoreview, Minn. 55112

Filed Apr. 13, 1979, Ser. No. 29,787
Int. Cl.[2] B65D *17/24, 65/28, 75/60*
U.S. Cl. 206—634 **10 Claims**



1. A holder for a product comprising: first casing means having a first wall, a second wall, and a third wall, first hinge means joining the first and second walls, second hinge means joining the first and third walls, a first side wall attached to the first, second and third walls, a second side wall attached to the first, second and third walls, said first and second side walls having separable sections extended to the first and second hinge means allowing the side walls to be separated, second casing means adapted to be positioned over the first casing means to close the holder, and connecting means attaching the second casing means to the first casing means allowing the second casing means to be moved relative to the first casing means to a position to open the holder.

4,189,055

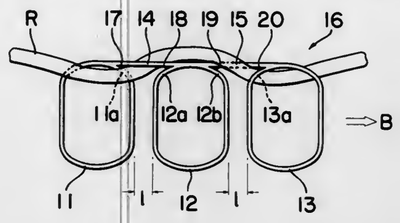
FIXTURE FOR AN ELONGATED FLEXIBLE MEMBER

Hiromichi Nohzuka, 4-5-20-305, Shakujiidai, Nerimaku, Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,746
Int. Cl.[2] D06F *53/00;* **F16G** *11/00*
U.S. Cl. 211—119.12 **4 Claims**

1. An apparatus for securing one or more objects comprising at least two spaced rigid identical parallel fixing portions to which said objects may be secured;

a linear connection portion perpendicularly connecting two of said at least two fixing portions, said fixing portions and connecting portion all lying within a single plane;
a single elongated flexible member having two ends, said elongated flexible member being helically wound near a mid portion thereof around said linear connecting portion by an angle of at least 360 degrees, said ends being fixed so as to provide said elongated flexible member with tension;
whereby an external force acting on said parallel fixing portions will create a reaction force along the area of contact between said elongated flexible member and said linear connecting portion so as to maintain said linear



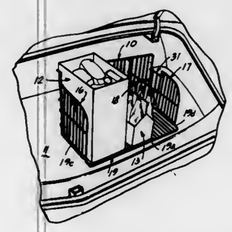
connecting portion's position with respect to said elongated flexible member; and
each parallel fixing portion possessing a progressively decreasing width in the direction towards said linear connecting portion adjacent said connecting portion to form a notch into which said elongated flexible member becomes wedged;
whereby an external force acting on said parallel fixing portions will cause said elongated flexible member to become wedged between said linear connecting portion and said parallel fixing portions at each point where the helix intersects the intersection of said linear connecting portion and said parallel fixing portions.

4,189,056

KNOCK-DOWN PORTABLE SHOPPING RACK

Elmer J. Majewski, 9436 Crawford Ave., Skokie, Ill. 60076

Filed May 25, 1978, Ser. No. 909,440
Int. Cl.[2] A47F *5/01*
U.S. Cl. 211—195 **2 Claims**



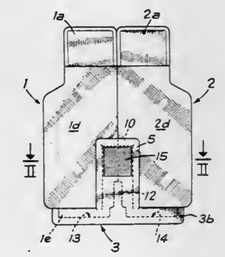
1. A collapsible portable knock-down storage rack for minimizing movement of packages during transport which comprises:
   a rod-form rectangular back having a length longer than its height;
   a rod-form rectangular base having a length equal to the length of said back, and a width less than said length;
   two sides;
   a plurality of partitions;
said back and said base being further comprised of a perimeter formed by a rod formed into a rectangle and a plurality of equally spaced apart straight rods parallelly transversing said height of said back and said width of said base, said rods terminating at points of intersection with the perimeters of said base and said back and joined to the respective perimeters at said points;
   first hinge means for connecting said base to said back comprising eye-bolt shaped rods each having a curved portion and a straight portion, said straight portion attached at its end to said base at a point on one of the longer sides of the perimeter and extending upwardly therefrom, and said curved portion enclosing the rod forming the perimeter of said back along the length thereof;
said partitions and a first one of said sides further comprising a rod-form member generally forming three sides of a square, with one corner thereof rounded in the manner of an arc of a circle having its center in approximate coincidence with the center of said square, and the free ends of said rod-form member being curved in eye-bolt fashion so as to accept an adjoining rod-form member forming the perimeter of the back or one of the straight rod-form members transversing said back;
a second of said sides formed of the same general shape of said first sides further including a second hinge means allowing said second side to bend 180° along an axis parallel to said back and, said second hinge means located approximately one-half of the distance from the free ends of said side to the portion of the perimeter of said side parallel to said back;
   said straight portion of said first hinge means extending vertically a distance above said base so that said back may be swiveled to a position parallel said base with said partitions and sides folded therebetween; and
   a means for temporarily securing each of said sides and said partitions to said base to maintain said rack in a rigid, upright position by preventing movement of said curved portions of said rod-form members around said enclosed rod-form members.

4,189,057

DEVICE FOR PACKAGING LIQUID SUCH AS PERFUME

Alfred Morille, Neuilly, France, assignor to Paco Rabanne Parfums S.A., Paris, France

Filed Nov. 27, 1978, Ser. No. 963,772
Claims priority, application France, Nov. 28, 1977, 77 35786
Int. Cl.[2] B65D *21/02*
U.S. Cl. 220—23.4 **5 Claims**



1. In a device for packaging liquid, of the type comprising two coupled bottles mounted on a common base,
   the bottles are clipped on the base by means of two tongues thereon between which are inserted each of said bottles, each bottle being in contact with each of said tongues; a locking projection being provided on the inner face of each tongue to cooperate with a recess provided on the adjacent face of each bottle, and
   two guide elements are provided on said inner face of each tongue which each cooperate with a recess provided on the adjacent face of a corresponding bottle, these guide elements and the corresponding recesses being especially arranged and designed to guide the bottles with respect to the base in a path terminating in a final position of said bottles, for which these bottles are both clipped on the

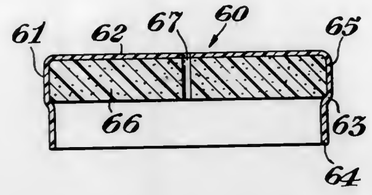
base by the cooperation of the locking projections with the corresponding recesses, and rest on the base.

4,189,058

FLOATING THERMALLY INSULATING TANK COVERS

James T. Seliskar, Midland, and Donald C. Adams, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1978, Ser. No. 885,845
Int. Cl.² B65D *87/20*
U.S. Cl. 220—218 **8 Claims**



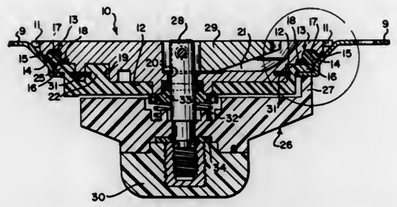
1. An improved liquid body covering element adapted to be disposed in edge-to-edge relationship with generally like elements to cover at least a major portion of a body of liquid, the improved element comprising a first, thermally insulating generally plate-like member having two major generally parallel surfaces, a periphery, a flange disposed about the periphery of the member the plate-like member being of close cell plastic foam, the flange being generally normal to the major surfaces the flange being a material which resists abrasion caused by relative motion between adjacent elements, the tank covering element being adapted to be disposed flange downwardly on a surface of liquid within a tank, vent means adapted to vent gases from a space enclosed by the flange and the plate-like member and an adjacent liquid body to a space adjacent a major face of the plate-like member remote from the face adjacent the flange, with the further limitation that the covering element floats on a liquid which it is intended to cover and the element is not readily removed from the liquid by wind.

4,189,059

SEALING MECHANISM FOR AIRCRAFT FUEL TANK CAP

James R. Shaw, Amagansett, N.Y., assignor to Shaw Aero Devices, Inc., East Hampton, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,236
Int. Cl.² B65D *45/00*
U.S. Cl. 220—246 **10 Claims**



1. An improved filler cap for a tank having an opening defined by an annular wall of the type comprising (1) a plug member having an outwardly extending flange at its upper end and a lower end having a contact surface for contacting a sealing member disposed about the plug periphery, (2) a sealing member, and (3) a retaining member positioned below the sealing member for compressing the sealing member against the lower end of the plug member, said filler cap characterized in that:

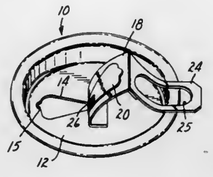
said contact surface of said plug member and said upper surface of said retaining member define between them a first grooved portion for clinching said sealing member in position adjacent the plug periphery and a second radially inwardly disposed grooved portion of reduced cross section for accommodating deformation of said sealing member, wherein said first grooved portion circumscribes a sufficient portion of the periphery of the sealing member to restrain radially outward deformation of said sealing member and thereby force such deformation into said second radially inwardly disposed grooved portion.

4,189,060

RETENTION MEANS FOR CONTAINER CLOSURE ASSEMBLY

Gladstone Trotman, III, Cottage Grove, Mich., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Mich.

Filed Oct. 5, 1978, Ser. No. 948,830
Int. Cl.² B65D *41/02*
U.S. Cl. 220—260 **7 Claims**



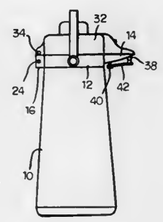
1. An end portion for a container, said end portion being of the type having a closure system thereon comprising an exterior tape removably secured to the top of said end portion over a pour hole in said end portion, wherein the improvement comprises a non-metallic flexible film having a plurality of flexible yarns thereon, said film having a first end portion and a second end portion, wherein said first end portion is bonded to the underside of said container end portion and said second end portion is bonded to the underside of said tape in the area of said pour hole.

4,189,061

FIXED BOTTLE COVER DEVICE OF COMPRESSED AIR THERMOS BOTTLE

Sheu-Jin Yu, 795, Tong-Ta Rd., HsinChu City, Taiwan

Filed Nov. 29, 1978, Ser. No. 964,849
Int. Cl.² B65D *45/16*
U.S. Cl. 220—326 **3 Claims**



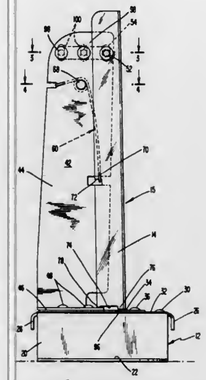
1. A fixed cover device for compressed air thermos bottle comprising a holding fixture for said cover, a bottle body, a top collar set on the upper end of the bottle body, one end of the top collar being provided with an extension portion, the other end of said top collar being provided with a fixed seat including said holding fixture for said bottle cover, said holding fixture including an external notched clamp plate cooperating with a shaft fixed to said cover fixed in said fixed seat by an axle pin, an internal seat plate, a compressed coil spring in the bottom end of said external clamp plate and said internal seat plate whereby in the closed position the upper end of the external clamp plate will tightly close on the upper end of the internal seat plate while the bottom end of the external clamp plate is forced by pressure of the compressed coil spring, and whereby said shaft fixed to said bottle cover may be intimately associated with said external notched plate.

4,189,062

DISPENSING METHODS AND APPARATUS FOR SPLIT RETAINING RINGS

Sylvester Jackson, Long Island City, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed May 26, 1977, Ser. No. 800,941
Int. Cl.² B65G *59/06*
U.S. Cl. 221—188 **13 Claims**



1. In a dispenser for split retaining rings comprising a base, a guide slot formed in the base, a rail carried by said base for rotational movement above said guide slot and adapted to retain a stack of split retaining rings for individual withdrawal by a ring removal tool which is insertable along said guide slot and rotatably displaces a lower end of the rail and grips the bottom-most retaining ring, the improvement comprising first and second vertically spaced stationary constraining surfaces carried by said base engaging opposite sides of said rail as the latter travels in its path of rotational movement, to prevent lateral displacement of said rail relative to said guide slot, said second surface disposed adjacent a bottom end of said rail.

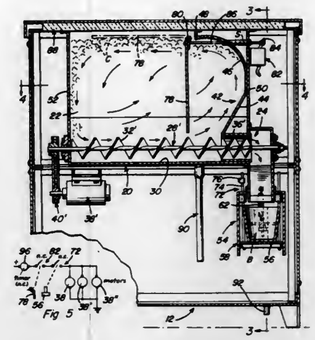
4,189,063

ICE DISPENSER

Ralph F. Matthiesen, 13005 Welcome Dr., San Antonio, Tex. 78233

Filed Nov. 7, 1977, Ser. No. 849,397
Int. Cl.² B65G *33/02*
U.S. Cl. 222—1 **9 Claims**

1. A dispenser, comprising, a hollow housing forming an article containing chamber and provided with a discharge opening communicating with the chamber, conveyor means arranged within the chamber of the housing for moving discrete articles disposed within the chamber toward the discharge opening for dispensing the articles, said conveyor means including baffle means disposed adjacent the discharge opening of the housing for diverting articles, in excess of those dischargeable through the discharge opening, along an orbital path about the chamber of the housing in order to assure that the articles remain loose within the chamber, said baffle means including a first baffle part and a second baffle part, the first baffle part extending linearly away from the discharge opening at an acute angle thereto and toward a terminal end, and the second baffle part being curved from the terminal end of the first baffle part and extending away from the discharge opening and toward a surface of the chamber disposed opposite a surface of the chamber in which the discharge opening is provided.

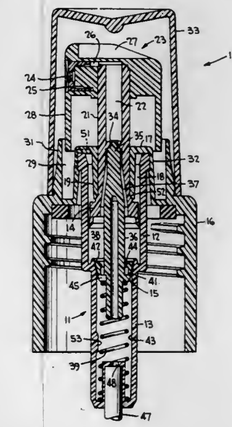


4,189,064

PUMPS SPRAYER

Richard K. O'Neill, and Roy T. Wells, both of Hacienda Heights, Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,503
Int. Cl.² B05B *9/043*
U.S. Cl. 222—321 **14 Claims**



1. In a pump sprayer including a cylinder having first and second sections defining a variable volume pump chamber, a discharge nozzle, discharge passage means interconnecting said first portion and said nozzle, liquid inlet means communicating with said second section, a first piston member reciprocable along said first section for building-up the pressure in said chamber for discharge through said passage means and out of said nozzle, a valve seat on said first piston member, a valve member engageable with said seat for opening and closing same upon movement relative thereto, means biasing said valve member into engagement with said seat, a second piston member connected to said valve member and having a resiliently radially deformable peripheral wall in constant sealing engagement with the inner wall of said second section throughout the entire circumference thereof, said second piston member being reciprocable along said second section, the improvement wherein said second piston member is provided

with a valve controlled flow passage therethrough and lying between said peripheral wall and an adjacent portion of said second piston member for establishing and interrupting communication between said first and second sections respectively upon an opening and closing of said flow passage, said inner wall having a relieved section located at a predetermined location at the beginning of the downward stroke of said second piston member for allowing said peripheral wall to become spaced from said adjacent portion in an open condition of said flow passage, said peripheral wall being inwardly deformed against said adjacent section for closing said flow passage during said downward stroke.

4,189,065

METERING DISPENSER FOR HIGH-VISCOSITY COMPOSITIONS

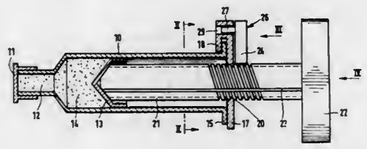
Wolf-Dietrich Herold, Herrsching, Fed. Rep. of Germany, assignor to ESPE Fabrik Pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 761,958

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1976, 7603096[U]

Int. Cl.[2] G01F *11/00;* B67D *5/42*

U.S. Cl. 222—46 **11 Claims**



1. A dispensing device for metering high-viscosity compositions comprising an elongate hollow body having a discharge opening at its front end, a piston disposed within the body for movement in the longitudinal direction thereof, the composition being contained between said piston and said discharge opening, a nut mounted on the rear end of the body, means preventing rotation of said nut relative to said body, a threaded spindle engaging said nut so as to be rotatable relatively to said body and bearing with its front end against the rear side of said piston, said spindle having at least one longitudinal groove, and detent means mounted on said nut for providing a snap-action with said at least one groove thereby indicating the angular position of said spindle relative to said nut.

4,189,066

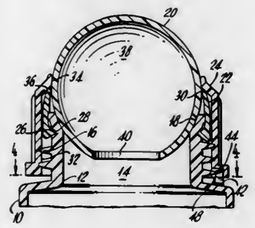
DISPENSER FOR DISPENSING LIMITED AMOUNTS OF MATERIALS

Walter G. Berghahn, Scotch Plains, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,413

Int. Cl.[2] G01F *11/10*

U.S. Cl. 222—48 **10 Claims**



1. In combination, a container with a circular opening defined by a cylindrical neck having external threads and a first bearing surface at its outer end, and a locking dispensing closure comprising:

(a) a ball having a diameter greater than the diameter of said circular opening but less than the outside diameter of said neck and in slidable contact on one side of its equator with said first bearing surface whereby said ball is rotatable in all directions thereon,

(b) a resilient open ended cylindrical retaining ring, the inner surface of one end of which is in tight contact with the outer surface of said outer end of said neck and the other end of which is provided with an inner second bearing surface in slidable contact with said ball on the other side of its equator, and

(c) an open ended cylindrical locking ring provided with internal threads at one end engaging the external threads on said neck, the other end of said locking ring having an inner third bearing surface with a diameter less than the diameter of said ball and in juxtaposition to said ball on said other side of its equator, said third bearing surface being adapted to lock said ball against rotation when said locking ring is tightened on said external threads on said neck, said ball having a cavity therein defining a dispensing volume and having an aperture into said cavity, no transverse dimension of said aperture being greater than the diameter of said first bearing surface.

4,189,067

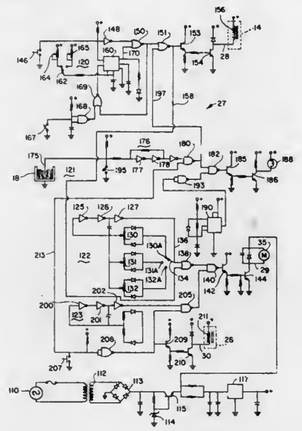
ELECTRONIC CONTROL FOR DISPENSER SYSTEM

James E. Nottke, Seminole, and Jack K. Ruebel, Clearwater, both of Fla., assignors to Lykes Pasco Packing Company, Dispenser Division, Clearwater, Fla.

Filed Feb. 14, 1977, Ser. No. 768,612

Int. Cl.[2] B67D *5/44*

U.S. Cl. 222—57 **6 Claims**



1. A circuit for controlling a device having flow means for controlling the flow of a first liquid and pumping means having a variable speed motor for pumping a second liquid in accordance with the input to the motor, comprising in combination:

generator means for generating an electrical pumping signal;

said generator means including a pulse width modulation generator for providing a series of electrical pulses each having a pulse duration in accordance with the value of modulation of said pulse width modulation;

means for selecting said value of modulation of said pulse width modulation generator;

connector means connecting said generator means to the input of the motor for controlling the pumping rate of the second liquid in accordance with said value of modulaton of said electrical pumping signal; and

activator means connected to said flow means and said generator means for activating simultaneous flow and pumping of the first and second liquids upon a selected signal from said activator means.

4,189,068

PERFORATING AND SEALING DEVICE FOR CARBON DIOXIDE CAPSULES AND SUCHLIKE

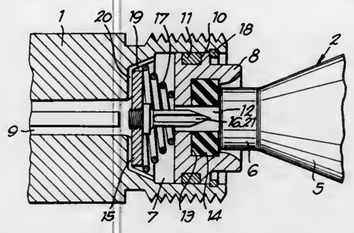
Ramon Apellaniz, Lasne-Chapelle-Saint-Lambert, Belgium, assignor to Waterlomat, Societé Anonyme, Brussells, Belgium

Filed Aug. 2, 1977, Ser. No. 821,321

Claims priority, application Belgium, Sep. 30, 1976, 255343

Int. Cl.[2] B67B *7/24*

U.S. Cl. 222—83.5 **7 Claims**



1. Perforating and sealing device for carbon dioxide capsules and suchlike, characterized by the fact that it comprises a capsule support; in this support, a bore for an axially moveable piston, for the purpose of capping the collar of the capsule; said piston being provided with an axial passage; a perforating element extending partially into aforesaid passage, and means for relatively moving aforesaid perforating element and the capsule towards each other until the latter is perforated, aforesaid piston being then firmly pressed against the capsule by the gas pressure in aforesaid bore.

4,189,069

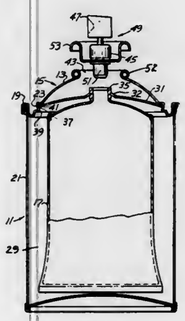
SQUEEZE TUBE SACK FOR AEROSOL TYPE CONTAINERS

William R. Stoody, 5008 County Line, New Haven, Mich. 48048

Filed Mar. 17, 1978, Ser. No. 887,580

Int. Cl.[2] B65D *35/22*

U.S. Cl. 222—83.5 **8 Claims**



1. In an aerosol-type container including a first pressure chamber and a cover, said cover having an opening for receiving propellant gas and having a valve assembly mounted thereon;

an elongated flexible and collapsible sack of impervious material nested within said chamber and containing material of predetermined form for dispensing through said valve assembly;

an upwardly concave sack retainer disc centrally mounting and suspending said sack;

and a single annular projection formed on the interior of the cover supportably and retainingly engaging said sack retainer disc by a snap fit;

said disc being apertured and spaced from said cover opening defining a second chamber above said disc communicating with said pressure chamber, said pressure chamber being pressurized with the propellant passing through the cover opening and through said second chamber immediately prior to the mounting of the valve assembly within said cover opening.

4,189,070

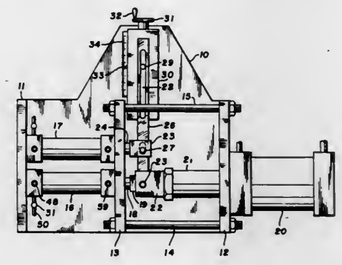
REACTION INJECTION MOLDING MACHINE

Christopher W. Macosko, Minneapolis, Minn., and Ly J. Lee, Akron, Ohio, assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Feb. 3, 1978, Ser. No. 874,798

Int. Cl.[2] B67D *5/46*

U.S. Cl. 222—134 **10 Claims**



1. A machine for metering and mixing at least two liquids which are reactive to form a polymer, said machine comprising:

(A) a plurality of vessels for separately containing reactive liquids,

(B) a plurality of reactant metering cylinders, said metering cylinders being in substantially parallel side-by-side relation,

(C) duct means connecting each of said vessels to one of said metering cylinders,

(D) a reciprocable piston in each of said metering cylinders,

(E) means for reciprocating said pistons together in the same direction, said means comprising:

(1) a power means for actuating the piston of one of said metering cylinders,

(2) a lever arm pivotally connected at one end to the piston of said first metering cylinder and the power means,

(3) a movable fulcrum pivotally engaging a first slot in said lever arm spaced from the connection of the lever arm to the first metering cylinder piston, and

(4) a further slotted pivotal connection between said lever arm and the piston of the other of said metering cylinders, said slotted pivotal connection lying between said fulcrum and the pivotal connection to said first metering cylinder,

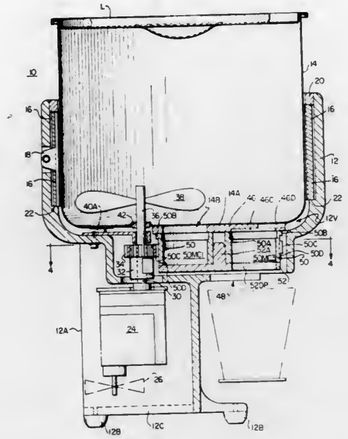
(F) a mixing head, and

(G) duct means connecting said mixing head to each of said metering cylinders.

4,189,071
SOUP DISPENSER

John B. West, Glyndon, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 851,950, Nov. 16, 1977, which is a continuation-in-part of Ser. No. 827,678, Aug. 25, 1977. This application Jun. 14, 1978, Ser. No. 915,467
Int. Cl.[2] G01F *11/22*
U.S. Cl. 222—189 42 Claims



1. A dispensing assembly for dispensing volumes of liquid or semi-liquid food product from the bottom of a reservoir by gravity filling and emptying, comprising:

a rotary dial shaped transfer plate means having a circular pattern of substantially identically configured measuring chambers formed therein and extending therethrough parallel to a central axis of rotation;

a conformal housing for said transfer plate means open at its top and having a supporting plate across the bottom thereof coextensive with said transfer plate means, said supporting plate having a discharge opening formed therein of substantially identical configuration as said measuring chambers for successive registry therewith in response to rotations of said transfer plate means on said central axis of rotation within said housing;

strainer means insertably mounted in selected ones of said measuring chambers substantially precluding the ingestion of garnish therethrough into a corresponding said measuring chamber;

sealing plate means fixed from rotation on said housing over said transfer plate means and overlying an area on said transfer plate means coincident with the said discharge opening and surface areas adjacent thereto and greater than the cross-sectional area of a said measuring chamber and having an intake port formed therein in registry with successive ones of said measuring chambers during rotation of said transfer plate means;

said sealing plate means including vent port means in registry with said discharge opening through successive ones of said measuring chambers;

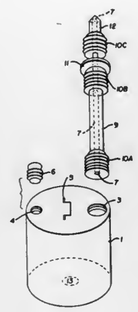
motor means having a rotary output shaft mounted for rotation adjacent said transfer plate means in said housing; and

drive means selectively actuated to interconnect said output shaft with said transfer plate means for rotating the latter in an amount to register a predetermined number of measuring chambers together with said selectively inserted strainer means with said intake port and said discharge opening for each selective actuation of said drive means.

4,189,072
CONTAINER WITH NOZZLE AND/OR DRINKING TUBE AND CLOSURE MEANS

John L. Conn, P.O. Box 4501-Station B, Spartanburg, S.C. 20303

Filed Oct. 30, 1978, Ser. No. 956,222
Int. Cl.[2] B67D *3/00, 5/06*
U.S. Cl. 222—519 1 Claim

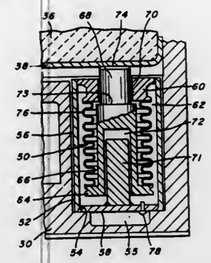


1. The construction of a container with nozzle and/or drinking tube with closure means wherein the construction of a hollow container having a bottom, side walls and a top wherein the top surface area of said container has constructed an internally threaded aperture through the top surface at a point near the surface's outer area near the peripheral wall and having another smaller internally threaded aperture through this top surface and closure means at an opposite top surface point near the peripheral wall wherein said container contains a centrally top surface mounted handle wherein the construction of a nozzle and/or drinking tube having an internal longitudinal aperture completely through the central area of said nozzle or drinking tube wherein the one end of said nozzle or tube has an externally threaded area equal in circumference and having similar thread fits as said container's larger internally threaded aperture wherein an adjacent extended central portion of said nozzle or tube is of a smaller un-threaded circumference than that of the container's internally threaded larger aperture wherein an adjacent externally threaded area is constructed upon said nozzle equal in circumference and similar thread fits as said container's larger internally threaded aperture wherein this portion of the nozzle is equal in length as that of the height of the inside of said container wherein adjacent to this second externally threaded area is constructed a thin washer having a larger circumference than that of the larger container's internally threaded aperture wherein adjacent to this washer is constructed a third externally threaded area equal to the first and second in circumference and of like threads wherein adjacent to this third externally threaded area is constructed a smaller extended rectangular shaped mouth piece or end that is smaller in circumference than that of the third externally threaded area wherein all nozzle or tube components are of one continuous integral assembly wherein the construction of a closure cap that is internally threaded and having like thread fits as the third externally threaded area wherein said closure cap will cover the rectangular mouth or end piece so to seal aperture at the nozzle's or drinking tube's end.

4,189,073
SPRING ELEMENT FOR USE IN SLIDING GATE VALVE

Joseph Lothmann, Langerwehe, Fed. Rep. of Germany, assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 603,056, Aug. 8, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,694
Int. Cl.[2] B22D *41/02*
U.S. Cl. 222—600 6 Claims



1. A resilient biasing device particularly adapted for use in a high temperature environment to impart an oppositely outwardly longitudinal bias between two spaced-apart members comprising:

(a) a rigid, hollow body defining an enclosure,

(b) the opposite ends of said body being closed by end closures, a first one of which forming a longitudinally outwardly facing bearing surface adapted to engage one of said members and a second one of which containing a through opening;

(c) a longitudinally movable piston within said enclosure having a piston head longitudinally spaced from said first end closure and a piston rod extending through the opening in said second end closure;

(d) shoulder means on said piston rod engageable with said second end closure for limiting the longitudinal movement of said piston;

(e) a resilient bellows concentrically disposed between the wall of said enclosure and said piston, said bellows having its opposite ends sealedly connected to said piston head and said second end closure about the opening therein;

(f) a bearing surface on said piston rod facing longitudinally outwardly opposite from the facing direction of said other bearing surface; and

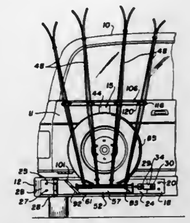
(g) a thermally expandable fluid sealedly contained in said enclosure in the space surrounding the exterior of said bellows and said piston head and operative to increase the oppositely outward bias between said bearing surfaces when subjected to an increase in temperature.

4,189,074
SKI CARRIER MOUNT FOR VEHICLES

David W. S. Davies, 410-668 Lakeshore Dr., Penticton, British Columbia, Canada

Filed Apr. 16, 1978, Ser. No. 897,407
Claims priority, application Canada, Apr. 21, 1977, 276708
Int. Cl.[2] B60R *19/02*
U.S. Cl. 224—42.06 10 Claims

1. A ski carrier mount to be secured to the back of motor vehicles having doors or tail gates that swing rearwardly when being opened, said mount comprising a base member to be secured to the rear bumper of a motor vehicle, a support member extending parallel to the base member, hinge means connecting an end of the support member to the base member to permit the support member to swing outwardly away from the base member, locking means for releasably securing the opposite end of the support member to the base member, a vertical support connected to the support member and extending upwardly therefrom, a spacer secured to the support member and extending outwardly therefrom substantially perpendicular thereto, means carried by said spacer for retaining ends of at least one pair of skis in a substantially vertical position, a rack secured to said vertical support near the upper end thereof and extending outwardly therefrom substantially perpendicular thereto, a tire carrier mounted on the vertical support and positioned to carry a spare wheel, said spacer and said rack extending outwardly sufficiently to permit a tire and wheel to

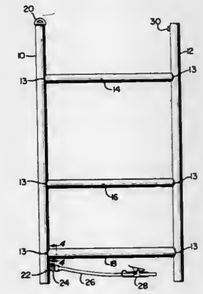


be supported between said skis and said vertical support securing means carried by said rack for releasably retaining said skis in the substantially vertical position, said support member, when said locking means is released, being swingable away from the base member to shift skis carried thereby out of the way of the doors or tail gate of said motor vehicle.

4,189,075
PACKFRAME-CANTEEN

John O. Hall, 222 E. Riverside Dr., #332, Austin, Tex. 78704

Filed Feb. 21, 1978, Ser. No. 879,277
Int. Cl.[2] A45F *5/00*
U.S. Cl. 224—148 16 Claims



1. A fluid-tight packframe structure for carrying a load or supply on an individual's back, said packframe having a top end and a bottom end when worn upon the back of an individual, wherein the improvement comprises: means for storing fluid within said packframe when said packframe is worn; a closable inlet mounted at the top of said packframe; and means disposed above the bottom end of said packframe for draining fluids stored therein.

4,189,076
BACKPACK AND FRAME APPARATUS

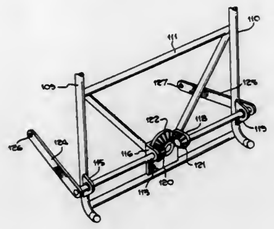
Anthony C. Zufich, P.O. Box 333, Bodfish, Calif. 93205

Division of Ser. No. 690,068, May 26, 1976, Pat. No. 4,099,657. This application Apr. 10, 1978, Ser. No. 894,872
Int. Cl.[2] A45F *3/10*
U.S. Cl. 224—211 2 Claims

1. A backpack and frame apparatus comprising:

(a) a frame including a pair of side bar members and upper and lower lateral cross members connecting said side bar members;

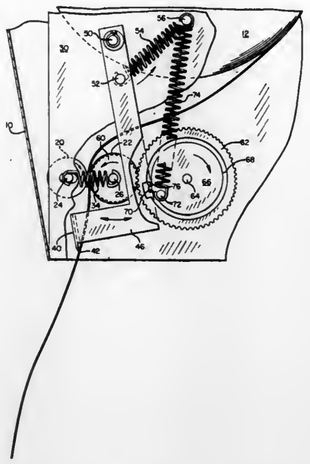
(b) an upper support tube coupled intermediate a pair of upper cross members intermediate said side bar members;
(c) a pair of shoulder straps, the upper ends thereof attached to said support tube;
(d) hip belt means for encircling the waist of a user, said hip belt means including downwardly extending panels adapted to lie along the hips of the user, each of said panels including grommets for attachment thereto, said grommets being diametrically opposed to one another;
(e) means for attaching the lower ends of said shoulder straps to respective ones of said side bar members substantially adjacent the waist of the user;
(f) first and second axles journeled intermediate said side bar members in axial alignment with one another;
(g) first and second beveled gears secured to the respective



ends of said first and second axles in justaposition to one another;
(h) a third beveled gear coupled intermediate said side bar members and adapted to rotate about an axis perpendicular to the axis of said first and second beveled gears, said third beveled gear being meshed with said first and second beveled gears whereby the rotation of one of said first or second beveled gears is transmitted to the other; and
(i) first and second lever arms having first and second ends, said first ends coupled to the ends of said first and second axles opposite said first and second beveled gears, the second ends of said lever arms being secured to said grommets whereby reciprocating motion of said hip belt means will be transferred between said lever arms maintaining said frame substantially stationary and independent of movement of said hip belt means.

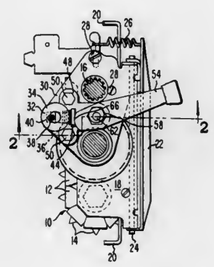
4,189,077
SHEET MATERIAL DISPENSING DEVICE
Ellsworth A. Hartbauer, Concord, and Rudolf R. Weis, Antioch, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Sep. 7, 1978, Ser. No. 940,407
Int. Cl.² B26F *3/02*
U.S. Cl. 225—14 **5 Claims**

1. In a cabinet for manually dispensing sheet material from a roll rotatably mounted within the housing of said cabinet, the combination of:
a blade having a cutting edge and movable from a first position to a second position relative to said housing when said sheet material is manually pulled against said cutting edge to sever a portion of said sheet material from the remainder of said roll; and
sheet delivery means in operative association with the remainder of said sheet material and responsive to movement of said blade from said first position to said second position to deliver the free end of the remainder of the



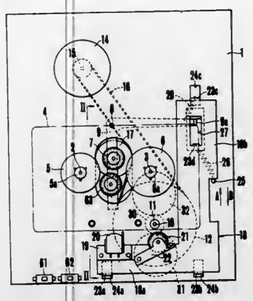
sheet material to a position facilitating manual grasping thereof by the user.

4,189,078
PAPER TRACTOR LOCKING APPARATUS
Albert S. Spisz, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Mar. 17, 1978, Ser. No. 887,743
Int. Cl.² G03B *1/30*
U.S. Cl. 226—74 **6 Claims**



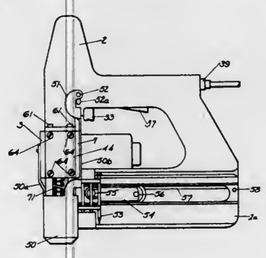
1. A locking mechanism for securing paper driving apparatus to a semi-rigid positioning member comprising:
driving means for moving prepunched, edge perforated material along a fixed path;
means for adjustably positioning the driving means to engage the edge perforated material;
means for radially deforming a portion of the semi-rigid positioning member in an outward direction to lock the driving means in and release it from a desired location; and
means for accommodating semi-rigid positioning members of various diameters.

4,189,079
CONTROLLABLE DRIVE FOR TAPE RECORDER
Zenshiro Uehara, Tokyo, Japan, assignor to Tokyo Rokuon Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 7, 1978, Ser. No. 913,513
Claims priority, application Japan, Oct. 31, 1977, 52-129641
Int. Cl.² B65H *17/22*
U.S. Cl. 226—188 **4 Claims**



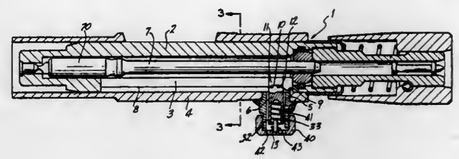
1. A controllable drive for tape recorder comprising a capstan rotatably mounted on a chassis, a flywheel mounted on and in concentric relationship with the capstan, a gear integrally connected with the flywheel in concentric relationship therewith, a toothed wheel with hiatus which is rotatably mounted on the chassis and disposed for meshing engagement with the gear, a cam integral with the hiatus wheel, a link disposed for angular movement on the chassis to be angularly driven by the cam for producing a force which is necessary to operate the tape recorder, a movable element mounted on the chassis so as to be engageable and disengageable from the hiatus wheel and operative to lock the hiatus wheel when a hiatus thereof is located in opposing relationship with the gear, and means for operating the movable element.

4,189,080
IMPACT DEVICE
James E. Smith, Boulder, Colo., and Carl T. Becht, Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio
Filed Feb. 23, 1978, Ser. No. 880,448
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.² B25C *1/06*
U.S. Cl. 227—8 **26 Claims**



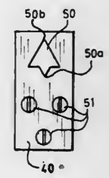
1. An impact tool comprising:
(a) an impact member;
(b) a rotatable flywheel and means to drive the same, and support means spaced apart by less than the thickness of the impact member;
(c) means for introducing the impact member between said flywheel and said support means; and
(d) means permitting at least one of said flywheel and support means to yield with respect to the other to permit the impact member to pass therebetween, while maintaining force against the impact member.

4,189,081
RETURN PAWL FOR POWDER-ACTUATED TOOL
Marc Combette, Valence, and Francois Noiray, Bourg-les-Valence, both of France, assignors to Societe de Prospection et d'Inventions Techniques SPIT, Bourg-les-Valence, France
Filed Sep. 18, 1978, Ser. No. 943,584
Int. Cl.² B25C *1/14*
U.S. Cl. 227—10 **7 Claims**



1. A powder-actuated fastening tool of the type including a barrel holder, a barrel, having a longitudinal slot, movably carried within the barrel-holder for reciprocation, from an open position through a closed, but non-cocked, position to a cocked position and return, a hammer piston slidably disposed within said barrel, and a pistonbiasing pawl, slidably mounted within a pawl-holder fixed to said barrel-holder, movable between a piston-engaging position, wherein said pawl protrudes through said longitudinal slot and engages said piston during the opening of the tool while at least one boss, formed on said pawl, engages a first plane milled surface of said barrel, and a cocked position, wherein a second plane milled surface of said barrel, more remote from the barrel axis than said first surface engages said boss to retract said pawl, the improvement comprising: a transverse groove, formed in said barrel, connecting said first and second milled surfaces and adapted for engagement with said boss to retain said barrel in said closed, but non-cocked, position.

4,189,082
GLAZIER'S POINT DRIVER
Sydney H. Solomon, 1 Wimbleton La., Great Neck, N.Y. 11023
Filed Sep. 18, 1978, Ser. No. 943,845
Int. Cl.² B25C *1/00*
U.S. Cl. 227—109 **6 Claims**



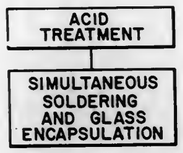
1. In a glazier point driver having a hand grip body with a rear leg portion and a front leg portion, and a pivotable handle in the body portion coupled to a spring loaded plunger, the improvement comprising:
a driver plate connected to said plunger and having at its driving end a V-shaped notch;
a cylindrical bore formed in said front leg portion communicative to said driver plate;
a cylindrical barrel disposed in said cylindrical bore;
means for aligning and securing said barrel in said bore; and
an adaptor plate having a combination diamond-shaped and triangularly-shaped opening for receiving diamond-shaped and triangularly-shaped points.

4,189,083

LOW TEMPERATURE AND LOW COST ASSEMBLY PROCESS FOR NONLINEAR RESISTORS

Barry C. Johnson, Tempe, and Vincent J. Pellechia, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1978, Ser. No. 916,325
Int. Cl.² H01B *1/08*
U.S. Cl. 228—123 **8 Claims**



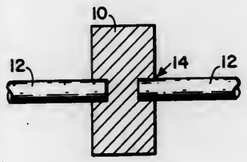
1. A method for attaching conductive means to a ceramic non-linear resistor pellet comprising the steps of:
treating preferentially at least one surface of the ceramic pellet with a diluted solution of acid to reduce an oxide material at said surface; and
soldering the conductive means to said surface with a solder material having a melting point in the range of from 150° C. to 350° C.

4,189,084

LOW COST ASSEMBLY PROCESSES FOR NON-LINEAR RESISTORS AND CERAMIC CAPACITORS

Barry C. Johnson, Tempe, and Vincent J. Pellechia, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1978, Ser. No. 916,326
Int. Cl.² H01B *1/08*
U.S. Cl. 228—123 **5 Claims**



1. A method of assembling a ceramic non-linear pellet device having conductive leads attached thereto comprising the steps of:
assembling the ceramic non-linear pellet, the leads and a silver-copper alloy perform at ambient temperature;
heating said assembly to the range of from 800° C. to 1100° C.; and
cooling the assembly to allow adherence of the parts of the assembly.

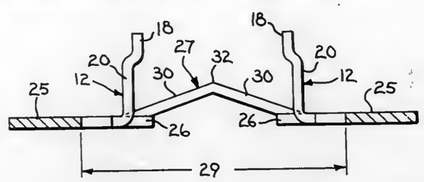
4,189,085

METHOD OF ASSEMBLING A MICROCIRCUIT WITH FACE-MOUNTED LEADS

Orville R. Penrod, Muskego, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 12, 1978, Ser. No. 895,758
Int. Cl.² B23K *1/12;* H01L *21/28*
U.S. Cl. 228—173 R **10 Claims**

1. A method of attaching leads to terminals of a microcircuit supported on a face of a substrate, comprising the steps of:
forming a lead frame, having spaced apart carrier strips and electrical leads extending from at least one carrier strip towards another, into a holder with opposed sides, at least one side including leads which are angular to a respective carrier strip, wherein the forming step includes moving the carrier strips closer together to adapt the lead frame to support the substrate;
securing the substrate between opposed sides of the holder



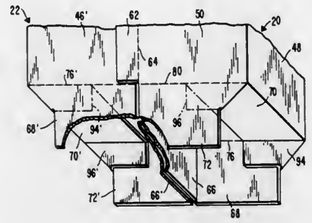
with the terminals held securely in contact with the leads on one side; and
forming bonded electrical connections between the terminals and the leads in contact therewith.

4,189,086

ASSEMBLED AND FOLDED BLANK FOR BULK CONTAINER WITH PARTIAL BELLOWS BOTTOM

Vernard S. Booth, and Billy W. Oswalt, both of Albany, Ga., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 701,577, Jul. 1, 1976, which is a continuation-in-part of Ser. No. 694,756, Jul. 10, 1976, Pat. No. 4,046,307. This application Sep. 5, 1978, Ser. No. 939,303
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.² B65D *3/24, 5/48*
U.S. Cl. 229—15 **10 Claims**



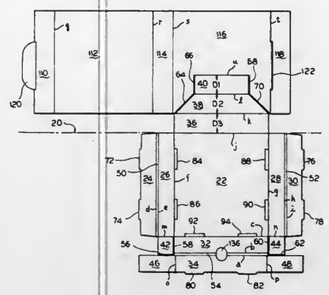
1. An assembled and folded blank for a bulk container having at least one cell, comprising
a container body including four wall panels with three integral hinges at vertical score lines serially joining the wall panels and means including a fourth hinge securing the end wall panels of the series of four wall panels together,
three bottom panels hinged at horizontal score lines on the bottom edges of three of the four wall panels forming an end bottom panel and two side bottom panels on opposite sides of the end bottom panel,
the two side bottom panels of said three bottom panels being hinged to the opposite sides of the end bottom panel of said three bottom panels by vertical score lines,
said two side bottom panels having respective partial diagonal score lines extending at one end from the respective corners defined by the vertical and the horizontal score lines,
said two side bottom panels further having respective cuts extending from the distal edges of the side bottom panels to the other ends of the partial diagonal score lines such as to form partial bellows corners at the bottom end of the bulk container,
a fourth bottom panel hinged on the bottom edge of the fourth side wall and free of the three bottom panels, and
said container body being folded flat by having the wall panels thereof folded together about diagonally opposite hinges of the four hinges joining the wall panels.

4,189,087

FOLDING BOX WITH A DRAWER MADE FROM SINGLE BLANK

Joseph Dlugopolski, 260 E. Taylor Rd., Lombard, Ill. 60148

Filed Sep. 25, 1978, Ser. No. 945,239
Int. Cl.² B65D *5/38*
U.S. Cl. 229—19 **12 Claims**



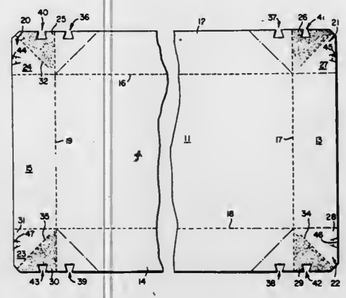
1. A folding box with a drawer made from a single blank comprising a series of housing panels formed by score lines positioned along one end of said blank, a plurality of drawer panels formed by score lines positioned along the other end of said blank, and a series of articulated drawer position control panel means interconnecting a center region of a top one of said housing panels and a rear edge of a bottom one of said drawer panels, each of said control panel means being shaped and having dimensions which fold entirely within said box when said drawer is slid within said box, said drawer panel means folding to form a generally rectangular bottom panel having upstanding walls positioned along three contiguous edges thereof, whereby said control panel means constitutes an extension from the fourth edge of said drawer bottom panel into one of said housing panels and moves between said top one of said housing panels and said drawer bottom panel.

4,189,088

CONTAINER WITH INTERLOCKING CORNERS

James F. Rappolt, Overland Park, and Edward L. Osborne, Kansas City, both of Kans., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,809
Int. Cl.² B65D *5/30*
U.S. Cl. 229—31 R **6 Claims**



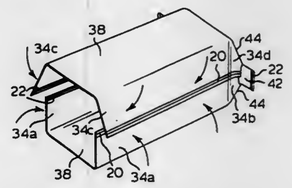
1. A web corner tray capable of being erected from a knocked down condition and prepared from a single blank of corrugated paperboard comprising, a centrally located rectangular bottom panel, a plurality of side walls foldably attached to the free edges of said bottom panel, a plurality of corner connecting panels between said side walls, the intersecting edges of which are foldably attached respectively to the adjacent free edges of said side walls, and a diagonal fold line in each corner connecting panel extending from the intersection of the foldable attachment between said side walls to a free edge thereof to divide the corner connecting panels into triangular sections, the improvement comprising means for locking the triangular sections of each corner connecting panel to an adjacent side wall when the tray is erected, said locking means comprising:
(a) a plurality of first tapered notches with two opposed parallel sides and two opposed tapered sides formed in the free edges of two opposed side walls at each corner of said bottom panel;
(b) a plurality of second tapered notches with two opposed parallel sides and two opposed tapered sides formed in the free edges of the triangular sections of said corner connecting panels adjacent to said notched side walls at each corner of said bottom panel, said tapered notches having a narrow entry portion along the outer edges of said side walls and triangular sections respectively, which tapers to a wider base portion remote from said outer edges; and,
(c) a plurality of tapered tabs with two opposed parallel sides and two opposed tapered sides formed in the free edges of the unnotched triangular sections at each corner of said bottom panel, said tapered tabs having a wider portion along the outer edges of said triangular sections which tapers to a smaller hinge portion remote from said outer edges and which are adapted to engage said tapered notches.

4,189,089

BAG HAVING SIDES SEAMED BY COMPLEMENTARY BANDS OF COHESIVE MATERIAL

Marinus J. M. Langen, Rexdale, and Edgar H. Strauss, Toronto, both of Canada, assignors to H. J. Langen & Sons Ltd., Rexdale, Canada

Division of Ser. No. 910,737, May 30, 1978. This application Dec. 12, 1978, Ser. No. 968,791
Int. Cl.² B65D *33/00*
U.S. Cl. 229—61 **4 Claims**



1. A square bottom bag comprising:
(a) a front wall, a bottom wall and back wall formed from a unitary panel having an inner face and an outer face, said front, bottom and back walls being arranged in an open U-shaped configuration,
(b) first, second and third side panels projecting from opposite sides of said front, bottom and back walls respectively, said first, second and third panels having serially arranged marginal edge portions,
(c) each second side panel being cut along a pair of cut lines extending inwardly from the free edge thereof to form a tab therebetween,
(d) a first band of adhesive extending along the full length of said serially arranged marginal edges on the outer face of said side panels, said first band including first and third lengths extending away from each tab on opposite sides thereof and a second length extending across the outer face of each tab,
(e) a second band of adhesive extending along the full length of said serially arranged marginal edges on the inner face of said side panels, said second band including first and

third lengths extending away from each tab on opposite sides thereof and a second length extending across the inner face of each tab,

(f) said first and third side panels being folded inwardly along their connection with the front and back walls respectively, each of said second side panels being folded upon itself along fold lines extending obliquely from opposite sides of said tabs to an adjacent corner of said bottom wall to form bottom side-edge closure flaps, said first length of said first adhesive band being disposed in a face-to-face bonding contact with said third length of said second band along the full length thereof to close opposite sides of the bag,

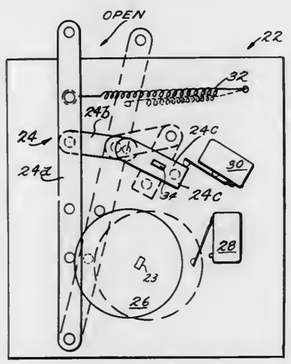
(g) said bottom side-edge closure flaps being folded along their connection with the bottom wall to fold said third length of said first band of adhesive upon itself into a face-to-face bonded relationship securing said bottom side-edge closure flaps in an outwardly overlying relationship with the first and third side panels.

4,189,090

AUTOMATIC DAMPER ASSEMBLY

Gerald E. Drinkuth, P.O. Box 444, Rumford, Me. 04276

Filed Sep. 22, 1977, Ser. No. 835,827
Int. Cl.² G05D *23/12*
U.S. Cl. 236—1 G **12 Claims**



1. A damper assembly for controllably closing the flue of an electrically ignited furnace comprising:

a damper, rotatably mounted within said flue;

a motor responsive to control signals applied thereto;

a cam driven by said motor;

a first linkage arm biased against said cam, whereby the position of said first linkage arm changes in accordance with the rotation of said cam;

a further linkage assembly, coupling said damper to said first linkage arm, to effect rotation of said damper in accordance with the position of said first linkage arm; and

means for generating control signals to said motor to effect rotation of said cam in accordance with the combustion state of said furnace.

4,189,091

FURNACE HAVING A NORMALLY CLOSED BLOWER RELAY

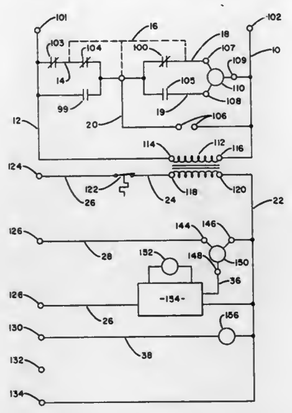
Gary W. Ballard, Brownsburg, Ind., and Robert A. Freliech, Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,869
Int. Cl.² F24D *5/00*
U.S. Cl. 236—11 **7 Claims**

1. In a furnace having a fuel burner supplied by a fuel regulator, a heat exchanger fired by the burner having a flue gas passage and a heated air passage, a blower powered by an electric motor for circulating the heated air, a thermostat for determining when heating is required, a power source for supplying current to the furnace blower motor and the thermostat, an improved blower control circuit which comprises:

normally closed blower relay contacts connecting the blower motor to the power source; and

a time-delay relay circuit controlling the blower relay contacts, said circuit being energized by the power source and being connected to the thermostat such that when heating is required an electric signal is received from the thermostat, the time-delay relay circuit including:



a. timing means for creating an electric signal upon the elapse of a delay period after the receipt of the thermostat signal, and for creating a delay period after the discontinuance of the thermostat signal;

b. a blower motor relay for controlling the blower relay contacts, said relay being energized to discontinue blower operation; and

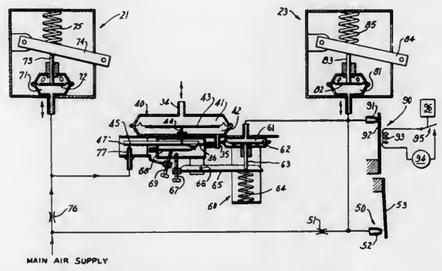
c. actuating means connected to the relay and the timing means, said actuating means receiving the electric signal from the timing means and determining therefrom whether or not to deenergize the relay and thereby operate the blower.

4,189,092

DAMPER CONTROL FOR PREVENTING SPREAD OF FIRE AND SMOKE THROUGH AN INDUCTION MIXING BOX

Dale E. Maxson, Rockford, Ill., and David E. Ober, Warren, N.J., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 8, 1979, Ser. No. 1,498
Int. Cl.² G05D *23/13*
U.S. Cl. 236—13 **9 Claims**



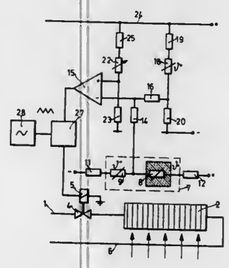
1. A damper control for preventing spread of fire into a controlled space through an induction mixing box wherein a flow of primary air through said box induces a flow of secondary air into and through the box, said flow of secondary air into the box being controlled by a normally closed secondary air damper variably opened by a pneumatic actuator in response to the variable effective pressure of branch air therein, a temperature sensor in said controlled space, and means for admitting the branch air under pressure into said actuator as a function of the sensed temperature in said controlled space, the damper control comprising a normally closed exhaust valve in communication with said actuator, a port in said valve sized to permit escape of the branch air therethrough in sufficient volume to remove all effective pressure of the branch air from said actuator, and a thermostatic element positioned to sense the temperature of said secondary air upstream from said damper and to open said valve upon sensing a predetermined excessive temperature, thereby removing the effective pressure of the branch air from the actuator, and thus permitting the secondary air damper to close and preventing flow of secondary air into said box.

4,189,093

APPARATUS FOR REGULATING THE TEMPERATURE OF A COMPARTMENT OR SPACE

Eberhard Schnaibel, Hemmingen, and Erich Junginger, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1977, Ser. No. 822,452
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635901
Int. Cl.² F28F *27/00*; G05D *25/00*
U.S. Cl. 236—37 **4 Claims**



1. An apparatus for regulating the temperature of a compartment or room, said apparatus including:

a heat exchanger for providing heated air to said room;

a valve for controlling the flow of heating medium in said heat exchanger;

a first temperature sensor for generating a first signal related to the temperature of the air in said room;

a second temperature sensor for generating a second signal related to the temperature of the heated air from said heat exchanger;

control means for receiving and summing said first and second signals, for comparing the sum to a reference value and for generating an output signal to control the actuation of said valve; and wherein the improvement comprises:

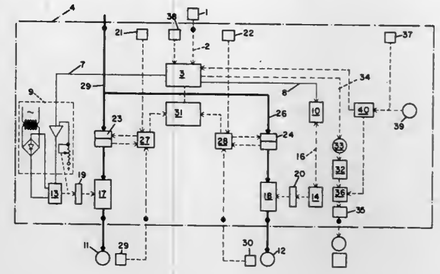
said second temperature sensor including means responsive to the dynamic rate of change in the heated air temperature and means responsive to the static temperature under equilibrium conditions of the heated air whereby excessively large control fluctuations during differing heating requirements are prevented.

4,189,094

CONTROL OF HEATING AND VENTILATION SYSTEMS

Anthony Robinson, London, England, assignor to E.S.G. Controls Limited, Cambridge, England

Filed Feb. 6, 1978, Ser. No. 875,525
Claims priority, application United Kingdom, Feb. 10, 1977, 5496/77
Int. Cl.² F23N *5/20*; F24F *7/00*
U.S. Cl. 236—46 R **11 Claims**



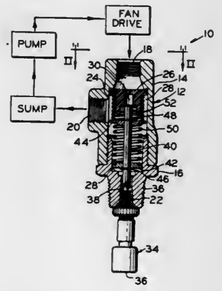
1. A ventilation control system for a building housing an indoor swimming pool, comprising at least two fans for respectively supplying air to and extracting it from the interior of the building, separate driving means for each of said fans in the form of electric motors the speed of which varies with the voltage applied thereto, a temperature sensor mounted externally of the building and means operable in response to the temperature sensed by said sensor for automatically varying the speed of the fan motors as an inverse function of the sensed outside temperature such that said fan driving motors are operated at maximum speed for maximum ventilation at a preselected minimum outside air temperature and at a fixed lower speed at and above a preselected higher temperature, whereby total energy consumption of the fans is reduced.

4,189,095

COMBINATION VALVE

Larry E. Monigold, and Ronald G. Cadwell, both of Cadillac, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Nov. 2, 1978, Ser. No. 957,147
Int. Cl.² G05D *27/00*
U.S. Cl. 236—92 R **2 Claims**



2. A temperature and pressure responsive fluid flow control valve for use with the fan drive of an engine having a circulating coolant comprising:

a valve body having a passage with a thermoexpansion element at one end thereof and a fluid entry port at the second opposite end thereof for entry of escaping pressurized fluid from the fan drive, an exit port from said passage

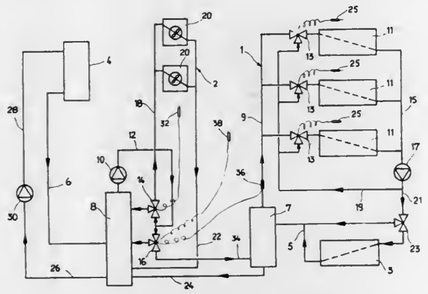
intermediate said ends, separated from said entry port by a valve seat, for discharge of fan drive fluid; a valve element in said passage, shiftable between a first entry-port-closing position in engagement with said valve seat to prevent fluid escapement from the fan drive and a second entry-port-opening position spaced from said valve seat to allow fluid escapement from the fan drive; primary and secondary biasing means for biasing said valve toward said entry-port-closing position, and said secondary biasing means being responsive to a first predetermined low fluid pressure force on said valve element by the fan drive fluid to allow said valve element to shift from said first position to said second position to open said entry port for release of fan drive fluid; shiftable push rod means extending from said first valve body end for engagement with a thermoexpansion element, to said primary and secondary biasing means, for shifting said biasing means toward said valve seat with expansion of said thermoexpansion element to thereby increase valve closing force on said valve element with increasing temperature, such valve closing force being counter to the fluid pressure at said entry port; and said primary biasing means being responsive to a second predetermined elevated fluid pressure at said entry port to be compressed and allow said valve element to again shift to said second position for controlled pressure release at said entry port even with shifting of said push rod element toward said valve element under expansion of said thermoexpansion element.

4,189,096

CENTRAL HEATING PLANT

Edmond Girard, Boulogne, France, assignor to Messier, Paris, France

Filed Nov. 18, 1977, Ser. No. 852,812
Claims priority, application France, Dec. 6, 1976, 76 36640
Int. Cl.[2] G05D *23/02*
U.S. Cl. 237—2 B **24 Claims**



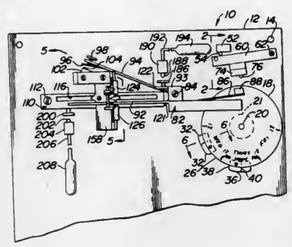
1. A central heating plant comprising a principal heat source and a make-up heat source which can operate simultaneously, a series of principal heat diffusers connected in parallel and arranged to be supplied with heat-carrying fluid by one and/or the other of said heat sources, and a series of make-up heat diffusers connected in parallel and arranged to be supplied by the one and/or the other of said heat sources, in which the two series are arranged to be supplied with heat at the same time, separately, or alternately, the principal source is a low-temperature heat source arranged to supply the series of principal diffusers via a first mixing cylinder, the make-up source is a high-temperature source arranged to supply the series of make-up diffusers via a second mixing cylinder, and the first and second mixing cylinders are joined by a double connection so that each can supply the other, the arrangement being such that the principal heat source can supply the series of make-up diffusers via the first mixing cylinder and then the second mixing cylinder, and that the make-up source can supply the series of principal diffusers via the second mixing cylinder and then the first mixing cylinder.

4,189,097

DEVICE FOR CONTROLLING HEAT

M. Rutledge Flynn, and Raymond P. Schultz, both of Wilkes-Barre, Pa., assignors to Control Devices, Inc., Wilkes-Barre, Pa.

Filed Sep. 21, 1977, Ser. No. 835,226
Int. Cl.[2] F24D *3/00*
U.S. Cl. 237—8 R **11 Claims**



1. A device for controlling the heat supplied to a space by a circulating medium comprising an electric circuit for controlling a heat source, a first lever mounted for pivotal movement in response to changes in the temperature of air outside said space

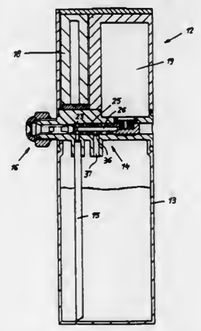
a second lever mounted for pivotal movement through a range in response to changes in the temperature of said circulating medium, two switches mounted on said second lever for movement therewith, and said first lever engages one of said switches when said second lever is in a first portion of said range to actuate a heat source for said medium, said first lever engaging said second switch when said second lever is in a second portion of said range to deactuate the heat source, said first lever lies between said switches when said second lever is in a third portion of said range and said switches are selectively engated as said first and second levers rotate about their pivots.

4,189,098

HOUSEHOLD SPRAY APPARATUS

Josef Wagner, and Heinrich Griebel, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Spray Tech Corporation, Minneapolis, Minn.

Filed Mar. 23, 1978, Ser. No. 889,444
Int. Cl.[2] B05B *9/043*
U.S. Cl. 239—127 **8 Claims**



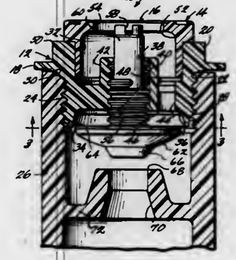
1. A household spray device for the spraying of liquids without air polluting propellants which comprises an open top canister for the reception of the liquid to be sprayed, a cap detachably mounted on said canister closing the open top thereof, an electric motor mounted in said cap, a pump mounted in said cap driven by said motor, a spray nozzle on said cap, said pump having an inlet conduit depending from the cap into the bottom of the canister, and an outlet supplying liquid to said spray nozzle, a bypass passageway in said cap between the pump outlet and spray nozzle returning liquid from the pump to said canister, a valve controlling flow through said bypass passageway, a battery mounted in said cap for energizing said electric motor, a switch in said cap having an actuator controlling current flow from said battery to said motor, and a single means including a valve stem rigidly connected to the switch actuator which valve stem operates to close the valve in the bypass passageway, said single means being mounted in said cap and accessible from the exterior of the cap to be manually actuated for successively closing said switch and said valve and for successively opening said valve and said switch whereby the pump will initially recirculate liquid back to the canister before discharging the liquid through the spray nozzle and liquid will drain back to the canister to prevent dripping of liquid from the nozzle when the pump is stopped.

4,189,099

SPRAY HEAD

Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Aug. 2, 1978, Ser. No. 930,165
Int. Cl.[2] B05B *1/06*
U.S. Cl. 239—200 **15 Claims**



1. A spray head comprising:

an annular body molded of plastic material including integral inner and outer annular portions and an intermediate portion therebetween,

said outer annular body portion having means on the exterior thereof for fixedly sealingly engaging the upper end of a supply conduit communicating with a source of water under pressure including a section of exterior threads for threadingly cooperating with interior threads on the supply conduit, lower annular flow control surface means disposed in a position to communicate with the water under pressure when said body is fixedly sealingly engaged with a supply conduit as aforesaid, and upper annular cap engaging surface means disposed in a position exterior of the supply conduit when said body is fixedly sealingly engaged therewith,

said intermediate body portion defining a plurality of annularly spaced openings having lower inlet ends disposed radially inwardly of said annular flow control surface means in communicating relation therewith and axially spaced upper outlet ends disposed radially inwardly of said upper annular cap engaging surface means in communicating relation therewith,

an annular cap member molded of plastic material having body engaging annular surface means disposed in fixed engagement with said upper annular cap engaging surface means and interior surface means defining at least one spray passage communicating with the outlet end of at least one of said openings for directing water flowing from said outlet into a predetermined spray pattern,

said inner annular body portion having a central axial aperture extending therethrough formed with internal threads,

said cap member being devoid of material in a position axially above said central axial aperture,

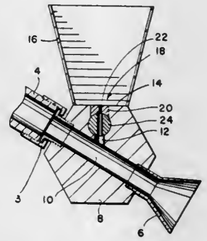
a flow adjusting member including an intermediate portion having external threads disposed in meshing engagement with said internal threads, a turnable upper portion disposed in upwardly exposed relation so as to be engaged from above to effect a turning of said adjusting member and through the meshing of said threads an axial movement of said adjusting member with respect to said body and a lower enlarged annular flow control portion movable toward and away from said lower flow control annular surface means for causing water under pressure communicated with the supply conduit when said body is fixedly sealingly engaged therewith as aforesaid to flow between the periphery of said annular flow control portion and said lower annular flow control surface means before entering the inlet ends of said openings so that the position of axial adjustment of said enlarged flow control portion with respect to said flow control surface means can be utilized to control the flow rate of water under pressure available from the supply conduit entering the inlet ends of said openings.

4,189,100

FLUID DISPENSER FOR A SHOWER BATH

Erich Karp, 3608-B Lighthouse Way, New Port Richey, Fla. 33552

Filed Jun. 12, 1978, Ser. No. 914,380
Int. Cl.[2] B05B *7/26*
U.S. Cl. 239—310 **7 Claims**



1. An improved fluid dispenser for a shower bath, for mounting between a pressurized water pipe and a shower nozzle, comprising:

a body portion having a water channel connected between said pipe at an upper end and said nozzle at a lower end, and a dispensing channel opening into said water channel at an intermediate point between said upper end and said lower end thereof and opening into an upper surface of said body at the upper end thereof above said water channel;

a fluid reservoir mounted on top of said upper surface of said body portion, having a drain opening into said dispensing channel, for storing fluid to be dispensed;

a valve seat composed of a high lubricity fluorocarbon resin mounted in said dispensing channel having a hole therethrough communicating between said upper end of said dispensing channel and a lower surface of said valve seat;

a cylindrical valve composed of a high lubricity fluorocarbon resin, rotatably mounted horizontally in said body portion with a circumferential surface in sealable contact with said lower surface of said valve seat, having a transverse hole therethrough which selectively communicates

between said lower end of said dispensing channel and said hole in said valve seat in response to axially rotating said cylindrical valve in said body;

said valve being rotatably mounted in a cylindrical hole in said body portion;

said cylindrical valve terminating at a first and second opposite ends, having transverse diameters which are larger than the diameter of said valve in the central portion between said first and second ends;

said first and second ends of said valve being in bearing contact with said cylindrical hole in said body;

said circumferential surface of said valve in said central portion being supported by said first and second ends of said valve out of contact with the walls of said cylindrical hole in said body portion, to prevent abrading said circumferential surface of said valve;

said lower surface of said valve seat having a concave arcuate contour which mates with the convex cylindrical contour of said circumferential surface of said cylindrical valve;

whereby the fluid seal provided by said valve is improved.

4,189,101

STABLE VORTEX GENERATING DEVICE

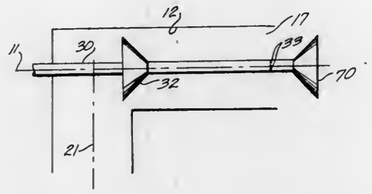
Nathaniel Hughes, 1934 Sonara Rd., Palm Springs, Calif. 92262

Continuation-in-part of Ser. No. 785,838, Apr. 10, 1977, Pat. No. 4,109,862. This application Mar. 13, 1978, Ser. No. 886,289

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.² B05B *17/06*; F15C *1/16*

U.S. Cl. 239—405 **60 Claims**



1. A vortex generating device comprising:

a fluid inlet;

a fluid outlet;

a flow passage having a given cross-sectional area connected between the inlet and the outlet;

a restriction in the flow passage between the inlet and the outlet comprising a cylindrical section having a cross-sectional area smaller than the given cross-sectional area; and

a stationary bluff body disposed in the flow passage between the inlet and the restriction, the bluff body having a flat surface facing upstream to interrupt fluid flow, the bluff body, the restriction, and the outlet, being aligned with a common flow axis and the inlet being aligned with an inlet axis that intersects the common flow axis at an angle.

4,189,102

COMMINUTING AND CLASSIFYING APPARATUS AND PROCESS OF THE RE-ENTRANT CIRCULATING STREAM JET TYPE

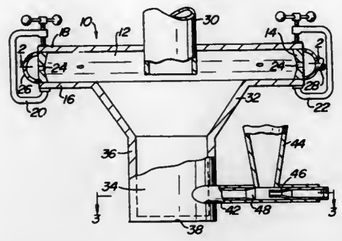
Norwood H. Andrews, P.O. Box 68, Moorestown, N.J. 08057

Filed May 10, 1978, Ser. No. 904,665

Int. Cl.² B02C *19/06*

U.S. Cl. 241—5 **21 Claims**

1. Comminuting and classifying apparatus comprising a generally circular vortex chamber including an annular peripheral wall and first and second opposed lateral walls, said annular peripheral wall including a plurality of gaseous fluid nozzles positioned to propel gaseous fluid with both a forward and a transverse component of direction of movement relative to the axis of said chamber to form a fluid vortex in said vortex chamber, a material product outlet in one of said lateral walls, a recess having a circular cross-section in the central portion of the other of said lateral walls, material feed means for said apparatus including a feed chamber closed at one end and opening into the apex of the recess at its other end, said feed chamber including a wall in the form of a regular surface of revolution coaxial with said recess, material inlet means for



said feed chamber positioned to propel gaseous carrier fluid and material into said chamber generally tangential to the wall of said feed chamber so that said material and its carrier fluid flow in the manner of a vortex in said chamber and are added to the fluid vortex in said recess and vortex chamber with a supplemental rotative velocity, means to connect said material inlet to a source of material, and means to connect said nozzles and said material inlet to a source of gaseous fluid under pressure.

4,189,103

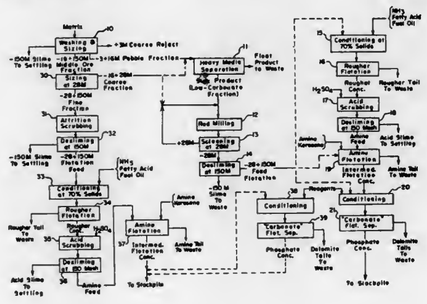
METHOD OF BENEFICIATING PHOSPHATE ORES

James E. Lawver; Robert E. Snow, both of Lakeland, and Walter O. McClintock, Bartow, all of Fla., assignors to International Minerals & Chemical Corporation, Northbrook, Ill.

Filed Mar. 10, 1978, Ser. No. 885,156

Int. Cl.² B02C *23/18*

U.S. Cl. 241—20 **21 Claims**



12. A method for beneficiating a phosphate ore matrix containing apatite, siliceous gangue, and an alkaline earth metal carbonate mineral impurity, comprising the steps of

(a) washing and sizing the ore matrix to substantially deslime the matrix and to remove particles larger than from about 2 mesh to about 5 mesh thereby forming a deslimed ore matrix;

(b) splitting the deslimed ore matrix at about 12 to about 20 mesh to form a pebble fraction having a particle size greater than about 12 to about 20 mesh and a middle ore fraction having a particle size less than about 12 to about 20 mesh;

(c) subjecting the pebble fraction to a gravity separation wherein a portion of the less dense alkaline earth metal carbonate mineral impurity is separated from the apatite, thereby producing a low carbonate fraction;

(d) splitting the middle ore fraction at about 24 mesh to about 32 mesh to form a coarse fraction having a particle size greater than about 24 mesh to about 32 mesh and a fine fraction having a particle size smaller than about 24 mesh to about 32 mesh;

(e) combining the coarse fraction with the pebble fraction to enter the gravity separation of step (c);

(f) comminuting, sizing and desliming the low-carbonate fraction to a deslimed particle size of less tha about 24 to about 32 mesh,thereby forming a flotation feed;

(g) subjecting the flotation feed to a flotation to remove alkaline earth metal carbonate impurity therefrom and to form a phosphate concentrate.

4,189,104

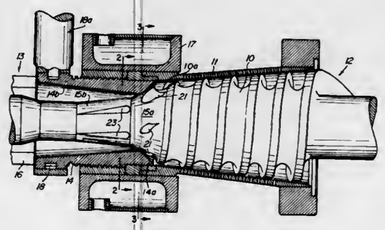
DEBONING MACHINE WITH BONE EXPELLER

Claudio dos Santos, Salt Lake City, Utah, assignor to Beehive Machinery, Inc., Sandy, Utah

Filed Apr. 6, 1978, Ser. No. 893,955

Int. Cl.² B02C *18/30*

U.S. Cl. 241—82.3 **6 Claims**



1. In a deboning machine of the type in which an auger conveys ground meat and bone material through a perforated conduit from one end thereof while exerting pressure on said materials to force meat components out of the conduit through the perforations thereof at the same time that bone components are being conveyed to discharge at the other end of the conduit through an adjustable valve ring with a face that surrounds and confronts an extension of the auger which includes a confronting face and is adapted to control pressure within the conduit, the improvement comprising an internal, circumferential series of indentations in said face of the valve ring, said indentations extending axially so as to facilitate material discharge through said valve ring.

4,189,105

APPARATUS FOR WINDING A REEL OF FILM

Ralf L. Klinkhammer, Cologne; Franz Hoffacker, Langenfeld; Gunter H. Steinbuchel, and Manfred Hilgers, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

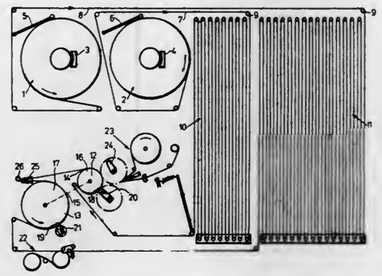
Filed Oct. 16, 1978, Ser. No. 951,739

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1977, 2747099

Int. Cl.² B65H *19/20, 19/18, 17/02*

U.S. Cl. 242—56 R **2 Claims**

1. An apparatus for winding a reel of perforated film strip and at the same time inserting a perforated covering strip in between the film strip windings, comprising a winding apparatus and, connected thereto, separate feed devices, one for supplying the film strip to the winding apparatus and the other for supplying the covering strip, each of said feed devices comprises sequentially traversed by the film and covering strips a supply roll, a loop stretcher for equalizing the lengths of strip, a driving wheel and rotating cutting knife associated therewith and deflecting rollers, an adhesive tape dispenser with a rotating stamper applicator being arranged in the feed device for the film strip and an adhesive tape dispenser with an auxiliary roller in the feed device for covering strip, the driving wheels for the film strip and the covering strip are positively connected by a drive and are coupled to the winding shaft by way of a sprocket belt, the sprocket belt having a taut section, a compensating roller over which the taut section is deflected, the compensating roller being suspended by a tension spring and provided with a stop on one side whereby the taut section is divided into two segments which can be shortened as the circumferential winding force increases, the sprocket belt having a slack section, another compensating roller engaged with and deflecting the slack section, the other



roller being suspended by an adjustable tension spring so that the taut section can take up the slack of said sprocket belt released from the taut section, vacuum openings for holding the film and covering strip on the driving wheels, air nozzles for correct positioning of the film strip and covering strip are provided on the circumference of the driving wheels, and means for opening the air nozzles for a short moment to slide the edges of the perforations in the film strip and in the covering strip against the teeth on the driving wheels whereby the perforations are engaged with the teeth.

4,189,106

DELIVERY ARM FOR A LAYING REEL OF A WIRE OR ROD MILL

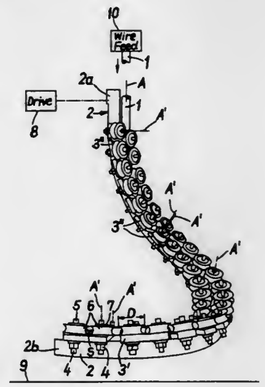
Herbert Weis, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 24,074

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814143

Int. Cl.² B21C *47/00*

U.S. Cl. 242—82 **10 Claims**



1. A delivery arm for depositing wire or rod in a laying reel, said arm comprising:

an elongated and rigid support member formed generally as

a three-dimensional spiral having an inlet end and an outlet end; and

two generally parallel rows of rollers mounted on said support member and defining a generally spiral path along said support member for said wire or rod, each of said rollers being rotatable about a respective roller axis generally perpendicular to said path at the respective roller and having a generally hyperboloidal outer surface engageable with said wire or rod.

4,189,107

COILABLE RULE WITH AUTOMATIC RECOIL

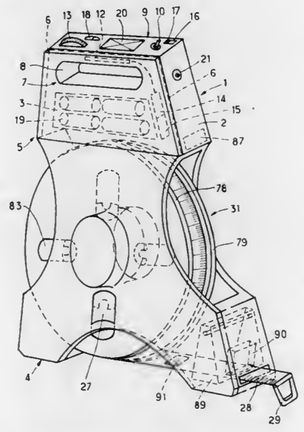
Michel Quenot, Besancon; Louis Scandella, Marnay, and Jean-Claude Grillier, Besancon, all of France, assignors to Stanley-Mabo S.A., France

Filed Jun. 15, 1978, Ser. No. 915,802

Claims priority, application France, Jun. 6, 1977, 77 19053; Apr. 12, 1978, 78 11434

Int. Cl.[2] B65H *75/16;* **G01B** *3/02*

U.S. Cl. 242—84.8 **15 Claims**



1. A length measuring instrument comprising:

a housing;

a spool mounted for rotation in the housing;

a measuring tape mounted on the spool;

an electrical motor for rotating the spool to wind the tape thereon; and

a reduction mechanism between the motor and the spool;

said instrument characterised in that the housing provides a nonrotatable hollow hub and the motor and reduction mechanism are disposed within the hollow hub coaxially with the spool.

4,189,108

BAIL RETAINING WASHER FOR FISHING REEL

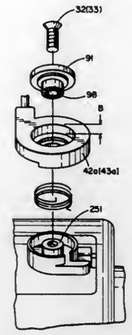
John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,846

Int. Cl.[2] A01K *89/01*

U.S. Cl. 242—84.2 G **2 Claims**

1. In an open face fishing reel having a bail mounted on a rotor cup by means of at least one bail arm, each arm having a passage therethrough so that it may individually be secured to the rotor cup by means of screws, the improvement comprising a retainer washer having three integral cylindrical cylinders, the cylinders comprising a first small diameter cylinder, a second mid-size diameter cylinder adjacent to and contiguous with the first cylinder and a third large diameter cylinder adjacent to and contiguous with the second cylinder, the washer and each cylinder having one central passageway therethrough, the outer base surface of the third cylinder having a frusto-conical shape, and the outer base surface of the first cylinder defining a bottom surface; the retainer cooperatively mounted in the bail arm passage, the combined height of the first and second cylinders being greater than the height of the cooperative portion of the bail arm passage, the bottom surface adapted to come into direct contact with the rotor;



screw means mounted in the retainer passage fastening the retainer and bail arm to the cup,

when the screw means is securely tightened into the cup, the greater height of the first and second retainer cylinders permits the bail arm to rotate freely.

4,189,109

AUTOMATIC LOCKING SAFETY BELT RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

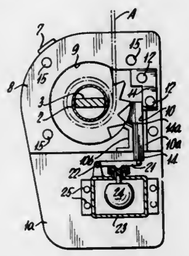
Filed Aug. 2, 1978, Ser. No. 930,474

Claims priority, application Japan, Nov. 29, 1977, 52/159197[U]

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.[2] A62B *35/02;* **B54H** *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. An automatic locking safety belt retractor comprising a mounting frame including opposite side walls, a belt retractor reel extending between said side walls and rotatable in belt extraction and belt retraction directions and spring biased to rotate in a belt retraction direction, a peripherally toothed brake wheel located along the outside face of a first of said side walls and rotatable with said reel, a guide member mounted on said first side wall outside face and having a circular opening concentric with and engaged by said brake wheel and a guide slot extending from a trailing to a leading edge thereof parallel to a tangent to said circular opening and communicating along a side of said slot with said circular opening through an access opening, a shock resistant bumper member located in said slot at the leading end thereof, a stop member engaging said slot and being longitudinally slidably movable therein between

retracted and advanced positions and including an inwardly directed tooth registering with said access opening and being out of engagement with said brake wheel in the stop member retracted position and engaging said brake wheel in a position of said stop member in advance of its retracted position, and sensing means for advancing said stop member to bring said tooth into engagement with said brake wheel whereby belt extraction rotation of said brake wheel further moves said stop member to its fully advanced position to strike and be stopped by said bumper member to thereby lock said brake wheel and reel against further extraction rotation.

4,189,110

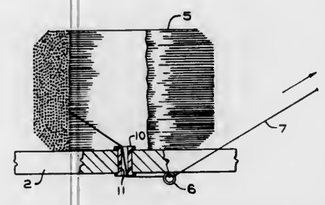
CREEL

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1978, Ser. No. 968,336

Int. Cl.[2] B65H *49/02*

U.S. Cl. 242—131 **4 Claims**



1. A creel for unwinding forming packages of strand comprising a frame member, a plurality of flat surfaced shelves mounted on said frame and spaced apart from each other, said shelves being spaced a sufficient distance apart to permit a forming package to be placed on its end on a shelf without contacting the next adjacent shelf, a plurality of spaced apart orifices in each of said shelves, said orifices being spaced so that a forming package can be placed over each said orifice without touching an adjacent forming package, a sleeve in each of said orifices constructed to permit strand to run therethrough and a guide eye spaced from one side of each shelf opposite each orifice and in a plane slightly below the bottom surface of said shelves to permit strand to be drawn between the exit of said sleeve and said guide eye free of contact with said shelf.

4,189,111

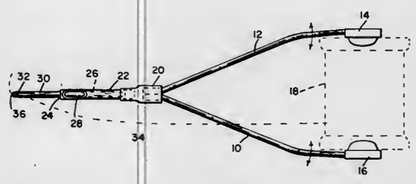
FLY TYERS BOBBIN

Joseph G. Doiron, 7520 SW. Bonita Rd., Tigard, Oreg. 97232

Filed Oct. 23, 1978, Ser. No. 953,634

Int. Cl.[2] B65H *49/18*

U.S. Cl. 242—140 **3 Claims**



1. A fly tyer's bobbin comprising a tube, tubular means to telescopically hold the tube, said tubular means being located at one end of the tube, and being of greater diameter to accept the tube,

an opening in a side wall of the tube adjacent the other end thereof, said opening communicating with the interior of the tube, said other tube end being open and communicating with the said opening for the passage of fly tyer's material through the opening and out through the open tube end,

an opening in the wall of the tubular means,

and means to hold a spool of fly tyer's material.

4,189,112

FORMATION OF BALLS OF KNITTING YARN

Andreas Sprecher, Neu Brunn, Switzerland, assignor to G & W Maschinen AG, Switzerland

Filed Apr. 20, 1978, Ser. No. 898,158

Int. Cl.[2] B65H *55/00, 55/04*

U.S. Cl. 242—159 **7 Claims**



1. The method of forming a spherical ball of a predetermined length of knitting yarn comprising the steps of continuously (a) winding the yarn for a predetermined period in an overlapping constantly progressing angular winding to form a partially completed sphere, (b) thereafter winding a plurality of turns of said yarn in substantially parallel circumferential turns about substantially a central equator of the partially completed sphere and (c) subsequently finishing the winding with a plurality of overlapping progressively angled windings so as to hide the circumferential turns and complete the sphere.

5. A ball of knitted yarn comprising a first portion formed of a plurality of overlapping constant angular progressing windings forming an inner body, a second portion formed of a plurality of substantially parallel turns wound circumferential about said body substantially along an equator thereof and a third portion formed by a plurality of overlapping constant angular progressing windings overlying said first and second portions.

4,189,113

ISOLATION POCKET FOR RACK MOUNTED TAPE DRIVE

August P. Epina; Robert J. Ganter, both of Boulder, and James H. Morehouse, Jamestown, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 9, 1978, Ser. No. 959,059

Int. Cl.[2] G11B *15/58*

U.S. Cl. 242—182 **7 Claims**

1. A magnetic tape drive comprising:

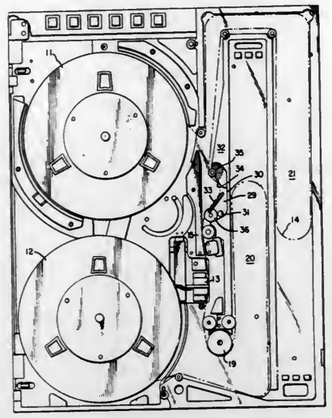
a supply reel hub and a take-up reel hub rotating about spaced parallel axes disposed one above the other;

two vertical vacuum chambers, one having an opening facing upwardly, adjacent one of said hubs and the other having an opening facing downwardly, adjacent the other of said hubs, each vacuum chamber accommodating a slack loop of the tape adjacent said supply reel hub and said take-up reel hub;

a tape head mounted in the tape path between said hubs;

an isolation pocket having an opening facing toward said hubs, a bottom wall and two side walls; and

support arms positioned in said pocket to form support surfaces for magnetic tape, said arms extending from the



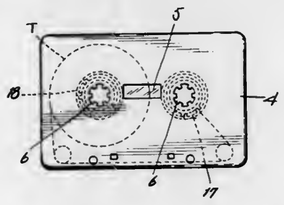
corners of the opening of said pocket and tapering toward the bottom wall of said pocket.

4,189,114

FAST REWINDING DEVICE FOR CASSETTE TAPES

Yoshiki Yukawa, No. 19-5, 2-chome Ohoka, Minami-ku, Yokohama, Kanagawa, Japan

Filed Jun. 27, 1978, Ser. No. 919,690
Claims priority, application Japan, Jun. 28, 1977, 52-84970[U]
Int. Cl.[2] B65H *59/38*
U.S. Cl. 242—186 **6 Claims**



1. A fast rewind apparatus in a tape recorder for rewinding tape from a first reel onto a second reel of a tape cassette, the tape cassette having a window extending therethrough adjacent at least said first reel, said first rewind apparatus comprising:

a motor for causing the cassette reel to be rotated in the rewind direction to rewind the tape from said first reel onto said second reel;

a light source for radiating light;

a photosensitive means for receiving radiated light;

mounting means for mounting said light source and said photosensitive means on opposite sides of said tape cassette in alignment with said window so that said photosensitive means receives light from said light source directed through said window transversely of the direction that the tape moves during rewinding when the amount of tape on said first reel is less than a predetermined amount, and so that the tape on said first reel blocks transmission of radiated light from said light source to said photosensitive means when the amount of tape on said first reel is greater than said predetermined amount; and

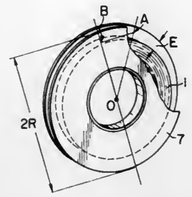
response means responsive to said photosensitive means receiving light for decreasing the speed of said motor.

4,189,115

AUTO-LOADING MAGNETIC TAPE

Yoshihisa Suzuki, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 21, 1977, Ser. No. 817,680
Claims priority, application Japan, Jul. 21, 1976, 51/86023
Int. Cl.[2] G11B *15/66*
U.S. Cl. 242—195 **6 Claims**



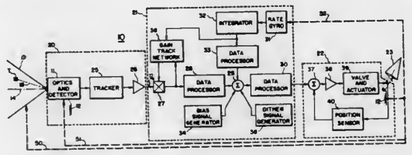
1. An auto-loading magnetic tape assembly for use with an auto-loading apparatus utilizing an air flow, comprising a reel and a magnetic tape wound thereon, wherein an end portion of the magnetic tape wound on the reel has a larger air resistance than other parts of said magnetic tape, said end portion being of a length longer than half the square root of the product of a reel radius R and the difference between the radius R and a radius of the space occupied by the tape when fully wound on said reel and being shorter than twice said square root.

4,189,116

NAVIGATION SYSTEM

Ralph D. Ehrich, Reynoldsburg, and Robert I. Emmert, Columbus, both of Ohio, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 5, 1977, Ser. No. 839,527
Int. Cl.[2] F42B *15/02*
U.S. Cl. 244—3.16 **7 Claims**



1. A proportional-type terminal guidance control system for on-board use on an aerodynamically-controlled vehicle for guiding the vehicle toward a target, said target being on a line of sight emanating from the vehicle and displaced angularly relative to the direction of flight of the vehicle, said system comprising

(a) optical detector means adapted to be mounted in fixed relation to a vehicle for viewing a target about a line of sight for producing a detection signal indicative of the signature of the target,

(b) tracker means responsive to said detection signal for producing a tracking signal indicative of the angular displacement of said line of sight relative to the vehicle,

(c) dithering autopilot means responsive to said tracking signal for producing a control signal for dithering and changing the direction of flight of the vehicle relative to said line of sight according to proportional navigation laws, and

(d) servo means receiving said control signal from said autopilot means and f or actuating a control furface that changes the direction of flight of the dithered vehicle relative to said line of sight,

said autopilot means including a first feedback loop which employs a vehicle attitude aignal proportional to the dithered

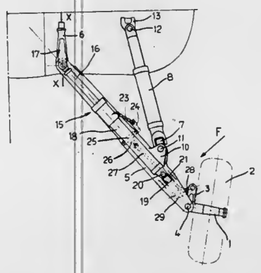
flight attitude of the vehicle relative to a reference plane and further including gain control means for combining, said attitude signal with said gain-scaled tracking signal as a gain control signalfor adjusting the gain of said gain-scaled tracking signal, said gain-adjusted tracking signal being further combined into said autopilot means control signal in accordance with laws of proportional navigation to thereby increase the flight path stability of the vehicle.

4,189,117

RETRACTABLE FUSELAGE MOUNTED UNDERCARRIAGE

Jean Masclet, Paris, and André Turiot, Morsang-Sur-Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Mar. 2, 1978, Ser. No. 882,640
Claims priority, application France, Mar. 8, 1977, 77 06835; Mar. 11, 1977, 77 07393
Int. Cl.[2] B64C *25/12*
U.S. Cl. 244—102 R **10 Claims**



1. A retractable fuselage mounted undercarriage for an aircraft comprising a leg casing mounted to pivot on a main universal joint about an axis which extends longitudinally of the aircraft, said leg casing mounting a wheel assembly which can pivot on said leg casing, a lateral deflection shock absorber and a manoeuvreing and wind bracing jack each connected to said leg casing by a joint and each connected to the fuselage of the aircraft by a joint, said main universal joint being mounted to pivot on said fuselage about an inclined retraction axis which does not pass through said joint which connects said shock absorber to said fuselage, so that, during lowering and retraction of the undercarriage effected by adjusting the length of said manoeuvreing and wind bracing jack, said shock absorber acts as a directer bar and orientates the axis of said leg casing, which leg casing is rotated as said main universal joint pivots on said fuselage about said inclined retraction axis.

4,189,118

SHEAR DETECTION AND COMPENSATION CIRCUIT FOR AIRCRAFT THROTTLE CONTROL SYSTEM

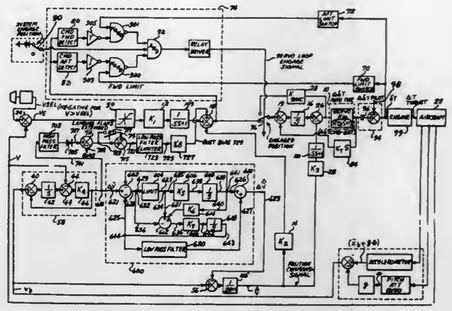
Henri Peter-Contesse, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 22, 1977, Ser. No. 853,953
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—182 **2 Claims**

1. In combination:

a shear detector circuit responsive to signals representative of airspeed and longitudinal acceleration for providing a first output signal; and,

compensation circuit means having an input terminal adapted to receive said first output signal and an output terminal for providing a windshear compensational signal, said compensation circuit means comprising a limiter circuit and a first integrator circuit coupled in series circuit path between said input terminal of said compensation circuit means and said output terminal of said compensation circuit means, said first integrator circuit providing a second output signal, a substracting circuit coupled between the input and output of said limiter circuit for providing a further signal, a second integrator circuit responsive to said further signal for providing a third signal, a filter circuit responsive to said third signal for providing a



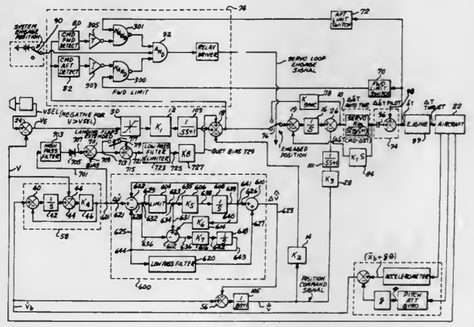
filtered output signal, and an adder circuit connected between said first integrator circuit and said output terminal of said compensation circuit means for adding said filtered output signal and said second output signal to provide said windshear compensation signal at said output terminal of said compensation circuit means.

4,189,119

TURBULENCE COMPENSATED THROTTLE CONTROL SYSTEM

Henri Peter-Contesse, Bellevue, and Leonard P. Stephan, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 22, 1977, Ser. No. 853,951
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—182 **1 Claim**



1. In combination in an autothrottle control system for an aircraft;

means including a first signal control channel for processing a signal representative of airspeed error and providing an output;

means including a second signal control channel for processing a signal representative of inertial longitudinal acceleration and providing an output;

means for combining the outputs of said first and second signal control channels to provide a throttle command signal;

means for providing a signal representative of airspeed;

washout and lag circuit means having an output, said washout and lag circuit means coupled between said second

signal control channel and said means for providing a signal representative of airspeed;

a signal processing circuit connected in series circuit path between the output of said washout and lag circuit means and said second signal control channel, said signal processing circuit including a limiter circuit (**604**) and subtraction means (**612**) for subtracting the limited signal (**631**) from the input signal upstream from said limiter circuit to provide a remainder signal (**636**), said signal processing circuit further including a filter circuit (**620**) for processing said remainder signal and combining circuit means (**610**) for adding an integrated limited signal (**626**) and the processed remainder signal (**627**); and,

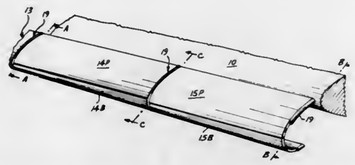
gust bias signal generating means coupled between said output of said washout and lag circuit means and said first signal control channel.

4,189,120

VARIABLE CAMBER LEADING EDGE FLAP

Timothy Wang, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Dec. 14, 1977, Ser. No. 860,645
Int. Cl.[2] B64C *3/50, 9/24*
U.S. Cl. 244—214 **19 Claims**



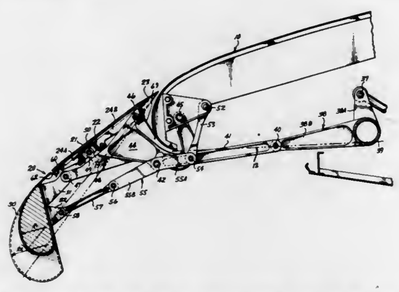
1. A leading edge flap span for an airfoil, comprising: a spanwise series of flap segments; each flap segment having in combination, a flexible constant chord length panel and a leading edge bullnose member, and said combination producing a flap-chord plane; each of said bullnose members being tapered spanwise to form in combination with each of said constant chord length panels, a series of spanwise tapered flap segments; means for extending the spanwise series of flap segments to form a uniformly varying tapered leading edge flap span for the airfoil; and each spanwise tapered flap segment having its flexible constant chord length panel and leading edge bullnose member, in chordwise combination, forming an aerodynamically smooth and continuous upper surface curvature.

4,189,121

VARIABLE TWIST LEADING EDGE FLAP

Philip M. Harper, Bellevue, and Kirby W. Johnson, Brier, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Jan. 23, 1978, Ser. No. 871,561
Int. Cl.[2] B64C *3/54*
U.S. Cl. 244—214 **6 Claims**



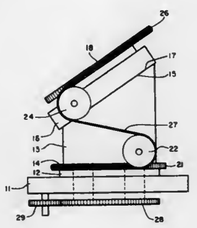
1. A retractable variable twist leading edge flap for a spanwise tapered airfoil, comprising: a spanwise flap segment having a semi-rigid flap panel and a bullnose leading edge; a pair of flap linkage mechanisms spaced apart spanwise and attached to the spanwise flap segment at an inboard and outboard end portion thereof for supporting said flap segment in a forward and downward extending operative position from the leading edge portion of the airfoil; each flap linkage mechanism having a flap support arm pivoted to the leading edge portion of the airfoil for rotation in a chordwise plane; said flap panel being articulated to the flap support arm for permitting the panel to torsionally twist in a spanwise direction, independently of the flap support arm, during both the extension and the retraction cycle of flap segment operation; said bullnose leading edge being rotatably supported directly from the swinging end of the flap support arm; means for separately sequencing rotation of the bullnose leading edge relative to the flap panel during rotation of the flap support arm, such that an unfolding rotation of the bullnose leading edge with respect to the flap panel is delayed during deployment of the spanwise flap segment to said operative position; and means for interconnectably rotating a drive arm of each set of flap linkage mechanisms of the flap segment, to torsionally twist the semi-rigid flap panel spanwise during extension from a first spanwise torsional twist in one direction when the flap segment is in a stowed position to match the undersurface contour of the airfoil, to a second spanwise torsional twist in the opposite direction when the flap segment is in the extended operative position.

4,189,122

WIDE ANGLE GIMBAL SYSTEM

Samuel A. Miller, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1978, Ser. No. 926,700
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—176 **6 Claims**



1. A gimbal system comprising:

a mounting base;

a central support member extending from said mounting base;

a first rotary member having a first planar surface and a second planar surface, said first planar surface being parallel to said mounting base and rotatably connected to said central support member, said second planar surface being at an angle to said first planar surface;

means for rotating said first rotary member relative to said mounting base connected therebetween, such that the maximum angular deviation of said two axis gimbal assembly from a line perpendicular to said mounting base is the sum of the angle between said first and second planar surfaces of said first rotary member and the angle allowed by the structure of said two axis gimbal assembly; and

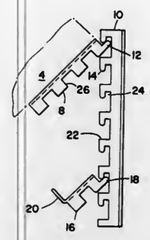
a two axis gimbal assembly effectively connected to said second planar surface of said first rotary member.

4,189,123

LOCKING MODULAR ASSEMBLY

Bernard L. Johnson, 183 Rubicon Cir., Danville, Calif. 94526

Filed Feb. 24, 1978, Ser. No. 881,111
Int. Cl.[2] A47B *57/16, 47/00*
U.S. Cl. 248—220.2 **8 Claims**



1. A locking modular assembly comprising an upright support means for supporting a modular component in a substantially upright position and a mounting bracket means connected to said modular component along a vertical plane extending from the top to the bottom of said modular component for adjustably affixing said modular component to said support means; said mounting bracket means comprising:

(a) an upper bracket member having an elongated body portion constructed to be connected to the upper portion of said modular component, and a plurality of linearly aligned first tabs extending outwardly from said body portion, said tabs having a substantially horizontal lower lip to support the vertical load of said modular component and having an outwardly upper lip on all tabs except the uppermost tab, said uppermost tab having a horizontal lower lip and an upwardly projecting finger on the upper lip adapted to communicate with said upright support means to prevent lateral displacement of the top portion of said modular component;

(b) a lower locking bracket member having a shortened second body portion and at least one linearly aligned second tab extending outwardly from said shortened body portion, the uppermost second tab having a substantially horizontal lower lip and an upper lip with upwardly projecting finger adapted to communicate with said upright support means to prevent lateral displacement of said lower locking bracket member, said second body portion being constructed to to be connected to the lower portion of said modular component thereby locking said modular component to said upright support means.

4,189,124

APPARATUS FOR SUSPENDING A PLANTER

Bernard L. Faris, R.F.D. 1, Box 166, Glen Allen, Va. 23060

Filed Jan. 16, 1979, Ser. No. 3,829
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—318 **8 Claims**

1. A rotative apparatus for pendantly suspending an object comprising:

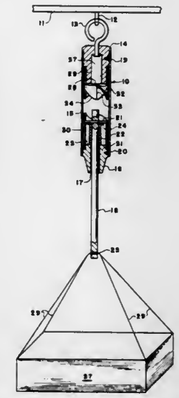
(a) coaxially spaced upper and lower opposed toothed members each possessing an even number of uniformly spaced vertically disposed teeth in a circular sawtooth array, each tooth having a vertical edge parallel to the center axis of said toothed members and a contiguous angled edge meeting with said vertical edge as an apex at the outermost reach of said teeth and meeting with the next adjacent vertical edge to form a substantially V-shaped bight at the base of said teeth, the direction of the angled edges of the teeth of one toothed member being opposite to the direction of the angled edges of the teeth of the opposed toothed member, said toothed members being aligned such that the vertical edges of the teeth of one toothed member are opposite the angled edges of the teeth of the opposed toothed member;

(b) means for maintaining said toothed members in fixed spaced relationship;

(c) a pull rod coaxially positioned with respect to said toothed members, extending below said lower toothed member and adapted for linear movement along said axis;

(d) means for pendantly suspending an object from said pull rod at a site below said lower toothed member;

(e) a bearing pin transversely associated with said pull rod adjacent the uppermost extremity thereof and adapted to engage said teeth at two sites diametrically across said axis;



(f) means for causing said pull rod to rise when no significant downward force is applied thereto; and

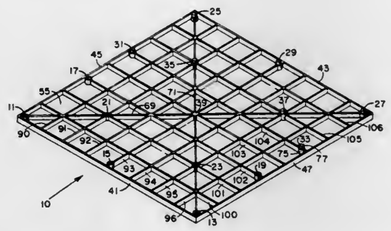
(g) means for attaching said apparatus to an overhead support; whereby said pull rod rises when downward force is removed therefrom, causing said bearing pin to engage the angled edges of the teeth of said upper toothed member and traverse said edges while rotating said pull rod until stopping at bights in said upper toothed member, and said pull rod descends when downward force is restored thereto, causing said bearing pin to engage the angled edges of the teeth of said lower toothed member and traverse said edges while rotating said pull rod until stopping at bights in said lower toothed member.

4,189,125

GROUND SUPPORT PADS FOR MOBILE STRUCTURES

Jim E. Little, P.O. Box 87, Blanco, Tex. 78606

Filed Dec. 8, 1978, Ser. No. 967,604
Int. Cl.[2] A47B *91/00;* **B65D** *9/00*
U.S. Cl. 248—346 **8 Claims**



1. A ground support pad comprising:

a first ground support pad half and a second ground support pad half which are separate and identical;

an equal number of male interlocks and female interlocks,

each said male interlock and each said female interlock being designed and constructed to form an intergral unit when the male interlock is engaged within the female interlock, such said integral unit providing maximum vertical support within said ground support pad and also securing said first ground support pad half to the second ground support pad half such that any movement between the two ground support pad halves is prevented, said interlocks being located upon each of said ground support pad halves so that said first ground support pad half may be reversed in relation to said second ground support pad half and engaged thereon by means of said interlocks to form a complete ground support pad;

latitudinal sides and longitudinal sides of said ground support pad, said latitudinal sides and said longitudinal sides being arranged to form a square;

latitudinal ribs and longitudinal ribs located within each ground support half, all said latitudinal ribs being perpendicular to all said longitudinal ribs, and all said latitudinal ribs and all said longitudinal ribs being equidistantly spaced in relation to each other so that all said ribs together form a systematic lattice structure within said ground support pad, longitudinal and latitudinal ribs being located upon each said ground support pad half so that when said ground support pad halves are engaged, each said rib of each said ground support pad half abuts squarely against a rib of the other said ground support half, said ribs being designed, constructed, and located to prevent said ground pad from tearing due to stress and to diffuse stress upon any portion of said ground support pad to all portions of said ground support pad; and

two diagonal ribs located within each ground support half, said diagonal ribs being perpendicular to each other, said two diagonal ribs being formed within said first and second ground support pad halves so that upon engagement of said first ground support pad half with said second ground support pad half said diagonal ribs of said first ground support pad half abut squarely against said diagonal ribs of said second ground support pad half, said diagonal ribs being designed, constructed, and located to provide additional support for a center portion of said ground support pad, said diagonal ribs being located upon each said ground support pad half so that when said ground support pad halves are engaged, each said rib of each said ground support pad half abuts squarely against a rib of the other said ground support half, said ribs being designed, constructed, and located to prevent said ground pad from tearing due to stress and to diffuse stress upon any portion of said ground support pad.

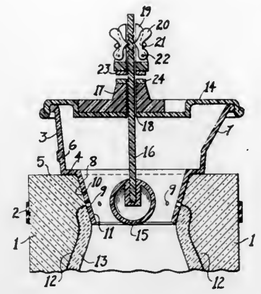
4,189,126
RIM SHIELD
Joe G. Thompson, 20635 6th Ave. SW., Seattle, Wash. 98166
Continuation of Ser. No. 845,980, Oct. 27, 1977, abandoned.
This application Oct. 31, 1978, Ser. No. 956,338
Int. Cl.² E04G *17/00*
U.S. Cl. 249—205 **2 Claims**

1. A rim shield for use in conjunction with a porous mold having a ware-forming cavity therein and an opening formed in communication with the ware-forming cavity, for preventing the deposition of excess clay to the lip or rim of a ceramic article during its molding, the rim shield comprising:

a central wall segment formed as a closed continuous surface shaped so as to interfit into the opening in the mold,

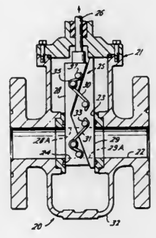
a lower segment extending from the central segment, the lower segment being sized so as to be received within the ware-forming cavity of the mold so as to be positioned a predetermined distance from the interior of the ware-forming cavity, the lower segment being of sufficient length to prevent the deposition of excess clay on the lip or rim of the article, and

the lower segment having a plurality of perforated holes formed in it in a horizontal row about its circumference located at a level so as to be positioned in the ware-forming in the mold adjacent the juncture of the opening and



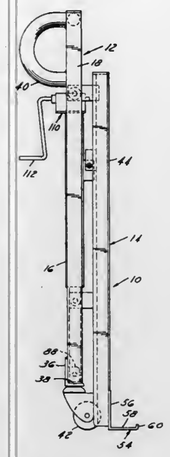
the ware-forming cavity in the mold when the rim shield is inserted into the mold.

4,189,127
EXPANDING GATE VALVE
Daniel G. Constantino, Mexico City, Mexico, assignor to FIP, S. A. de C.V., Mexico City, Mexico
Filed Aug. 24, 1978, Ser. No. 936,364
Int. Cl.² F16K *25/00*
U.S. Cl. 251—196 **12 Claims**



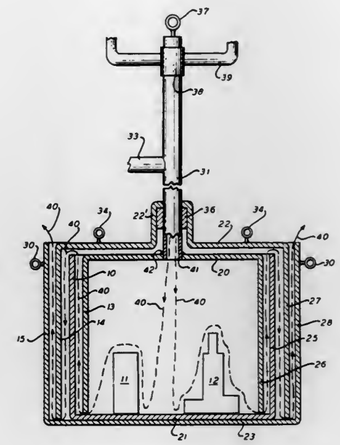
1. An expanding gate valve, comprising a body having a flowway therethrough and a guideway intersecting the flowway to form seating surfaces about the flowway on both sides of the guideway, an expanding gate comprising a pair of ported segments each having "V" shaped, oppositely facing inner surfaces, and means yieldably urging said surfaces into conformity with one another, means for moving the gate longitudinally between an open position in which the ports in the segments are substantially aligned with one another and the flowway, and a closed position in which solid portions of the segments are disposed across the flowway, one of said segments being engageable with abutment surfaces of the body so as to cause an inner surface of the one segment to slide along an oppositely facing inner surface of the other segment, and thereby spread said segments, as the gate moves into each of its opened and closed positions, and said means yieldably urging the inner surfaces of the segments into conformity comprising a pair of longitudinally spaced pins on one side of a first of the segments, and a pair of leaf springs each being disposed about a pin intermediate its ends, and having one end anchored to the first segment, and the other end anchored to the second segment.

4,189,128
MANUAL LIFTER AND MOVER ASSEMBLY
Larry J. Thompson, Pembroke Pines, Fla., assignor to Equipment Company of America, Hialeah, Fla.
Filed Aug. 23, 1978, Ser. No. 936,283
Int. Cl.² B66F *3/08*
U.S. Cl. 254—7 R **6 Claims**



1. A manual lifter and mover assembly comprising a pair of elongated and vertically parallel first and second frame members of generally equal width and which are spaced apart, one frame member forming a base and the other frame member forming a vertically movable carriage, said base including a pair of laterally spaced apart parallel channel members of equal length forming tracks which face said carriage, an upper horizontal member connecting the upper ends of said channel members and a lower horizontal member connecting the lower ends of said channel members, said lower member having a generally horizontal flange, a pair of ground engaging wheels located beneath said flange and secured thereto for movably supporting said lifter and mover assembly, said carriage having three parallel vertical elements including a pair of outer vertical elements and an intermediate vertical element, a top horizontal element secured to the upper ends of said vertical elements and a lift element carried by the lower end of said carriage on the front side thereof for engaging and supporting the load, a pair of vertically spaced apart roller assemblies carried by each of the outer vertical elements, said roller assemblies extending into the opposite tracks of said channel members, an elongated manually operated nut and screw jack assembly interposed between said base and said carriage, said nut and screw jack assembly being arranged parallel to said vertical members and elements and having a pair of telescopically arranged inner and outer tubes, said jack assembly having the lower end of said inner tube secured to said flange of the lower member of said base and said outer tube secured to said intermediate vertical element of said carriage whereby manual operation of said nut and screw jack assembly provides relative vertical movement between said inner and outer tubes and in turn relative vertical movement between said carriage and said base thereby raising or lowering said lift element, the tracks of said channel members each including a pair of parallel track flanges which are spaced apart and are located at the entrance to the channel member, each roller assembly having a pair of annular grooves which receive said track flanges, said roller assemblies being guided by said track flanges during movement of said roller assemblies in said tracks when said carriage is moved by said nut and screw jack assembly.

4,189,129
APPARATUS FOR PROTECTING PARTS IN HEATING AND COOLING PROCESSING CYCLES THEREOF
William E. Engelhard, Owego, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,807
Int. Cl.² C21D *1/62*
U.S. Cl. 266—251 **4 Claims**



1. An apparatus for cooling heat treated work parts wherein the work contained therein, preheated at a heating station, is then transferred out of the heating station to a station wherein the work is cooled, said cooling apparatus comprising:

(a) a cup-shaped work holder member, positioned in upwardly opening relation in said apparatus;

(b) a cup-shaped inner hood member of smaller proportions than said work holder member, proportioned for positioning therein in downwardly opening telescopic relation in the work holder,

(c) a cup-shaped outer hood member of larger proportions than the work holder, positioned in said apparatus in downwardly opening relation telescopically overlying the work holder and the inner hood member,

(d) an outermost cup-shaped member of larger proportions than the other previously mentioned members, disposed in said apparatus in upwardly opening relation to and receiving said previously mentioned members therein,

(e) said four cup-shaped members being formed of closely interfitting dimensions,

(f) said cup-shaped members being positioned, on assembly, telescopically in alternately upwardly and downwardly opening relation, defining a continuous sinuous gas passageway therebetween, unobstructed and uninterrupted, and

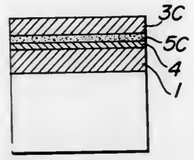
(g) means moving a gas under pressure into the work holder and over the work therein and thence unidirectionally through the continuous gas passageway defined by said so registered cup-shaped members and discharged therefrom, sweeping and discharging contaminating gases from said apparatus, into the ambient atmosphere.

4,189,130

BLAST-FURNACE TUYERE

Hideto Watanabe; Shigeo Shoji; Akimune Sato, all of Kurashiki, and Takashi Oka, Kyoto, all of Japan, assignors to Kawasaki Steel Corporation and Toyo Calorizing Ind. Co., Ltd., both of Kobe, Japan

Filed Oct. 19, 1978, Ser. No. 952,930
Int. Cl.[2] C21B 7/16
U.S. Cl. 266—270 7 Claims



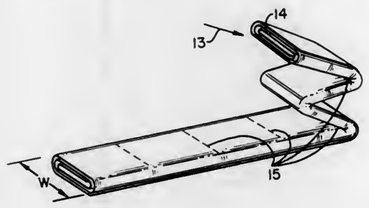
1. In a blast-furnace tuyere consisting of a tuyere substrate composed of copper or copper alloy, a self-fluxing alloy metallized layer sprayed on the surface of the substrate, a cermet coating sprayed on the surface of the alloy metallized layer, and a ceramic coating sprayed on the surface of the cermet coating, an improvement which comprises making the cermet coating from a mixture of an alloy material consisting essentially of 5 to 60 wt% of cobalt, 5 to 50 wt% of nickel, 5 to 25 wt% of chromium, 5 to 40 wt% of molybdenum, 5 to 40 wt% of tungsten, 3 to 40 wt% of silicon and inevitable impurities, and a ceramic material having an eutectic structure and consisting essentially of 95 to 65 wt% of Al_2O_3, 5 to 30 wt% of ZrO_2, 2 to 20 wt% of TiO_2, 3 to 30 wt% of SiO_2 and inevitable impurities and making the ceramic coating from a ceramic material having the same composition as used in the formation of the cermet coating.

4,189,131

PAPER SPRING METHOD AND PRODUCT

James E. McCabe, 12520 Pacific Ave., Apt. 7, Los Angeles, Calif. 90066

Filed Jan. 13, 1978, Ser. No. 869,055
Int. Cl.[2] F16F 1/20
U.S. Cl. 267—165 5 Claims



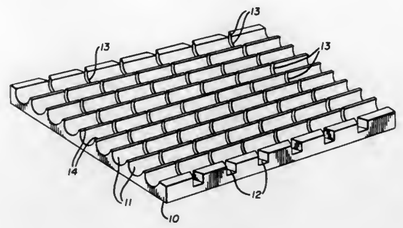
1. A paper spring comprising, in combination:
a sheet of paper longitudinally folded in the same direction along a plurality of fold lines parallel to one edge to provide a strip of folded paper of length equal to the length of said one edge and of a given width, the folded configuration as viewed from one end of said strip defining a flattened spiral having several overlapping turns, said strip being further transversely folded in a zigzag accordion manner back and forth in successively opposite directions along a series of parallel fold lines transverse to said length of said strip whereby the end portions of the first and last transverse folds are biased apart by the tendency of the transverse accordion folds to spring apart.

4,189,132

SAUSAGE CUTTING DEVICE

Augustine P. Di Russo, 151 Washington St., Lowellville, Ohio 44436

Continuation-in-part of Ser. No. 802,111, May 31, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,518
Int. Cl.[2] B25B 1/24
U.S. Cl. 269—295 5 Claims



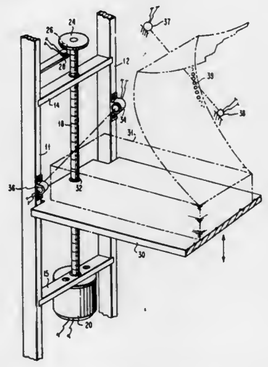
1. A sausage portion cutting device comprising a unitary body member having a plurality of spaced parallel rows of cross sectionally curved channels forming its upper surface, said rows of channels extending across said body member in one direction and a plurality of equally spaced parallel rows of narrow knife guiding slots in said body member extending at right angles to said channels wherein sections of the channels in each of said rows are separated by the slots and are in end to end alignment with one another, said channels arranged to receive continuous lengths of sausage in casings whereby a knife moved through said narrow slots will cut said length of sausage in casings into portions of equal length.

4,189,133

DOCUMENT STACKING TABLE LOWERING METHOD, APPARATUS AND CONTROLLING CIRCUITRY THEREFOR

Fred V. Arrasmith, San Jose; Donald G. Bruns, Saratoga, and David G. Killam, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,510
Int. Cl.[2] B65H 45/101, 31/10
U.S. Cl. 270—61 F 7 Claims



1. Document stacking table lowering method operating in accordance with the following steps,
initiating operation on sensing one condition of the height of the documents being stacked,
feeding a predetermined number of documents onto said stacking table,
lowering said stacking table a predetermined distance,
adjusting said number selectively by decreasing said predetermined number on determination that said stack height is in said one condition and increasing said predetermined number on determination that said stack height is in another condition,
feeding a number of documents as adjusted onto said stacking table,
lowering said stacking table by said predetermined distance, and
repeating the feeding, lowering and adjusting steps.

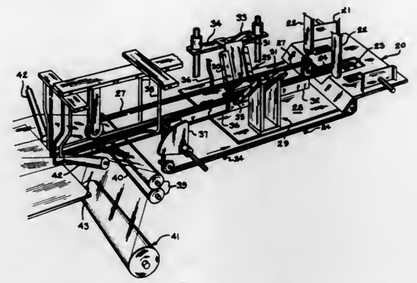
4. Document stacking table lowering apparatus and controlling circuitry therefor comprising
a frame,
a mechanism arranged in said frame for feeding documents one after the other,
a table on which said documents are to be stacked and which is to be lowered as the documents are deposited thereon in order that all of the documents are accepted in substantially the same space,
an elevator mechanism arranged in said frame and coupled to said table for raising and lowering said table,
a sensing device arranged in conjunction with said elevator mechanism for determining that said mechanism has moved said table a predetermined distance,
a sensor mounted on said frame for determining the effective height of a stack of documents on said table,
a source of pulses synchronized with said feeding mechanism whereby said pulses are indicative of said documents as they appear in readiness for stacking,
an incrementing counting circuit having an input terminal coupled to said source of pulses, a reset terminal coupled to said sensor and count output terminals at which is delivered the number of documents stacked before lowering the stacking table and after said sensor is indicating the presence of documents in the stack,
a reversible counting circuit having an incrementing input terminal coupled to said sensor, a decrementing input terminal and count output terminals at which is delivered the number of documents in response to said sensor indicating the presence of documents and before said table is again lowered,
a comparing circuit having input terminals individually connected to said count output terminals of said incrementing and said reversible counting circuits, and having an output terminal coupled to said reset terminal of said incrementing counting circuit for resetting the latter upon determining the equality of said numbers,
an incrementing counter circuit arrangement having an incrementing input terminal, and an output terminal connected to said decrementing input terminal of said reversible counting circuit for decrementing the latter upon the decoding of a prearranged number of table lowerings,
a latching circuit having a set terminal connected to said sensor, a reset terminal coupled to said output terminal of said comparing circuit and complementary output terminals, with one of said output terminals coupled to said reset terminal of said incrementing counter circuit and the complementary output terminal connected to said incrementing input terminal of said incrementing counter circuit for counting the number of consecutive lowerings of said table with said sensor indicating the presence of documents in the stack, and
another latching circuit having a set terminal connected to said output terminal of said comparing circuit, a reset terminal connected to said table movement sensing device, and having an output terminal coupled to said elevator mechanism for enabling the lowering thereof.

4,189,134

METHOD FOR MULTI-FOLDING A NEWSPAPER OR THE LIKE

Douglas C. Mills, and Jeffrey A. Clark, both of Adrian, Mich., assignors to Saxmayer Corporation, Blissfield, Mich.

Filed Jun. 7, 1978, Ser. No. 913,300
Int. Cl.[2] B65H 45/22
U.S. Cl. 270—66 8 Claims



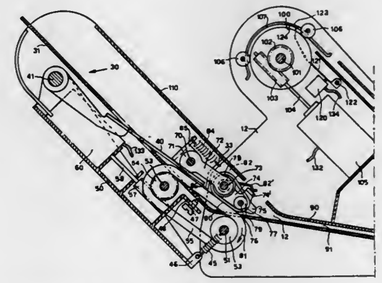
1. A method for folding a half-folded newspaper into compact configuration, said method consisting of the steps of
(a) feeding the newspaper along a path normal to the half-fold at the mid-point thereof,
(b) folding the newspaper back upon itself along a quarter-fold line that is coincident with the path while continuing to feed the newspaper along the path,
(c) folding both of the lateral quarters of the newspaper forwardly upon themselves along eighth-fold lines that are parallel to the path and the quarter-fold line on opposite sides thereof and at the centers of the lateral quarters while continuing to feed the newspaper along the path, and
(d) bringing the lateral edges of the newspaper into adjacency with and on opposite sides of the quarter-fold.

4,189,135

SHEET FEEDER FOR A WRITING SYSTEM

Armando Costa, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Italy

Filed Jul. 8, 1977, Ser. No. 814,136
Claims priority, application Italy, Sep. 22, 1976, 69271 A/76
Int. Cl.[2] B65H 3/04, 29/22
U.S. Cl. 271—4 2 Claims



1. In an automatic writing system including a frame, a cylindrical platen rotatably mounted on said frame, a printing station, an operative console, and a data processing central unit, an automatic sheet feeder comprising:
a control unit for controlling the sheet feeder functions;
a first container, fixed to said frame, for containing fresh sheets;
a second container, fixed to said frame, parallel to and lo-

cated above said first container for collecting the printed sheets;

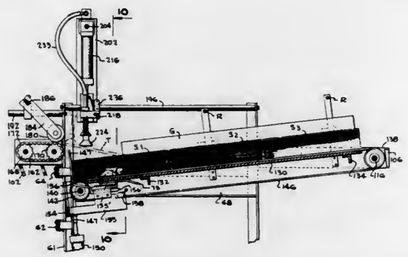
guiding means for guiding the sheets from said first container to said second container, said guiding means comprising a first pair of parallel spaced apart plates connected to said frame for guiding the fresh sheets from said first container to said printing station, a second pair of parallel spaced apart plates connected to said frame for guiding said printed sheets from the printing station towards said second container, an upper driving roller rotatably mounted on said frame between said second pair of plates and said second container for driving said printed sheets, an arcuate shield having its concavity directed towards said second container and being partially wrapped around said upper roller, and a wedge deviator in an upper position with respect to said platen cooperating with said first and second pairs of plates for guiding the fresh sheets from said first pair of plates to said printing station and for guiding the printed sheets from said printing station to said second pair of plates;

a rotational power source selectively operable by said control unit and mechanically linked to said upper roller for driving the printed sheets from said arcuate shield and for piling them into said second container in reversed position with their printed faces in the same order of printing; and

a sheet separator located between said first container and said first pair of plates for supplying to the printing station only one sheet at a time, said sheet separator comprising:

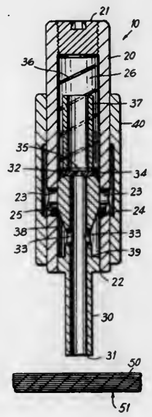
a support pivotally connected to said frame and located under said first container, a first pulley rotatably mounted on said support and a second pulley rotatably mounted on said frame, a closed loop belt wound around said pulleys, a motor mounted on said support and mechanically linked to said first pulley and selectively operated by said control unit for rotating said pulley, an annular belt located with respect to and partially overlying said closed loop belt, supporting means connected to said frame for supporting said annular belt and spring means connected between said support and said frame to urge said closed belt against said annular belt.

4,189,136
AUTOMATIC BAG TUBE FEEDER
James A. Robinette, Bristol, Tenn., assignor to Strong-Robinette Bag Company, Inc., Bristol, Tenn.
Filed Aug. 1, 1977, Ser. No. 821,391
Int. Cl.[2] B65H *3/08, 1/16*
U.S. Cl. 271—12 **22 Claims**



1. A bag tube feeding means comprising a supporting framework, a bag tube stack conveyor having an outfeed end defining an individual bag tube outfeed station and an infeed end for receiving and supporting a plurality of stacks of bag tubes, drive motor means for said bag tube stack conveyor, a plurality of movable suction cups, movable suction cup support means supporting said movable suction cups for movement about said outfeed station, individual bag tube outfeed means adjacent said outfeed station for receiving individual bag tubes fom said movable suction cups and removing said individual bag tubes to a desired discharge point, control means for said movable suction cups for sequentially lowering said movable suction cups to engage the uppermost bag tube of a stack of bag tubes in said outfeed station, lifting said movable suction cups and a supporting bag tube supported thereby to an elevated position and swinging said movable suction cups and said supported bag tube to a discharge position in which said supported bag tube is adjacent said individual bag tube outfeed means to be received thereby, conveyor control means for activating said drive motor means for said bag tube stack conveyor to feed a next adjacent stack of bag tubes to said outfeed station in immediate response to the depletion of a stack of bag tubes previously positioned in said outfeed station and elevation control means for automatically positioning and maintaining the upper end of a stack of bag tubes in said outfeed station within a desired height range by adjusting the elevation of the outfeed end of said bag tube stack conveyor.

4,189,137
VACUUM PICKUP DEVICE
General C. Denney, Manhattan, Kans.; John Lenz, Lindenhurst, Ill., and Joseph M. Williams, Manhattan, Kans., assignors to The McCall Pattern Company, New York, N.Y.
Filed Apr. 14, 1978, Ser. No. 896,459
Int. Cl.[2] B65H *3/08;* **B66C** *1/02*
U.S. Cl. 271—103 **15 Claims**



1. A vacuum pickup device, comprising:

a generally tubular, outer member having one of its ends open and one of its ends sealed and having a port, between its ends, that provides communication between its interior and exterior;
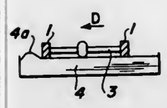
a generally tubular, inner member, positioned within the outer member and extending outwardly of the outer member through the open end of the outer member; the inner member having a port, between its ends, that provides communication between its interior and exterior; the inner member also being adapted to move through the open end of the outer member, between an extended position, wherein an open end of the inner member extends a predetermined maximum distance outwardly of the open end of the outer member, and a retracted position, wherein the open end of the inner member extends less than the predetermined maximum distance outwardly of the open end of the outer member;

means for urging the inner member from its retracted position to its extended position; and

means for connecting a source of vacuum to the port of the outer member;

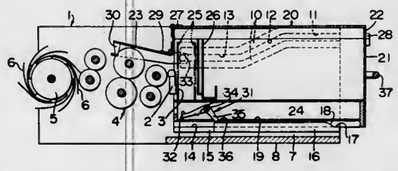
the port in the inner member and the port in the outer member being located, so that (1) in the extended position of the inner member, the port in the inner member is located between the port in the outer member and the open end of the outer member but is not in communication with the port in the outer member and (2) in the retracted position of the inner member, the port in the inner member is in communication with the port in the outer member.

4,189,138
PAPER FEEDER
Kiyoshi Kaneko; Shigeru Ikeda, and Ken-ichi Suzuki, all of Tokyo, Japan, assignors to Rank Xerox Ltd., London, England
Filed Jan. 31, 1978, Ser. No. 873,810
Claims priority, application Japan, Feb. 7, 1977, 52/12487[U]
Int. Cl.[2] B65H *3/06, 3/60*
U.S. Cl. 271—109 **1 Claim**



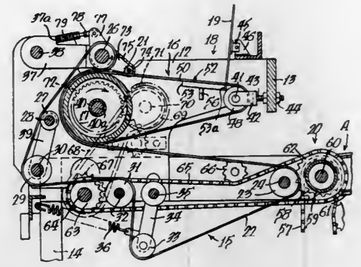
1. A sheet feeding apparatus including two feed rolls in axial alignment and adapted for rotation about an axis for feeding sheets from a sheet supply tray perpendicular to the feed rolls axis, the improvement comprising side registration means adjacent to the supply tray, and means for moving the feed rolls axially at the start of each feed cycle, said moving means being adapted to simultaneously shift said two feed rolls axially toward said side registration means to form a buckle in the top sheet in the tray between said side registration means and the feed roll adjacent thereto to reduce the attraction force between the sheet being fed and the adjacent sheet.

4,189,139
NOTE COUNTING APPARATUS
Isamu Uchida, and Akira Hirata, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan
Filed Dec. 29, 1977, Ser. No. 865,420
Int. Cl.[2] B65H *1/02*
U.S. Cl. 271—162 **1 Claim**



1. In a note counting apparatus having a counting device and a note storage box removably attached to the counting device wherein a front lid of the note storage box is unlocked in response to movement of the note storage box to a predetermined position along guide means of the counting device, the improvement comprising cam grooves on side plates of the counting device, means pivoting the front lid to said note storage box for opening or closing a front opening of the box, projections for engaging the cam grooves upon attachment of the note storage box to the note counting device, so that during the movement of the note storage box along the guide means, the front lid is first unlocked and said projections are then displaced by the cam grooves to swing the front lid about the pivot means to an opened position.

4,189,140
SHEET STACKING APPARATUS
Kermit E. Swanson, Naperville, Ill., assignor to R.R. Donnelley & Sons Company, Chicago, Ill.
Filed Apr. 28, 1978, Ser. No. 900,899
Int. Cl.[2] B65H *31/08*
U.S. Cl. 271—212 **6 Claims**



1. Apparatus for stacking limp paper sheets with their end edges in generally upright approximate alignment, said apparatus comprising in combination:

generally horizontal endless stacking conveyor means for effectively constantly and completely supporting and moving shingled sheets in a path;

means for continuously forming limp paper sheets into a shingled stream on said stacking conveyor means with the leading edge of each sheet beneath the immediately preceding sheet and close behind the leading edge of said preceding sheet and the trailing edge portion of each sheet projecting a short distance behind the trailing edge of said preceding sheet, so that only a short leading end portion of a sheet, between the leading edge of said sheet and the leading edge of the next succeeding sheet, has its bottom face exposed to contact with said stacking conveyor means;

a stop above the stacking conveyor means in the path of said shingled sheets for forming said sheets on said stacking conveyor means into a stack that is generally perpendicular to the plane of the conveyor means;

and vacuum means beneath the stacking conveyor means which is positioned and arranged to draw said short leading end portions of said shingled sheets constantly and firmly downwardly against said stacking conveyor means to subject each leading end portion to a strong conveying force, said vacuum means having a downstream end effectively directly beneath the stop so as to hold each said leading end portion until the leading edge abuts the stop and then release it rapidly as the leading edge of the next succeeding sheet is advanced beneath the leading end portion of the sheet next above it and against said stop,

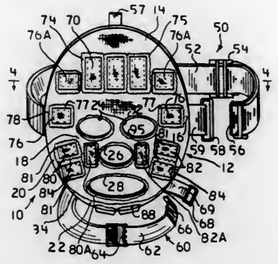
whereby each limp paper sheet is advanced by a strong conveying force beneath said forming stack and against said stop and said conveying force on each sheet is then quickly reduced.

4,189,141
MASK FOR EXERCISING FACIAL MUSCLES
Kenneth R. Rooney, 1248 Schenectady Ave., Brooklyn, N.Y. 11203
Filed Oct. 27, 1977, Ser. No. 846,115
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—95 **8 Claims**

1. A method of improving the tonicity of facial muscles using a facial exercise mask, comprising the steps of:

providing a facial exercise mask comprising an externally convex, elastic two-way stretch cloth body shaped to fit a wearer's face, said body having an upper brow portion, an upper side temple portion, a lateral cheek portion, a central face portion, and a bottom chin portion, said central

face portion being formed with a pair of eyeholes, a lower nosehole and a lowermost mouth-hole; massive plate weight means mounted within said body at certain of said portions, the massive weight means being at said brow portion, above said temple portion, at said temple portion, at said cheek portion, at said chin portion, and near said nosehole, said weights in conjunction with the stretchability of the mask providing resistance to movement of the muscles during performance of exercises; and attachment



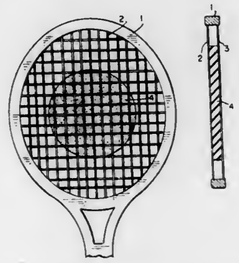
means for securing said mask body in place in snug juxtapostion to a wearer's face;

securing said mask to the face in snug conforming juxtaposition thereto;

selecting groups of facial muscles to be exercised; and

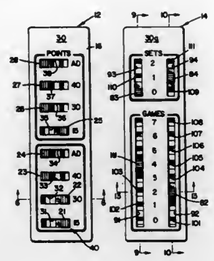
systematically exercising said selected groups of facial muscles with said weights in conjunction with the stretchability of the mask resisting movement of said facial muscles thereby requiring greater muscular effort than exercising with the mask.

4,189,142
TENNIS RACKET
Robert de Vries, The Hague, Netherlands
Filed Jun. 22, 1977, Ser. No. 808,921
Claims priority, application Netherlands, May 13, 1977, 7705313
Int. Cl.[2] A63B *51/06*
U.S. Cl. 273—73 D **6 Claims**



1. A tennis racket comprising a frame having two spaced apart peripheral rows of threading openings for two spaced apart string cord layers in conventional basket weave pattern, and an intermediate layer of a flexible material in at least the central interspace area between said two string cord layers to interconnect said two string cord layers.

4,189,143
TENNIS SCOREKEEPER
John A. Van Auken, and Lorraine A. Van Auken, both of 16 La Gorce Cir., Miami Beach, Fla. 33141
Filed Aug. 3, 1977, Ser. No. 821,358
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—73 R **14 Claims**



1. A tennis scorekeeping assembly for recording the point score, game score and set score in a tennis match and comprising a support structure, first and second portions mounted on said support structure in side-by-side relationship, said first portion being provided with point-scoring indicia, and said second portion being provided with game-scoring indicia and also with set-scoring indicia, a plurality of first indicator elements on said first portion, each of said first indicator elements being selectively operable for scoring a different point scored by each player in a given game and cooperating with said point-scoring indicia for indicating the point score in a given game, a plurality of second indicator elements disposed on said second portion and selectively operable for scoring games in a given set and cooperating with said game-scoring indicia to indicate the game score in a given set, and a plurality of third indicator elements disposed on said second portion and selectively operable for scoring sets in a given match and cooperating with said set-scoring indicia to indicate the set score in a given match.

4,189,144
GOLF CLUB
Timothy L. Guzzle, and Eugene L. Sheeley, both of Fort Worth, Tex., assignors to AMF Incorporated, White Plains, N.Y.
Continuation-in-part of Ser. No. 706,957, Jul. 20, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,175
Int. Cl.[2] A63B *53/00*
U.S. Cl. 273—77 R **5 Claims**

1. The method of making a lightweight golf club characterized in that:

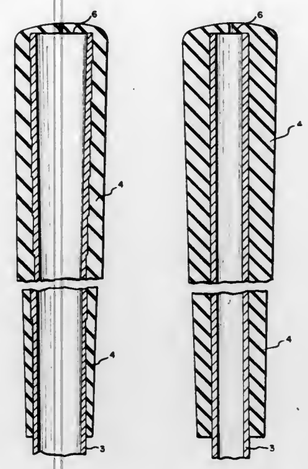
(a) establishing the parameters of a golf club having a predetermined swingweight, a normal weight of the butt end section, including the grip, which is greater than 20% of the total normal weight of the club including the grip, club shaft and head, and a moment of inertia (I_b) as measured about the butt end of the club by the equation $I_b = Icg + md^2$ where:

Icg = moment of inertia of club about its center of gravity (oz.in.)

m = total mass (weight) of club (oz.)

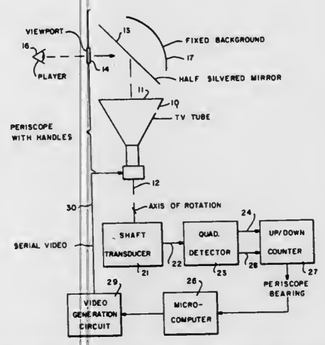
d = distance between the butt end and center of gravity of club (in.);

(b) constructing the butt end section, including the grip, of the club with a weight less than 20% of the total weight of the club to reduce the weight and moment of inertia of the club; and



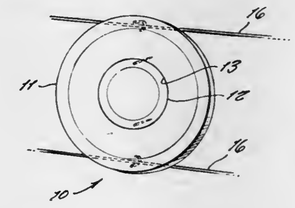
(c) constructing the head with a weight sufficient to give said predetermined swingweight with the butt end section of reduced weight.

4,189,145
APPARATUS FOR CONTINUOUS ROTATION SIMULATION OF VIDEO IMAGES
David R. Stubben, Santa Clara, and Dennis J. Koble, Cupertino, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 23, 1978, Ser. No. 871,601
Int. Cl.[2] A63F *9/02*
U.S. Cl. 273—313 **8 Claims**



1. A video game apparatus for the continuous rotation simulation of images on a video display screen comprising: means for mounting said display screen for rotation about a predetermined axis and for simultaneous viewing by said viewer; means for generating movable objects suitable for actual display on said screen, said objects having virtual angular bearings in a plane perpendicular to said axis, such objects at said bearings providing an effective panoramic view; video generation means for displaying at least one of said objects on said video screen and providing an effective field of view much smaller than said panoramic view; means for sensing rotary movement of said display screen; and means for comparing said rotary movement of said display screen with said bearings of said generated objects and for causing the actual display of an object whenever said object is within said field of view, said movable object generating means including means for changing said virtual angular bearings of said movable objects at a predetermined rate so that said objects have a predetermined normal display lifetime, means for extending said display lifetime whenever said lifetime has expired and said movable object is presently displayed, said lifetime extending means including predetermined time period means for prohibiting deactivation of said movable object after moving outside of said field of view, and means for deactivating the display of a previously displayed movable object whenever the corresponding predetermined display lifetime has been exceeded and said previously displayed movable object has been outside said field of view beyond said predetermined time period.

4,189,146
GROUP RING TARGET
Harold D. Warner, 14542-SR103, Arlington, Ohio 45814
Filed Mar. 29, 1978, Ser. No. 891,185
Int. Cl.[2] F41J *1/10, 3/00*
U.S. Cl. 273—408 **1 Claim**



1. A grouping target comprising an outer ring and an inner disc, means for said ring and said disc to removably interfit one another, and means for removably mounting said ring and said disc such that they are adapted to be mounted to a bale of hay, said outer ring being circular with a circular central opening sized so as to interfit with the circular periphery of said disc, both said ring and said disc being made of a flat material suitable to be pierced by a projectile, said outer ring having a pair of hooks mounted on its rear side extending rearwardly, each hook adapted to hook onto a string which is wrapped around a hay bale, said inner disc having a pair of rearwardly extending pins adapted to extend directly into and pierce a bale of hay such that said disc is adapted to be mounted either alone or in conjunction with said outer ring, and scoring means provided on said target.

4,189,147
RIFLE TARGET MOVING APPARATUS
August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-und Finanzierungsgesellschaft Serania AG, Glarus, Switzerland
Filed Nov. 4, 1977, Ser. No. 848,387
Int. Cl.[2] F41J *7/02*
U.S. Cl. 273—406 **13 Claims**

1. Apparatus for conjoint rotation of longitudinally slidable targets, positioned in an aligned row for shooting practice, and the like, comprising

a guide track system (**60**) guiding movement of the targets (**1**) from a target area towards the firing area;

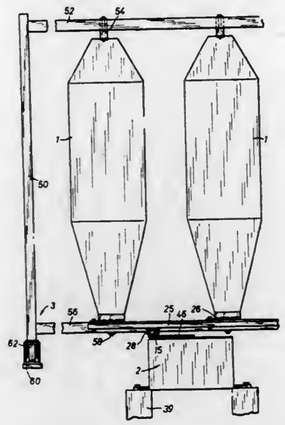
a drive gear (**2**) located at the target area and providing for about 90° rotary movement of the target;

and coupling means associated with the targets conjointly coupling a plurality of the targets with said fixed drive to provide for conjoint rotation of said targets by about 90° and permit longitudinal movement of the targets essentially parallel to their major plane, as rotated by said drive gear, said coupling means including

a link arm (**26**) having one end thereof coupled to each one of the targets (**1**);

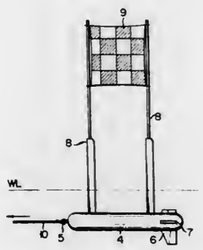
a common cross rod (**25**) extending essentially parallel to the

row of the targets, the other ends of the coupling arms (1) being attached to said cross rod;
a driven wheel (12) driven by said drive gear (2);
a coupling pin (15) axially projecting from said driven wheel (12) and eccentrically located thereon;
and a coupling guide track or rail (28) rigidly attached to said cross rod (25) and slidably receiving said coupling pin (15), to move the cross rod and hence said link arms upon rotation of the wheel (12) and hence move the targets (1)



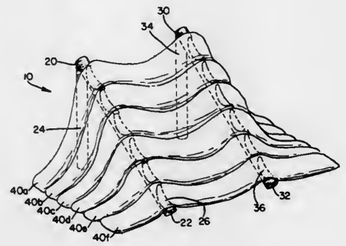
coupled to the link arms, said coupling track or rail (28) comprising a channel element extending in the direction of movement of the targets (1) between the target area and the firing area, and having means (24) to receive the coupling pin or bolt (15) of the driven switching wheel (12) if moved in coupling direction while permitting disengaging movement of the targets in a direction opposite to said coupling direction, the coupling pin (15) being slidably guided along said channel element (28) during a rotation of the wheel (12) and swinging the targets about 90°.

4,189,148
TOWED TARGET SHIP WITH SUBMERGED HULL
Shigeru Kato, Kamakura, Japan, assignor to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan
Filed Dec. 6, 1977, Ser. No. 857,977
Claims priority, application Japan, Dec. 8, 1976, 51/163858[U]
Int. Cl.² F41J 9/06
U.S. Cl. 273—350 **4 Claims**



1. A target ship comprising:
a hull designed to travel at a predetermined depth below a water level and completely submerged in the water;
a towing line connector on said hull for connection to a mother ship via a towing line;
target support means mounted on said hull and extending substantially upright from said hull substantially above the water level, said target support means including a pair of spaced apart upwardly extending poles; and
a replaceable bullet penetrable target mounted in a substantially vertical plane between said spaced apart poles of said support means substantially above the water level, said target being spaced a substantial vertical distance above said submerged hull and water level;
said hull including vertical and horizontal stabilizing blades extending therefrom to maintain said hull at a predetermined depth below the water level when it travels regardless of whether the target is penetrated.

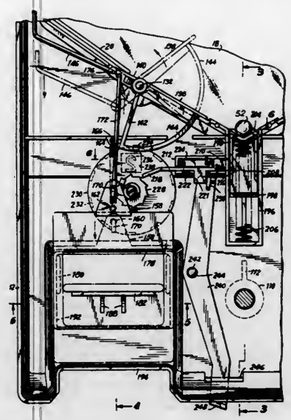
4,189,149
RECREATIONAL STRUCTURE INCLUDING FLEXIBLE TUBULAR MEMBER
Mary D. Katsiaficas, 2111 8th Ave. N., Seattle, Wash. 98109
Filed Sep. 8, 1977, Ser. No. 831,535
Int. Cl.² A63B 9/00
U.S. Cl. 272—113 **3 Claims**



1. Recreational structure comprising: a pair of spaced apart structures, a plurality of flexible elongated tubular members completely filled with a compressible solid material, each of said members including a suspended portion supported by said structures and extending between said structures in a free hanging condition, the suspended portions of said members being positioned such that they are approximately parallel to one another, said structures being rigid, and said structures including means mounted thereon for engaging the tubular members so as to prevent movement of said members along said structures.

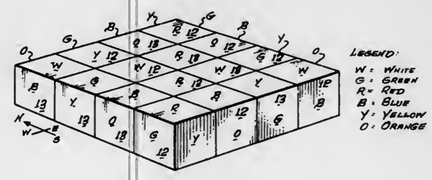
4,189,150
PINBALL GAME WITH LONGITUDINALLY MOVING FLIPPER CONTROLS
Michael Langieri, Butler, N.J., assignor to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 10, 1977, Ser. No. 767,430
Int. Cl.² A63F 7/00
U.S. Cl. 273—121 A **18 Claims**

1. A pinball game comprising a housing having a front edge, said housing being formed to define a game field spaced from said front edge and with at least one opening in a top surface thereof spaced from said front edge and positioned intermediate said front edge and said game field; flipper means pivotably mounted in said game field; longitudinally displaceable flipper lever means mounted in said housing opening for displacement in said opening towards and away from the front edge of said housing; means operatively coupling said flipper means and flipper lever means for the operable displacement of said flipper means in response to the displacement of said flipper lever means toward said front edge; and means biasing said flipper lever means in a direction away from said front edge, said flipper lever means being formed with a user engaging surface positioned so that when said flipper lever means is biased in a rest position said user engaging surface is in registration with a portion of said housing opening spaced from said front edge and a user may operably manually displace said flipper lever means toward said front edge to actuate said flipper means by inserting fingers through said housing opening into engagement with said user engaging surface of said flipper lever means and pulling said flipper lever means toward said housing



front edge, said flipper lever means being formed with an opening in a top surface thereof dimensioned in the direction of displacement of said flipper lever means so as to be narrower than said opening in said housing to define said user engaging surface.

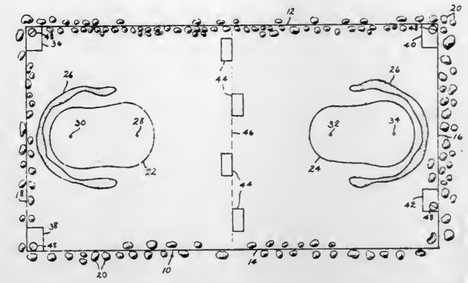
4,189,151
CUBE PUZZLE
Fred H. Klopfenstein, 15402 Mottley Dr., La Mirada, Calif. 90638
Filed Oct. 23, 1978, Ser. No. 953,360
Int. Cl.² A63F 9/08
U.S. Cl. 273—156 **1 Claim**



1. An educational color association puzzle comprising a plurality of cubes of equal size, said cubes being of two types of color configurations, the first type having a single first arrangement of six different colors, each face of the first type having a different color, and the second type having a single different arrangement of the same six colors, each face of said second type also having a different color, there being at least eight of each of said types.

4,189,152
GOLF LINK
John C. Raber, P.O. Box 356, Bristol, Ind. 46507
Filed Apr. 16, 1976, Ser. No. 677,695
Int. Cl.² A63B 69/36
U.S. Cl. 273—176 AB **7 Claims**

1. A golf link comprising a playing area having two side boundaries and two end boundaries, first and second spaced greens within said playing area, said first green being located adjacent one end boundary and said second green being located adjacent the other end boundary, each green having at least first and second spaced holes, a first tee area located adjacent said one end boundary and between said one side boundary and first green from which a golfer may hit to said second green and one hole thereof, a second tee area located adjacent said one end boundary and between the other side boundary and first green from which a golfer may hit to said second green and the other hole thereof, a third tee area lo-



cated adjacent said other end boundary and between said one side boundary and second green from which a golfer may hit to said first green and one hole thereof, and a fourth tee area located adjacent to said other end boundary and between said other side boundary and second green from which a golfer may hit to said first green and the other hole thereof, all said tee areas being located within said playing area.

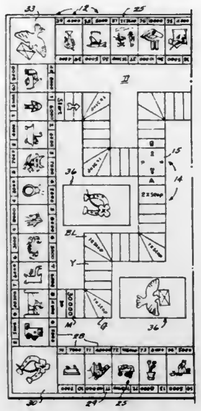
4,189,153
BOARD GAME
Werner Zollinger, 39, Bachtobelstrasse, 8045 Zurich 3, Switzerland
Filed Jul. 12, 1977, Ser. No. 814,881
Int. Cl.² A63F 3/00
U.S. Cl. 273—256 **13 Claims**

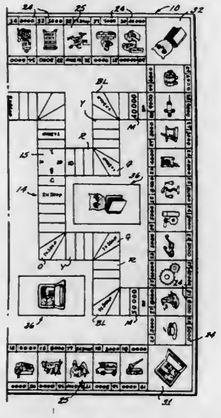
1. A parlor game for a number of participants comprising
a game board having a first plurality of consecutive playing sections disposed threon in a continuos path, and defining an interior area, at least some of said first playing sections having at least two different types of first indicia associated therewith for distinghishing between different common-type indicia groups;
a plurality of title cards, one title card being associated with each playing section having first indicia thereon, and each title card having one of said at least two different types of said first indicia provided thereon, corresponding to the type of indicia provided on the corresponding first playing section, the first indicia related to the relative freedom of a participant to purchase each of said title cards;
at least some of said first playing sections having more than one title card associated therewith, and each title card for playing sections having more than one title card associated therewith capable of possession by a different participant;
a plurality of movable game pieces, one for each participant, for movement from section to section, second indicia being associated with said game pieces for distinguishing between said game pieces;
a plurality of consecutive second interior, playing sections disposed within said interior area, said interior playing sections being disposed in at least two different paths, said two different paths having one, cross-roads, playing section in common; and a single entrance first playing section cooperating with all said at least two different paths, and an exit first playing section cooperating with each of said at least two different paths; said first indicia of said first playing sections being related to indicia associated with each of said at least two different paths of said interior playing sections which provide that the relative freedom of a participant to purchase said first playing section title cards of given type of first indicia is determined by the

particular interior path traversed by the participant's game piece;

a supply of play money providing a monetary standard;

a numerical monetary value indicia related to the monetary standard formed on at least one of each of said first play-





ing sections having first indicia and the title cards associated therewith; and

chance means for advancing the movable pieces along the interior playing sections from section-to-section, and for advancing the movable pieces around the game board continuous path from section-to-section.

4,189,154

WORD FORMING BOWLING GAME

Willard F. Bell, 1308 E. Church St., Stockton, Calif. 95205

Filed Oct. 31, 1977, Ser. No. 846,730

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—272 **3 Claims**

1. An educational word forming game for use by a plurality of players that is related to the game of bowling comprising

a marked game board,

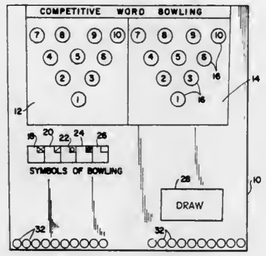
a set of marked cards, and

a set of playing pieces, in which

the game board is marked with a representation of at least two bowling lanes sections, said marked representation including marked pin locations for each of ten individually numbered bowling pins on each bowling lane, in conventional bowling lane array, and

each card of the set of marked cards is marked on a face side with a marked pin location for each of ten individual bowling pins that are oriented in similar respective position to the marked ten locations of bowling pins of a lane of the game board, with each of the said cards each individually marked to indicate that one or more of the said marked pin locations designates a location of a pin that has been struck as in a conventional game of bowling, and with each card marked with a title that describes a term in conventional bowling language that represents the configuration of the said designated locations when applied to the locations of pins that have been struck in a conventional game of bowling, and

each playing piece is of a size to fit on an individual marked pin location on a bowling lane section of the game board, with an underside of each playing piece marked with an individual letter of the alphabet, with sufficient pieces so that all the letters of the alphabet are individually marked on separate playing pieces, such that



a player may place in random order, an individual playing piece on each of the ten marked pin locations on a bowling lane with a marked letter on the underside of each playing piece concealed from view, and then select at random a said marked card so that the player, when viewing the face side of said marked card sees a title that describes in bowling language the configuration of the marked designated location of pins that have been struck in a conventional game of bowling, and so that the player may then expose the underside of each playing piece on his bowling lane section of the game board which occupies a said marked designated location on the card to view the letter of the alphabet marked on the underside of each said playing piece and so that said player may attempt to form a word using some or all of the said exposed letters of the alphabet.

4,189,155

RECORD PLAYER

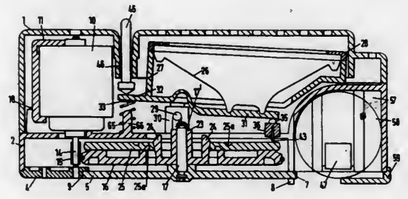
Mun-Hay Ngai, 130-132 Argyle St., 3/Fl., Flat C, Kowloon, Hong Kong

Filed Aug. 7, 1978, Ser. No. 931,371

Claims priority, application United Kingdom, Mar. 3, 1978, 8625/78

Int. Cl.[2] A63H *3/33;* **G11B** *25/04*

U.S. Cl. 274—1 A **12 Claims**



1. A record player suitable for a toy and comprising:

a container;

a cover therefore;

a rotably mounted turntable;

an electric motor including a driving spindle for driving the turntable;

a speaker in said container;

a tone arm having a stylus;

said tone arm being movable with said speaker toward the turntable and including means for causing said stylus to engage a record on the turntable;

a circuit supplying driving current to the motor, including switch means operable by said tone arm as the tone arm moves toward the center of the turntable to interrupt the driving current;

means for pivotly mounting the motor in the container;

a metal spring wire mounted so as to bias said driving spindle into driving contact with the periphery of the turntable; and

an adjustment spindle rotatably mounted in said container and having a notch engaged by said metal wire so that rotation of said adjustment spindle alters the bias of the drive spindle against the periphery of the turntable to alter the speed of the turntable.

4,189,156

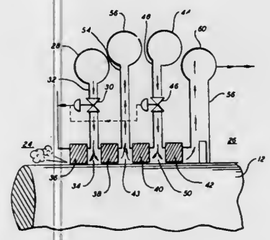
SEAL SYSTEM FOR A TURBOMACHINE EMPLOYING WORKING FLUID IN ITS LIQUID PHASE AS THE SEALING FLUID

Carl H. Geary, Jr., Greensburg; Norman A. Samurin, Irwin, and Frank H. Athearn, Greensburg, all of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 8, 1978, Ser. No. 913,619

Int. Cl.[2] F16J *15/40*

U.S. Cl. 277—1 **4 Claims**



1. A method of sealing a turbomachine employing a first fluid in its vaporous phase as the operating medium, comprising the steps of:

delivering a relatively small quantity of the fluid in its liquid phase to a first sealing region whereat the fluid flows in opposite directions along the shaft of the turbomachine, respectively towards the ambient and towards the working region of the machine;

reducing the pressure of the quantity of fluid flowing towards the working region whereby the fluid will flash into its vaporous state, with the vaporous fluid mixing with the operating fluid in the working region;

delivering the quantity of fluid flowing towards the ambient to a second sealing region disposed between the first sealing region and the ambient;

delivering a quantity of a second seal fluid to the second sealing region, with the pressure of the second seal fluid being somewhat greater than the pressure of the first seal fluid to prevent further flow of the first seal along the shaft;

mixing the first seal fluid with the second seal fluid at the second sealing region; and

collecting the mixture of first and second seal fluids.

4,189,157

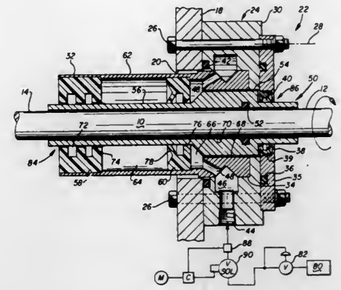
END FACE SHAFT SEAL

Dudley E. Mahan, Box 138-CA, Rte. 2; James D. Mahan, Box 1074, Rte. 3; Ronnie L. Mahan, Box C-138, Rte. 2; Walter D. Sewell, Rte. 2, Box 1634, all of Odessa, Tex. 79763, and Ray A. Warren, 6611 Dallas, Odessa, Tex. 79762

Filed Sep. 12, 1978, Ser. No. 941,609

Int. Cl.[2] F16J *15/40*

U.S. Cl. 277—3 **15 Claims**



1. A mechanical seal device for use in sealing the opening within structure through which a shaft is received;

said device includes a main housing adapted to be mounted to the structure, an axial passageway formed through said main housing through which a shaft can be received;

first and second seal means mounted in spaced relationship within said passageway and along a common axial centerline; a flow restrictor mounted in said passageway in axially aligned relationship respective to said first and second seal means, with said second seal means being located between said first seal means and said flow restrictor;

said first and second seal means cooperate with said housing to form a first annular chamber therebetween; said second seal means and said flow restrictor cooperate with one another and with said housing to form a second annular chamber therebetween; a flow passageway formed in said housing through which fluid can flow from a fluid source to said second annular chamber;

said first seal means is of a size to permit flow to occur thereacross and into said first annular chamber under static conditions of operation, and to prevent flow thereacross under dynamic conditions of operation;

said second seal means is of a configuration which permits flow to occur from said second into said first annular chamber while restricting flow from said first to said second annular chamber.

4,189,158

GAS LOADED FACE SEAL

Michael A. Roussin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

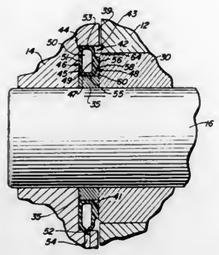
Filed Mar. 8, 1979, Ser. No. 18,705

Int. Cl.[2] F16J *15/36, 15/40*

U.S. Cl. 277—34.3 **21 Claims**

1. A face seal (44) having first (48) and second (51) side walls, first (53) and second (55) end walls, and a chamber (50) defined by said walls, said walls (48,51,53,55) being of a construction sufficient for maintaining a pressurized fluid within said chamber (50), said first side wall (48) being defined by an outwardly extending sealing band (57) connected to the first (53) and second (55) end walls by respective first (64) and

second (**60**) portions of the first side wall (**48**), said first (**64**) and second (**60**) portions of the first side wall (**48**) being of different

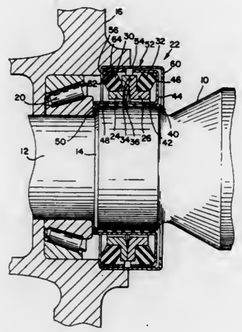


flexibility, said first portion (**64**) being of greater flexibility than said second portion (**60**).

4,189,159
UNITIZED FACE TYPE SEAL

E. A. Domes, Carpentersville; Forrest C. Taylor, Northlake, and Lawrence A. Venere, Wood Dale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 7, 1978, Ser. No. 931,587
Int. Cl.² F16J *15/38*
U.S. Cl. 277—39 **5 Claims**



1. A unitized face type seal comprising:

a first and a second annular face type seal ring having axially and radially extending surfaces and flat engagement surfaces machined on said radially extending surfaces;

a first and a second annular resilient ring in contact with the nonengaging surfaces of said respective first and said second annular face type seal rings;

an interior shell having a base portion, a radially extending wall and a transverse axially disposed upper portion for maintaining said second annular resilient ring in position;

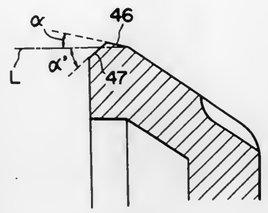
an exterior shell having a circumferential band portion and a first and a second radially projecting flange member, said second radially projecting flange member extending toward said base of said interior shell parallel to said radially extending wall of said interior shell;

a circumferential spacer carried on the interior of said exterior shell abutting said first radially projecting flange member, said circumferential spacer and said first radially projecting flange member retaining said annular resilient ring in position whereby said interior shell, said exterior shell and said circumferential spacer provide a unitized housing for supporting said first and second face type seal rings through said first and second annular resilient rings in face to face contact and properly aligned relative to each other at all times.

4,189,160
SEALING CUP

Junzo Hasegawa, Obu; Masatoshi Yamada, Nagoya; Kaoru Nakamura, Anjo, and Eiichi Yasuda, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya; Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, all of, Japan

Filed Jul. 14, 1978, Ser. No. 924,837
Claims priority, application Japan, Jul. 15, 1977, 52/95011[U]
Int. Cl.² F16J *15/32*
U.S. Cl. 277—205 **10 Claims**



1. A sealing cup for a hydraulic piston-cylinder device which comprises

an annular body of a resilient material including an annular base,

an annular inner sealing lip extending from said annular base and having an inner sealing surface adapted to be engaged with a wall to be sealed,

an annular outer sealing lip extending from said annular base so as to encircle said inner sealing lip in spaced relation therewith, and having an outer sealing surface adapted to be engaged with a wall surface of said cylinder to be sealed, said cylinder having a longitudinal axis,

one of said inner and outer sealing surfaces being slidably movable with respect to a corresponding one of said piston and cylinder walls, and

said slidably movable sealing surface having a tip part including a first annular portion inclined at an angle θ and a second annular portion forwardly of said first annular portion inclined at an angle α with respect to the axis of said cylinder, said first and second annular portions being inclined in the same direction with respect to said cylinder axis,

said first annular portion including an intermediate portion which is larger in diameter than that of said cylinder when it is provided on said outer sealing surface and smaller in diameter than said piston when provided on said inner sealing surface,

the angle α being smaller than the angle θ and being predetermined as follows;

$$1° \leqq \alpha \leqq 15°$$

whereby, on mounting said cup between said cylinder and piston, said inclined portion forms a wedge-shaped clearance between itself and said peripheral wall and guides fluid such as oil to a sliding surface of said at least one of said cylinder and piston.

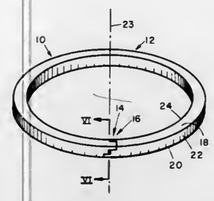
4,189,161
BI-DIRECTIONAL RING GAP SEAL

Raymond L. Grimm, Grand Haven, Mich., assignor to Muskegon Piston Ring Company, Muskegon, Mich.

Filed Aug. 28, 1978, Ser. No. 937,257
Int. Cl.² F16J *9/14*
U.S. Cl. 277—221 **7 Claims**

1. A sealing ring including inner and outer faces, upper and lower sides and having a bi-directional ring gap, said ring having a parted annular body; said body at its part having an overlapping joint characterized by a pair of circumferentially

projected elements defining circumferentially offset oppositely facing wedge surfaces on each of the ring body at said part; said wedge surfaces each having inner and outer edge portions extending circumferentially of said ring, said wedge surfaces on each end of said ring body being inclined so as to converge toward the outer circumferential face of said ring; said wedge surfaces of each end of said ring body at the outer circumferential face of said ring being spaced apart axially of said ring with

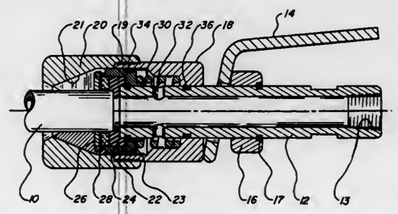


the wedge surfaces on one end of said ring body seating against and forming a seal with the oppositely facing wedge surfaces on the other end of said ring body when the gap in said ring is closed, said wedge surfaces extending radially of said ring, a wedge surface on each of said projections terminating short of the inner face to define a bearing surface, and the circumferentially projecting elements formed on each end of said ring body providing a joint having offset steps therein between the top and bottom sides of said ring.

4,189,162
HYDRAULIC CHUCK

Robert F. Rasmussen, Brooklyn Center; George R. Smida, Crystal; Robert L. Wietecha, Columbia Heights, and Gary L. Pearson, Coon Rapids, all of Minn., assignors to Air-Mo Hydraulics, Inc., Minneapolis, Minn.

Filed Dec. 19, 1977, Ser. No. 861,999
Int. Cl.² B23B *31/30*
U.S. Cl. 279—4 **7 Claims**



1. A hydraulic chuck comprising:

piston means having an axially centered passage, and a first end of said piston means having a tube seating means associated therewith for engaging a tube;

collet means located at said first end of said piston means for engagement of said tube upon closure of said collet means;

surface means bearing against said collet means to close said collet means;

biasing means operably connected to said piston means for normally forcing said surface means upon said collet means;

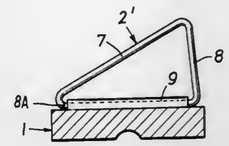
sealing means adjacent said tube, seating means for sealing said tube to said chuck, including seal seat means adjacent said collet positioned to compress said seal radially inward under pressure of said biasing means; and

attachment means operably connected to said biasing means to remove said surface means from the collet means to release said radially inward compression of said sealing means and permit insertion of said tube.

4,189,163
ANTI-CROSSOVER DEVICE FOR SKIS

Gottfried Schweizer; Axel Kubelka; Karl Stritzl, all of Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jul. 14, 1976, Ser. No. 705,268
Claims priority, application Austria, Jul. 18, 1975, 5599/75
Int. Cl.² A63C *11/00*
U.S. Cl. 280—11.37 E **2 Claims**

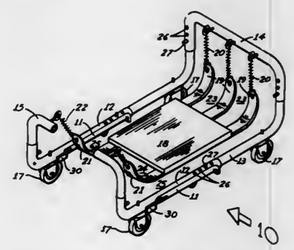


1. An anti cross-over apparatus for skis comprising an upstanding bracket adapted to extend substantially transversely across its associated ski, means mounting the upstanding bracket for pivotable movement about a transverse axis into a position bearing substantially flatly against the top surface of the ski, said upstanding bracket comprising a resilient spring bracket member having two free ends, said two free ends extending transversely to the ski in substantially parallel relationship to one another, said free ends being spaced from each other in the longitudinal direction of the ski and serving as pivot shafts for the spring bracket member, said mounting means comprising a base body, said two free ends of the spring bracket being pivotably mounted in said base body, the spring bracket member and the pivotable mounting of the free ends thereof enabling said spring bracket member to resiliently tilt over in the longitudinal direction of said associated ski in the event cross-over of the skis has occurred and to return to its upstanding position after the skis have been uncrossed.

4,189,164
CONVERTIBLE BABY VEHICLE

Donald K. Moorer, 3547 Jonathan Cir., Augusta, Ga. 30906

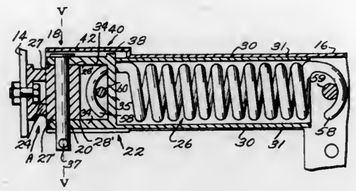
Filed Oct. 6, 1977, Ser. No. 840,051
Int. Cl.² B62B *7/12*
U.S. Cl. 280—87.05 **3 Claims**



1. The combination of a walker vehicle of a size intended for supporting a baby's movement in any direction while standing, and wheel means for support thereof in order to move about, comprising a frame formed of a plurality of tubular members that are telescopically, adjustably interconnected; said frame including parallel, longitudinally extending side frame sections having front and rear upstanding end portions; laterally, inwardly extending front frame sections detachably secured to said front upstanding portions; a rear frame section detachably secured to and extending between said rear upstanding portions; a platform detachably secured to said front and rear frame sections; extension arms pivotally mounted on said side frames adjacent said front upstanding portions for movement between a position extending along said side frames to a posi-

tion extending forwardly of said frame to provide added stability thereto; and said wheel means comprising a pair of caster wheels depending from each said side frame adjacent the front and rear upright portions.

4,189,165
MUD-FLAP SUPPORTING ASSEMBLY
Charles F. Leonard, Box 99, Rte. 1, and Claude H. Leonard, Box 127, both of Star, Id. 83669
Filed Jan. 16, 1978, Ser. No. 869,761
Int. Cl.[2] B62B *9/16*
U.S. Cl. 280—154.5 R **12 Claims**



1. A mud-flap supporting assembly, for mounting a mud-flap on a vehicle, comprising

a horizontally disposed mounting arm adapted to have a mud-flap attached thereto;

means for mounting said mounting arm to a vehicle at an attachment point, including means for substantially preventing movement of said arm in a vertical direction; and means for providing pivotal movement of said arm about a vertical axis adjacent the operative attachment point of the arm to the vehicle;

said means for providing pivotal movement of said arm about a vertical axis including a vertical pin, an arm portion for receipt of said pin, and a support portion adapted to be connected to the vehicle for receipt of said pin, said pin passing through said arm portion and said support portion; and said means for substantially preventing movement of said arm in a vertical direction including interfering portions of said arm portion and said support portion; and

spring means operatively connected between said arm and arm portion for centering said arm so that it is normally in a first position but may pivot against the bias of said spring means about said vertical axis out of the first position and so that it will be automatically returned by said spring means to the first position, said spring means consisting of a single coil spring having hook-shaped end portions each operatively engaging one of said arm and said arm portion.

4,189,166
SELF-PROPELLED VEHICLE
Ben Lindsey, P.O. Box 1256, Maljamar, N. Mex. 88264
Continuation-in-part of Ser. No. 865,705, Dec. 29, 1977, Pat. No. 4,147,370. This application Jan. 16, 1979, Ser. No. 3,889
Int. Cl.[2] B62M *1/16*
U.S. Cl. 280—234 **11 Claims**

1. A self-propelled vehicle having a main frame, a rear wheel located aft of said main frame, means by which said rear wheel is journaled to said main frame for ground supporting part of the weight of said vehicle;

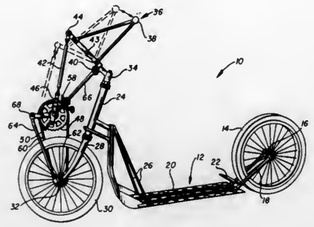
a front wheel, means by which said front wheel is journaled to said main frame at a forward location thereof;

a handle, a steering means connected between said handle and said front wheel by which said handle can be used to turn said front wheel and thereby guide said vehicle;

means by which said handle can be moved fore and aft respective to said main frame while concurrently steering said front wheel;

a crank; drive means connecting said crank to said front wheel so that rotation of said crank imparts rotational motion into said front wheel, thereby propelling said vehicle along the ground; connecting rod means interconnecting said crank and said handle so that the fore and aft movement of said handle imparts rotational motion into said crank;

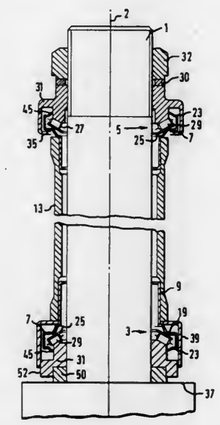
said crank having a central portion connected to said drive



means and opposed end portions which rotate about said central portion;

biasing means positioned to contact each opposed end portion as the connecting rod is reciprocated in each direction, thereby storing energy as the rod approaches the end of its travel and releasing the energy as the rod commences to travel in the opposite direction so that the crank is forced over-the-center each reciprocation of the rod.

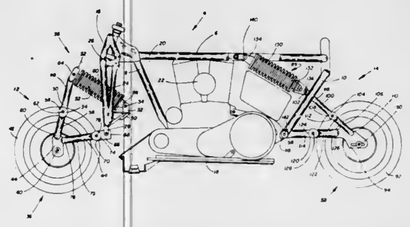
4,189,167
STEERING HEAD SET ASSEMBLY
Philippe Dubois, Rueil Malmaison, France, assignor to Nadella, Ruel-Malmaison, France
Filed Dec. 15, 1977, Ser. No. 860,874
Claims priority, application France, Dec. 20, 1976, 76 38262
Int. Cl.[2] B62K *21/06*
U.S. Cl. 280—279 **5 Claims**



1. A steering head set unit comprising a head tube (**13**), a fork axle (**1**) rotatably extending through said head tube, and first and second bearing assemblies spaced axially apart at opposite ends of said head tube and peripherally surrounding said axle, each of said bearing assemblies comprising (a) a bearing ring (**31**) receiving said axle, (b) a bearing cup (**7**) having a first portion received in said tube and a second portion extending axially beyond said tube and peripherally surrounding said axle in spaced relation thereto such that said second portion and said axle define therebetween an annular cavity, (c) at least one pressed metal conical bearing race (**25**) received in said cavity

and having oppositely facing sides lying obliquely to the longitudinal axis of said axle, (d) a set of caged, cylindrical thrust bearing rolling elements (**29**) arranged in an annulus in said cavity between said race and an opposing face of said bearing ring in rolling contact with one of the sides of said race to lie obliquely to the longitudinal axis of said axle, (e) an annular segment forming a part of said second portion and disposed radially outwardly of the sub-assembly of said race and said rolling elements in peripheral surrounding relationship thereto, and (f) an annular shoulder (**19**) forming a part of said second portion at a location that is intermediate and spaced from said annular segment and said first portion to seat against the other of the sides of said race to provide a support for said race while allowing relative movement of said race to provide for the self-alignment of said race.

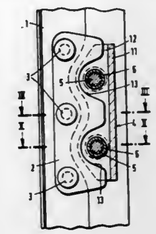
4,189,168
WHEEL SUSPENSION SYSTEM FOR A VEHICLE
Orley R. Courtney, 502 E. Wiley St., Marion, Ind. 46952
Filed Apr. 28, 1978, Ser. No. 900,790
Int. Cl.[2] B62K *25/26*
U.S. Cl. 280—284 **16 Claims**



1. A wheel suspension system for vehicles having a vehicle frame comprising a wheel assembly, and a spring and shock absorber assembly, said wheel assembly including a wheel with an axle rotatably disposed thereon, paired axle plates being rotatably attached to the opposite ends of said axle, a first pair of upstanding wheel supports having opposite ends, a second pair of wheel supports extending transversely of said first pair and having opposite ends, each of said wheel supports including at least two portions and means for detachably connecting said portions together and rigidly holding said portions in an end-to-end relation without any relative movement therebetween when connected, said portions having ends remote from said means defining said opposite ends of said wheel supports, said spring and shock absorber assembly including a shock absorber having opposite ends, one end of said upstanding wheel supports being secured to said paired plates and the other end of said upstanding wheel supports being connected to one end of said shock absorber, the other end of said shock absorber being connected to said vehicle frame; one end of said transversely extending wheel supports being secured to said paired plates and the other end of said transversely extending wheel supports being pivotally attached to said vehicle.

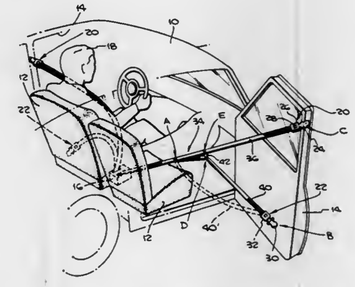
4,189,169
SEAT BELT FASTENING DEVICE
Klaus Meuser, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany
Filed Nov. 4, 1977, Ser. No. 848,595
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651265
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—802 **2 Claims**

1. Apparatus for coupling a safety belt, of the type adapted to be fastened at one end to a frame of a pivotal door of a motor vehicle, in force transmitting relation to the door column structure associated with said vehicle door, comprising a first plate mounted on said door frame and having a first arm freely extending parallel to the direction of door closing at a selected distance from the adjacent surface on said door frame, means connecting said safety belt with said first plate, and a second plate mounted to said door column and having portions for



receiving said first plate in force transmitting relation when said door is closed, wherein said first plate includes a second arm extending perpendicular to said first arm and having an edge butted against said adjacent door frame.

4,189,170
THREE-POINT PASSIVE SAFETY BELT SYSTEM
Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.
Filed Apr. 5, 1978, Ser. No. 893,254
Int. Cl.[2] B60R *21/02, 21/10*
U.S. Cl. 280—802 **13 Claims**



1. In a passive safety belt system including lap belt and upper torso belt portions for a vehicle having a seat for an occupant disposed adjacent a door hingedly mounted for rotatable opening outward about a vertical axis disposed forward of the seat, the improvement comprising:

(a) a lockable retractor including spool means for windably retracting a safety belt thereon and protracting said safety belt therefrom and further including means for selectively locking said spool to prevent protraction of the safety belt in an emergency, said retractor being mounted at a point substantially adjacent and below the in-board hip joint of an occupant in the seat;

(b) a first belt connector mounted to the door at a point substantially adjacent and above the out-board shoulder of an occupant in the seat;

(c) a second belt connector mounted to the door at a point substantially adjacent and below the out-board hip joint of an occupant in the seat;

(d) a first safety belt portion connected to said first belt connector on one end;

(e) a second safety belt portion connected to said second belt connector on one end;

(f) a third safety belt portion operably connected to said spool means on one end, the other ends of said first, second and third belt portions being connected in parallel at a common point to form a Y-shaped safety belt adapted

for retraction onto said spool both as to the single belt of said third portion and the two-belt parallel combination of said first and second portions, the length of said first and second portions being in the same ratio as the distance from said first belt connector to said lockable retractor across the upper torso of an occupant in the seat is to the distance from said second belt connector to said lockable retractor across the lap of an occupant in the seat, the distance from said first belt connector to said common point being such that with the door open said first and third belt portions in combination are taut and said second portion is in slack; and,

(g) means interconnecting said first and second belt portions disposed between said common point and said first and second belt connectors respectively for lifting said slack second belt portion towards said taut first belt portion when the door is opened whereby said second belt portion is lifted away from the path of the occupant's legs during entry and egress from the vehicle.

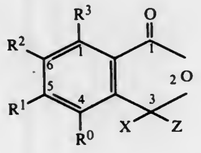
4,189,171

MARKING SYSTEMS CONTAINING 3-ARYL-3-HETERYLPHTHALIDES AND 3,3-BIS(HETERYL)PHTHALIDES

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 773,180, Mar. 1, 1977, abandoned. This application Jan. 11, 1978, Ser. No. 868,583
Int. Cl.[2] B41L *1/36;* **B41M** *5/16, 5/18*
U.S. Cl. 282—27.5 **15 Claims**

1. A pressure-sensitive carbonless duplicating system or thermal marking system containing as a color-forming substance a 3-X-3-Z-4-R°-5-R[1]-6-R[2]-7-R[3]-phthalide of the formula



wherein:

R°, R[1], R[2] and R[3] each represent hydrogen or halo or when R°, R[3] and one of R[1] and R[2] are each hydrogen, the other of R[1] and R[2] represents



in which B represents -OY or



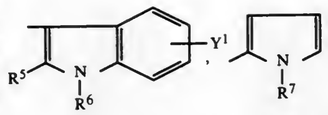
wherein

Y is hydrogen, an alkali metal cation, an ammonium cation, a C_1 to C_{18} mono-, di- or trialkylammonium cation, C_1 to C_{18} alkyl, C_2 to C_{18} alkenyl, benzyl or benzyl substituted in the benzene ring thereof by C_1 to C_{12} alkyl, halo or C_1 to C_8 alkoxy;

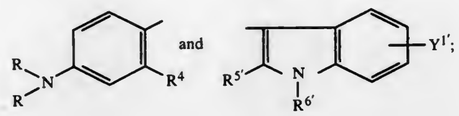
Y′ is hydrogen or C_1 to C_{18} alkyl;

Y″ is hydrogen, C_1 to C_{18} alkyl or C_4 to C_{12} N,N-dialkylaminoalkyl;

X represents a monovalent moiety selected from the class having the formulas



Z represents a monovalent moiety selected from the class having the formulas



in which

R represents non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^4 represents acetamido, dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl, and when one of R^1 or R^2 represents said



R^4 further represents hydrogen, C_1 to C_3 alkyl, C_1 to C_4 alkoxy or halo,

R^5 and $R^{5'}$ represent hydrogen, C_1 to C_3 alkyl or phenyl,

R^6 and $R^{6'}$ represent hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^7 and R^8 represent hydrogen, C_1 to C_3 alkyl or phenyl, and

Y^1 and $Y^{1'}$ represent one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro

with the provisos (i) that X and Z can both simultaneously represent monovalent indolyl moieties only when one of R^1 and R^2 represents said



and (ii) X represents a pyrrolyl or a carbazolyl moiety only when Z represents a 2-R^4-4-N(R)$_2$-phenyl moiety.

4,189,172

PIPE COUPLING

Duane O. Perrin, 2522 232nd St., Torrance, Calif. 90505

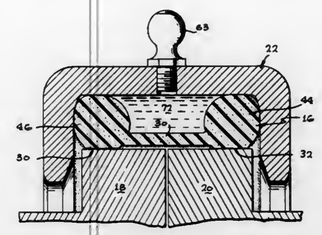
Continuation-in-part of Ser. No. 844,631, Oct. 25, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,888
Int. Cl.[2] F16L *23/00*
U.S. Cl. 285—12 **3 Claims**

1. A pipe coupling for connecting two pipes, comprising:

a clamp which includes a pair of body members pivotally joined at one side, which can be closed together over the ends of the pipes with the other ends of the body members locked together; and

a ring-shaped gasket having a substantially uniform cross-section, said cross-section having a main body portion and a pair of axially-spaced ridges extending radially outwardly from the periphery of said main body portion;

said ridges having substantially flat radially outer surfaces and extending along a minority of the axial length of the gasket; said clamp includes a grease fitting communicating



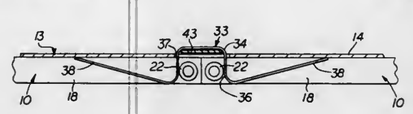
with the space between said axially-spaced ridges, and said gasket includes a pair of inner gasket flanges lying radially inside said ridges.

4,189,173

LATCH FOR A FIRE SCREEN FOLDING DOOR ASSEMBLY

Joe D. Rester, Decatur, Ala., assignor to Matthews Machine Co., Inc., Decatur, Ala.

Filed Apr. 24, 1978, Ser. No. 899,326
Int. Cl.[2] E05C *19/06*
U.S. Cl. 292—86 **4 Claims**



1. In a latch for a fire screen folding door assembly hingedly mounted along an outer edge thereof within an opening in a supporting frame with the door assembly having at least two door panels hingedly connected in edge to edge relationship with a generally vertically projecting guide member adjacent the inner edge of the door assembly adapted to move in a horizontal guideway in the frame as the door assembly is moved selectively to an open folded position and to an extended closed position,

(a) a movable latch element comprising an elongated spring member carried by said frame adjacent the position of said guide member while said door assembly is in said extended closed position and adapted for movement selectively to a first position in the path of movement of said guide member and to a second position out of the path of movement of said guide member and having end portions extending at an angle toward said supporting frame so that said latch element is urged by said end portions toward said first position,

(b) said spring member resiliently maintaining said first position until said guide member engages said latch element and moves said latch element to said second position in response to movement of said door assembly toward said extended closed position,

(c) an offset portion intermediate the ends of said elongated spring member defining a recess in said latch element in position to receive said guide member upon movement of said door assembly to said extended closed position so that said latch element returns to said first position and secures said door assembly in said extended closed position with there being a recess in said frame for receiving said offset portion upon movement of said latch element to said second position, and

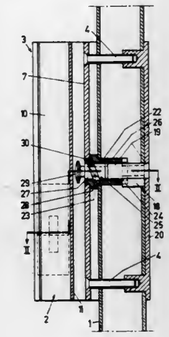
(d) an actuator member operatively connected to said latch element for moving said latch element to said second position to release said guide member for movement relative to said latch element.

4,189,174

CLOSING DEVICE FOR SLIDING DOORS AND WINDOWS

Remi E. Van Parys, 80, Zultseweg, Waregem, Belgium

Filed Mar. 23, 1978, Ser. No. 889,521
Claims priority, application Belgium, Apr. 4, 1977, 116394
Int. Cl.[2] E05C *19/10*
U.S. Cl. 292—98 **28 Claims**



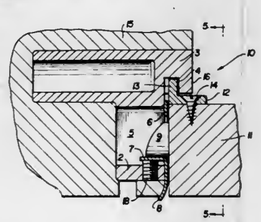
1. Closing device for sliding doors and windows, having a support to be fastened on one of those parts formed respectively by the sliding leaf and the fixed upright of a sliding door or window, and a lever swingably mounted on said support, the one end of said lever being provided with a projection acting as bolt and cooperating with a rim which is mounted on the other one of said parts of the sliding door or window, and which can fit behind said rim in one lever position, namely the closing position thereof, which comprises a cylinder lock, a worm which is connected to the rotating lock core in such a way that said worm rotates together with said core, and a pin which enters the groove, whereby one of those elements formed by the worm and the pin is movable in the direction of the lock core rotation axis relative to said core, said movable element cooperating with the lever to cause said lever to swing with the movement thereof in the core lengthwise direction caused by the worm rotation.

4,189,175

DOOR STRIKE

Lee C. Paxton, 5050 North Ave., Carmichael, Calif. 95608

Filed Mar. 1, 1978, Ser. No. 882,401
Int. Cl.[2] E05B *15/02*
U.S. Cl. 292—340 **7 Claims**



1. An improved door strike assembly to be inserted within a door, a door jamb, and a wall stud proximate to the jamb, the combination comprising:

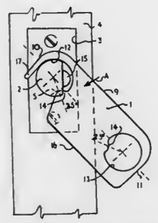
a cylindrical tang which extends through the jamb and into the stud,

a body portion integral with said tang extending from one

end of said cylindrical tang having a hollowed rectanguloid configuration and a curvilinear top surface which has a side which is hollowed,

a cylindrical disk portion integral with said body portion disposed on a side remote from said tang having a semicircular stepped upper portion linearly remote from the tang and provided with a lip and a groove and a hollowed lower portion communicating with the hollowed body portion so that a striker on the door is allowed to register with the hollowed portions and said lip serves as an abutment against the door and whereby said tang's disposition into the stud deters the door from being forced open as by the sudden load applied by a swift kick.

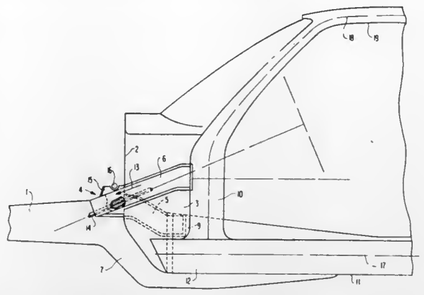
4,189,176
LATCH BOLT ACCESSORY
William J. Hamilton, 1180 Woodroffe Ave., Ottawa, Ontario, Canada (K2C 2T3)
Filed Jul. 5, 1978, Ser. No. 921,895
Int. Cl.[2] E05B *17/00, 15/12*
U.S. Cl. 292—346 **12 Claims**



1. In combination with a reciprocating latch bolt of a door, the bolt having a transversely extending slot cut therein, a free and portable thin flat member including suspension means for rotatably suspending said member on said bolt when said bolt is extended and latch means to engage in said slot to prevent retraction of said bolt.

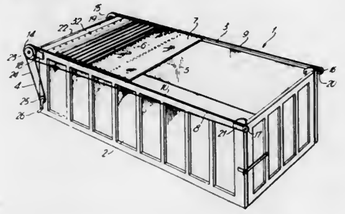
4,189,177
FORWARD LONGITUDINAL BEARER SUPPORTED AT THE END WALL OF A SELF-SUPPORTING MOTOR VEHICLE BODY
Norbert Schwuchow; Helmut Grantz, both of Sindelfingen; Hubert Hutai, Grafenau; Dietrich Rothacker, Sindelfingen; Gerhard Burk, Magstadt, and Manfred Mordau, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 2, 1978, Ser. No. 911,923
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725083
Int. Cl.[2] B62D *21/00*
U.S. Cl. 296—188 **16 Claims**

1. A motor vehicle body including a longitudinal bearer and comprising end wall means defining a wall of a passenger compartment and locally bulged out in the direction of the respective vehicle end in a manner forming a rigid body, said longitudinal bearer having an end supported against said end



wall and being forked so as to create a plurality of arms partially surrounding said rigid body.

4,189,178
TARPAULIN COVER SYSTEM
Nello Cramaro, 779 York Rd., Hamilton, Ontario, Canada
Continuation of Ser. No. 729,237, Oct. 4, 1976, abandoned. This application Jan. 4, 1979, Ser. No. 1,036
Claims priority, application Canada, Jan. 29, 1976, 244497
Int. Cl.[2] B60J *7/00*
U.S. Cl. 296—105 **4 Claims**



1. In combination with a truck box including a front wall and two generally upright side walls each having a generally horizontal top edge, a tarpaulin cover system including a tarpaulin; tarpaulin supporting rods fixedly secured to the tarpaulin and including a leading rod and a plurality of intermediate rods, said rods extending across said truck box; means for moving and guiding said rods along the top of said truck box to unfold or fold and to guide said tarpaulin and to maintain respective ends of the rods in proximity to the respective upper edges of said side wall, wherein:

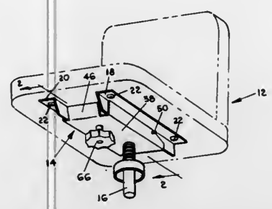
(a) the length of each of said rods is in excess of the width of said box, while the width of said tarpaulin is less than the width of said box, each rod having two end portions disposed between the respective ends of the rod and a respective side edge porion of said tarpaulin, each of said end portions being fully exposed and resting on the top edge of the respective side wall of the box;

(b) said means for moving and guiding said rods including two flexible cable means each secured to the box, one of each of the cable means extending along the respective horizontal top edge in proximity to same and exteriorly of the box;

(c) each of the intermediate rods having at each end thereof a transverse passage means for slidably receiving the respective cable, the spacing between each passage means and the respective adjacent edge of the tarpaulin being greater than the thickness of the respective side wall at the respective top edge thereof;

(d) each of said cable means being fully exposed along generally the entire length thereof, whereby undesired accumulation of solid particles or the like in proximity to the respective cable is prevented, to improve reliability of operation of said system.

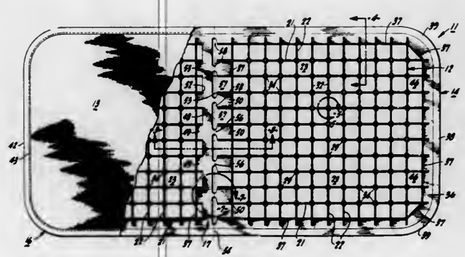
4,189,179
LOW PROFILE CHAIR IRON
Clare J. De Graaf, Grand Rapids, Mich., assignor to Gordon Manufacturing Company, Grand Rapids, Mich.
Filed Jun. 4, 1976, Ser. No. 692,848
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—305 **18 Claims**



1. In a chair iron for controlling the tiling of a first chair part with respect to a support means, the chair iron having a first bracket means adapted to be connected to the first chair part, a second bracket means adapted to be connected to the support means, means pivotably mounting the first bracket means with respect to the second bracket means for tilting movement about a pivot axis, and means for biasing the first bracket means with respect to the second bracket means to a given rest position, the improvement which comprises:

said biasing means being a substantially flat coil spring having a plurality of increasingly smaller diameter coils; and means connecting said coil spring to said first and second bracket means such that said coil spring is axially extended against the spring tension at least during portions of tilting of the first bracket means with respect to the second bracket means, said coil spring having a central axis which is substantially perpendicular to the pivot axis.

4,189,180
VENTILATED SEAT CUSHION CONSTRUCTION
Harold R. Klein, 411 N. Lincoln, Lodi, Calif. 95240
Filed Dec. 11, 1978, Ser. No. 968,442
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—453 **4 Claims**



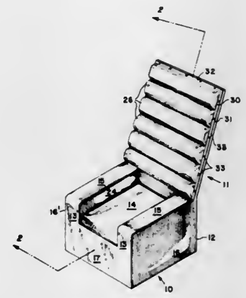
1. Ventilated seat cushion construction comprising:

a. a grid frame including a plurality of fore and aft rows of upstanding ribs and a plurality of transverse rows of upstanding ribs, said fore and aft ribs being oriented at right angles to said transverse ribs and being joined to said transverse ribs at the intersections therewith;

b. cushion support means including a plurality of discs or pads, said discs being centered on said intersections, affixed to the lower edges of said ribs with the bottoms of said discs substantially flush with the plane of said lower edges of said ribs, and located in a plane perpendicular to said ribs; and,

c. ventilation means including a plurality of extended weir-shaped indentations in the upper edges of said ribs, said indentations being located between said intersections and defining a plurality of channels for the passage of air both in a transverse and in a fore and aft direction.

4,189,181
WATER-FILLED CHAIR
David Noble, and Donald Noble, both of R.F.D. 6, Box 358, Richmond, Va. 23231
Filed Apr. 24, 1978, Ser. No. 899,605
Int. Cl.[2] A47C *5/00*
U.S. Cl. 297—455 **7 Claims**



1. A chair comprising a seating portion having an outer structure adapted to position the chair above a floor and to provide a supportive base for other components, said outer structure confining a water-filled container fabricated at least in part of a flexible film and having substantially identically shaped upper and lower surfaces interconnected by a vertically disposed sidewall of six to twelve inch height, said upper surface being flat and horizontal, said lower surface being supported by a shelf positioned within and attached to said outer structure, said sidewall abutting generally vertical surfaces associated with said outer structure, paired arm rests disposed on opposite vertical sides of said container as part of said outer structure, the uppermost portions of which are disposed at a level above the upper surface of said water-filled container, each of said arm rests having recessed therein a water-filled reservoir, and an upright portion originating at the rear of said seating portion and comprising a rigid substantially flat back panel, a surface of which faces said seating portion and supports an assembly of 5 to 20 water-filled elongated enclosures fabricated of thin flexible film and disposed horizontally as a parallel array, said enclosures having an arcuate shape convex in the direction of said seating portion when viewed in a plane perpendicular to the horizontal axes of said enclosures, and having a hydrostatic pressure between 1" and 4" of water, whereby said chair provides the user a buoyancy effect and supportive characteristics generally analogous to those of a water-filled mattress.

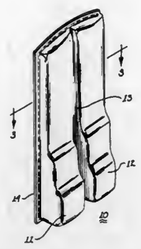
4,189,182
STEP TAPERED BACK REST CUSHION
Stanley A. Rhoe, 414 W. Santa Cruz Dr., Tempe, Ariz. 85281
Filed May 30, 1978, Ser. No. 910,232
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—460 **10 Claims**

1. A back rest for use with seat backs to provide support for a user's back, said back rest comprising in combination:

a. a support member having a longitudinal axis and a lateral axis;

b. a stepped unit secured to said support member for provid-

ing support against a user's back from the region of the user's upper buttocks to at least the region of the user's shoulder blades, said stepped unit being tapered upwardly along the longitudinal axis of said support member; and



c. a channel disposed along the center line of said stepped unit parallel to the longitudinal axis of said support member for receiving the user's spine.

4,189,183

MINING MACHINE WITH CUTTER DRUMS AND SENSING APPARATUS

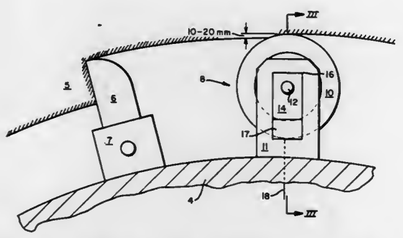
Karl-Heinz Borowski, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,644

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733405

Int. Cl.[2] E21C *39/00*

U.S. Cl. 299—1 **10 Claims**



1. A sensing apparatus in combination with a drum cutter mining machine which includes a controller for an actuator coupled to a pivot arm carrying a driven drum cutter having spaced-apart pick elements projecting radially therefrom for releasing material from the working face of an underground mine, said sensing apparatus including a sensor having a disc disposed to follow a preceding one of said pick elements through rotational movement by said drum cutter, said sensor being coupled to deliver a signal to said controller, and

mounting means including a pivot pin extending generally parallel with the rotational axis of said driven drum cutter to mount said disc for radial loading.

4,189,184

ROTARY DRILLING AND EXTRACTING PROCESS

Harold F. Green, 100 Fir St., Room 21, Sherwood Park, Alberta, Canada (T8A 1Z7)

Filed Oct. 13, 1978, Ser. No. 951,646

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—8 **7 Claims**

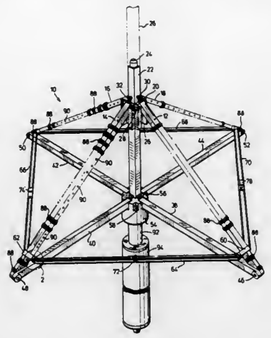
1. A process for in situ extraction of bitumen values from subterranean tar sand deposits, which comprises:

drilling a pilot hole of relatively narrow diameter from the ground surface, through the overburden and the tar sand deposit and a distance of 2-2½ times the thickness of the tar sand deposit into the sub-tar sand formation located beneath the tar sand deposit;

enlarging the pilot hole below the tar sand formation to form a sub-tar sand cavern and extracting the mined materials from said sub-tar sand tar cavern to the ground surface through said pilot hole;

filling the sub-tar sand cavern with aqueous liquid;

enlarging the pilot hole radially in the tar sand deposit by treating the tar sand deposit with circulating high pressure jets of heated mining fluid comprising a mixture of water



and normally gaseous hydrocarbons, the temperature difference between the in situ deposit and the mining fluid immediately prior to issue from the jets being at least 60° F., to cause breakup of the tar sand deposit and interaction of the bitumen portion of said deposit with gases of the mining fluid, and to form a tar sand cavern;

agitating the liquid slurry of tar sand and mining fluid formed in the tar sand cavern to wash and cause downward settling of the sand component of the tar sand;

and upwardly displacing the separated oil component to the ground surface.

4,189,185

METHOD FOR PRODUCING CHAMBERED BLAST HOLES

Archer W. Kammerer, Jr., Tryon, N.C., and Gary R. Johnson, Yorba Linda, Calif., assignors to Tri-State Oil Tool Industries, Inc., Los Angeles, Calif.

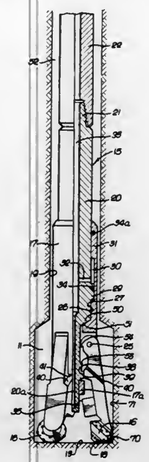
Filed Sep. 27, 1976, Ser. No. 726,947

Int. Cl.[2] E21C *41/00*

U.S. Cl. 299—13 **9 Claims**

1. A method of mining by forming blast chambers in earth formation, comprising drilling a pilot bore hole of a preselected diameter in the formation with a pilot drill bit and to a predetermined bottom depth, removing the drill bit from the pilot bore hole, then lowering on a pipe string a hole opener having initially retracted cutters in the pilot bore hole to an upper location spaced a pre-selected distance above the bottom of the previously formed pilot bore hole, circulating drilling fluid through said pipe string and expanding the cutters while rotating the hole opener to form an upwardly facing shoulder in said formation and lowering the hole opener to progressively remove said formation shoulder and enlarge the pilot bore hole progressively downwardly from said upper location to the bottom of said pilot bore hole to produce a substantially cylindrical blast chamber greater in diameter than the diameter

of the pilot bore hole and having a bottom substantially coplanar with the bottom of said pilot bore hole, removing the hole



opener from the bore hole, placing an explosive in the blast chamber; and detonating said explosive.

4,189,186

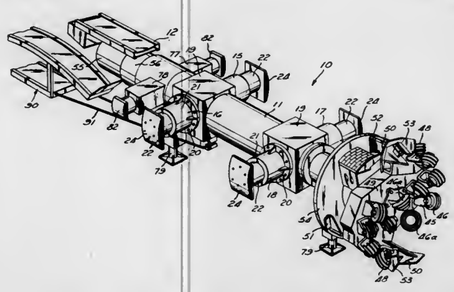
TUNNELING MACHINE

Larry L. Snyder, Richfield, Ohio, assignor to Jarva, Inc., Solon, Ohio

Filed Jun. 12, 1978, Ser. No. 914,743

Int. Cl.[2] E01D *9/10*

U.S. Cl. 299—31 **17 Claims**



1. A tunneling machine comprising a support frame, holding means on said support frame outwardly movable to grip a tunnel wall to fixedly position said support frame in the tunnel in a predetermined alignment, said support frame having a bore therethrough, a hollow piston mounted in said bore for longitudinal movement along the axis of the tunnel and having means defining a piston head slidable along said bore, said piston and bore defining fluid pressure chambers to advance and retract said piston, means coacting between said support frame and said hollow piston to prevent rotation of said hollow piston with respect to said support frame, drive shaft means rotatably mounted in said hollow piston and being fixed against longitudinal movement with respect to said piston, one end of said drive shaft means extending beyond one end of said support frame and driving a rotatable cutter head, and rotatable driving means on the other end of said drive shaft means, said drive shaft means being longitudinally fixed with respect to said driving means so that as said piston is advanced and retracted the hollow piston, the drive shaft means and the driving means travel as a unit.

4,189,187

MINERAL MINING PLANER HAVING PIVOTED FLOOR CUTTER CARRIER

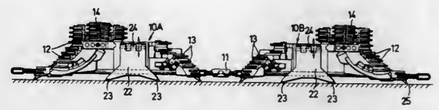
Christoph Rassmann, Lunen; Willy Heyer, Bochum-Gerthe, and Heinrich Wildforster, Gelsenkirchen-Buer, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 909,857

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728178

Int. Cl.[2] E21C *27/32*

U.S. Cl. 299—34 **11 Claims**



1. A mineral mining installation for winning material in a mineral mining working, the installation comprising: a plough and a plough guide, the plough having a plough body movable along the plough guide, and the plough body being provided with a carrier for floor cutter means, the carrier being pivotally mounted on the plough body about a pivot pin whose axis lies substantially parallel to the face to be won and in the longitudinal direction thereof, the carrier being supported and guided on a guide surface of the plough guide, said guide surface being positioned adjacent to the floor of the mining working and being constituted by a face-side end-face edge of a floor plate which forms part of the plough guide and which forms a slide track for the plough, the carrier being positioned substantially centrally of the plough body, and the pivot pin being disposed substantially vertically above said guide surface.

4,189,188

DRUM CUTTER MINING MACHINE

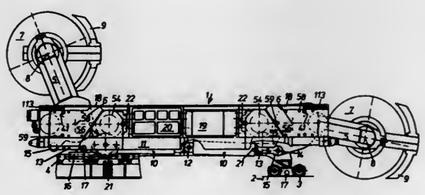
Herbert Schüpphaus, Bochum, and Klaus Oberste-Beulmann, Sprockhövel, both of Fed. Rep. of Germany, assignors to Gebr. Eickhöff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,799

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741660

Int. Cl.[2] E21C *29/22*

U.S. Cl. 299—53 **12 Claims**



1. A drum cutter mining machine adapted for movement along a mine face including the combination of:

a machine frame including a machine body and machine housings joined to the opposite ends of the machine body,

a cutter drum including a support arm carried by each of said machine housings,

drive motor means supported by said machine frame,

means extending along the course of travel by the mining machine for propelling movement thereof along the mine face,

a drive wheel carried by at least one of said machine housings to engage said means extending along the course of travel,

a drive gear means carried by each of said machine housings to transmit torque from said drive motor means to the cutter drum supported thereby, and

a drive train carried by the same machine housing which carries said drive wheel to transmit torque thereto from said drive motor means for propelling movement of said machine frame along the mine face.

4,189,189

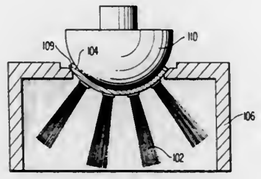
APPARATUS FOR FORMING TUFTED ANGULAR BRUSH CONSTRUCTION

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Continuation-in-part of Ser. No. 757,564, Jan. 7, 1977, Pat. No. 4,109,965. This application Jul. 14, 1978, Ser. No. 924,643

Int. Cl.[2] A46D *1/08*

U.S. Cl. 300—7 **5 Claims**



1. In an apparatus for making tufted constructions including a stock box for supporting parallel cut-to-length synthetic filament, means for picking a plurality of said filament to form a plurality of tufts thereof and means for heat sealing and fusing the non-working ends of said tufts, the improvement comprising:

means for supporting said tufts in a mutually spaced relationship while the ends of said tufts are individually heat sealed and fused, simultaneously;

mold means for supporting a plastic substrate sheet and heat means disposed adjacent thereto for heat softening said sheet;

indexing means coupled to said means for supporting said tufts for seating the fused ends of said tufts while heat softened on the heat softened plastic substrate and for holding said tufts thereon until said fused ends thereof fuse to the plastic substrate, and for subsequently withdrawing said supporting means leaving said tufts mounted on said substrate;

means for imparting a convex or concave configuration to said substrate before said substrate cools and for maintaining said substrate in said configuration until said substrate cools to form a tufted construction whereby each tuft is disposed at a different angle from each adjacent tuft on said substrate.

4,189,190

BRAKE SYSTEM FOR MOTORCYCLES

Hans-Henning Luepertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,630

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1977, 2731201

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 C **6 Claims**

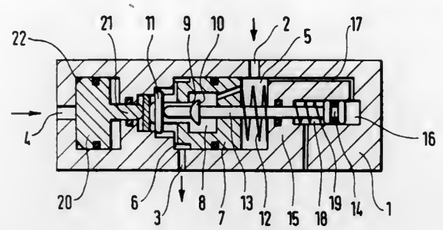
1. A brake system for motorcycles having a hand master cylinder connected to a front-wheel brake and a pedal master cylinder connected to at least one rear-wheel brake through a reducer unit controllable by the pressure from said hand master cylinder, said reducer unit comprising:

a housing having a longitudinal axis;

a first piston disposed within and slidably sealed to an inner surface of a bore of said housing, said first piston having one side providing a boundary for an inlet chamber communicating with said pedal master cylinder and the other side providing a boundary for an outlet chamber communicating with said rear-wheel brake;

a passageway disposed within said first piston coaxial of said axis;

a valve closure member disposed within said passageway coaxial of said axis to close said passageway, said valve closure member being preloaded in the open position and



subject to pressure from said pedal master cylinder in the closing direction;

a second piston disposed within said housing coaxial of said axis and spaced from said first piston, said second piston being subjected to pressure from said hand master cylinder in a direction toward said first piston; and

a rod connected to said second piston coaxial of said axis, said road bearing on said first piston.

4,189,191

CONTROL VALVE ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

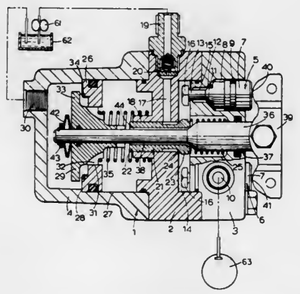
Hugh G. Margetts, Warwickshire, and Andrew J. Assinder, Redditch, both of England, assignors to Girling Limited, Birmingham, England

Filed Jan. 30, 1978, Ser. No. 873,694

Claims priority, application United Kingdom, Jan. 29, 1977, 3756/77

Int. Cl.[2] B60T *15/06*

U.S. Cl. 303—52 **5 Claims**



1. A control valve assembly for a vehicle dual hydraulic braking system comprising means defining an inlet for connection to a source of hydraulic fluid under pressure, means defining a distributor chamber to which fluid is supplied from said inlet, means defining a pair of outlets for connection to brakes on opposite sides of a vehicle, separate brake-applying valves operable independently or simultaneously to cause fluid from said chamber to be supplied to one or both of said outlets respectively, a pressure control valve operative to allow fluid under pressure to be supplied to said distributor chamber from said inlet when at least one of said brake-applying valves is operated, a one-way valve located upstream of said pressure control valve to prevent flow from said chamber in a reverse direction towards said inlet, means defining a bore in communication with said chamber, a back-up piston working in said bore to pressurise fluid in said chamber after said pressure-control valve has opened, a reservoir for fluid, an exhaust port for connection to said reservoir, and an exhaust valve for controlling communication between said chamber, said bore and said exhaust port, said exhaust valve being adapted to close before said control valve can open, wherein said exhaust valve comprises said back-up piston having a central bore, and a valve member, said valve member having an axially apertured stem guided to slide in said bore in said back-up piston and an axially extending radial flange, said flange being adapted to engage with an annular seal on a face of said piston remote from said distributor chamber, to isolate said reservoir from said distributor chamber.

4,189,192

APPARATUS FOR ADJUSTING THE APPLICATION OF BRAKES TO THE WHEELS OF VARIOUS TYPES OF VEHICLES

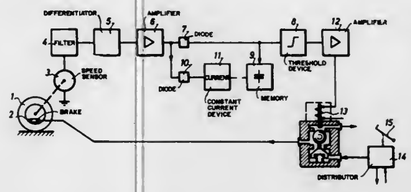
Jean Masclet, Paris, France, assignor to Messier-Hispano, Montrouge, France

Continuation-in-part of Ser. No. 868,462, Jan. 10, 1978, Pat. No. 4,138,164, which is a continuation of Ser. No. 565,253, Apr. 4, 1975, abandoned. This application Jun. 9, 1978, Ser. No. 914,299

Claims priority, application France, Apr. 12, 1974, 74 13045

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—105 **4 Claims**



1. A system for adjustment of braking applicable to the wheels of various types of vehicles and comprising for each of the wheels of the vehicles:

a tachometric generator means for producing a signal as a function of the speed of the wheel,

an assembly of a differentiator and a threshold amplifier having a variable gain as a function of frequency connected to the output of said generator means,

a memory constituted by a first resistor connected in series with a capacitor,

a diode connecting the amplifier and the memory to prevent discharge of the memory,

threshold means connected to the output of said diode, electromagnet means including a coil for controlling braking operation of the wheel,

a power amplifier connected to the output of said threshold means, and to the coil of said electromagnet means for controlling energization thereof,

first discharge circuit means for the memory comprising a second resistor connected between the output of the assembly of the differentiator and amplifier and said capacitor,

second discharge circuit means comprising switching means having a threshold for short-circuiting said first discharge circuit means and comprising a third resistor, and

a voltage divider having two outputs respectively controlling the value of the threshold of the amplifier of said assembly and of said threshold means.

4,189,193

CRANKSHAFT BEARING

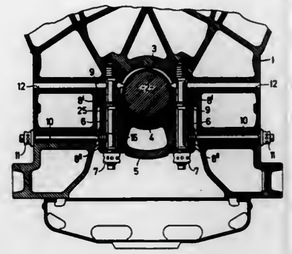
Arnold Schumacher, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 15, 1978, Ser. No. 915,723

Claims priority, application Switzerland, Jun. 17, 1977, 7450/77

Int. Cl.[2] F16C *9/02*

U.S. Cl. 308—23 **3 Claims**



1. A crankshaft bearing comprising

a casing for receiving a part of a crank pin;

a cap releasably received within said casing to define a gap with said casing and to receive a remaining part of the crank pin;

a pair of parallel guide surface means on said casing, each said means including a first portion disposed near said gap and a pair of parallel axially spaced apart portions disposed distally from said gap to define a groove therebetween; and

a pair of parallel guided surface means on said cap, each said guided surface means including a narrow portion disposed near said gap and a widened portion disposed distally from said gap, each said narrow portion being of an axial width to pass through a respective groove of said guide surface means on said casing while being slidably received on a respective first portion of said guide means on said casing and each said widened portion being slidably received on a respective pair of said parallel portions of said guide surface means on said casing.

4,189,194

COATED PLAIN BEARING AND PROCESS OF MANUFACTURE

Glyndwr J. Davies, Southall, England, assignor to The Glacier Metal Company Limited, Middlesex, England

Continuation-in-part of Ser. No. 557,291, Mar. 11, 1975, Pat. No. 4,148,966. This application Oct. 27, 1977, Ser. No. 846,134

Claims priority, application United Kingdom, Jan. 22, 1975, 2750/75

Int. Cl.[2] F16C *19/50;* **C10M** *7/36;* **B05D** *1/24*

U.S. Cl. 308—35 **6 Claims**

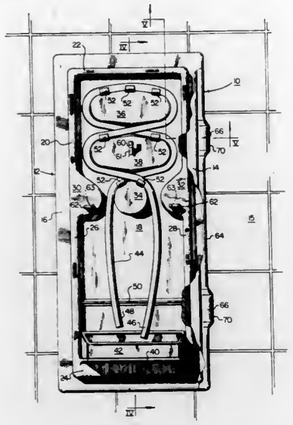
1. A plain bearing comprising a backing of aluminum or aluminum alloy and a coating on the backing and comprising a heat-treated polyarylene sulphide resin incorporating between 0.1 and 5.0% by weight of a strong base comprising a component of a metal from Group I or Group II of the Periodic Table, said base being stable at elevated temperatures up to at least 200° C., for establishing a bond between said backing and said coating.

4,189,195

BATHROOM CABINET

Virginia R. Turney; Frank Turney, both of P.O. Box 534, Denison, Tex. 75020, and Paul C. Gunn, Fort Worth, Tex., assignors to Virginia R. Turney and Frank Turney, both of Dennison, Tex.

Filed Jun. 12, 1978, Ser. No. 914,355
Int. Cl.[2] A61B *19/02;* **A47B** *81/00*
U.S. Cl. 312—209 **14 Claims**



1. A cabinet for storing and concealing personal hygiene objects including a fluid conducting hose, the cabinet comprising:

a frame mountable against a vertical supporting wall and a cover adapted to be pivotally secured to the frame, the frame including a back wall and a plurality of raised surfaces extending outward from the backwall, the frame further including means for supporting a receptacle in a lower portion of the cabinet for receiving the fluid drainage from the hose, the raised surfaces including an oval-shaped rest for supporting the hose in an upper portion of the frame and at least a second rest disposed between the oval-shaped rest, and the receptacle supporting means, the oval-shaped rest and the second rest being adapted to permit the hose to be wrapped around their peripheral edges in a convoluted manner whereby the hose can be stored in a space much shorter than the overall length of the hose while simultaneously allowing the hose to drain completely from both ends into the receptacle.

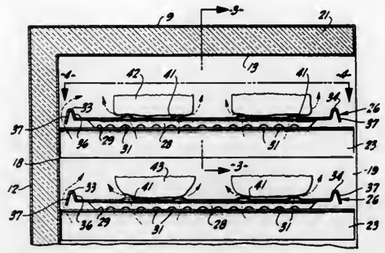
4,189,196

STAGING CABINET AND TRAY COMBINATION

Edward D. Baker, San Francisco, and Nils Lang-Ree, Los Altos, both of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Jun. 12, 1978, Ser. No. 914,358
Int. Cl.[2] A47B *77/08;* **F25B** *29/00*
U.S. Cl. 312—236 **1 Claim**

1. A staging cabinet and tray combination comprising an open-front cabinet including solid top, bottom, back and side walls abutting each other at right angles; a plurality of horizontal ledges secured to said side walls at selected vertical intervals, each of said ledges on one side wall being at the same height as and being directed toward a corresponding one of said ledges on the other side wall; and a plurality of metal trays each being supportable at a selected height in said cabinet on a pair of said ledges, each of said trays including a generally planar, rectangular metal sheet having longitudinally extending, stiffening and supporting downturned side flanges along opposite side edges of said sheet and slidable on said ledges, said side flanges being repetitively bottom-notched all along their bottom edges to leave only small contact areas with said ledges and said rectangular sheet having transversely extending, inverted U-shaped stiffening end ribs along the front and rear edges thereof, each of said end ribs having an inner wall upstanding from said sheet and an outer wall extending downwardly from the top of said inner wall, means upstanding from



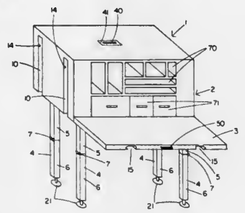
said sheet defining upwardly extending, button-like bosses disposed in groups to support individual bun portions, and means defining perforations in the tops of said bosses for air circulation therethrough and for edge engagement with said bun portions.

4,189,197

PORTABLE DESK

George O. Walker, Jr., 409 Hessel Blvd., Champaign, Ill. 61820

Filed Aug. 16, 1978, Ser. No. 934,208
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—258 **6 Claims**



1. A portable desk comprising:

(1) A main rectangular body having at least one opening in the forward face thereof for storing items,

(2) A table hingeably attached to the forward face of said main body and adapted to be folded (a) upwardly against said forward face of said main body to cover said storage opening therein, and (b) downwardly to form thereby a horizontal work surface,

(3) Means for supporting said table in said work surface-forming position comprising at least one slot formed in the bottom of said table and at least one slot formed in the bottom of said main body, said table slot and said main body slot being in alignment with each other when said table is in said work surface-forming position, and a bar element, said bar element being adapted (a) for slidable movement along the axis of said slots, (b) to be retained within said slots against movement radial to the axis of said slots, (c) to be fitted completely within said table slot wherein said table is in said upward folded position and, (d) when said table is in said work surface-forming position, to be fitted partially within each of said aligned table and main body slots to thereby support said table against vertical movement, and

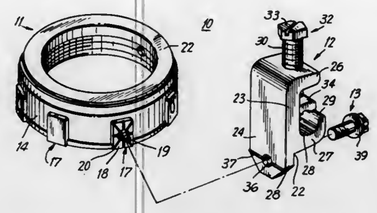
(4) A plurality of leg means, retractable within and extendable from said main body, for supporting said main body, when in said extended position, at least one of said main body support leg means, when in said extended position, being engagable with said bar element whereby said bar element assists to retain said main body support leg means against lateral movement.

4,189,198

CONDUIT GROUND WIRE COUPLING

Eli Reichman, Flushing, N.Y., assignor to Gould Inc., East Farmingdale, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,336
Int. Cl.[2] H01R *15/00*
U.S. Cl. 339—13 **10 Claims**



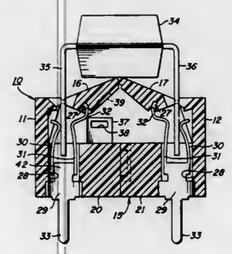
1. A conduit cable coupling device comprising a coupling collar including a protuberance having a first coupling face and disposed on and projecting radially from the outer peripheral surface of said collar and having a threaded radial first bore projecting through said first coupling face, a cable clamp member including a clamp section provided with a clamp tightening screw member and having a second coupling face in superimposed engagement with said first coupling face and a second bore projecting through said second coupling face in coaxial alignment with said first bore, one of said coupling faces having a plurality of recesses forned therein circumferentially spaced about the respective bore in said face and the other of said coupling faces having a projection releasably engaging a preselected recess and a bolt engaging said first and second bores to interlock said collar and clamp members with said projection in engagement with said preselected recess.

4,189,199

ELECTRICAL SOCKET CONNECTOR CONSTRUCTION

Thomas G. Grau, Mendham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1978, Ser. No. 934,326
Int. Cl.[2] H01R *13/54;* **H05R** *1/10*
U.S. Cl. 339—75 MP **13 Claims**



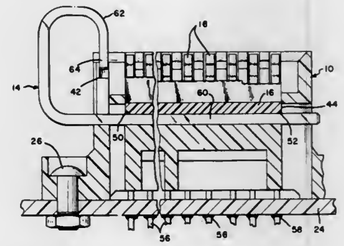
1. An electrical socket connector construction for receiving the terminals of an electrical circuit pack, said construction comprising an electrically insulative, rectangular housing having a top wall, two side walls and a base, said top wall having two parallel rows of apertures parallelly arranged with said side walls and dimensioned to freely admit said terminals, and a plurality of two-bladed contact receptacles fitted into said base in respective alignment with said apertures, characterized in that said top wall is peaked upwardly to present a pair of elongated lever members between said rows of apertures, each of said members has provided on the inner surface near its base, a pawl means running parallel with said side walls, one blade of each of said plurality of contact receptacles is extended to present a detent adapted to engage said pawl means for maintaining said blades open to admit said terminals, and in that said members are adapted to be rotated downwardly by the insertion of said circuit pack to close said one blade of each of said plurality of receptacles on a corresponding one of said terminals.

4,189,200

SEQUENTIALLY ACTUATED ZERO INSERTION FORCE PRINTED CIRCUIT BOARD CONNECTOR

Marvin L. Yeager, Carlisle, and Jerome A. Desso, Oberlin-Steelton, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 851,021, Nov. 14, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 955,058
Int. Cl.[2] H01R *13/59;* **H05K** *1/12*
U.S. Cl. 339—75 MP **22 Claims**



19. A zero insertion force printed circuit board edge connector, comprising:

an insulating housing having a channel therein for receiving a printed circuit board along a board insertion path;

a row of electrical contacts positioned beside the channel, each contact having a contact surface for engaging the printed circuit board when such has been inserted into the channel;

a contact driving member; and

a cam member movable to displace the contact driving member normally of the channel to move each contact between a board receiving first position in which the contact surface of the contact is withdrawn from the board insertion path and a board engaging second position in which such contact surface intersects the board insertion path, characterised in that the contact driving member is formed with relatively stepped surfaces succeeding one another in the longitudinal direction of the channel for sequential engagement with the contacts of the row, to move them sequentially between their first and second positions, in response to the movement of the cam member.

4,189,201

LATCH ASSEMBLY FOR CLAMPING ELECTRONIC COMPONENTS

Samuel R. Romania, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 2, 1979, Ser. No. 16,807
Int. Cl.[2] H01K *13/62, 13/54*
U.S. Cl. 339—75 MP **11 Claims**

1. A latch assembly for applying a clamping force to at least one electronic component installed in a connector which is located between an adjacent pair of parallel rods supported by bracket means mounted adjacent a cooling frame comprising:

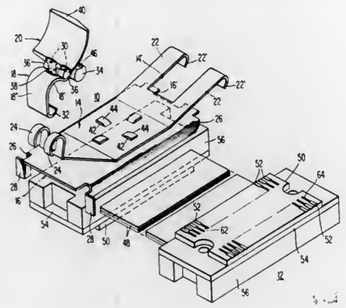
a main spring formed in a shallow, upright truncated V configuration, one extremity of said main spring being centrally notched in a U-shaped configuration such that the extremities of the legs of the U are pivotally wrapped

around one of said adjacent pair of rods, the opposite extremity of said main spring including a projection which is split to provide a pair of circular spaced-apart fingers open at one extremity,

a substantially planar pressure plate affixed to the central portion of said main spring and adapted to contact the surface of said electronic component,

a cam lever comprising first and second spaced-apart cylindrical members having parallel longitudinal axes, a supporting strut joining said cylindrical members to each other,

a spring latch having at respective opposite ends a pair of circular spaced-apart fingers open at one extremity thereof and a hook-like member for engaging the other of said adjacent pair of rods, said spring latch having an arcuate section adjacent the pair of fingers thereof,



said first and second cylindrical members being operatively disposed within said fingers of said main spring and said spring latch resulting in corresponding ones of the pairs of fingers being placed in contact with each other, said supporting strut in said cam lever occupying the respective spaces between sais pairs of fingers;

the rotation of said cam lever about said first cylindrical memer in one direction resulting in the rotation of said pair of fingers of said spring latch about said second cylindrical member in an opposite direction while concurrently being drawn over the surface of said fingers of said main spring, said main spring being deflected and applying a clamping force on said electronic component by way of said pressure plate, the resultant engagement of said arcuate section of said spring latch with said fingers of said main spring being indicative of a fully latched condition in said latch assembly.

4,189,202

RUBBER SLEEVE DEVICES

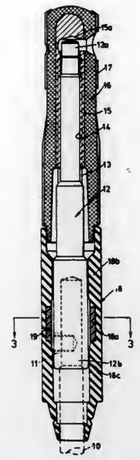
Reidar Myking, Isdalst Ø, Norway, assignor to Hakon Myking Metall-Industri, Isdalst Ø, Norway

Filed Mar. 28, 1978, Ser. No. 890,917
Claims priority, application Norway, Apr. 5, 1977, 771205
Int. Cl.[2] H01R *13/56;* **B23K** *9/28*
U.S. Cl. 339—101 **11 Claims**

1. Rubber sleeve device suitable for surrounding an electrical current conductor member and adapted for axial displacement relation thereto while being prevented from turning relative to said member, said device comprising

(a) a first fastening portion in the form of a support ring composed of a heat-durable, shape-stable, insulating material embedded in the body of said sleeve, said ring being adapted to be in fixed turning engagement as well as in spaced free fit relation with a fastening portion of said member whereby mutual axial movement of said sleeve and said member is permitted, and

(b) a second fastening portion axially bounding said first fastening portion and adapted to engage directly and frictionally another fastening portion of said member



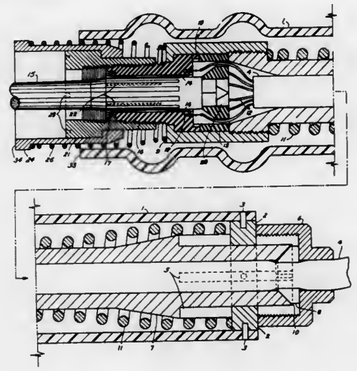
whereby unintentional mutual axial displacement of said sleeve and said member can be prevented.

4,189,203

CIRCULAR CONNECTOR

John W. Miller, Smyrna, Ga., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,434
Int. Cl.[2] G01B *7/12, 7/28;* **H01R** *13/64*
U.S. Cl. 339—184 M **1 Claim**



1. A high density circular connector, comprising:

a. an electrically non-conductive cylindrical male member, having longitudinal conductive segments distributed about its circumference and substantially flush therewith;

b. a V-shaped key, at the inserted end of the male member, for indexing the male member about its cylindrical axis of rotation;

c. an electrically non-conductive female member having a cylindrical passage therethrough, attachment notches at either end of said passage for fixedly retaining multiple connector clips concentric with and along the surface of the cylindrical passage, and a split bushing structural segment, having a tapered and threaded exterior, for engaging a compression ring and concentrically reducing the circumference of the cylindrical passage sufficiently to retain the male member;

d. a V-shaped keyway at one end of said passage in the female member compatible with the V-shaped key of the male member so that each conductive segment is aligned with its respective connector clip when the two members are completely mated; and

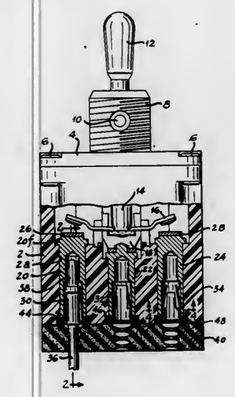
e. multiple conductive connector clips of an elongated shape, having opposite ends thereof fitting into the female member attachment notches, extending slightly into the passage and being electrically connected from their innermost ends.

4,189,204

INTEGRATED WIRE TERMINATION SYSTEM WITH REFLOW BONDED RETAINER

Harry W. Brown, Big Bend, and Erich E. Heider, West Allis, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 16, 1978, Ser. No. 886,992
Int. Cl.[2] H01R *9/06, 13/42*
U.S. Cl. 339—275 R **25 Claims**



1. An integrated wire termination system comprising:

a contact terminal having a cylindrical cavity extending thereinto;

a retainer disposed in said cavity and having an annular portion with a slit thereacross engaging the inner cavity wall and inherently biased radially outwardly thereagainst;

means for securing said retainer in said terminal cavity comprising a coating of a metal or metal alloy on at least one of said retainer annular portion and said terminal inner cavity wall which in reflowed solidified condition comprises an electrical and mechanical bond between said retainer and said terminal, the melting point of said metal or metal alloy being less than that of both said retainer and said terminal, such that during said reflow said retainer annular portion radially expands towards said inner cavity wall to close gaps created therebetween by said reflow and to provide a biased tight fit during formation of said bond; and

wire means including a terminating head pin inserted into said cavity and locked therein by said retainer.

4,189,205

COATED COPPER REFLECTOR

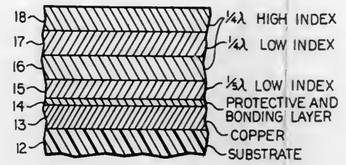
Peter T. Vandehei, Ventura, Calif., assignor to Infrared Industries, Inc., Santa Barbara, Calif.

Filed Feb. 21, 1978, Ser. No. 879,224
Int. Cl.[2] G02B *5/08, 5/28;* **C03C** *17/08*
U.S. Cl. 350—1.7 **6 Claims**

1. In a metallic copper reflector having an enhanced reflectance in the visible wavelength range without substantial degradation in the near infrared and resistant to humidity and abrasion, the improvement comprising:

(a) first layer on said copper of hard transparent material having a thickness of twenty to one hundred Angstroms;

(b) a second layer of low-index transparent material having an optical thickness of 0.2 of a visible wavelength;



(c) a third layer of high-index transparent material having an optical thickness of one-fourth of said visible wavelength;

(d) and at least one pair of layers of first low-index and then high-index transparent materials, each layer having a thickness of one-fourth of said wavelength.

4,189,206

OPTICAL SWITCHING DEVICE

Kiyoshi Terai, Tokyo; Kazuo Yakuwa; Shinya Okuda, both of Kawasaki; Keiji Tanaka, Yokohama, and Takashi Ishikawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Mar. 13, 1978, Ser. No. 885,995
Claims priority, application Japan, Mar. 14, 1977, 52-27703
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **12 Claims**



1. An optical switching device for switching an optical path comprising:

a first fixed optical fiber;

a supporting portion with a groove in the longitudinal direction, for supporting said fixed optical fiber;

a moving optical fiber, having one end fixed and one end free, arranged to be optically connected with said fixed optical fiber;

elastic body means, arranged parallel to said moving optical fiber, and having a guide portion for guiding said moving optical fiber at a position near its free end; and,

a driving coil for providing said elastic body means with an electromagnetic force, whereby said elastic body aligns the free end of said moving optical fiber with said supporting plate, and whereby said fixed optical fiber and said moving optical fiber are connected optically.

4,189,207

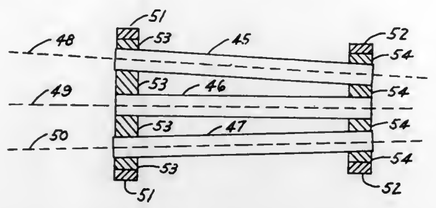
DEEP FOCUS FIBER OPTIC LENS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Mt. Royal, Montreal, Quebec, Canada (H3R 1K3)

Filed Apr. 10, 1979, Ser. No. 28,689
Int. Cl.[2] G02B *5/17*
U.S. Cl. 350—96.25 **2 Claims**

1. An optical lens comprising a bundle of straight cylindrical optical fibers, substantially uniformly distributed, with at least a portion of their cylindrical surfaces coated or treated to prevent internal reflection of optical rays, each of said fibers extending beyond said straight portion, said extended portion

coated to provide substantially complete reflection of internal rays striking its walls, and means for changing the angle between adjacent optical fibers in said bundle in a uniform manner, which comprises a flexible elastic mass which embeds said straight portions of said fibers, attachment means at each end



of said straight portions of said bundle of fibers, and means for rotating said attachment means at one end of said bundle relative to said attachment means at the other end of said bundle, which causes the fibers of said bundle to alter their relative angles while remaining substantially straight

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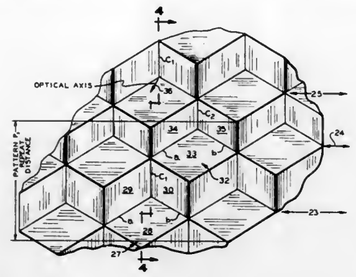
4,189,208
ZINC CHLORIDE OPTICAL FIBERS FOR TRANSMISSION IN THE INFRARED
William H. Grodkiewicz, Murray Hill; LeGrand G. van Uitert, Morris Township, Morris County, and Stuart H. Wemple, Chatham Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 10, 1978, Ser. No. 885,198
Int. Cl.[2] G02B *5/14;* **C03C** *25/02*
U.S. Cl. 350—96.34 **14 Claims**



1. An information transmission system comprising
a source of electromagnetic radiation,
a detector of electromagnetic radiation, and
an optical fiber for transmitting electromagnetic radiation between the source and the detector; the optical fiber comprising a core region having associated with it at least one first value of index of refraction and a cladding region having associated with it at least one second lower value of index of refraction; the core region of the said fiber comprising amorphous $ZnCl_2$; the invention CHARACTERIZED IN THAT the source and detector of electromagnetic radiation are capable of operating in the wavelength range between 1 and 7 microns.

4,189,209
RETROREFLECTOR OF INTEGRATED LIGHT REFLECTING UNITS OF VARYING CONFIGURATIONS
James H. Heasley, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio
Filed Oct. 13, 1978, Ser. No. 950,982
Int. Cl.[2] G02B *5/124*
U.S. Cl. 350—103 **19 Claims**

1. A retroreflector having a wide angle response comprising a light-transmitting body having a substantially smooth face defining a light-receiving surface and an opposite face having an array of substantially parallel rows of light-reflecting units extending over an appreciable area of said opposite face, each row comprising a plurality of juxtaposed light-reflecting units, each unit being formed from three mutually perpendicular facets forming a trihedral angle, each trihedral angle having three mutually perpendicular edges, two of said edges being disposed generally in the direction of a row and the third edge being disposed generally transversely of the direction of said row, the trihedral angles of the light-reflecting units of at least two appreciably adjacent rows having the same corresponding



lengths for said two edges disposed generally in the direction of a row but differing lengths for said edge disposed generally transversely of the row.

4,189,210
VISUAL EFFECT SYSTEM
Michael R. Browning, Balnarring, and Volkert E. Mol, Merricks, both of Australia, assignors to Phillip Andrew Adams, Victoria, Australia
Filed Jun. 19, 1978, Ser. No. 916,860
Claims priority, application Australia, Jun. 27, 1977, PD0575
Int. Cl.[2] G02B *27/22*
U.S. Cl. 350—132 **7 Claims**

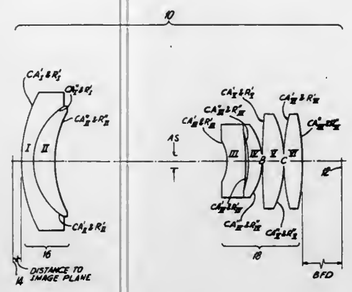


1. Apparatus for producing a three-dimensional effect from a two dimensional image carrier having a focussed area containing principal subject matter and a defocussed area containing incidental subject matter; said apparatus including a camera lens system, an optical device mounted within said lens system, said optical device comprising a module which includes a pair of coloured filter elements of different wavelength passbands, said filter elements being displaced laterally on opposite sides of an axis of said module, said module including a full colour spectrum passage between said filter elements said module being arranged to cause an aberration to be formed on at least some of the incidental subject matter in the defocussed area but not affect the principal subject matter in the focussed area; and a stereoscopic viewer comprising a pair of coloured filter elements one for each eye, said filter elements of said viewer having wavelength passbands which are balanced with respect to the wavelength passbands of said module filter elements so that a respective wavelength passband of said module filter elements is blocked by each viewer filter element but at the same time permitting a quantity of the full colour spectrum to pass.

4,189,211
WIDE ANGLE TELECENTRIC PROJECTION LENS ASSEMBLY
William H. Taylor, South Deerfield, Mass., assignor to Kollmorgen Corporation, Hartford, Conn.
Filed Jan. 3, 1978, Ser. No. 866,229
Int. Cl.[2] G02B *13/22, 9/60*
U.S. Cl. 350—175 TS **9 Claims**

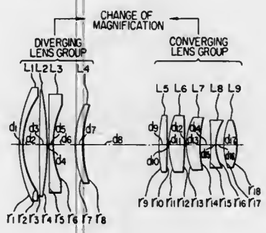
1. A wide angle telecentric lens assembly comprising:
a first meniscus lens element of negative power;

a second meniscus lens element of positive power, said first and second lens elements being bonded together to form a front lens doublet;
an aperture stop positioned behind said front lens doublet;
a third meniscus lens of negative power positioned behind the aperture stop;
a fourth meniscus lens of positive power positioned behind and adjacent said third lens element to provide an air space therebetween, the third and fourth lens elements having radii of curvatures reversed to that of said front doublet;



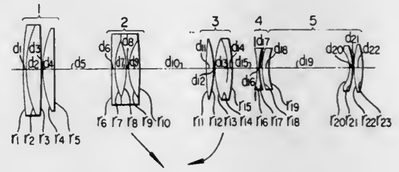
a fifth biconvex lens element positioned behind said fourth lens element, generally close thereto; and
a sixth biconvex lens element positioned behind said fifth lens element, said third, fourth, fifth and sixth lens elements forming a rear lens group adapted to refract light from an object through said aperture stop and said front lens doublet adapted to correct the light rays transmitted through said aperture stop for essentially precise focusing on an image plane, said lens assembly having a relative long back focal distance as compared to the equivalent focal length of the lens assembly.

4,189,212
WIDE ANGLE ZOOM LENS SYSTEM
Norio Mizutani, Kawasaki, and Soichi Nakamura, Kamakura, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed May 4, 1977, Ser. No. 793,593
Claims priority, application Japan, May 6, 1976, 51/50792; Oct. 26, 1976, 51/127766
Int. Cl.[2] G02B *15/16*
U.S. Cl. 350—184 **22 Claims**



1. A wide angle zoom lens system which comprises a diverging lens group and a converging lens group in order from the object side and in which both of said groups are movable on the optical axis of the lens system to vary the air space between said two groups so that the magnification of the image is variable while the image plane is being maintained at a fixed position.
said diverging lens group comprises, in order from the object side, a first member which is a negative meniscus lens component convex to the object side, a second member which is a positive lens component, a third member which is a negative lens component, a fourth member which is a positive meniscus lens component convex to the object side, said four lens components being separate from one another, and an air chamber having a converging effect between said second and said third members, said third and said fourth members being so disposed that the air space therebetween is greater than the center thickness of said third member.
said converging lens group comprising at least four positive lens components and a negative lens component, the foremost and the rearmost lens components of said converging lens group being positive lens components.

4,189,213
ZOOM LENS SYSTEM
Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed May 27, 1977, Ser. No. 801,353
Claims priority, application Japan, May 31, 1976, 51-62427
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 **6 Claims**



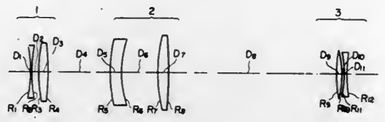
1. A zoom lens system comprising, in the order from the object side;
a positive first lens group including a positive lens component comprising a negative and a positive lens cemented together, and a positive meniscus lens component convex to the object side;
a negative second lens group including a negative lens component and a negative lens component comprising a negative lens and at least one positive lens cemented together;
a positive third lens group including at least one positive lens component and a positive lens component comprising a positive and a negative lens cemented together;
a negative fourth lens group including a negative lens component; and
a positive fifth lens group comprising a forward and a rearward group spaced a substantial distance apart from each other by an air space, said forward group including a positive meniscus lens component convex to the object side, said forward group bearing almost all of the power of the fifth lens group, said rearward group including a negative meniscus lens component convex to the image side and a positive lens component,
said first lens group being movable on the optical axis of the system to perform the focusing function, said second lens group being linearly movable on said optical axis and cooperable with said third lens group non-linearly movable simultaneously with, but in the opposite direction to, said second lens group to perform the magnification changing function of maintaining a predetermined image field position while converging the light flux over the entire magnification changing range, said fourth and said fifth lens groups being fixed for said magnification change and said focusing to thereby form a relay lens.

4,189,214

FOURIER TRANSFORM LENS SYSTEM

Yoshiya Matsui; Setsuo Minami, both of Kanagawa, and Shih Yamaguchi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 748,194, Dec. 7, 1976, abandoned, which is a continuation of Ser. No. 438,850, Jan. 24, 1975, abandoned. This application Feb. 23, 1978, Ser. No. 880,500
Claims priority, application Japan, Jan. 31, 1974, 49-12933
Int. Cl.[2] G02B *9/60, 9/62*
U.S. Cl. 350—215 **4 Claims**



1. A Fourier transform lens system, comprising three lens groups arranged on a common optical axis and spaced apart from each other, said lens groups each including at least two respective lenses and a complete lens system having an asymmetric configuration, the axial distance between lens groups being greater than the largest axial distance between lenses within each lens group, the lens system satisfying a plurality of third order aberration coefficients for an equivalent lens system of unit focal length satisfying the following conditions:

$$|I| \leqq 0.6,\ |II| \leqq 0.2,\ |III| \leqq 0.2,\ |IV| \leqq 0.3$$
$$|V+1| \leqq 0.2, \text{ and } |P| \leqq 0.6$$

wherein for the lens system; I is the coefficient of spherical aberration, II is the coefficient of coma, III is the coefficient of astigmatism, IV is the coefficient of sagittal field curvature, V is the coefficient of distortion, and I^s is the coefficient of spherical aberration of pupil; an object being placed in the primary focal plane of the complete lens system producing a spectrum of the object in the secondary focal plane, an axial spacing S_1 of the primary focal plane of the complete lens system from the front surface of the lens adjacent the primary focal plane satisfying $-0.5 \leqq S_1 < 0$, while the spacing t'_k of the secondary focal plane of the complete lens system from the secondary surface of the lens adjacent the rear focal plane satisfying $0 < t'_k \leqq 0.5$, wherein the focal length of the complete lens system is normalized as a unit; said axial spacing S_1 is represented by a negative value; and the spectrum of an object placed at the focal plane of the complete lens system is formed in the other focal plane.

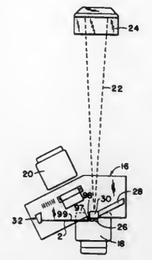
4,189,215

METHOD AND APPARATUS FOR THE CORNEAL POSITIONING OF A PATIENT'S EYE

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments Inc., San Leandro, Calif.

Filed Mar. 22, 1976, Ser. No. 669,132
Int. Cl.[2] A61B *3/14, 3/10, 3/00*
U.S. Cl. 351—7 **31 Claims**

1. A method for determining the position of a patient's eye during an eye examination comprising the steps of: generating a light beam which is substantially perpendicular to and traverses the patient's line of sight at the desired position of the patient's eye along a line of sight; moving the light beam and the patient's head relative to each other in the direction of the line of sight; and observing when the light beam is substantially tangent to the patient's cornea, whereby the iris of the patient's eye becomes illuminated with increased illumination when the



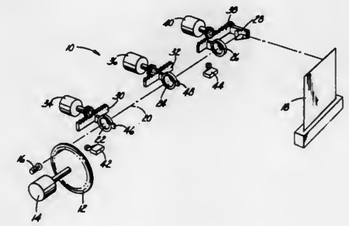
position of the patient's cornea along his line of sight coincides with that of the light beam.

4,189,216

OPTICAL SYSTEM FOR PHOTOGRAPHIC COMPOSING APPARATUS

Francis S. Szabo, Morristown, N.J., assignor to AM International, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 523,557, Nov. 14, 1974, Pat. No. 3,968,501. This application Jun. 10, 1975, Ser. No. 585,610
Int. Cl.[2] B41B *13/00*
U.S. Cl. 354—7 **8 Claims**



1. A photocomposition machine having a collimating and decollimating lens system wherein said decollimating lens is driven in a composition path through escapement steps, characterized in that an aerial image is provided to said collimating lens by a variable focus lens positioned to project an illuminated character to an aerial image located along an optical path passing through the variable focus lens, collimating lens and decollimating lens, means for moving said variable focus lens parallel to the optical path relative to a character font for providing an aerial image of preselected size,

processor means responsive to the preselected size for selecting the proper positions for the collimating lens and variable focus lens; and

stepper means for moving in discrete steps the collimating lens and variable focus lens to the positions selected by the processor means in order to focus the aerial image onto the focal plane of said collimating lens.

4,189,217

DOCUMENT PRINTING SYSTEM

Amnon Goldstein, Manhasset, N.Y.; Robert W. Swett, Smoke Rise, N.J., and David L. Greenwood, New York, N.Y., assignors to Sweda International, Inc., Paramus, N.J.

Continuation of Ser. No. 675,401, Apr. 9, 1976, abandoned. This application May 1, 1978, Ser. No. 901,869
Int. Cl.[2] G03B *15/00, 17/06*
U.S. Cl. 354—7 **21 Claims**

1. System for printing particular information-bearing symbols corresponding to data emanating from a source, comprising:

source means capable of generating data in a serial sequence;

memory means for storing information-bearing symbols;

a medium comprising a printable record material adapted to bear printed information-bearing symbols;

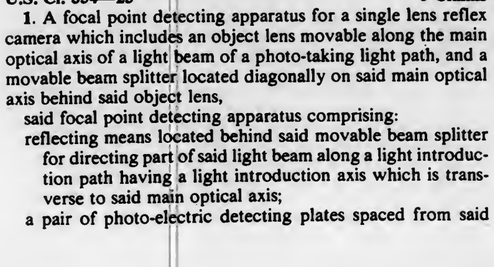
selection means comprising illumination means for selecting particular symbols from said memory means corresponding to data emanating from said source;

transmitting means for transmitting each of said particular symbols from said memory means to said medium;

said memory means comprising mask means for storing said information-bearing symbols in a visible format;

said mask means being movable relative to said illumination means for bringing said information-bearing symbols into operative proximity to said illumination means for subsequent selective illumination thereof;

said mask means comprising an endless loop of material embodying said information-bearing symbols;



said information-bearing symbols being arranged on said mask in rows and columns, an entire column of said symbols being brought into operative proximity to said illumination means at a given time and successive columns of said symbols being brought into operative proximity to said illumination means at corresponding successive times;

said illumination means ordering said particular symbols by selectively illuminating, simultaneously, certain desired symbols included within the given column which is in operative proximity with said illumination means;

said transmitting means transmitting in a column-by-column format said selectively illuminated desired symbols to said record material; whereby

said record material is printed by simultaneously printing the desired symbols in a column-by-column sequence, the columns being substantially perpendicular to the direction in which said record material would conventionally be read by a human agency.

4,189,218

APPARATUS FOR DETECTING FOCAL POINT

Kaneo Saito, Hino; Michio Yagi, Hachioji; Kunio Nakajima, Fuchu, and Takehiko Hamaguchi, Hauchioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,547
Claims priority, application Japan, Jun. 1, 1976, 51-64401
Int. Cl.[2] G03B *3/10, 7/08*
U.S. Cl. 354—25 **3 Claims**

1. A focal point detecting apparatus for a single lens reflex camera which includes an object lens movable along the main optical axis of a light beam of a photo-taking light path, and a movable beam splitter located diagonally on said main optical axis behind said object lens,

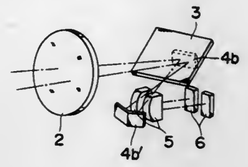
said focal point detecting apparatus comprising:

reflecting means located behind said movable beam splitter for directing part of said light beam along a light introduction path having a light introduction axis which is transverse to said main optical axis;

a pair of photo-electric detecting plates spaced from said reflecting means and located on opposite sides of said light introduction axis, each plate generating an electric signal in response to an image projected thereon, the value of which signal varies according to the position of said image relative to a cardinal point on said plate, said cardinal point being related to the focal point of said object lens;

a pair of additional lenses, each additional lens being located between one of said plates and said reflecting means on an optical measuring axis which is disposed diagonally relative to said light introduction axis;

said pair of additional lenses being operative to project an image appearing at a basic point on said light introduction



axis onto their respective plates, the position of said basic point being determined by the position of said object lens on said main optical axis and the position of said images on said plates relative to said cardinal points being determined by the position of said basic point;

second reflecting means disposed between said reflecting means and said pair of additional lenses;

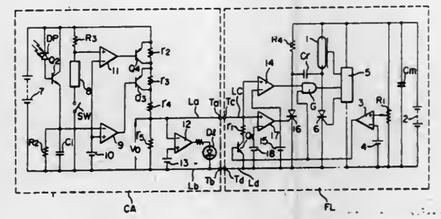
and a circuit connected to receive and compare electric signals from said pair of plates and to provide an output signal indicative of the relationship between the positions of said images projected thereon relative to the cardinal points of said plates and therefore indicative of the position of said object lens relative to said focal point.

4,189,219

CONTROL SYSTEM FOR FLASH PHOTOGRAPHING APPARATUS

Hiroshi Hasegawa, Tokyo; Yoshiaki Ohtsubo, Kawasaki; Sakuji Watanabe, Yono, all of Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kousaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,075
Claims priority, application Japan, Jun. 23, 1976, 51-73103
Int. Cl.[2] G03B *15/05, 17/38*
U.S. Cl. 354—33 **5 Claims**



1. A control system for flash photographing apparatus comprising:

a flash unit capable of automatically adjusting the amount of emitted flash light in accordance with brightness of an object to be photographed;

a camera for photographing said object illuminated with the flash light from said flash unit; and

a pair of electric channels electrically interconnecting said flash unit to said camera;

said flash unit comprising:

a main capacitor for accumulating charges for flash illumination;
a flash tube for emitting flash light;
a trigger circuit for triggering said flash tube;
a circuit for terminating emission of the flash light;
a first signal generator circuit for generating a first signal when a voltage across said main capacitor reaches a predetermined value;
a series arrangement of a first resistive element and a first switching device connected across the pair of electric channels, said first switching device being operative in response to the first signal;
a second detecting circuit for detecting a second voltage across the pair of electric channels; and
a third detecting circuit for detecting a third voltage across the pair of electric channels;
said camera comprising:
a synchronizing switch;
a second signal generator circuit for generating a second signal in response to an actuation of said synchronizing switch;
a photoelectric conversion element for receiving the flash light reflected from said object to be photographed to convert the light into an electrical signal;
a third signal generator circuit operative in response to the electrical signal for generating a third signal when the photoelectric conversion element receives a predetermined amount of the light;
a second switching device operative in response to the second signal;
a third switching device operative in response to the third signal;
a light-emitting indicator device;
a first detecting circuit for detecting a first voltage across the pair of electric channels;
a power source; and
a series arrangement of second, third and fourth resistive elements connected to said power source, said second and third resistive elements being connected in parallel to said second and third switching devices, respectively, said fourth resistive element being connected across the pair of electric channels;
said first switching device being connected to produce, when energized, the first voltage on the pair of electric channels, said light-emitting indicator device being connected to be turned on by said first detecting circuit in response to the first voltage detected;
said second switching device being connected to produce, when energized, the second voltage on the pair of electric channels, said trigger circuit being connected to be energized by said second detecting circuit in response to the second voltage detected;
said third switching device being connected to produce, when energized, the third voltage on the pair of electric channels, said terminating circuit being connected to be energized by said third detecting circuit in response to the third voltage detected.

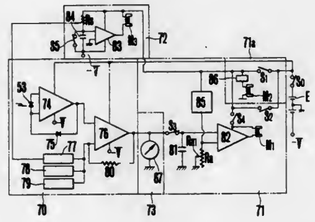
4,189,220

DIAPHRAGM CLOSING DEVICE FOR A CAMERA WITH AN ELECTROMAGNETIC CONTROL SYSTEM

Masayoshi Yamamichi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1977, Ser. No. 761,961
Claims priority, application Japan, Jan. 27, 1976, 51-7666
Int. Cl.[2] G03B *7/08, 9/02, 17/38*
U.S. Cl. 354—43 **11 Claims**

1. A diaphragm closing arrangement for a camera having electrical exposure control means and an interchangeable lens, said arrangement comprising:
(1) an interchangeable lens including:
(a) a diaphragm device;
(b) an aperture ring which is rotatably mounted at an outer ring portion of the interchangeable lens and is provided with aperture value graduations for manual adjustment and an automatic exposure position mark; and
(c) aperture preset means which engages with the diaphragm device and the aperture ring and presetting the diaphragm device by the aid of an urging member at a value corresponding to an aperture value graduation at which the aperture ring is set;
(2) a camera body which permits mounting the interchangeable lens thereon including:
(a) automatic exposure control means provided with computing means for computing an aperture value by receiving information on the brightness of an object to be photographed and information on setting made for photographing;
(b) automatic exposure aperture control means provided with engaging means which engages with said aperture preset means to be moved by the urging force of said urging member, converting means for producing an electrical signal corresponding to the degree to which said engaging means is moved, locking means for locking said engaging means in a predetermined position, and stopping means which stops the movement of the engaging means, the automatic exposure aperture control means thus being arranged to move said aperture preset means to a position corresponding to the moving degree of the engaging means;
(c) release means for releasing said locking means in response to a release action of the camera;



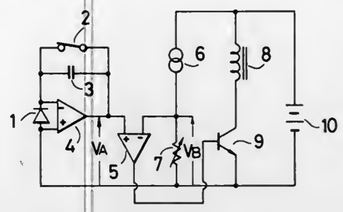
(d) electrical control means for producing a control signal on the basis of the signal produced by said computing means and the signal produced by the converting means;
(e) electromagnetic means which is electrically connected to said electrical control means and engages with said stop means for actuating the stop means in response to said control signal in such a manner as to stop the engaging means at a position corresponding to a computation output produced by said computing means; and
(f) automatic aperture means provided with actuating means which stops down the diaphragm device into a position where the aperture preset means which is interlocked with said engaging means is movable; and
(3) diaphragm closing means suitable for combination with said camera and interchangeable lens, the diaphragm closing means including:
(a) an engaging means unlocking member arranged to permit operation thereof from the outside of the camera to release said engaging means from the locking action of said locking means; and
(b) manual diaphragm closing means for permitting manual operation of said actuating means and said unlocking member from the outside of the camera to cause said aperture preset means to rotate to an aperture value to be set on the aperture ring and at the same time to cause said actuating means to close the diaphragm device down to the set aperture value.

4,189,221

ELECTRICAL SHUTTER CIRCUIT

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1978, Ser. No. 876,372
Claims priority, application Japan, Mar. 2, 1977, 52-22361
Int. Cl.[2] G03B *7/08, 17/18*
U.S. Cl. 354—51 **4 Claims**



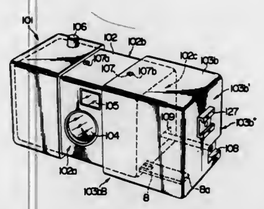
1. An analog electrical shutter circuit comprising:
a light receiving element;
an operational amplifier for applying a biasing voltage of approximately zero volts to said light receiving element;
a switch which is switched in accordance with a selected ASA sensitivity range;
at least two integrating capacitors which are selectively connected between the output and the input of said operational amplifier in response to the operation of said switch and in accordance with a selected range of ASA sensitivity;
at least two resistance elements;
means for selecting one of said at least two resistance elements in accordance with a selected range of ASA sensitivity, said means for selecting being mechanically coupled to said switch;
means for supplying a current through said selected resistance elements;
means for adjusting the magnitude of said supply current in accordance with a desired range of received light; and
a comparator for comparing a voltage corresponding to a desired quantity of received light, as determined by said supplied current and said selected resistance element, to the integration voltage of a selected one of said integrating capacitors to control the shutter speed, whereby, the range of voltages received by said capacitor is decreased.

4,189,222

CAMERA WITH SLIDING CASE

Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 9, 1977, Ser. No. 859,011
Claims priority, application Japan, Feb. 3, 1977, 52-11878[U]; Apr. 1, 1977, 52-41327[U]; Apr. 1, 1977, 52-41328[U]
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—126 **7 Claims**



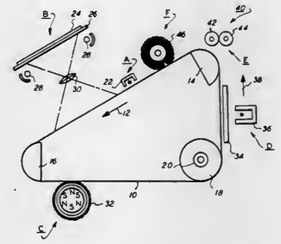
1. The combination of a camera and a strobo unit comprising a sliding case movable relative to a camera body between a first position in which it covers at least the taking lens of the camera and a second position in which the taking lens is exposed, an accessory receiving member mounted on the sliding case, a switch operating mechanism arranged within the sliding case and camera, said strobo unit including a mounting fixture adapted to engage the accessory receiving member and also including a power switch means disposed in opposing relationship to said switch operating mechanism, the power switch means being closed by said switch operating mechanism when the sliding case is moved to the second position.

4,189,223

STEERING AND SUPPORTING SYSTEM FOR A PHOTOCONDUCTIVE BELT

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1978, Ser. No. 922,720
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 BE **20 Claims**



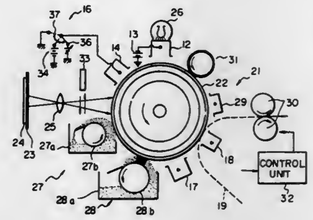
1. An apparatus for tracking an endless belt in a pre-determined path of movement, including:
means for supporting said belt, said supporting means includes a pivotably mounted post defining an interior chamber; and
pneumatic means, in communication with the interior chamber of said post and being responsive to a deviation of the belt from the pre-determined path of movement, for pivoting said post so that the belt tracks in the pre-determined path of movement.

4,189,224

TWO COLOR ELECTROSTATIC COPYING MACHINE

Katsuo Sakai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

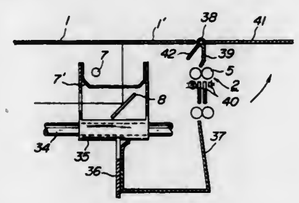
Filed Oct. 5, 1978, Ser. No. 949,001
Claims priority, application Japan, Oct. 13, 1977, 52/122817
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 **17 Claims**



1. An electrostatic copying machine including a photoconductive member having a conductive substrate, a first photoconductive layer formed on the substrate and a second photoconductive layer formed on the first layer, the first and second layers having different spectral sensitivities, characterized by comprising:
first charging means for applying a first electrostatic charge of a first polarity to the second layer;

second charging means for applying a second electrostatic charge of a second polarity opposite to the first polarity to the second layer in the absence of light;
imaging means for radiating a light image of an original document onto the second layer to form an electrostatic image on the photoconductive member through localized photoconduction;
first developing means for electrostatically charging a first toner of a first color to the second polarity and applying the first toner to the second layer to form a first toner image;
second developing means for electrostatically charging a second toner of a second color to the first polarity and applying the second toner to the second layer to form a second toner image; and
control means for selectively actuating the first and second charging means and the first and second developing means for operation.

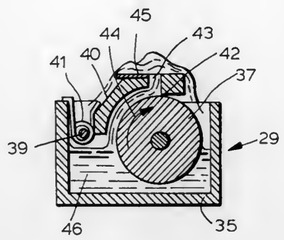
4,189,225
ELECTROPHOTOGRAPHIC APPARATUS
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed May 9, 1978, Ser. No. 905,037
Claims priority, application Japan, May 11, 1977, 52-53228
Int. Cl.[2] G03G *15/28*; G03B *27/48*
U.S. Cl. 355—8 **9 Claims**

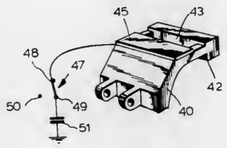


4. An electrophotographic apparatus comprising a fixed copy board for exposing and scanning a document by a movable optical system, and a sheet feed device adjacent to the board for exposing a sheet-like document during conveying thereof, the movable optical system being fixed to a position corresponding to the sheet feed device when the sheet feed device is used, the sheet feed device being mounted movably and being accommodated in the apparatus by moving and movable optical system to the position corresponding to the fixed copy board when the sheet feed device is not used.

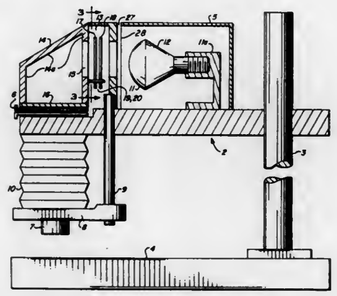
4,189,226
ELECTROPHOTOGRAPHIC APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON A SLIDE FILM
Isao Yamaguchi, Kyoto; Noboru Katakabe, Katano, and Masaru Onishi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 30, 1977, Ser. No. 838,402
Claims priority, application Japan, Sep. 30, 1976, 51/118113
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **11 Claims**

1. An electrophotographic apparatus for developing an electrostatic latent image on a slide film which has a transparent film base, a conductive layer and a photosensitive layer having an electrostatic latent image thereon, and which is mounted on a slide mount, said apparatus comprising: a supporting means for supporting and holding a slide film in a processing position with said electrostatic latent image facing downwards; and developing means movable below and across a slide film held in said processing position, said developing means having a developing vessel containing a liquid developer, a developing roller partially immersed in said liquid developer for carrying a layer of the liquid developer along the peripheral surface thereof upon rotation of said roller, and developer overflow means frictionally abutting the peripheral surface of said roller for intercepting the layer of the liquid developer carried by said roller and directing said liquid developer into contact with said electrostatic latent image on the slide film in said processing position and having a developing electrode plate on the upper surface thereof facing the film held in the processing position.



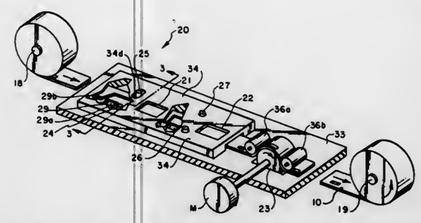


4,189,227
ILLUMINATING SYSTEM FOR PHOTOGRAPHIC COLOR ENLARGEMENT OR COPYING
Siegfried Barbieri, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy
Filed Aug. 17, 1978, Ser. No. 934,697
Claims priority, application Italy, Sep. 20, 1977, 4853 A/77
Int. Cl.[2] G03B *27/76*
U.S. Cl. 355—35 **8 Claims**



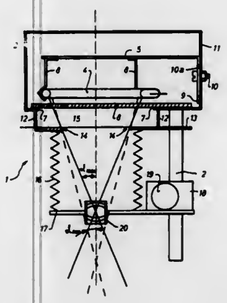
1. An illuminating system for photographic color enlargement or color copying, having a source of light for generating a beam of light in which the ratio of the energy distribution at three wave length ranges does not agree with the spectral sensitivity of photographic copying material at said three wave length ranges, said light exhibiting a different energy excess at two such wave length ranges in relationship to the spectral sensitivities of the copying material at these wave length ranges, said illuminating system comprising: means for continuously changing the spectral energy distribution of the light by inserting filters in two colors into a portion of the light beam from the light source, one of said filters having a first filter color that influences both wave length ranges and another of said filters having a second filter color that influences only the wave length range with the larger excess energy of the two wave length ranges.

4,189,228
APPARATUS FOR DETECTING LOCATORS ON A FILM STRIP
Robert J. Farrell, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 2, 1979, Ser. No. 8,662
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—41 **3 Claims**



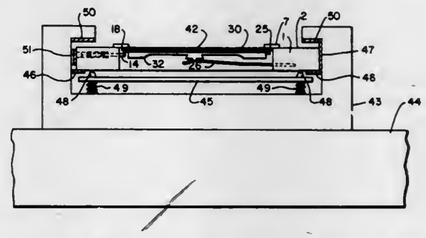
1. In an apparatus for detecting one or more locators on a strip which is subject to transverse wavering movement as it is longitudinally advanced, said apparatus having means for detecting the locators, and first and second guiding means disposed adjacent opposite longitudinal edges of the strip for contacting the edges to position the strip relative to the detecting means, the improvement comprising:
means supporting the first and second guiding means and the detecting means and operable to move transversely, in response to tranverse wavering movement of the strip against the guiding means, for maintaining the detecting means in a substantially constant position relative to each locator as it approaches the detecting means.

4,189,229
ENLARGER
Emile A. H. Guillaume, Ballaigues, Switzerland, assignor to Zelacolor Systems Establishment, Vaduz, Liechtenstein
Filed Mar. 6, 1978, Ser. No. 883,470
Claims priority, application Switzerland, Mar. 8, 1977, 2854/77
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—67 **11 Claims**



1. Enlarger, comprising:
an enlarger head;
a light source in the enlarger head; the light source being annular in shape and having an axis; the light source directing light out of the head and along the light source axis;
a diffuser plate on the head and placed so that light from the light source passes by the diffuser plate as the light is directed out of the head; the light source being positioned near to the diffuser plate such that light from the light source directly impinges upon the diffuser plate;
a film guide for supporting an original to be enlarged, the film guide having an exposure window therethrough; the film guide being placed such that light passing the diffuser plate passes the film guide and the exposure window therethrough;
a lens spaced from the exposure window and at the side thereof away from the diffuser plate;
the diffuser plate being arranged with respect to the lens and the exposure window such that the orthogonal projection of the light source directly on the diffuser plate corresponds to the greatest surface of the plate that is seen by the lens.

4,189,230
WAFER HOLDER WITH SPRING-LOADED WAFER-HOLDING MEANS
Gabriel Zasio, Los Altos, Calif., assignor to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 26, 1977, Ser. No. 845,496
Int. Cl.[2] G01N *21/30*; G03B *27/02, 27/62*; H01L *21/68*
U.S. Cl. 355—76 **17 Claims**

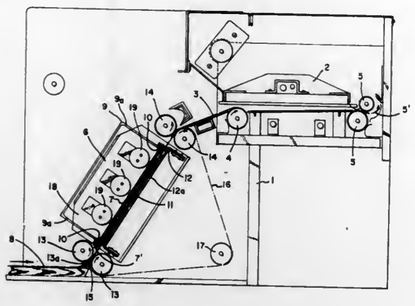


1. A wafer holder for holding a wafer with an upper surface of the wafer exposed, comprising,
a frame having an opening defined by an inner wall for receiving said wafer,
a flange extending from said inner wall into a portion of said opening and having a bottom surface for receiving the upper surface of said wafer,
stop means secured in a fixed position relative to said flange and extending into said opening,
first forcing means forcibly extending from said frame to force said wafer into contact with said stop means, whereby said wafer is rigidly held by said holder.

4,189,231
APPARATUS FOR THE CONTINUOUS EXPOSURE OF SHEET OR STRIP COPY MATERIAL
Hans Haus, Jahnstr. 7, D-6250 Limburg, Lahn, Fed. Rep. of Germany
Filed Oct. 26, 1978, Ser. No. 954,746
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747911
Int. Cl.[2] G03B *27/30*
U.S. Cl. 355—100 **12 Claims**

1. Apparatus for continuously processing sheet or strip copy material fed from a horizontal plane comprising, an endless belt conveyor for moving the copy material, a translucent rigid plate disposed in a plane inclined to the horizontal plane, a backing element gapped from and pressing the copy material against said translucent rigid plate during movement through an exposure compartment, two pairs of driving rollers disposed forwardly and rearwardly of said translucent rigid plate, the drive rollers of each of said two pairs of drive rollers having a drive gap disposed in the plane of the gap between said translu-

cent rigid plate and said backing element, and an inclined guide strip for the copy material extending from the horizontal plane



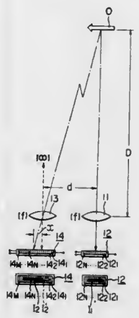
into said drive gap between the pair of drive rollers disposed forwardly of said translucent rigid plate.

4,189,232

RANGE DETECTING METHOD AND APPARATUS

Noriyuki Asano, Kawasaki; Yukichi Niwa, Yokohama; Mitsutoshi Owada, Yokohama; Takaaki Yamagata, Yokohama, and Shin Tsuda, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,339
Claims priority, application Japan, Jan. 6, 1977, 52-505
Int. Cl.[2] G01C *3/00;* G03B *7/08*
U.S. Cl. 356—1 **32 Claims**



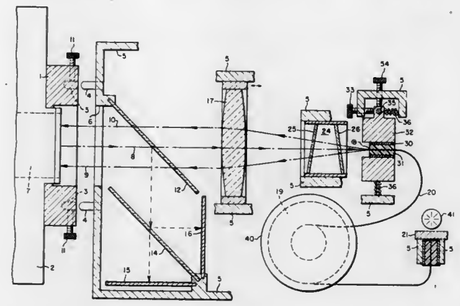
1. A method of detecting a range of an object comprising the steps of:
(a) deriving first and second images of said object along different sight lines;
(b) electrically sensing said first and second images to produce an electrical analog signal for each image element of said first and second images;
(c) quantizing said electrical analog signal to produce quantized data for each image element of the first and second images;
(d) storing the quantized data on N successive elements of the first image and successively storing, on one set-by-set basis, the quantized data on each of a plurality of different sets of N successive elements of the second image;
(e) comparing the stored quantized data on said set of the N successive elements of the second image with the stored quantized data on the N successive elements of the first image at every time the quantized data on a set of the N successive elements of the second image are stored;
(f) detecting, through said comparison process, a set of the N successive elements of the second image which can be regarded as being substantially identical with the N successive elements of the first image; and
(g) determining the range of the object on the basis of a location, within the second image, of said set of the N successive elements of the second image which has been regarded as being substantially identical with the N successive elements of the first image through said detection process.

4,189,233

PASSIVE OPTICAL RANGE SIMULATOR DEVICE

Fred S. Hurt, Ellicott City, and Michael A. Cross, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 7, 1977, Ser. No. 775,061
Int. Cl.[2] G01C *3/08;* G01J *1/02*
U.S. Cl. 356—5 **2 Claims**



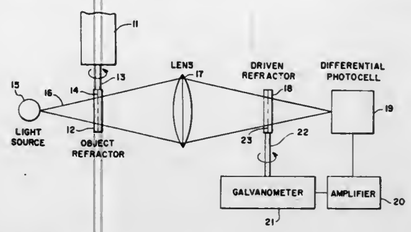
1. An improved passive optical range simulator device comprising,
an adapter member for mechanical fixed-position coupling with an optical radar ranger system having a working aperture means via which incoming and outgoing optical radar beams enter and leave along parallel axes, respectively,
a housing having a testing aperture means for registry with said working aperture means through affiliation with said adapter member,
a primary attenuator in said housing having a planar glass primary attenuator plate disposed in the path of said parallel axes at a tilt angle with respect thereto,
a common refractive focusing lens assembly in said housing in the path of both of said parallel axes for transforming said incoming and outgoing beams between such parallel axes and a focal spot in a common plane,
an optical fiber coil in said housing having one end for disposition in said common plane in registry with said focal spot and having a reflector at its opposite end for enabling such fiber coil to function as an optical delay medium, said reflector being effective at the wavelength of the optical radar beam and transparent to visible light and a light source behind said reflector to light up the aforesaid one end of said optical fiber for alignment with the aforesaid focal spot, and
position adjusting means for said one end.

4,189,234

NONCONTACTING METHOD FOR MEASURING ANGULAR DEFLECTION

Emmett L. Bryant, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,390
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **9 Claims**



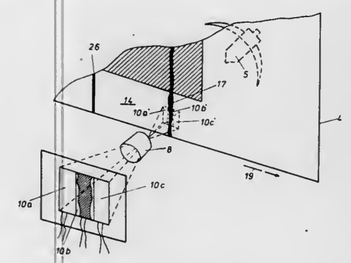
1. Apparatus for measuring the angular deflection of an object about a first axis through the object comprising:
a first flat refractor with a uniform thickness attached to said object such that said first axis is perpendicular to the thickness dimension of said first refractor;
a second flat refractor with a uniform thickness not attached to said object; and
electro-optical means for deflecting said second flat refractor about a second axis in the plane of said first axis and perpendicular to the thickness dimension of said second refractor in response to and substantially equal to any deflection of said first flat refractor about said first axis whereby the deflection of said second refractor about said second axis is substantially equal to the angular deflection of said first refractor about said first axis.

4,189,235

TEST DEVICE FOR DYNAMICALLY MEASURING THE DEGREE OF DIRT ACCUMULATION ON BANK-NOTES

Norbert Guter; Josef Gier, both of Munich; Herbert Bernardi, Arget, and Erhard Lehle, Muelheim, all of Fed. Rep. of Germany, assignors to G.A.O.Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,734
Claims priority, application Austria, Nov. 29, 1976, 8827/76
Int. Cl.[2] G01N *21/32*
U.S. Cl. 356—239 **20 Claims**



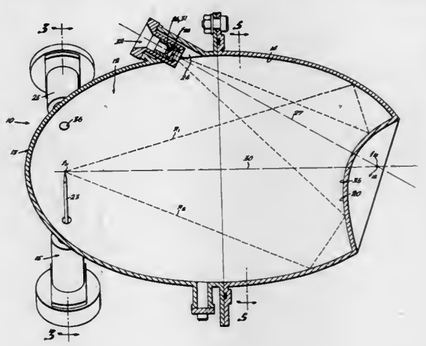
1. A testing device for dynamically testing a bank-note, said device comprising:
means to provide illumination for for an elemental area of a bank-note;
means to provide relative movement between said bank-note and the illumination to cause the illumination to scan a narrow track across said bank-note to modify the intensity of the illumination as a function of darkness of elemental areas scanned;
transducer means to receive the modified light and to produce electrical signals corresponding to the intensity of the modified light;
comparison means connected to said transducer means to compare a first one of said signals produced when a first said elemental area is illuminated with a second one of said signals produced when a second said elemental area adjacent said first elemental area is illuminated and to produce a comparison signal that has a value based on successive ones of said comparisons;
integrating means connected to said comparison means to produce an integrated signal based on changes in value of said comparison signal as the illumination scans along the track; and
indicating means connected to said integrating means to indicate whether or not the integrated signal has exceeded a predetermined value as the illumination scans between two predetermined points along the track.

4,189,236

ELLIPSOID-CONIC RADIATION COLLECTOR AND METHOD

Walter R. Hogg, South Miami, and Albert Brunsting, Miramar, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 20, 1978, Ser. No. 888,560
Int. Cl.[2] G01J *3/30;* G01N *21/00*
U.S. Cl. 356—317 **15 Claims**



1. A radiation collector apparatus for analyzing individually isolated particulate material by illuminating the particulate material to produce a source of detectable radiation, comprising:
a reflector chamber including a first reflector surface and a second reflector surface,
said first reflector surface having a substantially ellipsoidal configuration with a first focus and a second focus defining a first symmetry axis,
said first reflector surface having said first focus disposed at the source of detectable radiation,
said second reflector surface having a primary focus and a secondary focus defining a second symmetry axis,
said second reflector surface having said primary focus disposed at said second focus of said first reflector surface,
said first symmetry axis being disposed in angled relationship with respect to said second symmetry axis,
whereby detectable radiation converged toward said second focus of said first reflector surface is reflected by said second reflector surface in an organized beam without significant stray light for further processing and analysis.

4,189,237

METHOD OF PREPARING AND POURING CONCRETE ON A BUILDING SITE AND A CONTAINER AND A VEHICLE FOR USE WITH THIS METHOD

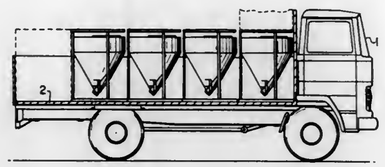
Willem J. H. Bake, c/Darro, No. 7, Madrid II, Spain

Continuation of Ser. No. 758,795, Jan. 12, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,612

Claims priority, application Netherlands, Jul. 6, 1977, 7607466

Int. Cl.² B28C *5/20, 7/04*

U.S. Cl. 366—2 **4 Claims**



1. The method of mixing and pouring concrete at a building site, which comprises the steps of:
   (a) providing a self-contained storage and discharge unit having two compartments and a bottom discharge means responsive to weight-supported relation of the unit on a cement mixer for commingling the contents of the two compartments while discharging them downwardly as a confined stream;
   (b) measuring and storing individual predetermined quantities of cement and aggregate respectively in said two compartments, each such quantity of cement and aggregate respectively being relatively proportioned to provide, when mixed with a predetermined quantity of water, a batch of predetermined quality concrete having a predetermined volume;
   (c) transporting said unit to a building site;
   (d) hoisting said unit to a position above the inlet to a cement mixer and discharging said stream of commingled contents of the two compartments into the mixer by lowering said unit into said weight-supported relation on said mixer; and
   (e) introducing a measured quantity of water into said mixer to provide said predetermined volume of concrete having said predetermined quality.

4,189,238

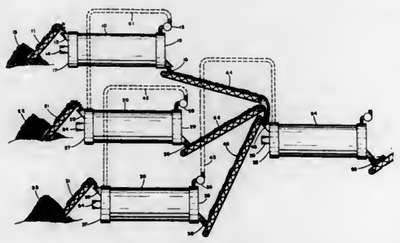
RECYCLED ASPHALT-AGGREGATE PROCESS AND APPARATUS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Division of Ser. No. 729,705, Oct. 5, 1976, Pat. No. 4,096,588, which is a continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743. This application Jan. 9, 1978, Ser. No. 868,176

Int. Cl.² B28C *5/46, 7/10;* **C10C** *3/00*

U.S. Cl. 366—7 **8 Claims**



1. In a process of recycling used and crushed solid asphaltic concrete composition particles comprising a mixture of asphalt and aggregate and having at least a portion of particles passing a No. 8 U.S. Series sieve the improvement comprising heating said composition particles passing said No. 8 sieve by direct exposure to hot gases of combustion having a maximum temperature below about 1000° F.

5. In a process of recycling used and crushed solid asphaltic concrete composition particles comprising a mixture of asphalt and aggregate and having at least a portion of particles passing a No. 4 U.S. Series sieve the improvement comprising heating said composition particles passing said No. 4 sieve by direct exposure to hot gases of combustion having a maximum temperature of below about 1000° F.

4,189,239

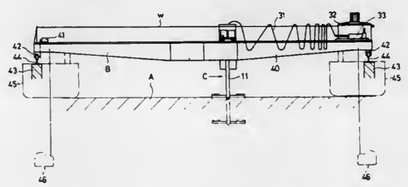
APPARATUS TREATING SLUDGE DEPOSITS

Masao Miyaguchi; Tateo Kawamura, both of Tokyo; Kazuyoshi Nakanishi, Yokohamashi, and Shoji Kohno, Chibashi, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Dec. 2, 1977, Ser. No. 856,788

Int. Cl.² B01F *7/18, 15/02*

U.S. Cl. 366—169 **5 Claims**



1. A sludge deposit treating apparatus comprising a girder including first running means, which is arranged so that it can be moved above and across a sludge deposit layer along the longitudinal direction of the sludge deposit layer, a holding frame on said girder and including second running means moving in the longitudinal direction of said girder, said holding frame having longitudinal upper and lower beams; a moving frame disposed within said holding frame and being capable of being moved in the vertical direction between said longitudinal upper and lower beams of the holding frame through guide means, lift means disposed between said holding frame and moving frame to move the moving frame in the vertical direction repeatedly, a hollow kneading shaft having the upper end thereof rotatably held on the moving frame and the lower portion thereof rotatably and slidably held on the holding frame, agitation blades attached to the lower end of the kneading shaft, each agitation blade having an extrusion opening communicated with the hollow portion of the kneading shaft, a driving device mounted on the moving frame to rotate the kneading shaft, and chemical supply means communicated with the top end of the hollow portion of the kneading shaft.

4,189,240

MIXER FOR ANIMAL FEED

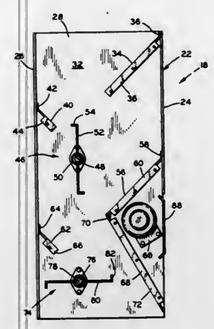
Lyle W. Scheppele, Dubuque, Iowa, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Filed Jan. 31, 1979, Ser. No. 7,882

Int. Cl.² A23N *17/00;* **B01F** *5/26*

U.S. Cl. 366—186 **10 Claims**

1. A mixer for receiving and mixing different animal feeds, said mixer comprising a housing forming a generally vertical passage, a first baffle in said passage slanted downwardly and inwardly toward the center of the passage from a side thereof, a second baffle in said passage slanted downwardly and inwardly toward the center thereof from the side opposite said first baffle, a third baffle in said passage below said first baffle and on the same side of said passage as said first baffle and extending upwardly and inwardly toward the center of said passage from the side and terminating adjacent the inner edge of said first baffle, an agitator including an agitator blade below said first and second baffles and rotatably mounted in an intermediate portion of said passage, said blade having a sufficient



width to exceed the horizontal distance between the inner edges of said first and second baffles when said blade is in a horizontal position, said third baffle being positioned to receive feed thrown from said agitator blade and deflect it downwardly, and means for driving said agitator blade at a high rate to maintain the feed contacted thereby in a fluidized condition.

4,189,241

ICE-CREAM MAKING MACHINE FOR HOUSEHOLD USE

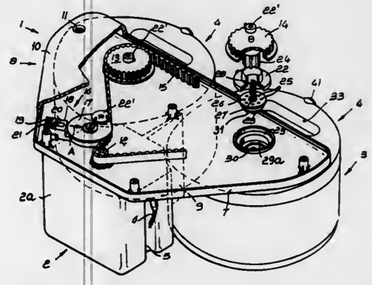
Lapo Baldacci, via lungo l'Affrico, 212, Firenze, Italy

Filed Jun. 1, 1978, Ser. No. 911,606

Claims priority, application Italy, Jun. 23, 1977, 3482 A/77; Jan. 10, 1978, 3306 A/78

Int. Cl.² B01F *7/32*

U.S. Cl. 366—245 **5 Claims**



1. An ice-cream making machine for household use, comprising a motor drive unit, a box like bracket mounted on said unit and having a portion projecting in cantilever fashion therefrom, a gearing arranged in said bracket and including a pair of gear wheels rotatably supported in said bracket portion and provided with coupling means projecting out of said bracket portion, a pair of cylindrical containers for the mixture to be whisked, a pair of covers each closing a respective of said containers, spindle elements each rotatably supported at the center of said covers and having means for rotative engagement with said coupling means, stirrer elements rotatably connected on said spindle elements and projecting inside said containers and means for detachably supporting each of said covers under said bracket portion in position in which said coupling means are in rotative engagement with respective spindle elements, said coupling means being disengageable from the spindle elements during lateral removal of the covers.

4,189,242

MIXER WITH A MIXING MECHANISM REVOLVING IN A CYLINDRICAL OR PARTLY CYLINDRICAL MIXING CONTAINER

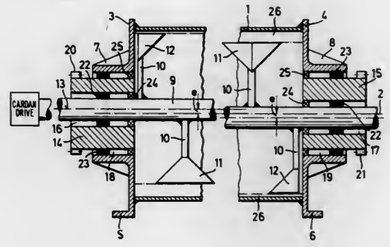
Karlheinz Lüke, Egolzwil, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbau GmbH, Paderborn, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,728

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800371

Int. Cl.² B01F *7/04, 9/22*

U.S. Cl. 366—288 **5 Claims**



1. A mixer comprising an at least partly cylindrical mixing container having a longitudinal axis; a driven mixing mechanism revolving about the said longitudinal axis, the mixing mechanism having a central shaft which supports mixing tools on radial arms ending at a short distance from the internal wall of the mixing container; and means for rotatably mounting the said central shaft to revolve over an arc of a circle running concentrically round the said longitudinal axis of the mixing container, said means permitting the rate of rotation of the said central shaft about its own axis to be independent of the rate of rotation about said arc of a circle.

4,189,243

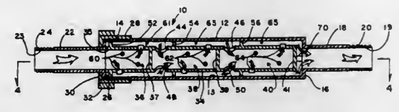
IN-LINE MUD SHEARING APPARATUS

Wesley F. Black, 2014 10th Ave., E., Apt. 206, Williston, N. Dak. 58801

Filed Jan. 25, 1978, Ser. No. 872,052

Int. Cl.² B01F *5/06*

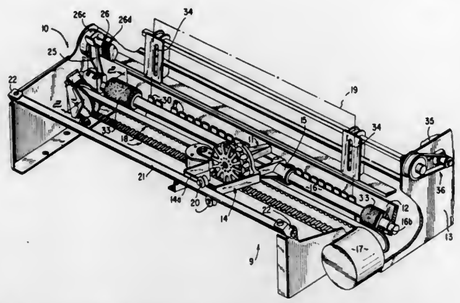
U.S. Cl. 366—336 **11 Claims**



1. Fluid mixing and shearing apparatus comprising:
   an elongated tube with one end open and the opposite end closed and being divided into a plurality of chambers by a plurality of partition plates axially spaced apart from each other within said tube, each of said chambers having an enlarged inlet opening and a discharge port in its respective wall section of said tube, said one open end of said tube being the inlet opening of the first chamber, and the subsequent chambers having enlarged apertures in the walls of the respective tube sections for each chamber, said apertures being the inlet openings in said subsequent chambers; and
   an elongated casing positioned in radially outward spaced concentric relation around said tube, one end of said casing being sealed to the outer peripheral surface of said

tube and the opposite end being open to fluid flow and forming an outlet opening.

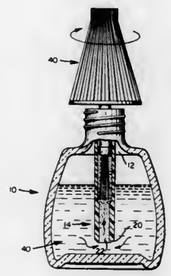
4,189,244
PLATEN GAP ADJUSTER
Gregory F. Harrison, San Jose, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.
Filed Nov. 21, 1977, Ser. No. 853,346
Int. Cl.[2] B41J *11/20*
U.S. Cl. 400—55 **3 Claims**



1. In a printer of the type having a print head which traverses across a page to be printed, wherein said printer has a stationary frame, the improvement for adjusting the gap between said print head and a platen behind said page, comprising:
a shaft having a circular cross-section and extending across said page in spaced parallel relation to said platen, said print head being bearing mounted to said shaft so as to be slideable along said shaft across said page;
said shaft having integral offset spindles, said spindles having a common axis that is offset from but parallel to the axis of said shaft, said spindles being journal mounted to said frame so that slight rotation of said spindles about said common axis will cause eccentric rotation of said shaft so as to impart slight transverse displacement to said bearing mounted print head, whereby the spacing between said print head and said platen is adjusted without impairing the slideability of said print head along said shaft; and
means for imparting rotation to said spindles and shaft comprising a lever arm attached to said shaft and extending laterally therefrom, and a cam action knob rotationally mounted to said frame, said knob having a cam integral therewith, said lever arm being ordinarily biased against said cam so that rotation of said knob will impart slight rotation to said shaft via said cam and said lever arm, said lever arm being moveable away from contact with said cam so as to impart a relatively large amount of rotation to said shaft, thereby imparting maximum transverse displacement of said print head away from said platen to facilitate insertion and removal of paper from said printer.

4,189,245
SUCTION PRODUCING DISPOSABLE PUMP AND DISPENSER
Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425
Filed Apr. 28, 1978, Ser. No. 900,990
Int. Cl.[2] A46B *11/00, 11/02*
U.S. Cl. 401—126 **1 Claim**

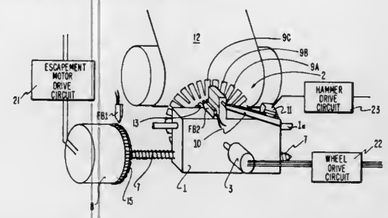
1. A suction producing disposable pump and dispenser in combination with a container having an open neck with liquid to be dispensed therein, the liquid filling essentially the entire container with the exception of said neck and comprising:
a vertically elongated hollow member having a top end with a circular opening therein having a first diameter and with an outwardly extending circular peripheral lip, said member having a bottom end with a circular opening therein having a second and smaller diameter, said ends being interconnected by a vertical bore having integral upper, middle and lower sections, said lower section defining a first cylinder having a diameter equal to said second diameter, said middle section defining a second cylinder having a third diameter which is intermediate the first and second diameters in size, said upper section defining an inverted truncated core with an upper end having a diameter equal to said first diameter and with a lower end having a diameter equal to said third diameter, the member having an outer surface with a vertical groove extending upward to a point just below said lip, said member being disposed in the container with the lip resting upon the top of the open neck and the outer surface of the member which is within the neck engaging the inner surface of the neck in airtight manner, the bottom of the member being only slightly above the bottom of the container, the groove extending upward along the entire length of the neck whereby insertion of said member in said container causes any air in the container below the neck to be expelled via said groove;
a vertically elongated cylindrical piston having a bottom enlarged end defining a third cylinder having a diameter



larger than said second diameter, said piston extending downwardly into the bore and manually movable up and down therein between a raised position at which the piston is completely removed from the member and a lowered position at which said enlarged end engages the lower end of said second cylinder, the piston movement causing the first cylinder to be filled with fluid by suction;
a plurality of elongated parallel bristles secured at their upper ends to said enlarged end of the piston and extend downward, said bristles, when the piston is in the lowered position, extending downwardly into said first cylinder to reach the opening in the bottom end of said member, the bristles being charged with fluid when disposed in the first cylinder whereby when the piston is removed, the bristles can be used to transfer fluid charged thereon to a suitable surface; and
a cap detachably securable to the outer surface of the neck of the container and secured to the top end of the piston, said cap when detached from the neck being manually operated to enable the piston and bristles to be removed from and replaced into the member.

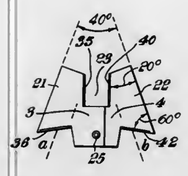
4,189,246
VARIABLE PRINT-HAMMER CONTROL FOR ON-THE-FLY-PRINTING
Milburn H. Kane, Round Rock, and Norman F. Barrow, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1977, Ser. No. 863,450
Int. Cl.[2] B41J *1/30, 9/38*
U.S. Cl. 400—144.2 **1 Claim**

1. A printer for printing at a plurality of print positions along a printing line on a document, comprising, in combination;
a carrier;
means for moving said carrier at a plurality of different velocities along said print line past said print positions in response to an escapement control signal;
a rotatable type element mounted on said carrier, and having characters thereon;
means for rotating said type element in response to a type selector signal;
a print hammer mounted on said carrier and operable to impact said type element when a selected one of said characters is positioned at a print position at which said selected one of said characters is to be printed;
means for actuating said print hammer in response to a hammer firing pulse;
a plurality of buffer registers adapted to receive and store data indicative of the values of said escapement control signal, said type selector signal, and said hammer firing pulse, and to receive and store data concerning the time of initiation and duration of said hammer firing pulse;
a plurality of operating registers for receiving and storing data from said buffer registers;



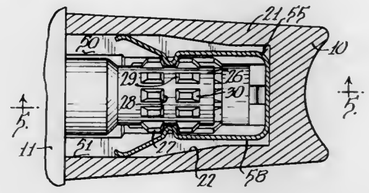
a selection control logic circuit for receiving said data indicative of the value of said type selector signal from said operating registers to provide said type selector signal;
an escapement control logic circuit for receiving data in said operating registers indicative of the value of said escapement control signal to provide said escapement control signal to cause said moving means to move said carrier at one of said plurality of different velocities; and
a hammer control logic circuit for receiving data in said operating registers concerning initiation time and duration of said hammer firing pulse to provide said hammer firing pulse at the correct point in time during movement of said carrier and for one of a plurality of different durations to cause said hammer to impact said type element, said duration of said hammer firing pulse being dependent upon said type selector signal, and said initiation time being dependent upon said duration and said escapement control signal.

4,189,247
STRUCTURAL CONNECTOR
Sten B. Burwall, Hjartervagen 7, 142 00 Trangsund, Sweden
Filed Jul. 20, 1978, Ser. No. 926,444
Int. Cl.[2] F16B *7/00*
U.S. Cl. 403—4 **7 Claims**



1. A structural connector comprising
a first connector portion having a first fixing surface to which a first structural member may be secured and having first and second securing surfaces;
a second connector portion having a second fixing surface to which a second structural member may be secured and having third and fourth securing surfaces; and
coupling means pivotally connecting said first and second connector portions for pivoting said first and second connector portions about a pivot axis between a first position in which said first and second fixing surfaces are arranged at a first angle and said first and third securing surfaces form a first mouth for receiving a third structural member and a second position in which said first and second fixing surfaces are arranged at a second angle and said second and fourth securing surfaces form a second mouth for receiving a third structural member.

4,189,248
SNAP-ON-HANDLE STRUCTURE
George R. Sully, Waseca, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Filed Dec. 22, 1977, Ser. No. 863,470
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—11 **5 Claims**



4. A snap-on handle structure including a handle with an internal recess having a wall, an operating shaft with detent notches and a sloped cam surface with the latter disposed adjacent an end of the operating shaft, and a generally U-shaped spring member secured to said handle and positioned in said recess with a pair of spaced-apart arms with outwardly diverging free ends extending toward an open end of the recess and engaging said wall, each of said arms having a generally V-shaped hook portion spaced from said free ends and spaced from said recess wall to define a pair of inclined legs engageable in a pair of said detent notches, one of said legs engaging said cam surface to deflect said arms and the hook portions outwardly toward said wall as the handle is placed on the shaft and the other of said legs engaging the detent notch to hold the handle on the shaft against removal and with said free ends still outwardly diverging after handle placement on the shaft.

4,189,249
REPLACEMENT TORQUE ROD ASSEMBLY
Donald R. Gaines, Farmington; Jon M. Smallegan, Farmington Hills, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.
Continuation of Ser. No. 787,667, Apr. 15, 1977, abandoned.
This application Sep. 22, 1978, Ser. No. 945,093
Int. Cl.[2] B25G *3/00;* **F16D** *1/00;* **F16G** *11/00*
U.S. Cl. 403—27 **2 Claims**



1. A fixed dimension replacement rod assembly for field replacement in vehicles which comprises:
(a) a first movable joint having a first containing body and a

fastening means extending axially therefrom movable relative to the body and a first elongate solid member permanently secured to and extending radially from the containing body,

(b) a second movable joint having a second containing body and a fastening means extending axially therefrom movable relative to the body and a second elongate solid member permanently secured to and extending radially from the second containing body,

(c) a third elongate tubular member having at opposite ends a telescoping slidable fit with each of said first and second elongate members, the third member comprising an outer member of the telescoping parts encircling first and second elongate members which comprise inner members, the outer member having radial openings spaced from the ends thereof, and

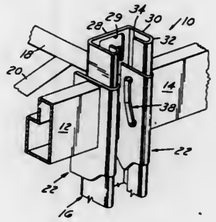
(d) circular welds around the ends of the encircling outer member of the telescoping members joining the outer member to said inner members and puddle welds in said radial openings joining said outer member to said inner member to provide a torque rod of fixed dimension for installation in a prescribed position in a vehicle.

4,189,250

SELF-LOCKING CONNECTOR FOR STORAGE RACKS

George A. Abbott, West Bloomfield, and Leonard J. Dudzik, Brighton, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Dec. 28, 1978, Ser. No. 973,913
Int. Cl.[2] F16B *7/22;* F16L *41/00*
U.S. Cl. 403—190 **8 Claims**



1. A connector for attaching a horizontal beam to a vertical post of a storage rack, said connector being of U-shaped section having one leg fixed to an end of the horizontal beam and a free leg terminating in attachment means for engagement with the vertical post, and said vertical post including a portion adapted to be received between said connector legs; wherein the improvement comprises:

locking means carried by said free leg of said connector for limiting relative horizontal separating movement between the horizontal beam and the vertical post;

said locking means including a locking portion resiliently biased to a locking position in which said locking portion projects from said free leg toward said fixed leg of the connector and is adapted to overlap a locking surface on said vertical post portion in response to engagement of said attachment means with the vertical post.

4,189,251

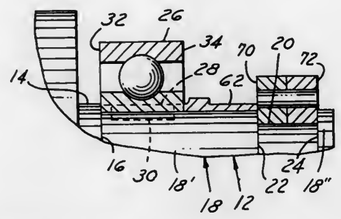
EXPANDABLE ANNULAR LOCKING DEVICE FOR A SHAFT

Romolo P. Bianco, 2803 Grindley Park, Dearborn, Mich. 48124

Filed Dec. 15, 1978, Ser. No. 969,787
Int. Cl.[2] B25G *3/00*
U.S. Cl. 403—261 **9 Claims**

1. In combination, a shaft of varying diameter, with a first portion of the shaft containing a first abutment and with a second portion of the shaft having a diameter smaller than the first portion and being provided with an annular groove having oppositely facing second and third abutments which are axially aligned with and spaced for said first abutment, at least one sleeve-like element mounted on said second portion of the shaft at the side of said groove closest to said first abutment for engagement therewith, a spacer sleeve mounted on said second portion of the shaft at one end operably engaging said sleeve-like element and at its other end extending to said annular groove;

an annular locking device for retaining said sleeve-like element against said first abutment, said locking device being formed by a pair of arcuate members disposed in said



annular groove about opposite portions of said shaft, each of said arcuate members having a pair of first and second flat surfaces which face said second and third abutments respectively, said first pair of flat surfaces facing and operatively engaging said spacer sleeve;

first means pivotally interconnecting the one ends of said arcuate members; and

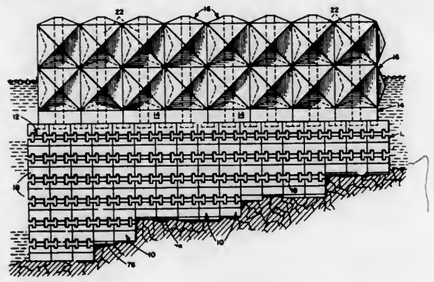
second means interconnecting the other ends of said arcuate members for securing said arcuate members within the shaft annular groove and tightly against said spacer sleeve for anchoring said sleeve-like element between said first and third abutments.

4,189,252

UNDERSEA PLATFORM CONSTRUCTION SYSTEM

Calvin R. Inman, Bronx, N.Y., assignor to Cygnus X-5 Company Inc., Bronx, N.Y.

Filed Sep. 1, 1978, Ser. No. 938,757
Int. Cl.[2] E02B *3/06;* E02D *27/52;* E04C *1/10*
U.S. Cl. 405—33 **3 Claims**



1. An undersea platform construction comprising:

(a) a plurality of foundation blocks, each of said foundation blocks comprising a rectahedral parallelepiped opposite faces of which are concave and convex, respectively, the opposite faces being sized and shaped to interengage matingly, said foundation blocks being interfitted into a three-dimensional array;

(b) a plurality of base pad units supporting said foundation blocks, each of said base pad units comprising a rectahedral parallelepiped one face of which is convex, the opposite face of which has a plurality of protruding lugs, and the intermediate faces of which have T-shaped slots extending the length of each side, said base pad units being interfitted into a two-dimensional array by means of I-shaped keys which fit into adjacent T-shaped slots;

(c) a plurality of leg blocks supporting said base pad units, each of said leg blocks comprising a rectangular parallelepiped one face of which is convex, the opposite face of which is concave, the opposite faces being sized and shaped to interengage matingly, and the intermediate faces of which have T-shaped slots in each side, said plurality of leg blocks being interfitted into a three-dimensional array by means of the mating concave-convex faces in one direction and by means of T-shaped key assemblies to be recited which fit into adjacent T-shaped slots in the other two directions, some of said base pad units interengaging matingly with some of said foundation blocks by means of interengaging, mating convex and concave faces; and

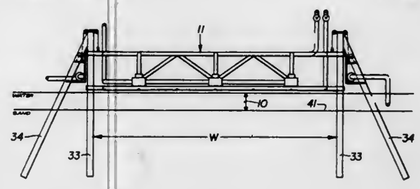
(d) a plurality of key assemblies, each of said key assemblies comprising four T-shaped keys symetrically mounted on a planar base, the heads of said T-shaped keys extending perpendicularly to the plane of said planar base and fitting into T-shaped slots in adjacent leg blocks.

4,189,253

PROCESS AND APPARATUS FOR MAINTAINING A DESIRED DEPTH OF A WATERWAY

Charles B. Pekor, P.O. Box 4010, Columbus, Ga. 31904

Filed Jun. 23, 1978, Ser. No. 918,393
Int. Cl.[2] E02B *3/02*
U.S. Cl. 405—74 **4 Claims**



1. The process of maintaining a desired depth of a waterway wherein the bottom is subject to accumulation of sediment such as sand,

(a) permanently placing an array of jet pumps on a common, vertically movable support, which support substantially spans the waterway and is mounted for said vertical movement by means alongside the waterway,

(b) lowering the entire array of pumps to a depth greater than the desired depth of the waterway,

(c) supplying injection water to each of the pumps from a common source of water under pressure whenever sediment accumulates enough to decrease the desired depth of the waterway, whereby the sediment is discharged by the pumps as a sediment-water slurry, and

(d) removing the sediment-water slurry from the waterway through a common conduit.

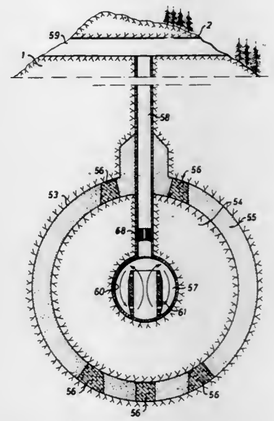
4,189,254

SYSTEM FOR THE STORAGE OF RADIOACTIVE MATERIAL

Bengt Å. Åkesson, Goteborg, Sweden, assignor to Tore Jerker Hallenius, Sundsvall and Karl Ivar Sagefor, Oregrund, both of, Sweden

Filed Jun. 21, 1978, Ser. No. 917,410
Claims priority, application Sweden, Jun. 30, 1977, 7707639
Int. Cl.[2] G21F *7/00;* E02D *29/00*
U.S. Cl. 405—128 **5 Claims**

1. a system for the storage of radioactive material in rock comprising a substantially spherical cavity excavated in the rock, said cavity being surrounded by a shell of rock and said shell being surrounded by a shell of clay, characterized in that within the cavity is arranged a vertically standing tubeshaped member of a heat resistant and mechanically strong material which divides the cavity into an outer space and an inner space and is provided at its lower and upper ends with openings connecting the outer space with the inner space, that both the inner space and the outer space are filled with substantially spherical bodies of a heat resistant and mechanically strong material which bodies are provided with through openings and arranged so that these openings extend at an angle to the horizontal plane, and that the radioactive material to be stored is formed into rods which are placed within said openings in part of said spherical bodies in such manner that the rods of radioactive material are at a certain distance from the insides of the openings, and that those spherical bodies which contain radioactive material are situated in the lower part of the interior of the tubeshaped member.

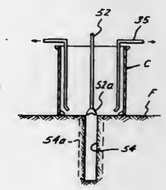


4,189,255

SEA-FLOOR SHORING CELLAR AND METHOD OF INSTALLING SAME

John J. Macan, Fulshear, and James M. Magill, Houston, both of Tex., assignors to Atwood Oceanics, Inc., Houston, Tex.

Filed Jun. 28, 1978, Ser. No. 919,752
Int. Cl.[2] E02D *5/60*
U.S. Cl. 405—211 **5 Claims**



1. An implantable sea-floor shoring cellar, which is adapted for placement at least partly in the floor of the ocean to house oil well flow control equipment such as a blowout preventer stack, comprising:

a substantially cylindrical retainer wall assembly having a hollow interior, said retainer wall assembly having an upper rim structure forming a top opening and a lower rim structure forming a bottom opening;

attachment means mounted with said upper rim structure for attaching said retainer wall assembly to a suitable crane for lowering said sea-floor shoring cellar to the sea-floor from a drilling vessel;

an annular air ejector mounted within said retainer wall assembly adjacent to said lower rim structure, said annular

air ejector including means for connecting said air ejector to a source of air under pressure, said annular air ejector including a tubular air ring having mounted therewith a plurality of air nozzles directed generally vertically upwardly; and

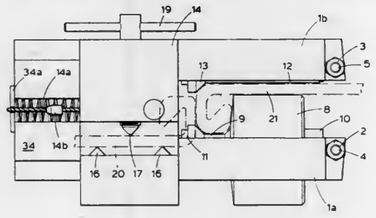
a plurality of discharge tubes, each discharge tube being mounted substantially within the interior of said retainer wall assembly and including an upper outlet portion extending outwardly of said retainer wall assembly and an inlet portion positioned at least partly over one of said nozzles for directing air, water and solids through said discharge line upwardly and outwardly of the interior of said retainer wall assembly.

4,189,256

PILE GUIDES

Robin Dawson, 8 Holts Green, Great Brickhill, Milton Keynes, Buckinghamshire, England

Filed Jul. 27, 1978, Ser. No. 928,619
Int. Cl.[2] E02D *13/04*
U.S. Cl. 405—277 **11 Claims**



1. A guide for guiding a pile during pitching said pile with a portion of a lateral edge region of the pile in engagement with a portion of a lateral edge region of an already-pitched pile, the guide comprising a carrier, clamping means at an upper region of the carrier for securing the guide to the bottom of the pile being pitched at said lateral edge region thereof, engagement means at a lower region of the carrier for engaging the guide with said lateral edge region of the previously pitched pile, said engagement means comprising a pair of shafts side-by-side, a pivotable connection between at least one of said shafts and the carrier for displacement of said shaft away from the other shaft, means for locking said at least one shaft against pivotal movement on said connection to hold the two shafts substantially parallel, at least one roller on each said shaft, said rollers engaging opposite side faces of said lateral edge region of the already-pitched pile, the rollers having profiles conforming generally to the profiles of the faces of the pile lateral edge region that they engage, and biassing means on said carrier for causing relative displacement between said clamping means and said engagement means whereby, when the pile being pitched is above the level of the already-pitched pile with the rollers engaging the already-pitched pile, the biassing means urge the pile being pitched into the correct lateral position for engagement of said lateral edge portions of the two piles.

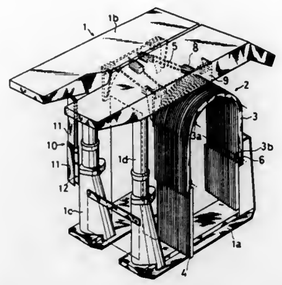
4,189,257

SHELTERING APPARATUS FOR USE IN LONG WALL MINING

Shigeo Nakajima; Masao Tanaka; Ken Takahashi, all of Tokyo; Nobuo Kiyama, and Takao Kanno, both of Yokohama, all of Japan, assignors to Taiheiyo Engineering Inc., Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,817
Claims priority, application Japan, Jul. 7, 1977, 52-81193
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—291 **12 Claims**

1. A sheltering apparatus for use in the long-wall face of mine wherein a plurality of plates are arranged in overlapped manner between a self-advancing support and its adjacent one, and hung from wires whose ends are fixed to the supports, said plurality of plates forming an inner space between said self-



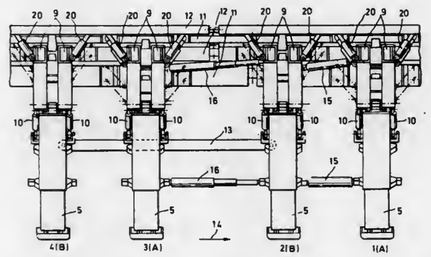
advancing supports whereby floating dust and falling dusty materials can be repelled from the inner space of the supports.

4,189,258

WALKING MINE-ROOF SUPPORT

Alfred Maykemper, and Hans-Jürgen Kahl, both of Wuppertal, Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,951
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742650; Sep. 29, 1977, 2743776
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—291 **9 Claims**



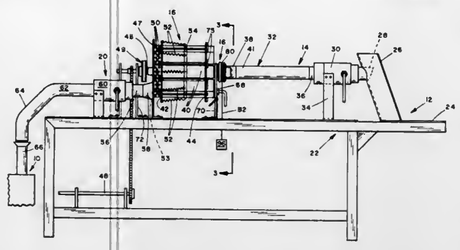
1. A walking mine-roof support comprising first, second, third and fourth frames, said first and third frames forming a first roof support unit, said second and fourth frames forming a second roof support unit, said units being movable with respect to one another for advancing the support, the respective frames in each unit being spaced-apart and each comprising a pair of hydraulically-extensible props disposed one at each side of the respective frame, means connecting each pair of props to a respective cross-member extending between the props, roof-supporting bars interconnecting the two frames of each unit by being connected to the respective cross-members of the frames, the two roof support units overlapping one another in the direction of advance of the support so that the first roof support unit having said first and third frames forms a leading one of the units and the second roof support unit having said second and fourth frames forms a trailing unit, the two frames of one unit being connected to a frame of the other unit disposed between the said two frames by respective first and second rams, whereby during relative movement between the units one of the rams is extended while the other retracts.

4,189,259

ARTICLE HANDLING AND ADVANCING

James F. King, Winston-Salem, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Oct. 2, 1978, Ser. No. 947,721
Int. Cl.[2] B65G *53/04*
U.S. Cl. 406—63 **14 Claims**



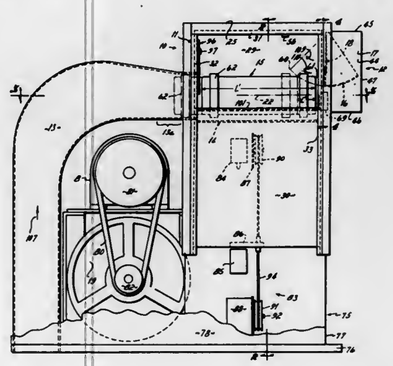
1. An article handling system for receiving a plurality of discrete articles fed sequentially thereto at random rates of feed by a operator, and discharging the articles therefrom sequentially at a constant rate of feed comprising; support means, a magazine assembly mounted upon said support means and including a series of discrete article receivers mounted for displacement along an endless path, driving means for displacing said series of receivers along said endless path, loading tube means including a tube having a discharge outlet mounted for displacement along a predetermined path conforming to at least a segment of said endless path for alignment with selected article receivers within said endless path segment, said loading tube means further including means for conveying articles through said loading tube and into said receivers, means for controlling displacement of said discharge outlet along said endless path for sequential alignment with selected article receivers upon displacement of articles through said loading tube means, and ejector means for discharging sequentially, articles from the receivers at a constant rate of feed when the receivers reach a predetermined location along said endless path.

4,189,260

DISPATCH AND RECEIVE TERMINAL FOR A PNEUMATIC CARRIER SYSTEM

Robert E. Morano, Ringwood; Adam Weissmuller, Pompton Plains, and Victor J. Vogel, Oakridge, all of N.J., assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Jun. 19, 1978, Ser. No. 916,566
Int. Cl.[2] B65G *51/26*
U.S. Cl. 406—76 **26 Claims**



1. A dispatch and receive terminal for a pneumatic carrier system of the type adapted to convey carriers from one location to another location, said terminal comprising

a terminal housing strcutured to support a carrier at a rest position therein, said terminal housing also being structured to present a substantially air tight first plenum chamber when said terminal is in the dispatch mode,

a system tube connected to said housing at a system tube port,

a pusher movable between retracted and extended positions for pushing said carrier from said rest position at least partially into said tube when said terminal is in the dispatch mode,

a pressure port defined in said terminal housing, said pressure port being closed by said pusher when said pusher is moved to said retracted position and being opened by said pusher when said pusher is moved to said extended position, and

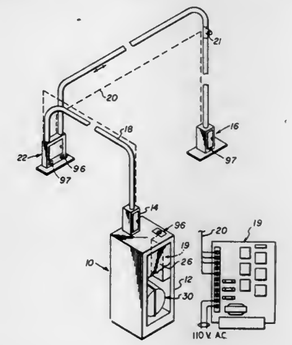
a pressure source connected to said pusher for selectively moving said pusher from said retracted to said extended position, said pressure port automatically connecting said pressure source to said system tube through said terminal housing when said pusher reaches said extended position to aid in dispatching said carrier through said system tube.

4,189,261

SINGLE LINE PNEUMATIC TUBE SYSTEM

Charles K. Kelley, and William W. Jones, both of Houston, Tex., assignors to Charles K. Kelley and Sons, Inc., Houston, Tex.

Filed Feb. 8, 1978, Ser. No. 876,112
Int. Cl.[2] B65G *51/26*
U.S. Cl. 406—112 **14 Claims**



1. A single line pneumatic tube system comprising: a self-contained main station and power unit formed of an acoustically insulated housing having a central terminal mounted thereon, said power unit including in the housing a pressure-vacuum chamber having a pressure port and a vacuum port, an air shifter valve connected to the ports, and a flexible tubing attached to the air shifter valve and to the terminal for selectively providing pressure or vacuum to the terminal, electronic control means to energize the system and shift the shifter valve to the proper mode for transmission of the carrier, and means extending from the housing to connect the unit to normal 120 V A.C. service,

an end terminal, switch means in the end terminal connected to the control means by low voltage wiring, and

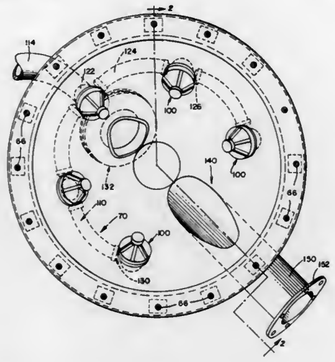
tubing connecting the central terminal to the end terminal, means in the tubing remote from the end terminal permitting the exhausting of air whereby a carrier free falls into the end terminal during pressure operation, the end terminal having a valve normally biased closed for pressure operation and automatically opening for vacuum operation.

4,189,262

APPARATUS AND METHOD FOR HANDLING DRY BULK MATERIALS IN A HOPPER-TYPE CONTAINER USING AIR AGITATION

Arthur I. Anderson, St. Paul, Minn., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed May 11, 1978, Ser. No. 904,789
Int. Cl.[2] B65G *53/38*
U.S. Cl. 406—136 **15 Claims**



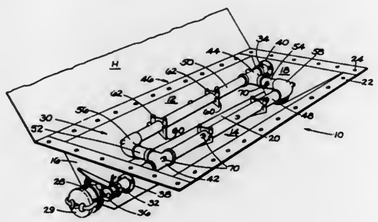
1. A hopper-type container comprising:
a container body having a hopper for containing a product to be formed into and handled as a slurry or solution;
a gas induction system for inducting gas into said container body, said gas system including an inlet conduit for connecting a source of gas to said container body, an aeration device mounted on the bottom of said container body hopper, said aeration device having gas discharge means located closely adjacent the hopper bottom for discharging air into said container body adjacent the hopper bottom, and a conduit connecting said aeration device to said inlet conduit;
a liquid handling system connected to the bottom of said hopper for conducting liquid to and from said container body hopper from a liquid source and conducting a slurry or a solution from said container to a slurry or solution handling system; and
cross-over valves connecting said gas induction system to said liquid handling system for introducing gas into said container body through said liquid handling system.

4,189,263

SPARGER OUTLET HAVING SPARGER LOOP VALVE ASSEMBLY

John A. K. Krug, Jr., St Charles, Mo., and John W. Matthews, Madison, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 8, 1978, Ser. No. 932,028
Int. Cl.[2] B65G *53/30, 53/38*
U.S. Cl. 406—137 **12 Claims**



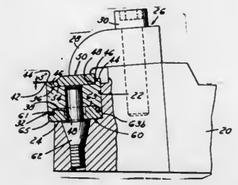
1. A sparger loop comprising: a hollow tubular member having an inlet and a continuous loop portion, said continuous loop portion including a plurality of fluid openings; said openings in the loop portion each including a hollow seat in fluid communication with said loop; said seat having an external portion adapted to receive a check valve in closed position and an interior portion located in said loop; a check valve including a stem portion extending through said seat and a tail portion which engages the interior portion of the seat; said check valve further including a head portion connected to the upper end of said stem portion which in closed position seats on said seat; at least one of said stem and said tail portion being made of elastomeric material; said tail portion engaging the interior portion of said seat; said head portion being biased into seated position on said seat; whereby when fluid under pressure is circulated through said loop, at least one of said stem and tail portions deform under fluid pressure to allow the head portion to move off said seat and fluid to exit continuously from the loop when said head portion is spaced from said seat, and whereby when the fluid pressure is turned off, the head portion returns to its original seated position, whereby when the head portion is in seated position, material adjacent the loop is substantially prevented from entering the loop.

4,189,264

CUTTING INSERT AND CHIP CONTROL ASSEMBLY

Rolf H. Kraemer, Gurnee, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Sep. 15, 1978, Ser. No. 942,552
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—2 **9 Claims**



1. An indexable cutting insert assembly to be removably disposed in a prepared recess in a toolholder which comprises:
(a) a ploygonal insert of hard cutting material having conjunctive side walls lying in planes intersecting each other at predetermined angles and parallel to the axis of the insert and having at least one face surface normal to said walls and said axis, and spaced inwardly of said walls,
(b) a peripheral dike surrounding said face surface having a cutting land with an outer cutting edge at the side walls and extending inwardly to an inner edge and having a secondary wall dropping precipitously within the inner edge to provide a retaining wall, and
(c) a chip breaker insert selectively positionable within said retaining wall having outer walls to fit complementally within said retaining wall and provided with a surface above at least one of said outer walls to serve as a chip breaker surface in cooperation with a cutting land on said insert.

4,189,265

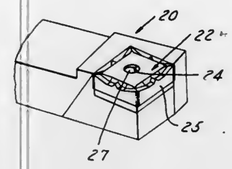
POSITIVE CHIP CONTROL INSERT

Leonard R. Arnold, Highland Park, Ill., and Robert W. Berry, Jr., Hazel Park, Mich., assignors to Fansteel Inc., North Chicago, Ill.

Filed Sep. 15, 1978, Ser. No. 942,549
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—114 **6 Claims**

1. A positive rake cutting insert of hard material adapted for being mounted in a negative rake holder, said insert comprising a polygonal body having opposed top and bottom faces in parallel planes and a polygonal peripheral surface formed of

side edges perpendicular to said planes and joining conjunctively at corners of said polygon, at least one of said faces having a groove recess descending along an edge from a corner of said polygon having an outer region formed by a first outer plane descending in a compound angle inwardly toward the axis of said polygon at a downward angle inclined to said axis and progressing downwardly from said corner along a polygonal side toward the central portion of said side, and by



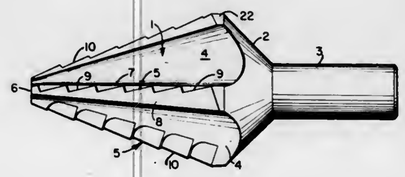
a second outer plane descending from a line parallel to said faces at an angle to said axis, said groove having an inner region formed by a plane angled upwardly from the bottom of said groove away from a respective peripheral side and angled inwardly from a corner toward the axis of said insert, said inner and outer regions joining conjunctively with the base of a ridge extending outwardly from the inner region to a polygonal side and formed by rising planes terminating adjacent the plane of said grooved face.

4,189,266

ROTARY DRILL BIT FOR HAND-HELD POWER DRILLS

George Koslow, 28 Warren St., New York, N.Y. 10007

Continuation-in-part of Ser. No. 601,387, Aug. 1, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,326
Int. Cl.[2] B23B *51/00, 51/02;* B23G *15/00*
U.S. Cl. 408—224 **11 Claims**



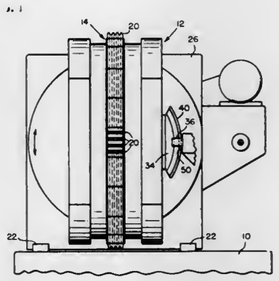
1. A rotary metal-cutting drill bit for handheld power drills comprising successively a solid conical cutting section having a central apex and increasing in diameter rearwardly from said apex, the included angle of said conical cutting section being an acute angle, an integral adjoining section of decreasing diameter and an integral shank for mounting said drill bit in a handheld power drill, said shank being smaller than the maximum diameter of said cutting section, said cutting section having in its periphery at least three flutes of concave cross section extending rearwardly from said apex and increasing progressively rearwardly in width and depth, and cutting edges between said flutes, said cutting edges being defined by the intersection of forward faces formed by said flutes and relieved clearance surfaces, each of said cutting edges having inclined cutting portions alternating with noncutting portions regularly arranged with cutting portions of the respective cutting edges located at different distances from the axis of rotation of said bit so that, in drilling a hole in a metal workpiece, cutting portions of a first cutting edge cut portions of the metal, cutting portions of a second cutting edge cut portions of metal left by said first cutting edge and cutting portions of a third cutting edge cut portions of metal left by said second cutting edge, whereby all of said cutting edges together cut all diameters of said hole exclusive of any pilot hole, the sum of cutting portions of all of said cutting edges being approximately equal in length to the overall length of one cutting edge, whereby the pressure and torque required to operate said bit are reduced to the capability of handheld power tool usage, and said cutting portions of said cutting edges being disposed to balance lateral forces on said bit during drilling.

4,189,267

CLAMPING MEANS FOR REDUCING DEFLECTIONS IN MACHINE TOOL

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,231
Int. Cl.[2] B23F *5/28*
U.S. Cl. 409—59 **3 Claims**



1. In a machine of the type that includes an endless chain for carrying stock removing tools which can engage a workpiece to remove stock therefrom, and in which the endless chain and the workpiece are carried by separate housings that are relatively movable toward and away from each other, the improvement comprising
clamping means operative between the housing for said endless chain and the housing for said workpiece for effectively limiting force deflections between said stock removing tools and said workpiece when the tools are removing stock from the workpiece, said clamping means being characterized by
a first part carried by the housing for said endless chain, said first part being in the form of an arcuate sector which is engageable by a second part of said clamping means over a range of tilted positions of said endless chain relative to a workpiece.
a second part carried by a fixed structure of said machine, and
actuating means connected to said second part for moving said second part into and out of clamping engagement with first part, said actuating means including a piston fitted for reciprocation within a chamber, said piston being connected to said second part of said clamping means, and including a hydraulic circuit for delivering a controlled flow of hydraulic fluid to said chamber to cause a movement of said piston in one direction or another within the chamber.

4,189,268

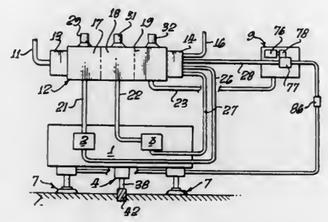
DIVER-CONTROLLED UNDERWATER LINEAR MILLING MACHINE

Donald J. Hackman, Columbus, and Roger L. Brunel, Grove City, both of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1978, Ser. No. 909,319
Int. Cl.[2] B23C *1/20*
U.S. Cl. 409—183 **9 Claims**

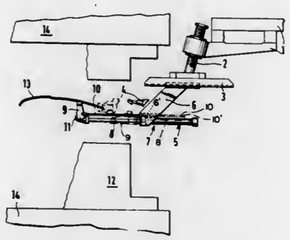
1. Diver-controlled apparatus for performing underwater milling operations on a deeply submerged work piece comprising:

an elongate frame,
a feed screw carried by and extending lengthwise of the frame,
a frame-supported cutter housing,
a cutter member operably mounted in said housing,
a hydraulic diver-controlled submersible motor for rotatably driving said cutter member,
nut means carried by said housing in threaded engagement with said feed screw,
a diver-controlled hydraulic submersible motor for rotatably driving said feed screw whereby the housed cutter member is threadably advanced along the screw to perform said cutting operation,
diver-controlled suction gripper means for securing the frame to said submerged workpiece, said means including:



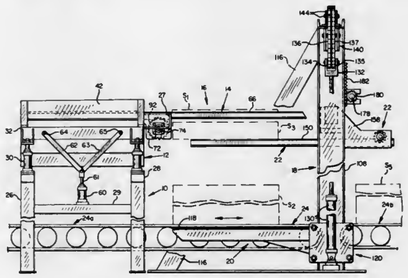
a plurality of gripper members having surfaces for engaging said submerged workpiece,
a hydraulic pump for establishing a submerged pressure-differential across said engaged gripper member surfaces whereby said gripper members securely hold said frame on said workpiece during said cutting operations,
a diver-controlled hydraulic motor for driving said pump, and
a thin-walled submersible casing including pressure-compensation means for balancing ambient seawater pressure enclosing said pump and pump motor,
a source of hydraulic fluid,
conduit means for applying said source fluid to said hydraulic motors, and
diver-controlled means for individually regulating the fluid flow rate to each motor.

4,189,269
WORKPIECE TRANSPORT DEVICE
Karl Maier, Kuchen, and Herbert Hohn, Göppingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany
Filed Apr. 27, 1978, Ser. No. 900,594
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718646
Int. Cl.[2] B65H *29/10*
U.S. Cl. 414—19 **14 Claims**



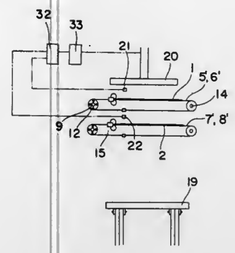
1. A workpiece transport device which includes at least one gripper tong means for gripping a workpiece in a marginal area and for transporting and depositing a gripped workpiece, the at least one gripper tong means being driven in conformity with a work rhythm of a machine tool required to be charged and-/or discharged, characterized in that slide means are provided for supporting the workpiece during a transport phase, means are provided for selectively displacing said slide means in parallel to said at least one gripper tong means from a retracted position to an extended position beneath the workpiece, a variable position nose is pivotally mounted at an end of said slide means facing the workpiece, means are provided for normally biasing said nose into a first position, and in that means are operatively connected with said nose for pivoting said nose against said biasing means through an angle of about 90° to a second position.

4,189,270
SHEET TRANSFER AND STACKING APPARATUS
Stanley V. Ehrlich, Portland, Oreg., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed Apr. 24, 1978, Ser. No. 899,338
Int. Cl.[2] B65H *31/32, 31/30*
U.S. Cl. 414—45 **14 Claims**



9. In an apparatus for transferring sheet material to a stacking station and stacking said material, a sheet-stacking apparatus comprising:
an upright support frame including a pair of transversely spaced-apart upright support columns,
carriage means vertically movable on said columns and including a carriage beam extending horizontally between said columns,
multiple parallel stacking arms cantilevered horizontally from said carriage beam in transversely spaced relationship,
and means for lowering and raising said carriage means on said support frame including indexing means for indexing said carriage means downwardly upon each receipt of sheet material on said stacking arms, and
accumulator means carried by said support frame, said accumulator means comprising a second carriage means movable vertically along said columns above said first-mentioned carriage means, said second carriage means including a second carriage beam extending between said columns above said first-mentioned beam, and multiple parallel accumulator arms extending horizontally from said second beam parallel to said stacking arms, said accumulator arms being mounted on said second beam for horizontal reciprocation between a retracted position generally behind said stacking arms and an extended position overlying said stacking arms.

4,189,271
APPARATUS FOR PILING VENEER SHEETS
Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan
Division of Ser. No. 791,220, Apr. 27, 1977, Pat. No. 4,144,112.
This application Nov. 15, 1977, Ser. No. 851,738
Int. Cl.[2] B65G *57/03;* **B65H** *9/04, 9/20*
U.S. Cl. 414—35 **8 Claims**

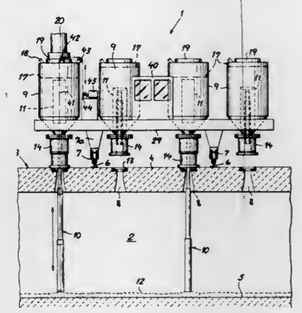


5. An apparatus for piling veneer sheets comprising:
at least two conveyer means, each conveyer means having two parallel and spaced veneer sheet conveyer support elements arranged in a horizontal plane, wherein one conveyer means is vertically aligned with the other conveyer means;
drive means for driving each said conveyer means to each convey a respective veneer sheet supported at lateral opposite edge positions by the support elements in a predetermined direction;
at least two detecting means, each detecting means transmitting first and second signals when a front or rear edge of the veneer sheets which are supported by each said conveyer means at both lateral opposite edge portions passes the respective detecting means, each detecting means being vertically aligned with the other detecting means;
stopping means for stopping each said conveyer means in response to a respective said first signal whereby one of the front or rear edges of each veneer sheet is stopped in a predetermined position in vertical alignment with the respective front or rear edges of the other veneer sheets; and
pressing means provided above said at least two conveyer means for moving downwards in response to said second signal to press a middle portion of each stopped veneer sheet rapidly and vertically downwards onto a piling position under said at least two conveyer means.

4,189,272
METHOD OF AND APPARATUS FOR CHARGING COAL INTO A COKE OVEN CHAMBER
Karl Gregor, Bochum, and Kurt Asmus, Erfstadt, both of Fed. Rep. of Germany, assignors to Gewerkschaft Schalker Eisenhutte, Gelsenkirchen-Schalke, Fed. Rep. of Germany
Filed Feb. 27, 1978, Ser. No. 881,609
Int. Cl.[2] C10B *31/04*
U.S. Cl. 414—161 **10 Claims**

1. A process for the charging of coal, especially predried and/or preheated coal and/or coal containing a high portion of volatile components into a coking chamber of a coke oven, said process comprising the steps of:
positioning a filling hopper over an opening in the roof of said chamber and sealingly connecting said opening to said hopper;
lowering a filling tube from said hopper substantially to the bottom of said chamber;
feeding coal from said hopper through said filling tube into said chamber and simultaneously evacuating gas from said chamber during the filling thereof with coal through said tube;
raising said filling tube in said chamber continuously as said chamber is filled with coal through said tube; and
controlling the velocity with which said tube is raised as a function of the subatmospheric pressure generated in said chamber by the evacuation of gas therefrom.

3. A charging apparatus for a coke oven having at least one coking chamber provided with a roof having a plurality of filling openings, said apparatus comprising:
a charging carriage displaceable across said roof and provided with a plurality of hoppers each having an outlet alignable with a respective one of said openings;
means for sealing each of said hoppers to the respective openings;

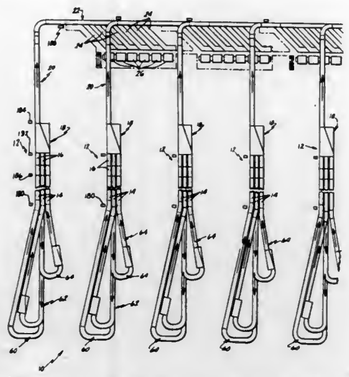


a respective telescoping filling tube received in each of said hoppers and lowerable substantially to the floor of said chamber through the respective outlet and opening;
means for raising and lowering each of said tubes;
a respective hollow body received in each of said hoppers and shiftable therein to close the respective outlet, said body being positioned and constructed to receive the respective filling tube in a compact state thereof upon withdrawal of the respective filling tube from said chamber; and
means for evacuating said chamber and control means responsive to the level of evacuation of said chamber for controlling the velocity with which the respective filling tube is raised.

4,189,273
MODULAR WAREHOUSE CONVEYOR SYSTEM
Edward C. Soderstrom, Sparta, and David L. Neu, Grand Rapids, both of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.
Filed Mar. 24, 1978, Ser. No. 889,660
Int. Cl.[2] B65G *1/06*
U.S. Cl. 414—285 **13 Claims**

1. A modular conveyor system for use in a warehouse storage area of the type including an elongated, multilevel order selection rack, said system comprising:
a plurality of powered picking conveyors supported in vertically spaced, superimposed relationship adjacent said order selection rack, one of said picking conveyors being positioned at each level of said rack;
a plurality of accumulator conveyors supported above said picking conveyors in a common horizontal plane, each of said accumulator conveyors being connected to one of said picking conveyors for receiving a batch of articles placed thereon;
a merge conveyor for sequentially receiving a batch of articles from said accumulator conveyors and discharging each of said batches at a common outlet;
a sortation conveyor for receiving a batch of articles from said merge conveyor at said common outlet, said sortation conveyor including a plurality of diverter means for selectively diverting articles from said sortation conveyor;

a plurality of discharge conveyors, one adjacent each of said diverter means for receiving articles from said sortation conveyor; and



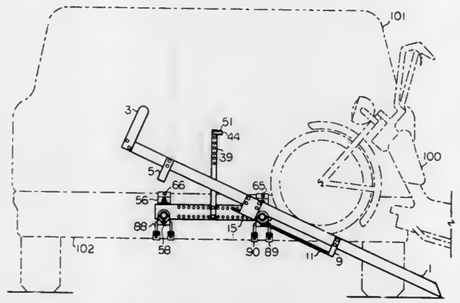
a plurality of palletizer stations, one adjacent each of said discharge conveyors, said palletizing stations each including means for holding a pallet to be loaded and means for discharging a loaded pallet to a loading area.

4,189,274

TWO-WHEELED CYCLE BUMPER CARRIER FOR MOTOR VEHICLES

Ernest M. Shaffer, 5861 Dugan Ave., La Mesa, Calif. 92041

Filed Jun. 14, 1978, Ser. No. 915,543
Int. Cl.[2] B60R *9/00*
U.S. Cl. 414—462 **1 Claim**



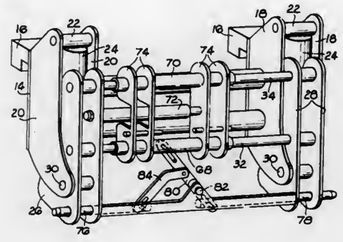
1. A two-wheeled cycle bumper carrier apparatus comprising: a track assembly provided with guide rails that permit the track assembly to move in a linear direction upon a set of free-wheeling sleeves and tilt into an inclined ramp position which is most convenient to wheel-up and load a two-wheeled cycle; said track assembly and set of sleeves are adjustable to accommodate various tire widths; said set of sleeves are mounted on each of two cantilevered rod members solidly attached and reinforced to and supported by a single horizontal structural member supported by two bumper bracket attachments; said cantilevered members are substantially in alignment with bumper brackets for a direct load transfer to the bumper; said track assembly has a cutout to permit the front tire of a cycle to drop into and adjustable brackets to support and brace the front tire; said horizontal structural member has a series of holes providing attachment and adjustment along its length for a vertical member with an adjustable crank lock mechanism that is clampable onto various cycle pedal cranks.

4,189,275

ATTACHMENT FOR MOUNTING A PIVOTAL AND OR SHIFTABLE LOAD HANDLING APPARATUS ON A VEHICLE

Maurice C. Arnold, Dudley, England, assignor to Ward Plant Spares (Henley) Limited, Warley, England

Filed Jan. 24, 1977, Ser. No. 761,671
Claims priority, application United Kingdom, Jan. 24, 1976, 2243/76; Jan. 24, 1976, 2272/76; Oct. 15, 1976, 42875/76
Int. Cl.[2] B65G *47/00*; B66F *9/06*
U.S. Cl. 414—640 **5 Claims**



1. A device for use with a vehicle of the kind comprising a mast and a carriage guided on the mast, said device comprising a main frame adapted for attachment to said carriage, said main frame comprising at least one main frame plate at each lateral side of the main frame, a sub-frame pivotally mounted on said main frame plates, at least one fluid-powered first ram connected between said main frame and the sub-frame for controlling tipping of said sub-frame, a pair of shafts extending across said sub-frame, a further frame mounted on and slidably guided by said shafts, and a further fluid-powered ram coupled between the further frame and said sub-frame for controllably side shifting the further frame, said device providing one mounting point for an ancillary apparatus on said sub-frame, and an alternative mounting point for an ancillary apparatus on said further frame, whereby an ancillary apparatus so mounted may be tipped and/or side shifted according to which ram is fluid-powered, wherein said main frame comprises a pair of parallel plates at each lateral side of the main frame, and the sub-frame comprises pairs of parallel plates each of which sub-frame pairs is located between one of the pairs of plates of the main frame.

4,189,276

SIDE LOADING ULTRA-NARROW AISLE LIFT TRUCK

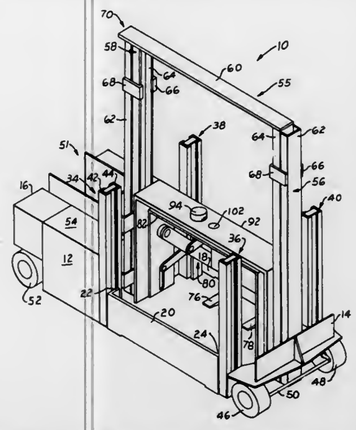
Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 650,587, Jan. 19, 1976, abandoned. This application May 31, 1977, Ser. No. 801,484
Int. Cl.[2] B66F *9/14*
U.S. Cl. 414—659 **3 Claims**

1. A lift truck vehicle comprising a body defining discrete front and rear body portions, laterally opposite left and right outrigger and support assemblies connecting said discrete front and rear body portions, a mast assembly, including a front telescoping mast mounted on said front body portion and a rear telescoping mast mounted on said rear body portion, a u-shaped carriage, a pair of forks, said carriage mounting said pair of forks for load handling, and carriage support member means;

said carriage support member means comprising vertically movable u-shaped carriage support means movably mounted in said mast assembly for vertical movement of said carriage between said front and rear telescoping masts, said u-shaped carriage disposed within said vertically movable u-shaped carriage support means, carriage rotating means mounted in said vertically movable u-shaped carriage support means for rotation of said u-shaped carriage about a generally vertical axis, and a rotatable carriage support member mounted in said carriage rotating means for extending said u-shaped carriage from positions generally between said laterally opposite left and right outrigger and support assemblies to positions outside said laterally opposite left and right outrigger and support assemblies;

each said left and right outrigger and support assemblies including an outrigger and support member and front and rear vertically movable uprights mounted on said front and rear body portions respectively, each said outrigger



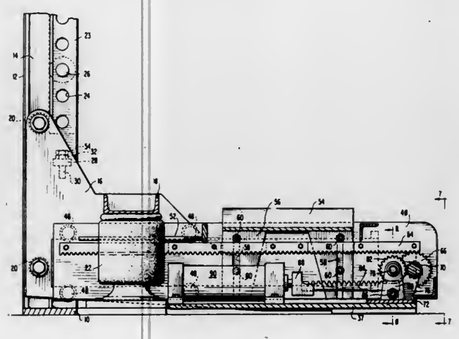
and support member affixed to said front and rear vertically movable upright for movement therewith and for selective ground engagement or load clearance, so that with said vertically movable u-shaped carriage support means in its lowest position, one of said outrigger and support members may be positioned in a ground engaging position and the other of said outrigger and support members may be positioned higher than said vertically movable u-shaped carriage support means so that loads may be picked up and deposited on the ground outside of said other of said outrigger and support members.

4,189,277

SUPPORTING AND HANDLING DEVICE FOR USE WITH A TIRE PROCESSING MACHINE

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Aug. 22, 1977, Ser. No. 826,691
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—664 **9 Claims**



1. An apparatus for supporting an item while transporting and positioning same at a work station and subsequently removing same therefrom, comprising:

a base member having a pair of spaced upright elements provided with trackways;

a pair of side members terminating in reduced end portions;

a plurality of rollers provided on said side members adjacent the end opposite the reduced end portions for engaging said trackways;

a bracing member connecting said side members intermediate said reduced end portion and the roller carried end;

plate members disposed in spaced parallel relation to said side members;

bracing members connected to said plate members for maintaining them in spaced parallel relation to one another;

slotted plate members interposed between said side members and said plate members;

means carried by said side members for supporting said slotted plate members for movement with respect to said side members;

said plate members having rollers engagable with said slotted plate members for movement of said plate members in a plane parallel with respect to the plane of said side members;

an upwardly facing supporting surface adjustably mounted on said plate members for vertical movement in a plane parallel to the plane of said upright elements with the movement of said surface being independent of the movement of said side members on said upright elements;

an actuating member supported on said base member and engaging the bracing member for said side members for raising and lowering said side members and said slotted plate members and said plate members and said supporting surface on said upright elements; and

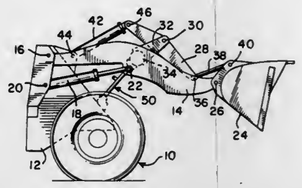
means carried by said side members and engagable with said plate members for moving said plate members and said slotted plate members and said supporting surface between said side members towards and away from said upright elements while supporting said item on said supporting surface.

4,189,278

BOOM PROP

Ronald A. Dewey, Buffalo Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 791,903, Apr. 28, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,310
Int. Cl.[2] E02F *3/36*
U.S. Cl. 414—713 **1 Claim**



1. In a material handling vehicle having a pair of boom arms pivotally mounted at one of their ends to the vehicle, a bucket pivotally mounted on the other end of said arms, a cross tube extending between and connected to the boom arms at a location intermediate the ends of the boom arms, means for pivoting said boom arms to define a path of movement for said cross tube; an improved support for selectively holding the boom arms in an elevated position while permitting normal manipulation of the bucket comprising:

a base member having a stop surface affixed to the vehicle;

a prop including a tubular link member with a clevis affixed to one end and a saddle affixed to the other end;

said clevis straddling said base member and pivotally at-

tached thereto to permit said prop to be pivoted between a stored position adjacent said vehicle and a support position;

said saddle having an outwardly-opening arcuate surface complementary to and engageable with said cross tube, and an inclined surface merging with said arcuate surface to function as a cam follower;

a cross-member having a threaded opening attached to and spanning said clevis;

a threaded stop member engaging said threaded opening and, by contact with said stop surface, limiting movement of said prop toward its support position to permit positioning of said saddle precisely in said path;

a tab on each of said link member and said vehicle having alignable openings when said prop is moved to its stored position;

a retaining pin insertable in said alignable openings to releasably secure said prop in its stored position;

said clevis having pin-receiving openings substantially the same as said alignable openings on said tabs;

said base member having an enlarged opening to permit insertion of said retaining pin through said pin-receiving openings and said enlarged opening, after adjustment of said threaded stop member, to releasably secure said prop in its support position; and

said prop, when in its support position, having a center of gravity located so that travel of said cross tube, as said boom arms are raised from their lowered position, will engage said cam surface to move said prop toward its stored position, but will maintain the center of gravity of said prop forward of the vertical plane passing through the pivotal connection of said prop to said base member, whereby said prop will return to its support position.

4,189,279

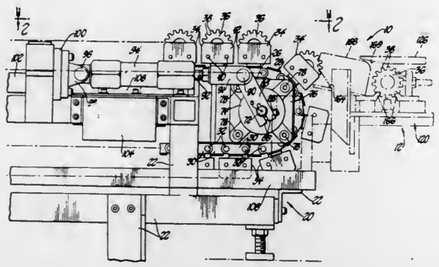
APPARATUS AND METHOD FOR BURNISHING GEARS

Marvin R. Anderson, 17 Deepland South, Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 758,983, Jan. 13, 1977, Pat. No. 4,080,699. This application Nov. 10, 1977, Ser. No. 850,439

Int. Cl.[2] B65G *47/34*

U.S. Cl. 414—750 **7 Claims**



1. Apparatus for loading toothed gears to be burnished between a pair of spaced gear racks, the apparatus comprising: a base; a carriage mounted on the base for movement relative thereto; a first cylinder for reciprocating the carriage on the base; a gripper mechanism mounted on the carriage and including movable grippers for positioning the toothed gears between the gear racks for meshing engagement therewith during driven rack movement so that the meshing of the gear and rack teeth provides the sole support for the gears; a toggle linkage for moving the grippers between gripping and nongripping positions; a second cylinder for moving the toggle linkage to move the grippers between the gripping and nongripping positions; and pushers on the grippers for pushing a burnished gear from between the gear racks during loading of another gear to be burnished.

4,189,280

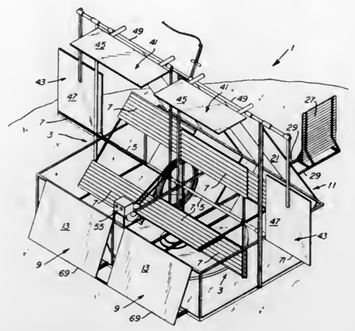
WINDMILL

Grant G. Dohm, Grinnell, Kans. 67738

Filed Nov. 16, 1977, Ser. No. 851,976

Int. Cl.[2] F03D *7/06*

U.S. Cl. 415—2 **9 Claims**



1. A windmill comprising:

a plurality of blade members and means for mounting said blade members for rotation about a first, substantially horizontal axis, each of said blade members having a surface extending in a first direction substantially parallel to said first axis and in a second direction substantially perpendicular to said first axis,

means for continuously aligning said first axis in a direction substantially perpendicular to any incoming wind, and,

means extending substantially about said first axis and said blade members for directing said incoming wind about said first axis to create a vortex of whirling winds whereby said whirling winds strike said surfaces of said blade members and cause said blade members to rotate about said first axis along a closed path, said directing means including a back portion with a substantially concave shaped surface and means for supporting said back portion in a fixed relationship to and facing said first axis with said substantially concave shaped surface spaced from said closed path of said blade members and extending upwardly higher than the closed path of said blade members, said aligning means aligning said first axis substantially perpendicular to said incoming wind with said back portion downwind thereof, said directing means further including a front portion having a surface and means for supporting said front portion with said surface spaced from said closed path of said blade members and extending downwardly at an angle from a horizontal plane substantially co-planar with said first axis with said surface inclined upwardly toward said first axis, said aligning means aligning said first axis substantially perpendicular to said incoming wind with said front portion upwind thereof, each of said front and back portions of said directing means extending in a direction substantially parallel to said first axis and together forming a shape having two open ends spaced from each other along said first axis, said whirling winds of said vortex being able to exit said windmill through said open ends, said front and back portions having upper edges spaced from each other whereby an inlet for the incoming wind is defined between said upper edges of said front and back portions of said directing means and a major portion of said incoming wind is directed by said front and back portions to strike said blade members at a location above said horizontal plane as said blade members move along said closed path, and each of said front and back portions further having a lower edge with said lower edges being spaced from each other whereby a portion of said incoming wind can pass between said spaced apart lower edges and strike said blade

member as said blade members move along said closed path.

4,189,281

AXIAL FLOW FAN HAVING AUXILIARY BLADES

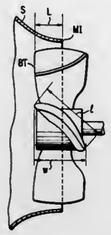
Haruo Katagiri; Kenji Fujikake, and Katsuhito Yamada, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 20, 1977, Ser. No. 862,372

Claims priority, application Japan, Dec. 20, 1976, 51-153068

Int. Cl.[2] F04D *29/32*

U.S. Cl. 415—213 C **22 Claims**



1. An axial flow fan having auxiliary blades comprising:

a hub member rotatably supported and driven by a drive source;

a plurality of main blades having a predetermined angle with respect to the rotational direction thereof and a predetermined width and height, said blades being radially provided on said hub member;

at least one auxiliary blade formed on at least one of a suction surface and a pressure surface of each of said main fan blades and having a predetermined length in a width of said main fan blades, a leading edge of each of said auxiliary blades being positioned closer to the axis of rotation of the respective one of said main fan blades than a trailing edge thereof; and

a shroud comprising a thin hollow member having a large opening and a small throttled opening at opposite ends thereof,

said fan blade being inserted within said shroud from said small throttled opening toward said large opening of said shroud, and

an axial inserted width L of said main fan blade, which is defined by a point of minimum opening of said small throttled opening and an inserted end portion of said inserted fan blade in the axial direction, and an axial entire width W of said fan blade being maintained in the following relation

$$0 \leqq L \leqq W.$$

4,189,282

DEVICE TO SECURE VANES TO A ROTOR

Josette Benoist, Le Mee sur Seine; Pierre A. Glowacki, Melun, and Gerard M. F. Mandet, Epinay sous Senart, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jun. 5, 1978, Ser. No. 912,862

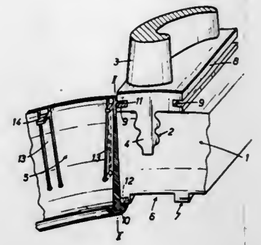
Claims priority, application France, Jun. 8, 1977, 77 18254

Int. Cl.[2] F01D *5/32*

U.S. Cl. 416—221 **5 Claims**

1. In a device for securing vanes to a turbine rotor wherein said rotor is a disk having a rim with a plurality of axial grooves on its outer periphery, vanes having roots extending slidably into said grooves and said device comprising at least one annular retaining check plate coaxial with said disk, abutting the ends of said roots, and means for securing said check plate in position, the improvement comprising:

said securing means being in the form of radially inwardly extending projections on the radially inner edge of the rim, and generally hook-shaped hangers formed on the radially inner edge of the check plate and engaging said projections to prevent axial movement of said check plate away from said disk, said projections being spaced apart to define indentations for receiving said hangers, said hangers being engageable with and disengageable from said projections by rotating said check plate relative to said disk;



elastic tongues defined by cuts extending radially inwardly from the radially outer edge of said check plate;

axially extending studs at the outer ends of said tongues, extending toward said disk; and

recesses in the adjacent ends of said vanes, said studs extending into said recesses to prevent rotation of said check plate relative to said disk.

4,189,283

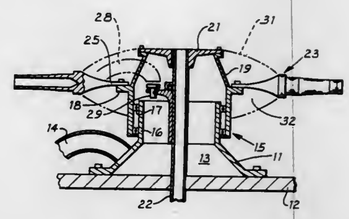
ROTOR HUB FOR A HELICOPTER

George A. McCoubrey, Westfield, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1978, Ser. No. 924,024

Int. Cl.[2] B64C *21/04, 11/06*

U.S. Cl. 416—20 A **2 Claims**



1. A rotor assembly for a helicopter comprising,

a rotor mast having a lower conical section and an upper cylindrical section, said lower conical section being adaptable for attachment to a fuselage of a helicopter,

bearing means on said cylindrical section of said rotor mast,

a rotor hub having a lower cylindrical section, an upper conical section having an open end, and an annular flange, said cylindrical section being rotatably supported by said bearing means on said cylindrical section of said rotor mast,

a flexible hub plate having a central flat plate section attached to said annular flange on said rotor hub and having a plurality of radially extending pitch axles, said central flat plate section having a width substantially greater than its thickness to provide a bending stiffness in the plane of

rotation higher than the bending stiffness normal to the plane of rotation,

a torque plate closing the open end of said upper conical section of said rotor hub whereby said rotor mast, rotor hub and torque plate form an air plenum,

a plurality of rotor blades pivotally attached one each to each said pitch axle,

a plurality of flexible ducts connected one each between each rotor blade and said air plenum,

valving means within said air plenum for regulating flow of air through said flexible ducts to said rotor blades, and

shaft means engaging said torque plate for rotating said rotor hub.

4,189,284

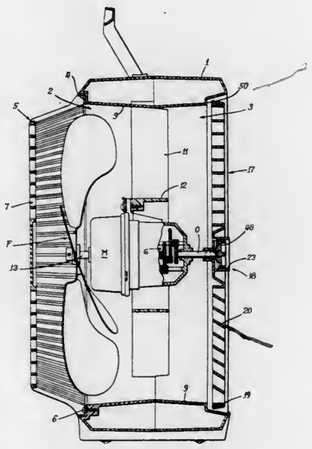
SLIPPING CLUTCH MECHANISM

Kevin T. Cummins, Eltham, Australia, assignor to Zardana Corporation N.V., Curacao, Netherlands

Filed Jan. 26, 1978, Ser. No. 872,453

Int. Cl.[2] F04B *39/00*

U.S. Cl. 417—313 **8 Claims**



5. A fan comprising a casing; a fan blade assembly mounted within said casing; an electric motor having an output shaft mounting and driving said fan blade assembly; means associated with the output of said motor providing a reduced speed output shaft; a driving member mounted for rotation with the reduced speed output shaft; a driven member coaxially mounted on and rotatably independent of the reduced speed output shaft; a clutch mechanism operable to couple said driving member and said driven member; means to render the air flow from the fan blade assembly more axial; and an air directing grille mounted in the path of air flow from said fan blade assembly and said axial rendering air flow means, said grille being supported on said driven member for rotation therewith and including a plurality of louvers arranged to direct the air flow in a substantially gyratory distribution pattern, said clutch mechanism including singular elastic means extending generally radially around the central axis intermediate said drive member and said driven member and engaging both with a force adequate to transfer driving force therebetween and rotate said members together, said elastic means having cam means to slip the engagement and to permit said rotary drive member to rotate independently of said driven member when either a predetermined restraint of rotation is applied to said grille and driven member or an external driving force is applied to the grille that would otherwise tend to either oppose or overdrive said driving member.

4,189,285

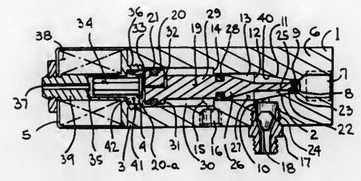
METERING PUMP

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Dec. 4, 1975, Ser. No. 637,647

Int. Cl.[2] F04B *17/00, 17/04;* F01B *7/18;* F01L *25/08*

U.S. Cl. 417—403 **8 Claims**



1. A metering pump for displacement of exact fluid quantities per stroke comprising:

an elongated pump housing having first and second ends interconnected by a central bore of different diameters including integral pump and check valve seats inside said bore passing therethrough for receiving slidably an axially movable reciprocating piston assembly with elongated piston portions of diameters corresponding to the diameters of said bore, said piston assembly dividing said bore into a first pump actuating and a second pumping ends, including a pump chamber with mating pumping members provided therein by a first of said piston portions together with said integral pump seat, an integral check valve in said pumping end comprised of a second of said piston portions and the check valve seat being a reduced diameter portion of the bore, including fluid communication means with said bore adaptable to deliver fluid into said pump chamber via a first side port provided therein, and a second check valve in said first side port,

means for actuation of said pumping piston assembly comprising a solenoid-operated valve controlled fluid motor means capable of shifting said piston assembly to change positions therein from a first fluid delivery into said pump chamber via said first side port to a second fluid discharge from said pump chamber via a fluid discharge port means, said fluid discharge port means including said integral check valve adjacent a fluid discharge port incorporated therein so as to allow said second of said piston portions engage said check valve seat when said piston assembly is in said first position, and when said piston assembly is shifted to said second position, said second of said piston portions disengages said check valve seat to render said first check valve open and said second check valve closed by the fluid being displaced from said pump chamber in exact quantities per stroke through an annulus created between said check valve seat and a straight necked down piston section adjacent said second piston portion until said mating pumping members of said pump meet inside said bore at the end of the pumping stroke resulting in a complete fluid displacement therefrom, said first pump actuating end including also a solenoid cavity housing an axially movable plunger disposed over a central protrusion of an end face of a first end of said piston assembly provided with a large piston head having a bore therethrough leading to the central protrusion and which is undercut opposite said end face to an intermediate diameter piston portion forming together with an inwardly extending large diameter elongated bore portion from said first housing end an annular space separated from said solenoid cavity by a seal inside said piston head, said annular space including a second side port for supply of a pilot fluid thereto to exert a constant fluid pressure over said undercut representing a biasing force means that maintains said piston assembly in said first position, and to deliver said pilot fluid from said annular space via said bore initiating adjacent said undercut to exit through said central piloted protrusion into said solenoid cavity when said plunger is moved allowing pressurization of said solenoid cavity housing said piston end face which exerts larger end force than said biasing force means forcing said piston assembly to shift from said first to second positions with fluid displacement, including means for depressurization of said solenoid cavity and an automatic return of said piston assembly to said first position by said biasing force means acting over said undercut when said solenoid operator is deenergized, there being solenoid operator actuated means to move the plunger away from or toward the central protrusion.

4,189,286

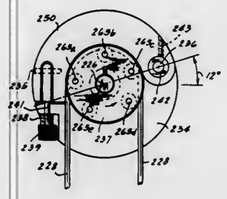
PERISTALTIC PUMP

Edward J. Murry, Palos Park, and Joseph F. Brumbach, Niles, both of Ill., assignors to Fibra-Sonics, Inc., Chicago, Ill.

Division of Ser. No. 777,582, Mar. 15, 1977. This application Mar. 17, 1978, Ser. No. 887,717

Int. Cl.[2] F04B *43/12*

U.S. Cl. 417—477 **2 Claims**



1. A peristaltic pump comprising a frame member, a drive shaft, a rotor rotatably supported in said frame member on said drive shaft, a plurality of roller mounted on the outer surface of said rotor, a semicircular frame portion partially surrounding said rotor, a flexible tube mounted between said rotor and said semicircular frame member and said rollers engageable therewith, means for adjusting the spacing between said rotor and said semicircular frame portion, wherein said adjusting means comprises a pivot shaft attached to said frame on a radius from said drive shaft on an angle between zero and 30 degrees from where said tube enters the path of said rotor and one end of said semicircular frame supported on said pivot shaft, adjustable means mounted between the other end of said semicircular frame portion and said frame, and including an off center eccentric cam mounted between said pivot shaft and said frame member and means for selectively locking said cam in any desired position depending on headspacing required.

4,189,287

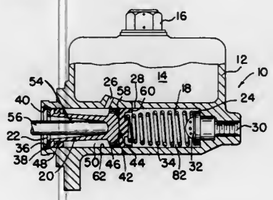
BACK-UP RING FOR CUP SEAL

Ernest C. Sindelar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 9, 1977, Ser. No. 804,974

Int. Cl.[2] F04B *39/10, 7/04*

U.S. Cl. 417—490 **7 Claims**



1. In a pump having a housing defining a bore within which a piston is movable to move a front face thereof to define a pumping and a non-pumping state;

an annular resilient member disposed within said bore adjacent the front face of the piston;

elastomeric seal means disposed within said bore to contact the inner periphery of the bore, to be moved upon movement of the piston defining a pumping state;

the outer periphery of the annular resilient member being spaced from the inner periphery of the bore to define an annular gap therewith, with the piston in a non-pumping state;

the outer periphery of the elastomeric seal means being adjacent to the annular resilient member; and

means for providing that the outer periphery of the annular resilient member is brought into substantially continuous annular contact with the inner surface of the bore with the piston in a pumping state, said substantially continuous annular contact occuring adjacent the area of contact of the elastomeric seal means and inner periphery of the bore, wherein the means for providing that the outer periphery of the annular resilient member is brought into substantially continuous annular contact with the inner periphery of the bore comprises a tapered surface defined by the piston adjacent the face thereof, tapered rearwardly outwardly relative to the face, said tapered surface bearing against the annular resilient member to force the outer periphery thereof against the inner periphery of the bore with the piston in a pumping state.

4,189,288

APPARATUS FOR PRODUCING BLOWN SYNTHETIC-RESIN FOILS AND FILMS

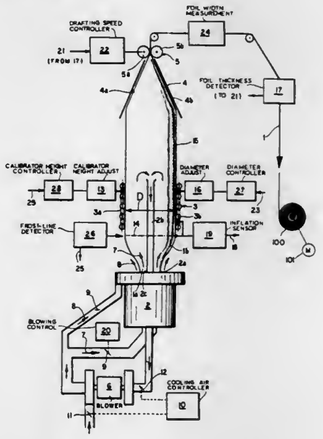
Hartmut Halter, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Reifenhauser KG, Troisdorf, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,549

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721609

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—72 R **5 Claims**



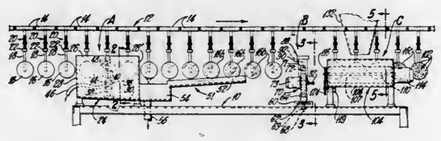
1. An apparatus for the blowing of foils from a synthetic-resin material, comprising:

a blowing head adapted to eject a continuous tube of plastically deformable synthetic-resin material and provided with blowing means for inflating said tube to form a bubble and thereby reduce the wall thickness of said tube;

a calibrating basket downstream of said blowing head and surrounding said bubble for calibrating the external diameter thereof;

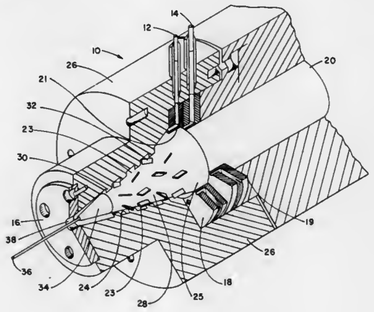
flattening means downstream from said basket for flattening the bubble formed from said tube of synthetic-resin material to form a flattened web thereof;
drawing means downstream of said flattening means engaging said web and advancing same;
a winding station for coiling the flattened web into a roll downstream of said drawing means;
a height-adjusting device connected with said calibrating basket for positioning same in a predetermined relationship with a frost line formed on said bubble, said blowing head including control means for regulating the flow of internal cooling air into said tube, external cooling air around said bubble, the intake of fresh air and the discharge of air from said bubble;
a diameter-setting device connected with said basket for adjusting the calibrating diameter thereof;
a foil-thickness measuring device disposed along said web between said drawing means and said winding means;
a filling degree control circuit including a filling-degree measuring device responsive to the degree of expansion of said balloon and connected with said control means for regulating at least some of the flows of air thereof;
a foil-thickness control circuit responsive to said thickness-measuring device for controlling the drawing speed of said web at said drawing means;
a foil-width control circuit including a width-measuring device responsive to the width of said web;
a basket-height control circuit for the positioning of said basket with respect to said frost line and including a frost line detecting device, the foil-breadth control circuit including said diameter setting device and said basket-height control circuit including said height-adjusting device;
respective feedback loops for said filling-degree control circuit, said thickness-control circuit, said foil-width control circuit and said basket-height control circuit; and
coupling means functionally interconnecting said control circuits through the feedback loops thereof in accordance with a start-up state of the apparatus, thereby interlocking the control circuits and shifting the feedback responses thereof in accordance with at least one of the following operating conditions:
the drawing speed and the distances between said blowing head and said frost line measuring device and said filling-degree measuring device;
the drawing speed of said drawing means; and
the distance between said blowing head and at least one of said measuring devices.

4,189,289
METHOD AND APPARATUS FOR PRODUCING AND PROCESSING FROZEN CONFECTIONS
Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio
Division of Ser. No. 781,698, Mar. 28, 1977, abandoned. This application Mar. 2, 1978, Ser. No. 882,574
Int. Cl.[2] A23G *3/24, 9/26*
U.S. Cl. 425—93 **9 Claims**



1. Apparatus for processing chocolate-coated frozen bodies of confection including, in combination, a movable conveyor, said conveyor supporting the chocolate-coated bodies, the chocolate coating on the bodies solidifying on the bodies under the influence of the reduced temperature of the bodies, a source of heat adjacent the conveyor arranged to direct heat onto the solidified chocolate coating on the bodies as the bodies are moved by the conveyor past the heat source to soften the chocolate coating to a tacky condition, a chamber containing particulate edible material through which the bodies having the softened chocolate coating are advanced by the conveyor, and a rotatable member in the chamber having vanes for impinging the particulate edible material onto the tacky chocolate coating on the bodies whereby substantial amounts of the particulate edible material are adhered to the coating on the bodies.

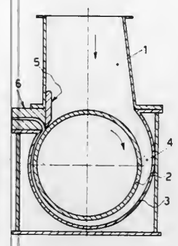
4,189,290
WIRE COATING USING A LIQUID POLYMER
Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Division of Ser. No. 728,345, Sep. 30, 1976, Pat. No. 4,098,861. This application Mar. 9, 1978, Ser. No. 884,932
Int. Cl.[2] B29F *3/10*
U.S. Cl. 425—113 **1 Claim**



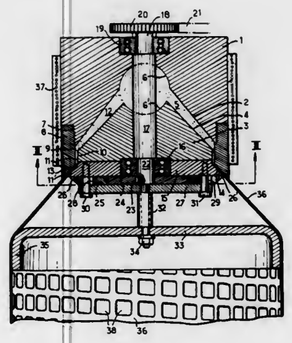
1. A device for coating a wire-like workpiece with a thermosetting elastomer formed from two or more liquid components, the device comprising a barrel type housing, a mandrel rotatably mounted inside the barrel so as to define a mixing chamber between the barrel and the mandrel, the mandrel having an end tapering toward a die attached to the barrel and through which the workpiece is moved, a plurality of toroidal distribution rings inside the barrel, each ring adapted to supply one of the liquid components of the elastomer, heating means for heating the components and pressure means for placing the components under sufficient pressure to move them into the mixing chamber and to move the resulting mixture through the mixing chamber and onto the workpiece.

4,189,291
APPARATUS AND PROCESS FOR RECOVERING SCRAPS OF THERMOPLASTIC MATERIAL, EVEN OF HETEROGENEOUS SHAPES, BY GRADUAL MELTING AND COMPRESSION THROUGH ONE OR MORE ORIFICES
Eligio Longhi, Via Don Minzoni, 2-San Lazzaro di Savena (Bologna), Italy
Filed Jul. 10, 1978, Ser. No. 923,326
Claims priority, application Italy, Jul. 18, 1977, 25808 A/77
Int. Cl.[2] B29H *19/00*
U.S. Cl. 425—215 **7 Claims**

1. An apparatus for recovering homogeneous or heterogeneous thermoplastic materials, comprising a hopper into which the material is introduced, a chamber downstream of said hopper, the chamber being of decreasing cross-section, means for feeding the material along said chamber from said hopper, and means for supplying heat to the material, so that the latter gradually melts in its forward movement in the chamber, the material on forward moving being compressed to the most restricted zone and being then forced to the outside through one or more orifices.

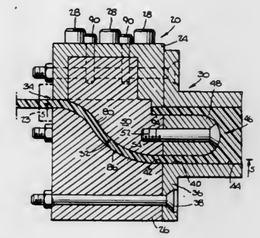


4,189,292
EXTRUDING HEAD FOR MAKING RETICULATED SEAMLESS TUBES
Jacques Hureau, Saint Remy des Monts 72600-Mamers; Jean-Claude Hureau, 56 rue Leon, 78310-Maurepas, and Hubert Gaillard, 182 Av. Rouget de l'Isle, 94400 Vitry sur Seine, all of France
Filed Mar. 14, 1978, Ser. No. 886,548
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—290 **9 Claims**



1. In an extruding head for making reticulated seamless tubes of synthetic resin material comprising extrusion die means including a central core and a surrounding die member co-axial with said core and having a portion forming an annular gap therewith for causing said material to be extruded through a gap of a contour closed on itself, a perforating member bearing an array of radially projecting extensions mounted immediately downstream of said gap in a manner allowing a nutational movement so that said extensions may variably project across said gap and a fixed rigid member shaped and disposed so that said extensions of said perforating member will bear against said rigid member to assure perforation of said material when the respective extensions project completely across said gap in the course of said nutational movement,
a drive for producing nutational movement of said perforating member, said drive comprising:
a set of cylindrical studs, respectively passing through apertures of said perforating member and mounted on said extrusion die means parallel with the axis of said core and surrounding die member, said apertures of said perforating member being of a diameter greater than that of said studs;
means for maintaining said perforating member axially in close proximity to said gap-forming portion of said extrusion die means near said gap with sufficient looseness to allow displacement of said perforating member in a plane transverse to said axis of said core and surrounding die member within limits allowed by engagement of said studs with said apertures; and
means including a rotary member and an associated rotary drive therefor for driving said perforating member in rotation about said axis, said rotary member having a cylindrical surface eccentric with respect to said axis in sliding engagement with a cylindrical edge surface of said perforating member for causing said perforating member to respond to rotation of said rotary member by nutation around said studs.

4,189,293
EXTRUSION HEAD
Theodore L. Ether, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.
Filed Mar. 30, 1978, Ser. No. 891,672
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—376 A **6 Claims**

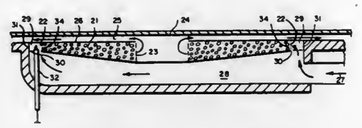


1. An extrusion head comprising:
(a) first means defining a cylindrical entrance zone through which extrudate is introduced into said extrusion head in the form of a solid cylindrical rod;
(b) second means arranged axially within said entrance zone for shaping said extrudate into an annular cross-sectional configuration of substantially uniform wall thickness;
(c) third means in said extrusion head downstream of said second means for splitting said annular extrudate longitudinally along one generatrix of said annular configuration;
(d) fourth means defining in said extrusion head downstream of said third means a transition zone having first and second wall surfaces approximating the contours of the internal and external wall surfaces, respectively, of a tube split from adjacent one end along one generatrix and gradually unfolded to a desired terminal shape at its other end, whereby said transition zone is operable to unfold said split annular extrudate into said terminal shape; and
(e) fifth means defining an exit zone through which said extrudate leaves said extrusion head;
(f) whereby said extrudate arrives at said exit zone with a constant shear history and under constant pressure across the entire terminal shape of the extrudate and with all particles of the extrudate having travelled paths of the same length from said entrance zone to said exit zone.

4,189,294
FLAMELESS COMBUSTION BURNER AND METHOD OF OPERATION
Richard E. Rice, Arlington, and Charles W. Peterson, Stoughton, both of Mass., assignors to Comstock & Wescott Inc., Cambridge, Mass.
Filed Oct. 18, 1977, Ser. No. 843,434
Int. Cl.[2] F23D *13/14*
U.S. Cl. 431—7 **18 Claims**

1. In the process for operating a gas burner, the steps which comprise:
forming a combustible mixture of a fuel and a combustion supporting gas; flowing said mixture into the burner and

thence into an annular ring forming an ignition zone; igniting said mixture in said ignition zone and forming a flame and confining the flame within the ignition zone; flowing the products of combustion from said ignition zone into a second annular ring disposed within said first annular ring, said second annular ring containing an oxida-



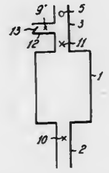
tion catalyst, whereby the catalyst is heated to a temperature sufficient to support combustion thereon; extinguishing said flame by stopping the flow of fuel or the combustion supporting gas or both and then flowing said mixture over said catalyst to flamelessly combust said mixture and provide heat.

4,189,295

CONTROL FOR HEATING APPARATUS

Noel A. Ramon, Brugge, Belgium, assignor to Naamloze Vennootschap A. Claeys-Flandria, Zedelgem, Belgium

Filed Jun. 28, 1977, Ser. No. 811,311
Claims priority, application Belgium, Jun. 28, 1976, 168409; Jun. 21, 1977, 178626
Int. Cl.[2] F23N *3/04*
U.S. Cl. 431—12 **1 Claim**



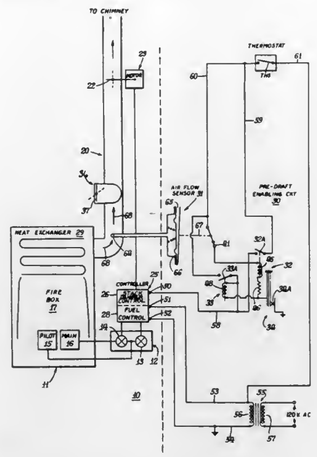
1. A heating apparatus comprising a sealed casing holding a combustion chamber, combustion means in the chamber, means for supplying a combustible to the combustion means, heat exchange means associated with the combustion chamber, a first fluid flow circuit including an inlet conduit for air leading to the combustion chamber and an outlet conduit for non-diluted combustion gases leading from the heat exchange means, a second fluid flow circuit including a by-pass branching off directly from the air inlet conduit to the outlet conduit for the non-diluted combustion gases, a fan means forcing the air through the first circuit from the inlet conduit to the combustion chamber and forcing the non-diluted combustion gases through the outlet, and forcing the air through the second circuit by-pass, the fan means being arranged to exhaust the combustion gases from the first circuit and the air from the by-pass together, and means including a bimetallic device for detecting the temperature of the combustion gases coming from the heat exchange means arranged in the first circuit in the outlet conduit for the non-diluted combustion gases and being responsive to the detected temperature for modifying the fluid flow through at least one of the circuits until the volume of the air forced through the first circuit into the combustion chamber corresponds to the volume of air necessary for obtaining an operating efficiency at least close to an optimum efficiency of the heating apparatus under the detected temperature, supplementary air volume passing through the second circuit.

4,189,296

METHOD AND APPARATUS FOR CONTROLLING FURNACE

Thomas E. Hayes, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Mar. 13, 1978, Ser. No. 885,867
Int. Cl.[2] F23N *1/00, 5/20*
U.S. Cl. 431—20 **21 Claims**



1. In a control system for an appliance having a burner, fuel valve means for connecting a source of fuel to said burner, a stack for coupling flue gasses from said appliance to a chimney, and a thermostat for generating a heat demand signal in response to a call for heat from a space to be heated, the improvement comprising: stack damper means operable between a closed and an open position; controller means responsive to an input signal for operating said stack damper means to said open position and for operating said fuel valve means to supply gas to said burner; pre-draft enabling circuit means responsive to said heat demand signal for generating a pre-draft enabling signal for a predetermined time interval and for coupling the same to an input of said controller means; sensing means in said stack for disabling said pre-draft enabling circuit means if a draft is sensed in said stack within said time interval; holding circuit means responsive to said heat demand signal for generating an input signal to said controller means after said pre-draft enabling circuit is disabled if draft is sensed within said time interval; and pressure responsive means for relieving pressure in said stack outside a predetermined normal range.

4,189,297

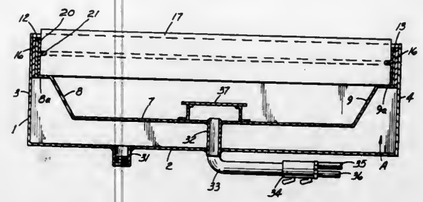
MATRIX MOUNTING MEANS FOR GAS BURNERS

Rudolph S. Bratko, Hinckley, and Werner Zwipf, Parma, both of Ohio, assignors to Slyman Manufacturing Corporation, Parma, Ohio

Filed Oct. 26, 1977, Ser. No. 845,643
Int. Cl.[2] F23D *13/12*
U.S. Cl. 431—328 **8 Claims**

1. In infra-red burner construction of the class described, in combination, an upwardly open combustion plenum, means extending around said plenum to support a burner face comprising a combustible medium permeable matrix, means extending around the periphery of said matrix to direct a non-combustible medium upwardly along said periphery entirely outside the same and beyond the upper surface of said matrix, means to supply said medium, instrumentalities to supply a combustible medium to and through said matrix to burn at or near the surface thereof to generate infra-red radiation, and means to regulate such supply, the means to direct the non-combustible mixture along the periphery being arranged to

provide a narrow stream of such mixture close to said periphery and in such volume to prevent the combustible mixture from burning outside of said stream, a non-permeable band member extending around the periphery of the matrix to com-



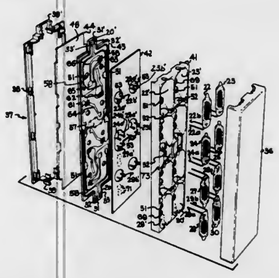
pel the combustible medium to pass entirely through the matrix to the upper face thereof, the band member being connected to the matrix for positioning the matrix at the opening of the combustion plenum, and means being provided to fasten the band member to the plenum.

4,189,298

MULTILAMP PHOTOFLASH UNIT HAVING CONDUCTIVE ADHESIVE CONNECTION

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,262
Int. Cl.[2] A23C *1/12*
U.S. Cl. 431—359 **5 Claims**



1. A photoflash unit comprising a plurality of electrically ignitable flashlamps each having a pair of lead-in wires, circuit means containing circuitry for selectively igniting said flashlamps, means electrically connecting the lead-in wires of said flashlamps to said circuitry, said circuitry including a common conductor connected electrically to one lead-in wire of each of said flashlamps, an electrically conductive reflector unit positioned between said lamps and said circuit means and shaped to reflect light from said lamps when flashed, and means electrically connecting said conductive reflector unit to said common circuit conductor, said last-mentioned connecting means comprising an electrically conductive adhesive material positioned between and adhesively joined to said conductive reflector unit and said common circuit conductor.

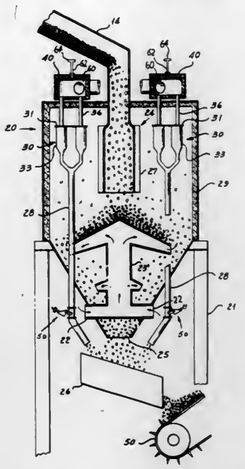
4,189,299

DIRECT COOLER FOR CALCINING APPARATUS

Percy V. Bourne, Scarborough, Canada, assignor to Calcimatic International, Limited, Cayman Islands, United Kingdom

Filed Mar. 13, 1978, Ser. No. 885,874
Int. Cl.[2] F27D *15/02*
U.S. Cl. 432—78 **10 Claims**

1. Apparatus for cooling lime including in combination, a cooling chamber, means for introducing hot lime to be cooled into said chamber at a location below the top thereof, said cooling chamber having an outlet for cooling lime, means for introducing cooling air into said chamber, means for bringing said cooling air into direct heat exchange relationship with hot lime introduced into said inlet to cool the hot lime and to heat the cooling air, a dust separator having an inlet for receiving dust laden air, means mounting said separator within said chamber with said inlet thereof disposed above said location,



means for directing heated air resulting from direct heat exchange into said dust separator inlet to produce clean heated air, and means for carrying said clean heated air away from said dust separator and away from said chamber.

4,189,300

ROTATING DRUM DRYER APPARATUS

Theodore G. Butler, Orlando, Fla., assignor to Mechtron International Corporation, Orlando, Fla.

Filed Aug. 28, 1978, Ser. No. 937,041
Int. Cl.[2] F27B *7/14*
U.S. Cl. 432—118 **8 Claims**



1. A rotating drum dryer comprising in combination:
a burner adapted to provide a flame of predetermined shape;
a rotating drum dryer having a hollow interior positioned adjacent said burner in a position for said burner flame to be directed into an end thereof;
said rotating drum dryer having a plurality of flights fixedly attached to the interior walls thereof for rotating therewith, a plurality of said flights having means to capture loose material in said drum as said flights rotate through material accumulated in said drum below said burner flame and releasing a portion of the captured material in a pattern on one side of the burner flame through approximately 135 degrees of rotation of each flight on said drum beginning from below said burner flame and releasing a second portion of captured material on the other side of the burner flame; and
said flights holding loose material therein during approxi-

mately 100 degrees of rotation of said dryer while passing over the center axis of said burner flame whereby loose material is prevented from falling into the center portion of the flame.

4,189,301

REINFORCED INSULATING MEMBERS

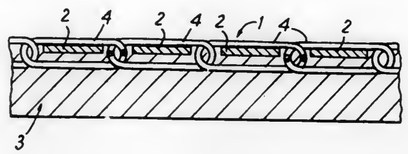
Thomas J. Twort, Greenford, England, assignor to Bloom Engineering Company, Inc., MIddlesex, United Kingdom, GB2 and Bloom Engineering Company, INc., Pittsburgh, Pa.

Filed Apr. 24, 1978, Ser. No. 899,451

Claims priority, application United Kingdom, May 6, 1977, 19128/77

Int. Cl.[2] F27D *1/06*

U.S. Cl. 432—252 **6 Claims**



1. A thermal insulating member for protecting heat absorptive elongated elements in a high temperature heat treating furnace comprising a refractory insulating material, a reticulated metal mesh reinforcement structure defining a plurality of interconnected loops and embedded at least partly within the refractory insulating material and a fibrous insulating material interwoven within said loops.

4,189,302

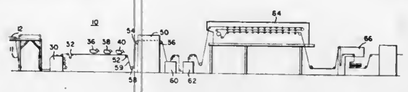
CONTINUOUS PROCESS AND APPARATUS FOR RANDOMLY COLORING PILE FABRIC

James Toland, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Filed Sep. 13, 1977, Ser. No. 832,905

Int. Cl.[2] D06P *5/12*

U.S. Cl. 8—1 XA **11 Claims**



1. A two step dyeing process for coloring the pile yarns of a carpet web or the like continuously conveyed through several operating stations comprising pretreating the pile yarns to be colored with a wetting agent at one of said operating stations, coating the surface tips of the pile yarns with a continuous layer of viscous gum coating having a viscosity in the range of 100 to 1600 c.p.s., applying a layer of first dyeing agent of a viscosity in the range of 20 to 400 c.p.s. on said gum coating, penetrating said viscous gum coating and said first applied layer with a second dyeing agent having a viscosity less than said first dyeing agent to apply a dye color to the surface of the lower body portion of the yarns beneath the tips of said pile yarns coated with said gum coating and subjecting said web to an elevated temperature for thinning the gum coating to allow the first applied dyeing agent to flow to the tips of the pile yarns and setting the color in the pile yarns such that the lower body portions of the pile yarns are dyed by the second dyeing agent and the tips of said pile yarns are dyed by the first dyeing agent.

4,189,303

METHOD OF SHRINKPROOFING ANIMAL FIBERS WITH OZONE

Walter J. Thorsen, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,646

Int. Cl.[2] D06M *3/08, 9/08*

U.S. Cl. 8—115.7 **6 Claims**

1. A process for shrinkproofing proteinaceous animal fibrous materials, which consists of —

(a) preparing an aqueous solution of ozone containing about 1 to 20 milligrams of ozone per liter of solution and

(b) contacting the so-prepared solution with the material at neutral pH at a temperature of about 20°–30° C. for a period of about 2–6 minutes.

4,189,304

DEVICE AND METHOD FOR DETECTING MYOGLOBIN

Ernest C. Adams, Jr., Elkhart, and Kathleen M. Layman, New Paris, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 27, 1978, Ser. No. 955,452

Int. Cl.[2] G01N *33/16, 31/22*

U.S. Cl. 23—230 B **11 Claims**

7. A test device for the detection of myoglobin in a test sample containing hemoglobin, which comprises:

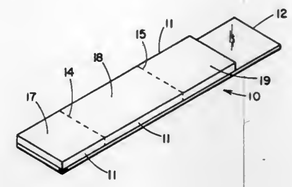
a length of capillary matrix having a first and second end;

a first zone located in said length of capillary matrix extending from the first end of the matrix for contact with a test sample;

a second zone located in said length of capillary matrix in the direction of said second end from said first zone;

a first reagent incorporated with said matrix in said second zone and adapted to slow or prevent capillary movement through said second zone of hemoglobin present in the test sample;

a third zone located in said length of capillary matrix extending from the second end toward the second zone; and



a second reagent incorporated with said matrix in said third zone and a adapted to provide a detectable response when contacted with myoglobin.

4,189,305

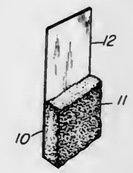
SMOKELESS FIRE KINDLING DEVICE

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 769,644, Feb. 17, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,342

Int. Cl.[2] C10L *11/00*

U.S. Cl. 44—41 **8 Claims**



1. A device, useful for the kindling of fires, comprising:

(a) a normally solid, shaped composition comprising wax in admixture with a particulate combustible cellulosic material, said admixture comprising the wax in major amount based on the weight of the admixture; and

(b) an integral lighting means of combustible sheet material attached to only a portion of the surface area of said composition.

2. A method for kindling a fire in a combustible material, comprising:

a. positioning a shaped solid composition on top of said combustible material, said shaped solid composition comprising an intimate mixture of in excess of 50 percent by weight and up to 90 percent by weight of wax and from 10 percent by weight to less than 50 percent by weight of cellulosic material, based on the total weight of wax and cellulosic material in said composition, said composition further comprising a lighting means of flammable sheet material attached to only a portion of the surface thereof;

b. igniting said shaped solid composition by contacting said lighting means with a flame, which flame is conveyed by said lighting means to the body of said composition, thereupon igniting said wax and cellulosic material;

c. allowing a controlled portion of said wax in the burning composition to melt and permeate said combustible material while the remainder of said wax is held substantially where it was positioned by means of said cellulosic material functioning as a binder for said wax to prevent the entire composition from melting and flowing off of said combustible material; and

d. raising the temperature of said combustible material to its ignition point by the continued burning of said shaped composition and of said wax which has melted and permeated said combustible material.

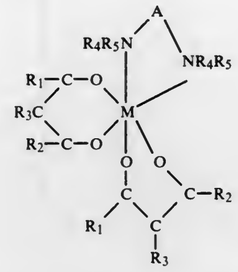
4,189,306

HEXACOORDINATED TRANSITION METAL COMPOUNDS AND FUEL COMPOSITIONS CONTAINING THEM

Charles A. Sandy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 4, 1978, Ser. No. 948,582
Int. Cl.² C10L *1/30*
U.S. Cl. 44—68 **10 Claims**

1. The hexacoordinated transition metal compound represented by the formula



wherein:

M is selected from at least one member of the group Mn, Fe, Co and Ni,

R_1 and R_2 are hydrocarbyl groups of 1 to 6 carbon atoms,

R_3 is hydrogen or an alkyl of 1 to 6 carbon atoms,

R_4 and R_5 are hydrogen or alkyl of 1 to 4 carbon atoms, and

A is a divalent hydrocarbyl group of 2 to 10 carbon atoms selected from a member of the group alkylene, phenylene and cycloalkylene, each member providing 2 or 3 carbon atoms between the nitrogen atoms with the proviso that when A is phenylene the number of carbon atoms between the nitrogen atoms is 2.

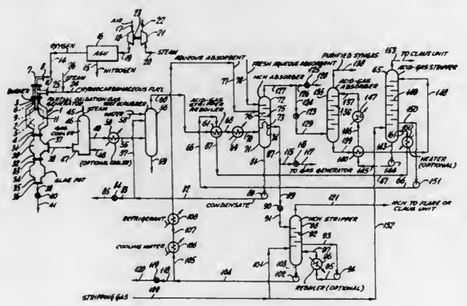
10. The composition comprising hydrocarbons boiling in the gasoline boiling range and an octane-improving amount of the compound of claim **1**.

4,189,307

PRODUCTION OF CLEAN HCN-FREE SYNTHESIS GAS

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,091
Int. Cl.² C10K *1/10*
U.S. Cl. 48—197 R **13 Claims**



1. A process for producing a clean stream of synthesis gas containing substantially no HCN nor sulfur-containing gases comprising:

(1) reacting a hydrocarbonaceous feed by partial oxidation with a free-oxygen-containing gas with or without a temperature moderator in the reaction zone of a free-flow synthesis gas generator at a temperature in the range of about 1300° F. to 3500° F. and at a pressure in the range of about 10 to 200 atmospheres to produce a stream of synthesis gas comprising H_2, CO, CO_2, HCN, entrained solids and at least one material from the group H_2O, H_2S, COS, CH_4, N_2, A, and NH_3;

(2) removing at least a portion of said entrained solids and cooling the gas stream to a temperature in the range of about 300° F. to 900° F.;

(3) cleaning the gas stream from (2) in a gas-scrubbing zone by scrubbing with condensate and make-up water if any so as to remove the remaining entrained solids without removing substantial amounts of HCN and to produce a clean synthesis gas stream containing HCN as an impurity at a temperature in the range of about 212° F. to 600° F. and at a pressure which is substantially the same as that in the synthesis gas generator less ordinary pressure drop in the intervening lines and equipment;

(4) cooling the gas stream from (3), condensing out and separating water from said clean gas stream, and recycling at least a portion of the condensed water to the gas scrubbing zone in (3) as said condensate;

(5) introducing the clean gas stream from (4) containing HCN impurity into an HCN-absorption zone and contacting said gas stream therein with an aqueous absorbent comprising about 90 to 100 volume % water in liquid phase at a temperature in the range of about 50° F. to 95° F. and a pressure in the range of about 100 to 1600 psia so as to produce an HCN-rich aqueous absorbent stream;

(6) removing clean substantially HCN-free synthesis gas from said HCN-absorption zone; and introducing at least a portion of the HCN-rich aqueous absorbent stream from (5) into said gas generator in (1);

(7) introducing the remainder of said HCN-rich aqueous absorbent stream into an HCN-stripping zone at reduced pressure with or without reboiling and separately removing therefrom a stream of gaseous impurities and a lean aqueous absorbent stream; and introducing said gaseous stream of impurities into the synthesis gas generator in (1) or into a Claus operation or sending same to flare;

(8) cooling said lean aqueous absorbent from (7) and recycling same to the HCN-absorption zone in (5);

(9) contacting the clean substantially HCN-free synthesis gas from (6) with lean liquid absorbent in an acid-gas absorption zone and separately removing a stream of rich liquid absorbent and said product gas; and

(10) heating the stream of rich liquid absorbent from (9) and regenerating same in a regeneration zone wherein at least a portion of said liquid absorbent is heated during regeneration by indirect heat exchange with the clean gas stream leaving the scrubbing zone in (3); cooling the lean liquid absorbent from said regeneration zone and recycling same to said acid-gas absorption zone; and removing from said regeneration zone a stream of acid gas.

4,189,308

HIGH VOLTAGE WETTED PARALLEL PLATE COLLECTING ELECTRODE ARRANGEMENT FOR AN ELECTROSTATIC PRECIPITATOR

Paul L. Feldman, Bridgewater, N.J., assignor to Research-Cottrell, Inc., Somerville, N.J.

Filed Oct. 31, 1978, Ser. No. 956,266
Int. Cl.² B03C *3/08, 3/12, 3/16, 3/78*
U.S. Cl. 55—13 **6 Claims**

1. A wetted parallel plate collecting electrode arrangement for an electrostatic precipitator, said arrangement comprising:

a source of high negative potential referenced to ground potential;

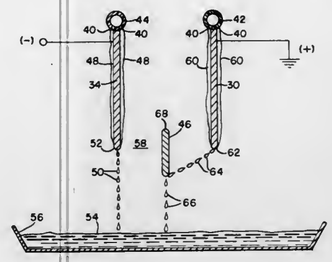
a pair of generally parallel plate-like electrodes having generally parallel lower edges;

electrical conductors connecting opposite of said plate-like electrodes to said source of high negative potential and to ground potential;

means for flowing a liquid film downwardly over a surface of at least one of said electrodes;

a flat, elongated, electrically conductive partition plate disposed between the lower edges of said electrodes in a plane generally parallel to the planes of said electrodes, and means maintaining said partition plate at a voltage intermediate the voltages on said electrodes; and

wherein said partition plate extends above and below the lower edges of said electrodes, and substantial portions of said electrodes are exposed above said partition plate.



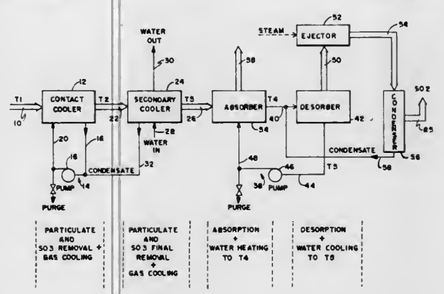
5. A method for reducing the tendency of atomized liquid droplets to travel from the lower edge of one of the parallel plate electrodes of an electrostatic precipitator parallel plate collecting section to the other of the parallel plate electrodes, the two parallel plate electrodes being oppositely charged, said method comprising the step of intercepting the liquid droplets by means of an electrically conductive partition plate which is disposed between the lower edges of the parallel plate electrodes and which has a voltage intermediate the voltage on the two parallel plate electrodes.

4,189,309

DESULFURIZATION OF FLUE GAS

Irenus A. Hoekstra, 28 Lynn Lea, Williamsville, N.Y. 14221

Filed Mar. 14, 1978, Ser. No. 886,610
Int. Cl.² B01D *19/00*
U.S. Cl. 55—44 **6 Claims**



1. The method of removing particulates, SO_2 and SO_3 from an effluent gas, which comprises the steps of;

(a) contacting the effluent gas with water in a first stage closed recirculating water system and recovering the gas with particulates and SO_3 partially removed therefrom;

(b) cooling the gas recovered from step (a) to a temperature sufficient to cause condensation of water vapor whereby further to remove particulates and SO_3 all of which are returned to step (a), and recovering the cooled gas;

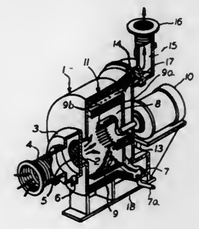
(c) in a further stage isolated both as to liquid and vapor phases from those of steps (a) and (b), first absorbing SO_2 from cooled gas from step (b) under substantially atmospheric pressure by contact with water flowing in a second closed system to produce water plus absorbed SO_2 at a temperature which is selected to obtain a cleaned effluent gas discharge from which a predetermined percentage of SO_2 has been removed and then desorbing the SO_2 under vacuum conditions sufficient to desorb the required amount of SO_2 while simultaneously cooling the water to a temperature which stabilizes the temperature of the water plus absorbed SO_2 at said selected temperature.

4,189,310

APPARATUS FOR REMOVING OIL MIST

Shigeo Hotta, Osaka, Japan, assignor to Kabushiki Kaisha Sanetsu, Osaka, Japan

Filed Jan. 23, 1978, Ser. No. 871,589
Claims priority, application Japan, Jan. 26, 1977, 52/8070
Int. Cl.² B01D *45/14*
U.S. Cl. 55—317 **16 Claims**



1. Apparatus for removing oil mist from an air stream comprising:

a main body having an air inlet at one end thereof for the admission of a stream of oil mist-containing air and an outlet at the other end for the discharge of substantially oil-free air;

a cylindrical filter rotatably mounted within said main body;

a centrifugal fan rotatably mounted within said cylindrical filter and coaxial with said cylindrical filter so as to be rotatable therewith;

drive means for driving said cylindrical filter and said centrifugal fan, said fan being operable to take in air from said air inlet and cause oil-borne mist in said air to adhere to said cylindrical filter so that the oil mist on the cylindrical filter is centrifugally forced outwardly;

a main oil adsorbent layer provided on the inner surface of said main body concentrically arranged radially outwardly of said cylindrical filter and extending axially of said main body such that said oil forced centrifugally outwardly from said cylindrical filter passes to said main oil adsorbent layer and is adsorbed by said main oil adsorbent layer without splashing; and

an oil outlet means adjacent the downstream end of said main oil adsorbent layer and in communication therewith, said adsorbed oil in said main oil adsorbent layer flowing toward said oil outlet means due to the air passing between said main oil adsorbent layer and said cylindrical filter and due to the capillarity of said main adsorbent layer.

4,189,311

1,3-DI-N-DECYL-2-METHYL-IMIDAZOLIUM CHLORIDE OR BROMIDE AND MICROBIOCIDAL PREPARATION CONTAINING THIS COMPOUND

Arnold Laqua, and Ulrich Holtschmidt, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,020

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829137

Int. Cl.² A01N *9/22*

U.S. Cl. 71—67 **2 Claims**

1. A microbiocidal composition comprising a carrier and a microbiocidally effective amount of 1,3-di-n-decyl-2-methyl-imidazolium chloride or bromide.

4,189,312

WEIGHT RATIO MIXING OF VOLATILE CONTAINING CARBONACEOUS MATERIALS WITH MATERIALS TO BE TREATED BY THE VOLATILES EVOLVED THEREFROM

Ray E. Kranz; John B. Harrell, and William E. Solano, all of Pittsburgh, Pa., assignors to Salem Furnace Co., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 627,704, Jan. 5, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,696

Int. Cl.² C21B *13/04*

U.S. Cl. 75—34 **6 Claims**

1. A process for producing metallized ores and a char within a substantially air tight enclosure wherein there is provided an oxidizing atmosphere in the upper portion of the enclosure and a reducing atmosphere about the floor of the enclosure, the improvement comprising the steps of mixing a carbonaceous material with an iron ore on a weight ratio basis of about ½ coal to 1 iron ore to about 1½ coal to 1 iron ore wherein the iron content in the ore is between about 25% to about 65% and the volatile content in the carbonaceous material is between about 5% to about 40% then subjecting said mixture to a temperature within the enclosure of between about 1800° F. to about 2200° F. for a period of between 2 hours and 4 hours.

4,189,313

CARBOTHERMIC PROCESS

Franco Colautti, Ragosa di Povoletto ud, Italy, assignor to Kinglor Metor S.p.A., Buttrio, Italy

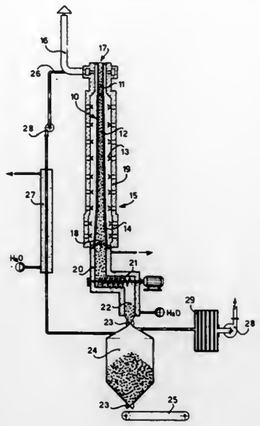
Division of Ser. No. 585,486, Jun. 10, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,906

Claims priority, application Italy, Jun. 11, 1974, 83365 A/75; Apr. 24, 1975, 83361 A/75

Int. Cl.² C21B *13/02*

U.S. Cl. 75—37 **13 Claims**

1. A carbothermic process for converting iron ore directly to sponge iron comprising the steps of charging a reaction mixture comprising iron ore to be reduced and a reducing agent at the top of a vertical retort comprising first, second, and third reaction zones; pre-heating said reaction mixture in said first reaction zone to a temperature below the reduction temperature of the iron ore of said reaction mixture by means of combustion gases from said retort to eliminate any water content which may be present in said reaction mixture and maintaining the speed of descent of the reaction mixture constant within said first zone as said charge flows to said second zone; increasing the heat of said second reaction zone in relation to said first zone, by use of external burners to provide uniform heat within any section of said zone, to a temperature sufficient to initiate the reduction of the reaction mixture and varying said heat in different sections within said second zone while causing the speed of descent of the reaction mixture within said second zone to become progressively slower as said reaction mixture flows to said third zone; maintaining said third zone at a constant reduction temperature by use of external burners and causing the speed of descent of said mixture within said third zone to become progressively slower to thereby complete the reduction of the reaction mixture in said third zone, and controlling the withdrawal of the sponge iron



from said retort to coordinate the descent of the reaction mixture through said first, second, and third zones to obtain substantially complete reduction.

4,189,314

METHOD OF UTILIZING WASTE DUST AND WASTE SLUDGE FROM BLAST FURNACES AND STEEL WORKS

Ludwig Fiege; Hans-Werner Höhle, both of Moers; Wilhelm J. P. Janssen, Mülheim, and Klaus-H. Ulrich, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,004

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740675

Int. Cl.² C21B *1/20*

U.S. Cl. 75—46 **10 Claims**

1. In a method for subsequent steel production of utilizing waste dust and waste sludge from blast furnaces and steel works having a refining vessel and a pig iron charging ladle comprising forming the waste sludge into pellets containing basic gangue and higher sulphur contents and having a metallization degree of over 80%, the improvement comprising:

placing said pellets into said pig iron charging ladle and intimately mixing up to 10% by weight of said pellets with liquid pig iron relative to the weight of the pig iron to form a pig iron melt, and

deslagging the pig iron melt prior to the pouring thereof into said refining vessel.

4,189,315

PROCESS FOR THE DESULPHURIZATION OF MOLTEN CAST IRON AND TREATING AGENT

James F. Bregi, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 875,273, Feb. 6, 1978. This application Dec. 6, 1978, Ser. No. 966,940

Int. Cl.² C21C *7/02;* **C22C** *33/08*

U.S. Cl. 75—251 **2 Claims**

1. A metal treating agent, comprising: a supply of substantially spherical particles, each particle consisting essentially of low carbon steel and having a thin shell coating of substantially pure magnesium thereabout in the thickness range of 0.018–0.022 inches, and an outer coating consisting essentially of a non-metallic refractory in the thickness range of 0.004–0.010 inches, each of said particles being discrete and independent from the adjacent particles and being free flowing as a supply of particles, the iron based particles each having a diameter substantially in the range of 0.04–0.2 inches.

4,189,316

IRON MODIFIER AND METHOD OF USING SAME

Lev V. Peregudov; Mikhail M. Malashin, both of Tula; Anatoly S. Naletov, Moscow, and Nikolai S. Martynets, Tula, all of U.S.S.R., assignors to Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia, Tula, U.S.S.R.

Filed Jan. 30, 1978, Ser. No. 873,664

Int. Cl.² C22C *33/08, 33/00*

U.S. Cl. 75—252 **1 Claim**

1. An iron modifier consisting essentially of, in percent by weight:

Silicon	25 to 50%
Rare-earth metals	20 to 40%
Carbon	10 to 30%
Sulfur	0.1 to 0.3%
Iron	the balance.

4,189,317

FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,939

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.² B05D *1/08*

U.S. Cl. 75—252 **9 Claims**

1. A flame spray powder mixture consisting essentially of a metal silicide and a coating metal powder,

said metal silicide being at least one silicide selected from the group consisting of disilicides of Ti, Zr, Hf, V, Nb, Ta, Cr, W, Mn and Co, and magnesium silicide and boron silicide, said metal silicide having an average size ranging from about 10 to 150 microns,

the average size of said coating metal powder ranging from about 30 to 140 microns,

the composition of said powder mix ranging from about 2% to 20% by weight of said silicide, with substantially the balance said coating metal powder.

4,189,318

FLUX FOR USE IN CENTRIFUGAL CASTING OF BIMETALLIC PIPES

Nikolai Zorev; Nikolai N. Alexandrov; Gennady S. Strizhov; Genrikh S. Mirzoian, all of Moscow; Gennady M. Slepnev, Moskovskaya; Gleb S. Akubov, Izhevsk; Evgeny V. Gerlivanov, Izhevsk; Vladimir M. Lvov, Izhevsk, and Viktor G. Tinyakov, Moscow, all of U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash", Moscow, U.S.S.R.

Filed Jul. 11, 1978, Ser. No. 923,942

Claims priority, application U.S.S.R., Jul. 15, 1977, 2507556[U]

Int. Cl.² C22B *9/10*

U.S. Cl. 75—257 **2 Claims**

1. A flux intended for use in centrifugal casting of bimetallic pipes and consisting essentially of calcium oxide, silicon oxide, boron oxide, sodium oxide and sodium fluoride, said components being contained therein in the following amounts:

percent by weight

CaO, the base

SiO_2 . . . 7 to 10

B_2O_3 . . . 10 to 12

Na_2O . . . 18 to 24

NaF . . . 20 to 25.

4,189,319

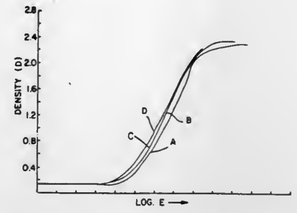
ARGININE OR SALT THEREOF AS A DEVELOPMENT ACCELERATOR OF COLOR DEVELOPMENT OF COLOR PHOTOGRAPHIC MATERIALS

Burton H. Waxman, Endwell, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Jul. 18, 1975, Ser. No. 597,225

Int. Cl.² G03C *7/16, 7/00, 5/30, 1/06*

U.S. Cl. 430—380 **13 Claims**



1. A process for color development of a photographic element comprising a light-sensitive multi-layer photographic silver halide emulsion that has been exposed to actinic radiation, which comprises treating the exposed silver halide emulsion with a processing solution comprising a photographic color developer in the presence of a color coupler reactive with oxidized color developer to form a coupled product and arginine or a salt thereof in an amount effective to accelerate development.

4,189,320

LIGHT-SENSITIVE O-QUINONE DIAZIDE COMPOSITIONS AND PHOTOGRAPHIC REPRODUCTION PROCESSES AND STRUCTURES

Shane H. Hsieh, Somerville, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Continuation of Ser. No. 572,662, Apr. 29, 1975, abandoned. This application Nov. 1, 1977, Ser. No. 850,761

Int. Cl.² G03C *1/54, 1/70;* **G03F** *7/00, 7/08*

U.S. Cl. 430—145 **19 Claims**

1. A positive-working, light-sensitive coating composition comprising at least one solvent-soluble, isocyanate-free, free hydroxy-containing condensation product of an organic isocyanate and a phenol-formaldehyde novolak resin, in admixture with at least one light-sensitive diazo compound selected from the group consisting of esters and amides of o-quinone diazides and mixtures thereof, said composition being soluble in aqueous alkaline developer solution after exposure to light.

4,189,321

PROCESS FOR FORMING MAGENTA DYE IMAGES

Tamotsu Kojima; Mitsuto Fujiwhara; Takaya Endo, and Osamu Ezawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1978, Ser. No. 936,915

Claims priority, application Japan, Aug. 31, 1977, 52-104437

Int. Cl.² G03C *7/00*

U.S. Cl. 430—381 **11 Claims**

1. In a process for forming a magenta dye image comprising imagewise exposing a light-sensitive silver halide photographic material and processing the photographic material in the presence of a magenta coupler and a color developing agent, the improvement wherein the magenta coupler is a compound obtained by reacting at least one 5-pyrazolone compound with a compound having two or more aldehyde groups, said magenta coupler having at least four residues of the 5-pyrazolone compound, from each of which one hydrogen atom at the 4-position has been removed, wherein the compound having aldehyde groups is a compound represented by the following formula:

Z_1—$(CHO)_n$

wherein n represents an integer of 2 or more, and when n is 2, Z_1 represents a single bond or an aliphatic hydrocarbon residue, aromatic hydrocarbon residue or heterocyclic residue, each of which being divalent, said heterocyclic residue selected from the group consisting of 2,4-furandiyl, 2,5-furandiyl, 2,5-thiophenediyl and 3,5-pyridinediyl, and when n is an integer of 3 or more, Z_1 represents an aliphatic hydrocarbon residue, aromatic hydrocarbon residue or heterocyclic residue, each of which being n-valent, said heterocyclic residue being 3,5,7-benzofuranetriyl.

4,189,322

PHOTOPOLYMERIZABLE COMPOSITIONS FOR THE PRODUCTION OF PRINTING PLATES AND RELIEF PLATES CONTAINING DIANTHRONYL OR BISANTHRONE COMPOUND

Gerhard Hoffmann, Speyer; Dieter Kleuser, and Bernd Bronstert, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,764

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720560

Int. Cl.[2] **G03C** *1/68*

U.S. Cl. 430—284 **5 Claims**

1. A photopolymerizable composition for the production of printing plates and relief plates, consisting essentially of a photoinitiator-containing mixture of at least one low molecular weight compound having at least one olefinically unsaturated photopolymerizable double bond with at least one organic polymeric binder that is compatible with said compound, wherein the composition contains, uniformly dispersed therein, from about 0.0001 to 1% by weight of 9,9'-dianthronyl or 10,10'-bisanthrone.

2. A photopolymerizable composition as claimed in claim 1, wherein the amount of anthrone compound is from 0.0001 to 0.1% by weight.

4,189,323

RADIATION-SENSITIVE COPYING COMPOSITION

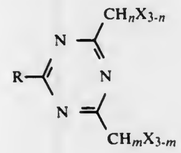
Gerhard Buhr, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,272

Int. Cl.[2] **G03C** *1/68*

U.S. Cl. 430—281 **13 Claims**

1. A radiation sensitive composition which comprises an ethylenically unsaturated compound capable of undergoing a polymerization reaction initiated by free radicals or a compound whose solubility is changed by the action of an acid and, as the radiation sensitive compound, from about 0.05 to 10 percent, based on the solids content of the composition, of an s-triazine corresponding to Formula I



I

wherein

X is bromine or chlorine, and

m and n are whole numbers from 0 to 3, which, taken together, do not exceed 5,

and in which

R is a substituted or unsubstituted bi- or polynuclear aromatic or heterocyclic aromatic group which may be partially hydrogenated and which is linked via an unsaturated nuclear carbon atom.

4,189,324

STABILIZED ELECTROLESS PLATING SOLUTIONS

Michael Gulla, 24 Ivy La., Sherborn, Mass. 01770, and Christy Savas, 398 Central St., Framingham, Mass. 01701

Filed Jun. 2, 1978, Ser. No. 911,807

Int. Cl.[2] **C23C** *3/02*

U.S. Cl. 106—1.22 **12 Claims**

1. In an aqueous electroless plating solution comprising a source of nickel ions, a pH adjuster and a reducing agent for said ions; the improvement comprising the addition of gallium to the solution in an amount of at least 1 part per million parts of solution.

8. A method for increasing the stability of an electroless nickel plating solution comprising a source of mickel ions, a pH adjuster and a reducing agent for said ions, said method comprising the step of adding a source of gallium to said solution in a concentration of at least one part per million parts of solution.

4,189,325

GLASS-CERAMIC DENTAL RESTORATIONS

Joy M. Barrett; David E. Clark, and Larry L. Hench, all of Gainesville, Fla., assignors to The Board of Regents, State of Florida, University of Florida, Tallahassee, Fla.

Filed Jan. 9, 1979, Ser. No. 2,019

Int. Cl.[2] **C03C** *3/04, 3/22;* **C09K** *3/00*

U.S. Cl. 106—35 **36 Claims**

1. A glass consisting essentially of about 25 to about 33 mole percent Li_2O, about 73.5 to about 52 mole percent SiO_2, about 0.5 to about 5 mole percent Al_2O_3 and about 1 to about 10 mole percent CaO.

13. A glass-ceramic substantially free of cracks arising from the local volume change of crystallization, said glass-ceramic comprising Li_2O; SiO_2; Al_2O_3; CaO; from about 0.003 to about 0.01 weight percent, based on the weight of $Li_2O+SiO_2+Al_2O_3+CaO$, of platinum; and from about 0.2 to about 2 weight percent, based on the weight of $Li_2O+SiO_2+Al_2O_3+CaO$, of Nb_2O_5,

with the molar ratio of Li_2O to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.25 to about 0.33,

the molar ratio of SiO_2 to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.735 to about 0.52,

the molar ratio of Al_2O_3 to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.005 to about 0.05, and

the molar ratio of CaO to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.01 to about 0.1.

4,189,326

NONSTOICHIOMETRIC $MgAl_2O_5$ FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Apt. A-8, Van Antwerp Village, Schenectady, N.Y. 12309, and Frederic J. Klug, 99 Van Dyke Ave., Amsterdam, N.Y. 12010

Division of Ser. No. 775,758, Mar. 9, 1977, Pat. No. 4,108,676. This application Jan. 5, 1978, Ser. No. 867,190

Int. Cl.[2] **C04B** *35/04, 35/44;* **B28B** *7/34;* **C01F** *7/16*

U.S. Cl. 106—62 **2 Claims**

1. A ceramic article for use in the casting and directional solidification of advanced superalloy materials comprising

a mixed oxide compound material consisting essentially of nonstoichiometric $MgAl_2O_3$,

a porosity content which is from about 10 percent by volume to about 70 percent by volume,

at least 10 percent of the porosity is interconnected, and

the material of the ceramic article is leachable in a molten salt bath selected from the group consisting of M_3AlF_6, M_3AlF_6+MF, $M_3AlF_6+M'F_2$ and M_3AlF_6+MCR wherein

M is Li, Na, or K

M' is Mg, Ca, Ba or Sr.

4,189,327

SEMI-CORDIERITE AND METHOD OF MAKING THE SAME

George L. Winchester, Jr., Greensboro, N.C., assignor to Resco Products, Inc., Norristown, Pa.

Filed Apr. 17, 1978, Ser. No. 896,668

Int. Cl.[2] **C04B** *35/16*

U.S. Cl. 106—60 **32 Claims**

1. A method of making a semi-cordierite grog composition comprising forming a mixture comprising about 8 to about 20 weight percent olivine and about 80 to about 92 weight percent of a natural mineral selected from the group consisting of kaolin, fireclay, bauxite, bentonite, pyrophyllite, sillimanite, kyanite, andalusite, diaspore, quartz and mixtures thereof, wherein the kaolin comprises at least about 75 weight percent of the natural mineral, and sintering the mixture at a temperature of about 1330° C. to about 1390° C.

4,189,328

METHOD OF PRODUCING A GREENER SHADE ALKALI BLUE PRODUCT AND PRODUCT PRODUCED THEREBY

Robert J. Flores, Alsip, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 5, 1978, Ser. No. 939,337

Int. Cl.[2] **C09B** *11/10*

U.S. Cl. 106—288 Q **7 Claims**

1. A method for producing Alkali Blue pigments of enhanced green hue which comprises dispersing an Alkali Blue pigment and a minor quantity of at least one additive agent in an aqueous alkaline solution, heat-treating said admixture but not above the boiling point thereof, thereafter acidifying the aqueous admixture to a pH of less than five and recovering said hue modified Alkali Blue, said additive agent comprising at least one substituted aromatic single and/or multiple-fused ring structure having at least one phenolic hydroxyl group substituent and further characterized by substantial water insolubility at pH of less than five and said additive melting point greater than about 35° C.

4,189,329

HALOGEN-CONTAINING PLASTIC REFUSE TREATMENT

David R. Marshall, 1306 Treme, New Orleans, La. 70016, and Ronal C. Morie, 140 Roseacre, St. Louis County, Mo. 63119

Filed May 9, 1973, Ser. No. 358,629

Int. Cl.[2] **B08B** *15/00*

U.S. Cl. 134—5 **6 Claims**

1. The method of cleaning a halogen containing plastic coating from a metallic article by thermally decomposing the plastic coating in such a manner as to prevent the escape into the ambient atmosphere of the halogen gas formed during the decomposition of the coating, said method comprising the steps of:

(a) fluidizing a bed of granular material of at least one reactive carbonate composition selected from the class consisting of alkaline earth metal carbonates, alkali metal carbonates, and combinations thereof;

(b) heating the fluidized bed to a temperature sufficient for complete thermal decomposition of the plastic coating but below the melting point of the metallic article;

(c) fully immersing the plastic coated metallic article within the heated fluidized bed for a time sufficient to complete the thermal decomposition of the plastic coating and allow any halogen gas released by the decomposition to react with the reactive carbonate material of the bed, thereby preventing any halogen containing gas from escaping into the ambient atmosphere; and

(d) removing the cleaned metallic article from the bed.

5. The method of disposing of halogen-containing plastic refuse in a manner for preventing escape into the ambient atmosphere of the halogen within such refuse comprising providing a bath of at least one carbonate from the class consisting of alkaline earth metal carbonates, namely calcium carbonate, magnesium carbonate, barium carbonate, and strontium carbonate, and alkali metal carbonates, namely sodium carbonate, potassium carbonate, lithium carbonate, and combinations thereof, heating the bath to a temperature for thermal decomposition of the plastic refuse, fully immersing the plastic refuse within said bath, maintaining said bath at the said temperature until the decomposition has been completed, and retaining the products of decomposition within said bath for a time interval sufficient to permit the halogen released by decomposition to react with the bath carbonate within the bath.

4,189,330

METHOD FOR MAKING HUMIDITY AND HEAT EXCHANGER APPARATUS

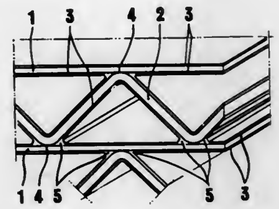
Ove Strindehag, and Erik Wrangel, both of Jonkoping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation-in-part of Ser. No. 651,589, Jan. 22, 1976, Pat. No. 4,038,059. This application Apr. 20, 1977, Ser. No. 789,149

Claims priority, application Sweden, Jan. 30, 1975, 7500987; Nov. 24, 1975, 7513148

Int. Cl.[2] **C23C** *1/08;* **C23F** *7/00*

U.S. Cl. 148—6.27 **6 Claims**



1. In the method of making a regenerative humidity and/or heat exchanger having transfer elements for transporting moisture between two different bodies of air, the steps of:

forming said transfer elements of non-hygroscopic aluminum or alloys thereof;

subjecting the surfaces of said transfer elements to an oxidizing treatment including immersing said surfaces of said transfer elements in an aqueous solution of sodium hydroxide or sodium carbonate and heating said elements to convert said surfaces to an integral hygroscopic layer of oxide of aluminum;

wherein said treatment comprises impregnating said layer with a hygroscopic salt.

3. The method of forming an integral hygroscopic layer of oxide of aluminum on the surfaces of aluminum transfer elements of a humidity and/or heat exchanger, comprising:

(a) initially rendering said surfaces porous by immersing said surfaces in an aqueous acidic bath;

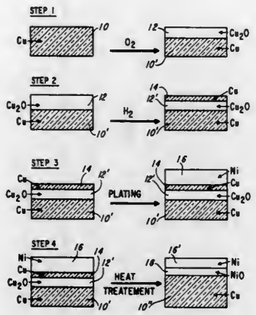
(b) then, chemically forming an aluminum oxide layer on and from said surfaces by immersing them in an alkaline solution consisting essentially of sodium hydroxide, sodium carbonate or mixtures thereof heated to a temperature of from about 25° C. to about 75° C.; and

(c) thereafter heating said surfaces in an environment consisting essentially of water or water and air to increase the thickness of said aluminum oxide layer and render it highly hygroscopic.

4,189,331
OXIDATION RESISTANT BARRIER COATED COPPER BASED SUBSTRATE AND METHOD FOR PRODUCING THE SAME

Clermont A. Roy, Sherbrooke, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed Jun. 22, 1978, Ser. No. 918,269
Int. Cl.[2] C23F *7/02*
U.S. Cl. 148—6.31 23 Claims



1. A copper substrate comprising a copper core, a protective nickel oxide barrier formed in situ directly in contact with the copper core and a protective layer of nickel directly in contact with the nickel oxide barrier layer.

4,189,332
VAPOR TREATMENT OF METAL TIRE CORD

Grover W. Rye, Cuyahoga Falls, Ohio, and Karol Marencak, Bissen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 644,673, Dec. 29, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 950,333
Int. Cl.[2] C23F *7/00*
U.S. Cl. 148—6.31 2 Claims

1. In a process of treating a filament of steel having a brass coating thereon with a reagent reactive with the brass and/or any exposed surface of the steel filament, the improvement characterized by (A) continuously passing a steel filament having a microscopically porous brass coating thereon through the vapors of molten benzotriazole and (B) subjecting the treated filament to a water vapor treatment; wherein said benzotriazole vapor is heated to a temperature of up to about 180° C., to form primarily a monomolecular coating on said filament so as to promote both corrosion resistance to said filament and aged adhesion between a cord thereof of such stranded filaments and adjacent, adherent sulfur vulcanized rubber.

4,189,333
WELDED ALLOY CASING

George M. Waid, Burton, and Anthony T. Davenport, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 9, 1978, Ser. No. 868,261
Int. Cl.[2] C22C *38/06*
U.S. Cl. 148—36 2 Claims

1. A rolled and normalized welded tubular product formed of a steel consisting essentially of the following elements in amounts by weight based on the total weight of the steel: from 0.20 to 0.40% carbon, from 1.00 to 1.75% manganese, from 0.15 to 0.50% silicon, from 0.20 to 1.00% chromium, from 0.01 to 0.05% aluminum and the balance iron except for normal residual constituents, said steel being further characterized by a yield strength of from about 55 to 80 ksi and an ultimate tensile strength of at least about 95 ksi.

4,189,334
PROCESS FOR THERMAL TREATMENT OF THIN 7000 SERIES ALUMINUM ALLOYS AND PRODUCTS OBTAINED

Bruno Dubost, and Jean Bouvaist, both of Grenoble, France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Oct. 26, 1978, Ser. No. 954,768
Claims priority, application France, Nov. 21, 1977, 77 35672
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—159 10 Claims

1. In a process for the thermal treatment of a thin product, having an equivalent thickness of less than about 15 mm, comprising 7000 series aluminum base alloy of the Al-Zn-Mg-Cu type, containing about 0.4% to 5%, by weight of copper, and comprising a solution heat treatment, quenching and tempering, the improvement comprising effecting tempering in three stages:

(a) pre-tempering within a temperature range of about 100° to 150° C. for a period lasting from about 5 minutes to 24 hours;

(b) intermediate tempering comprising a continuous increase in temperature immediately followed by continuous cooling without an isothermal plateau; and,

(c) final tempering for about 2 to 48 hours at between about 100° and 160° C.,

wherein said intermediate tempering comprises a rise in temperature at a rate above about 1° C. per minute in a temperature range from about 150° C. to 190° C., followed by an increase in the temperature of the product (θ) as a function of the time (t) whatever $\theta(t)$, comprising at least one period at a temperature above 190° C. for a total duration T, such that the function:

$$R(T) = \frac{10^{10}}{1.5} \int_{v}^{T} e^{\frac{-13400}{\theta(t)}} dt$$

is comprised between 0.5 and 1.5 and in which:

e is the base of Naperian logarithms;

T is the total duration, in seconds, of this portion of stage (b), starting from the time when the temperature of the product, as it is increasing in temperature, reaches a temperature of about 190° C. for the first time;

$\theta(t)$ is the temperature in °K of the coldest point of the product above about 463° K. (190° C.) and below about 523° K. (250° C.); and

t is the time in seconds.

4,189,335
METHOD FOR DETERMINING DISTRIBUTION OF A COATING COMPOSITION ON A CARPET STRUCTURE

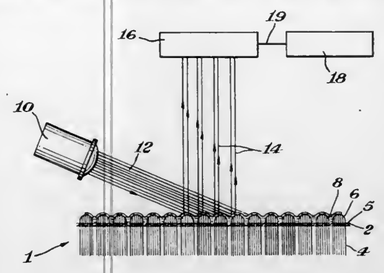
John C. Evans, Midland, and Edwin L. Wittbrodt, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1978, Ser. No. 946,908
Int. Cl.[2] A47G *27/02*; G01B *15/02*
U.S. Cl. 156—64 14 Claims

1. A method for determining the distribution of a coating composition on a carpet structure, wherein the coating composition and the carpet structure being coated have sufficiently different light deflecting properties, said method comprising:

(a) illuminating a surface of the carpet structure, at least a portion of said surface having the coating composition deposited thereon, and

(b) measuring the intensity of at least a fraction of the light returned therefrom, the intensity of said light fraction

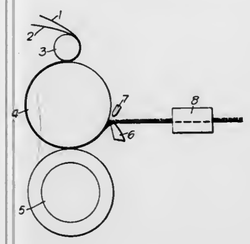


varying with the distribution of the coating composition on the carpet structure.

4,189,336
METHOD OF FORMING PILE PRODUCTS BY TACK-SPINNING AND HEAT TREATMENT THEREFORE

Heather E. Hutflesz, Angelbachtal, Fed. Rep. of Germany, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 5, 1977, Ser. No. 839,569
Claims priority, application United Kingdom, Oct. 7, 1976, 41715/76
Int. Cl.[2] D04H *11/00*; B32B *5/00*
U.S. Cl. 156—72 11 Claims



1. A method for increasing the depth of the pile of a pile-surfaced product made by a tack-spinning process, the product having a pile of thermoplastic material on a backing layer, said method comprising space heating the pile side of the product without any mechanical buffing for a time and temperature less than that at which the pile collapses, said product being free of liquid treating agents, said temperature being between the glass rubber transition temperature but above ambient and the temperature at which the pile collapses, using a heat source not in contact with the pile, and subsequently cooling the pile to ambient temperature.

4,189,337
REAL TIME LABELER SYSTEM

Bobby L. Higgins, Dallas, and Jerry Comer, Richardson, both of Tex., assignors to Camsco, Inc., Richardson, Tex.

Filed Apr. 10, 1978, Ser. No. 895,199
Int. Cl.[2] B65C *9/18*
U.S. Cl. 156—351 7 Claims

1. A labeler mechanism for printing and depositing labels on work pieces comprising:

a label carrier web containing a plurality of spaced apart labels;

a supply reel mounted for rotation and for receiving said label carrier web;

a take up reel mounted for rotation and for receiving said label carrier web;

said label carrier web extending from said supply reel to said take up reel for being wound on said take up reel;

a print station including means for printing at a predetermined position on said plurality of labels;

means for moving said label carrier web from said supply reel to said take up reel and to said print station;

label transfer means having an end surface and being operable between first and second positions, said first and second positions being spacially displaced from one another;

means for moving said label transfer means between said first and second positions;

stripper means having a surface for bending said label carrier web away from one of said plurality of labels to thereby partially strip one of said plurality of labels from said label carrier web and for transferring said partially stripped label to said end surface of said label transfer means in said first position;

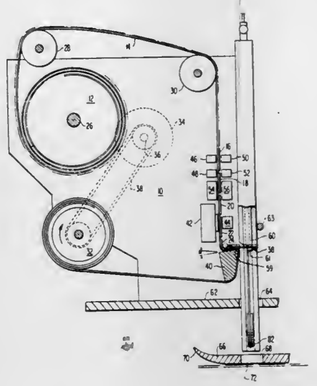
spring means mounted to said label transfer means and being operable between first and second positions, such that when said label transfer means is in said first position, said spring means is in said first position to thereby completely remove said partially stripped label from said label carrier web and to guide said removed label toward said end surface of said label transfer means;

said spring means further maintaining said removed label in contact with said end surface of said label transfer means during movement of said label transfer means from said first position to said second position and further being operable in said spring means second position to permit said removed label to be transferred to the work piece;

cam means mounted to said label transfer means and contacting said spring means, such that as said label transfer means moves between said label transfer means first and second positions, said cam means causes said spring means to move between said spring means first and second positions;

vacuum means for generating vacuum pressure for releasably maintaining said removed label in contact with said end surface of said label transfer means; and

means for applying pressurized air to said removed label in contact with said end surface of said label transfer means in said label transfer means second position to thereby transfer said label from said label transfer means to the work piece, such that said label transfer means does not contact the work pieces.

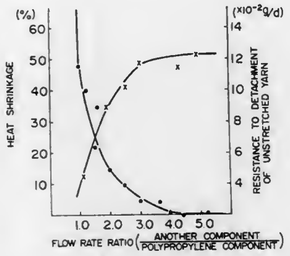


4,189,338

METHOD OF FORMING AUTOGENOUSLY BONDED NON-WOVEN FABRIC COMPRISING BI-COMPONENT FIBERS

Shozo Ejima; Susumu Tomioka; Tadao Matsumoto, and Naruaki Hane, all of Moriyamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 419,165, Nov. 26, 1973, abandoned. This application Jul. 29, 1975, Ser. No. 600,037
Claims priority, application Japan, Nov. 25, 1972, 118322
Int. Cl.[2] D04H *3/14*; D01F *8/06*
U.S. Cl. 156—167 **7 Claims**



1. A process for preparing a non-woven fabric having a porous structure which consists of

(a) forming a plurality of unstretched side-by-side composite fibers consisting of a first component comprised mainly of crystalline polypropylene and a second component composed mainly of at least one olefin polymer other than crystalline polypropylene, said second component
having a melting point at least 30° C. lower than that of said polypropylene, and
having a melt flow rate in the range of 1.5–5 times that of said polypropylene

(b) stretching said unstretched composite fibers at a stretching temperature at or above 20° C. below the melting point of said second component at a stretching ratio of 3 or more,

(c) incorporating said stretched fibers having 12 crimps or less per 25 mm into a web,

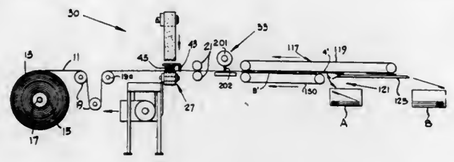
(d) subjecting said web to heat treatment at a temperature higher than the melting point of said second component but lower than the melting point of said polypropylene whereby said non-woven fabric is stabilized mainly by melt adhesion of said second component of said composite fibers.

4,189,339

METHOD FOR PROVIDING SECTIONS OF WRAPPING MATERIAL HAVING A STRIP OF ADHESIVE TAPE ATTACHED TO AN END PORTION THEREOF

Romain E. Loeffler, Littleton, Colo.; Calvin P. Sorensen, Toledo, Ohio, and Larry J. Weinstein, Littleton, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 31, 1977, Ser. No. 846,731
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—263 **8 Claims**



1. A method for adhering to sections of a first sheet material a length of a second sheet material having an edge that registers with an edge of an end portion of each of said sections, comprising the steps of:

(a) constantly advancing a continuous length of first sheet material in a first direction;

(b) periodically advancing a continuous length of a second sheet material transverse to said first direction and proximate to said first sheet material, said second sheet material having a first and second adhesive surface, said first adhesive surface being exposed and said second adhesive surface being covered by a removable strip of material;

(c) severing said second sheet material into strips having a length slightly less than the width of said first sheet material by periodically cutting across the path of advance of said second sheet material;

(d) periodically and in succession, advancing, positioning and holding stationary a strip of second sheet material transverse to said first direction with the exposed adhesive surface of said strip positioned opposite a surface of said constantly advancing first sheet material;

(e) in rapid succession, compressing together said positioned strip and said first sheet material in order to form a composite of materials which is temporarily held due to the continuing hold on said strip, releasing the compression and releasing the temporary hold upon said composite of materials, and

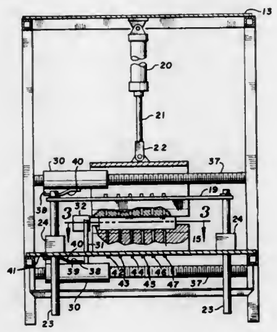
(f) severing said composite of materials through the middle of said strip and midway between a first adhered strip and a succeeding one.

4,189,340

METHOD OF FUSION WELDING OF THERMOPLASTIC COMPONENTS

Raymond K. Newkirk, 148 W. Lake, Excelsior, Minn. 55331

Continuation of Ser. No. 795,808, May 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 781,700, Mar. 28, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 923,024
Int. Cl.[2] C09J *5/02*
U.S. Cl. 156—306 **8 Claims**



1. In the method of bonding together two surfaces of three-dimensional articles of foamed thermoplastic material along mutually abutting bonding surfaces to form a completed article of predetermined dimension, each article to be bonded having a substantial length, width and depth dimension, said method comprising:

(a) securing a pair of discrete articles into a fixture means in a first mounting disposition with said bonding surfaces being disposed in substantially mutually abutting relationship, and each article having a junction zone in continuation with and adjacent said mutually abutting surfaces;

(b) passing a heated element at a predetermined rate through said juncture zone and into contact with both of said bonding surfaces with said heated element having a dimension greater than the width of said juncture zone so as to melt the abutting surfaces of each of said discrete articles;

(c) as said heating element is passing through said juncture zone, immediately applying a sequential compressive force to said discrete articles at separated points aligned along spaced apart lines extending parallel to the plane of said juncture zone for compressing said discrete articles together at predetermined, separated, discrete locations along said bonding surfaces at predetermined delay times following the passage of said heating element past said discrete location; and

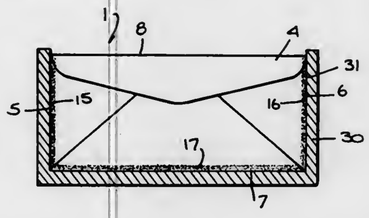
(d) maintaining said compression force on said articles at said discrete locations for predetermined times sufficient to allow the fused portions thereof to solidify.

4,189,341

ENVELOPE OPENING MECHANISM

John B. McPherson, Old Lyme, and William H. Gunther, Jr., Guilford, both of Conn., assignors to Thor Dahl, Inc., New York, N.Y.

Continuation of Ser. No. 599,596, Jul. 28, 1975, Pat. No. 4,082,603. This application Oct. 3, 1977, Ser. No. 838,655
The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.
Int. Cl.[2] B44C *1/22*
U.S. Cl. 156—654 **7 Claims**



1. The process of opening an envelope which has been previously treated along three edges with sensitizing and developing agents comprising resting a first treated edge of said envelope on a flat heating means, moving the envelope over said heater while the said first edge is in contact with and resting on the heater so that heat may be applied to the first edge, rotating the envelope 90° to place a second treated edge of the envelope in contact with and resting on the heater, moving said envelope over the heater while the said second edge is in contact with and resting on the heater so that heat may be applied to said second edge, rotating the envelope another 90° so that a third treated edge is placed in contact with and resting on the heater, moving said envelope over said heater while said third edge is in contact with and rests on said heater so that heat may be applied to said third edge whereby the heat applied will deteriorate the said edges, the edges being moved over the heater continuously and without interruption.

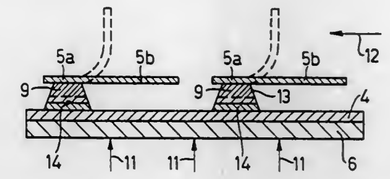
4,189,342

SEMICONDUCTOR DEVICE COMPRISING PROJECTING CONTACT LAYERS

Hendrikus G. Kock, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 569,098, Apr. 17, 1975, abandoned, which is a continuation of Ser. No. 437,014, Jan. 28, 1974, abandoned, which is a continuation of Ser. No. 294,452, Oct. 2, 1972, abandoned. This application Jun. 22, 1977, Ser. No. 808,803
Claims priority, application Netherlands, Oct. 7, 1971, 7113746
Int. Cl.[2] H01L *21/308*
U.S. Cl. 156—656 **3 Claims**

1. A method of manufacturing a semiconductor device comprising a semiconductor body having two substantially parallel oppositely located surfaces which are provided with a conductive connection, said method comprising the steps of providing a monocrystalline semiconductor layer provided with a metallic layer on both sides, said metallic layer on one side only locally adjoining directly the surface of the semiconductor and for the remainder being separated from the surface of the semiconductor layer by an intermediate layer with the metallic layer on said one side having one or more band shaped extensions present on the intermediate layer, entirely removing the intermediate layer prior to shaping the semiconductor layer, shaping the semiconductor body by subjecting the said semiconductor layer to a treatment to remove the semiconductor material from said one of the sides up to the oppositely located side while using a mask, said mask being formed by the part of the metallic layer on said one side directly present on the semiconductor layer surface, such that during the semiconductor material removal the part of the semiconductor layer present below said metallic layer is removed with the exception of the semiconductor body to be formed and at least a band-shaped part of the metallic layer projects laterally beyond the semiconductor body to form a projection which constitutes a connection conductor for said semiconductor body.

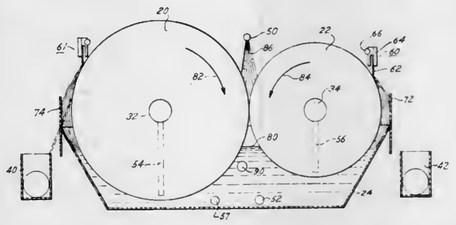


4,189,343

VARIABLE SPEED DRUM CONCENTRATING MACHINE

Lyle S. Overton, 217 Phelps St., Decateur, Mich. 49045

Filed Sep. 5, 1978, Ser. No. 939,389
Int. Cl.[2] B01D *1/22*
U.S. Cl. 159—11 R **10 Claims**



1. A liquid concentrating and solid drying machine, comprising a tank for liquid materials containing solids in suspension or solution, a first drying and concentrating drum having a smooth uninterrupted surface extending only partially downwardly into said tank below a high normal operating liquid level therein and fully above a low normal operating liquid level therein, a second drying and concentrating drum having a smooth uninterrupted surface in close proximity to the surface of said first drum and extending downwardly into said tank to a point below said first drum, a conduit means for discharging the liquid materials between the drums in and above the area of close proximity of the surface of said drums, power means for counter-rotating said drums downwardly in the area of said close proximity and at different peripheral speeds and for rotating said first drum at variable speeds, blade means mounted adjacent said first drum for removing material from the surface thereof, and means for discharging the material removed from said first drum from said machine.

4,189,344

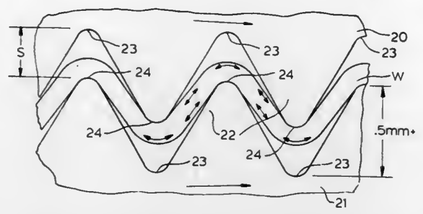
METHOD OF TEXTURING UNTEXTURED DRY SANITARY TISSUE WEB

Leroy H. Busker, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 800,737, May 26, 1977, abandoned. This application Nov. 21, 1978, Ser. No. 962,633

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—117 **10 Claims**



1. A method of producing bulky, soft sanitary tissue, comprising:

providing in a continuous strip a low bulk dry untextured tissue sheet web of about 0.115 mm thickness from a water slurry of tissue quality cellulose fibers hydrogen bonded by drying of the web to from about 85% to 97% dry condition;

providing cooperating grooved rotary texturing rolls each of which has generally radially projecting texturing ribs separated by grooves, the ribs on each of the rolls being the same and having from 4 to 30 equally spaced ribs per centimeter measured across the ribs, each rib being of generally triangular shape with a line contact crest;

orienting said rolls in nip relation with the texturing ribs and grooves of each roll partially interdigitated with the ribs and grooves of the other of the rolls, and with the spacing between the partially interdigitated ribs greater than the thickness of said web;

guiding said dry web under running tension through the rib and groove nip of said rolls;

effecting longitudinal running of said dry web and rotation of said rolls at a common speed;

thrusting said rib crests into the opposite faces of the running dry web and effecting progressive wave-stretch deformation of the web areas engaged by the thrusting crests out of the original plane of the tensioned web, and thereby mechanically breaking the hydrogen bond of and partially loosensing some of the fibers of the dry web and texturing and imparting desired tissue bulk and softness to the running dry web while retaining satisfactory web integrity, and elasticity and breaking length characteristics in the textured web;

and after said stretch deformation releasing said web areas from said rib crests and permitting said web areas to return elastically toward said original plane of the web;

whereby, the loosened fibers at both faces of the web provide a fluffiness which imparts the desired bulk and softness to the textured dry web.

4,189,345

FIBROUS COMPOSITIONS

William A. Foster, Midland; Dale M. Pickelman, Auburn, and Ritchie A. Wessling, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1977, Ser. No. 825,320

Int. Cl.[2] D21H *3/38*

U.S. Cl. 162—168 R **8 Claims**

1. A wet-laid fibrous web having good formation comprising a dried composite containing (a) a paper-making grade of fiber having an anionic charge (b) from about 5 percent to about 2000 percent, solids basis calculated on the weight of the fiber, of a structured-particle latex having a non-ionic core of a copolymer of from about 20 percent to about 50 percent of an aliphatic, conjugated diene, from about 20 percent to about 80 percent of a monovinylidene aromatic compound, from 0 percent to about 5 percent of polar, non-ionic ethylenically unsaturated monomers and from 0 percent to about 25 percent of other ethylenically unsaturated, nonionic monomers which when in the form of homopolymers are water-insoluble; said non-ionic core being encapsulated by a thin layer of a water-insoluble organic copolymer having bound charges of pH independent cationic groups; said latex having from about 0.15 milliequivalent to about 0.6 milliequivalent of bound charge per gram of polymer in the latex and (c) from about 0.15 percent to about 160 percent, based on the weight of the fiber, of a co-additive which is a water-soluble anionic polymer of an acrylamide having a degree of polymerization of from about 3000 to about 10,000 and having an available charge of from about 0.3 milliequivalent to about 8 milliequivalents per gram of co-additive wherein the co-additive retains its water solubility in the presence of polyvalent metal ions at a pH from about 4 to about 7; said latex and said coadditive having been added before laying down of the web; all percentages being by weight.

4,189,346

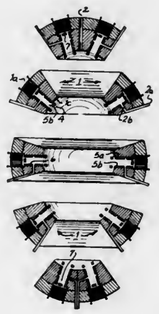
OPERATIONALLY CONFINED NUCLEAR FUSION SYSTEM

William S. Jarnagin, P.O. Box 127, Concord, Mass. 01742

Filed Mar. 16, 1978, Ser. No. 887,442

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—5 **1 Claim**



1. A ring cyclotron nuclear fusion system comprising a plurality of annular rings of varying diameter joined to form a spherical reaction chamber; each of said rings containing; (a) a plurality of spherical wedge electromagnets of C-shape cross section, said electromagnets having lips and being continuously connected around said ring; (b) flat annular ring electrodes located between the poles of said C-shaped electromagnets, said electrodes being of different diameters and positioned so as to form a gap there between; (c) a plurality of pin hole sized injection ports along the gap, each of said ports connected to an ion injector beam of at least about 10^{13} ions/cc; (d) focus coils located at the innermost lips of said C-shaped electomagnets (e) charged outer rim means; (f) output tubes and a high frequency kilovolt power supply connected to said electrodes wherein low energy ions are injected into the gap, accelerated by said electrodes so as to follow spiral or helical pathways until achieving sufficient energy for fusion where upon said ions are deflected out of orbit by said charged outer rim means and said focus coils so as to form beams, directed to the center of the spherical reaction chamber, and some of said beams colliding head-on with other of said beams and noncolliding ions passing on across the reaction chamber into other C-shaped electromagnets and thence spiral back toward the

middle ad infinitum or until the ions collide with one another or the apparatus.

4,189,347

BASE FOR VESSEL SUBJECT TO HIGH TEMPERATURE, ESPECIALLY FOR A PEBBLE BED REACTOR VESSEL

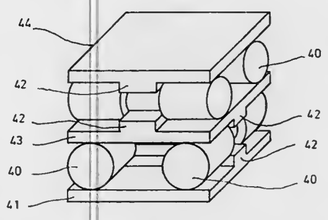
Herbert Reutler, Hohkeppel; Ulrich Müller-Frank, Bergisch Gladbach, and Heinz-Josef Klapperich, Cologne, all of Fed. Rep. of Germany, assignors to Gesellschaft für Hochtemperaturreaktor-Technik mbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,098

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636251; Mar. 3, 1977, 2709172

Int. Cl.[2] G21C *19/28*

U.S. Cl. 176—58 PB **8 Claims**



1. In a reactor vessel for pebble beds at high and varying temperatures having a side wall and a base formed of a multiplicity of stacked blocks of heat-resistant material and held together by an outer cylindrical or polygonal ring and supported on a foundation, the base and the side wall, respectively, being formed of a plurality of sectors having substantially vertical, radial parting lines therebetween, said sectors being supported with slight friction on the foundation and being braced against the outer ring, said sectors having boundary surfaces with a pebble bed, support surfaces on the foundation and abutment surfaces against the outer ring, the respective surfaces of said boundary surfaces, said support surfaces and said abutment surfaces having a convex mutual inclination whereby each of said sectors is held together in itself by external forces and is forced by its own weight and the weight of the pebble bed into a definite position.

4,189,348

FUEL ROD ASSEMBLY TO MANIFOLD ATTACHMENT

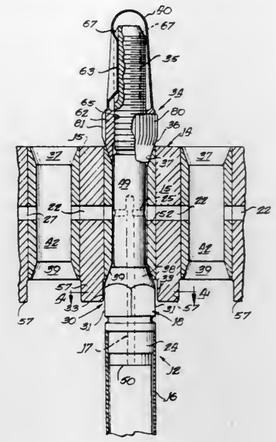
Harry A. Donck; Anthony R. Veca, and Harold J. Snyder, Jr., all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jul. 26, 1976, Ser. No. 708,410

Int. Cl.[2] G21C *3/10*

U.S. Cl. 176—79 **8 Claims**

1. In a nuclear fuel element, the combination comprising: a horizontally extending support with gas manifold passageways for receiving gas products, a vertically extending opening in said support, a depending fuel rod assembly having an upper end releasably secured to said support, a jacket on said fuel rod assembly enclosing solid nuclear fuel, a gas passageway formed in said fuel rod assembly for conveying gases generated during fission from said solid fuel upwardly to said support, a threaded portion on said upper end of said fuel rod assembly, a threaded member for threading engagement with the threaded upper end of said fuel rod assembly and for abutting said support to releasably secure said fuel rod assembly to said support, and cooperating sealing means to seal against leakage of the gas passing from said fuel rod gas passageway into said manifold gas passageway, said threaded member comprising a



closed cap nut having an outer dome wall for enclosing the threaded end of said fuel rod assembly.

4,189,349

α,δ-DIAMINOACID AND ITS LACTAM

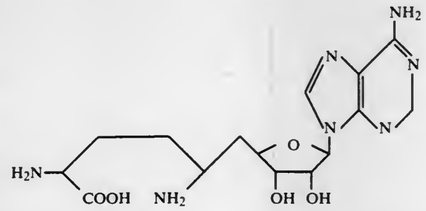
Jean Florent, Boulogne-Billancourt; Jean Lunel, Paris, and Denise Mancy, Charenton, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 19, 1977, Ser. No. 834,551

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—87 **10 Claims**

1. Process for the production of the α,δ-diaminoacid herein designated 32232 RP corresponding to the formula:



I

which comprises aerobically cultivating *Streptomyces incarnatus* DS 26068 (NRRL 8089), or a mutant thereof capable of producing 32232 RP, in an aqueous medium containing assimilable sources of carbon, nitrogen and inorganic substances, and isolating from the medium 32232 RP formed during the culture, as such or an internal salt of the said α,δ-diaminoacid, an addition salt of the said α,δ-diaminoacid with a non-toxic pharmaceutically acceptable acid, or an alkali metal or alkaline earth metal salt of the said β,δ-diaminoacid.

4,189,350

PROCESS FOR PURIFYING UROKINASE

Hideki Yanagi, Toyonaka; Yasuo Bai, Sakai; Junichi Yoshikawa, and Shigeo Ogino, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 1, 1978, Ser. No. 911,475
Claims priority, application Japan, Jun. 3, 1977, 52-65975
Int. Cl.[2] C07G *7/026*
U.S. Cl. 435—215 **3 Claims**

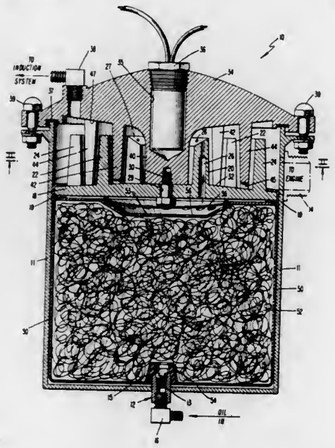
1. A process for purifying urokinase by contacting a crude urokinase-containing solution with a strongly acidic cation exchanger having sulfonic acid groups and adjusted to the NH_4^+ type to adsorb urokinase and then eluting the adsorbed urokinase from said exchanger, characterized in that urea is previously added to said crude urokinase-containing solution in such a rate that the final molar concentration of urea in the solution is 3 to 8 M.

4,189,351

OIL RECLAMATION DEVICE

Gary C. Engel, 123 NW. 109th St., Miami Shores, Fla. 33168

Filed Nov. 18, 1977, Ser. No. 852,976
Int. Cl.[2] B01D *3/28, 35/18;* **C10G** *7/00*
U.S. Cl. 196—115 **24 Claims**



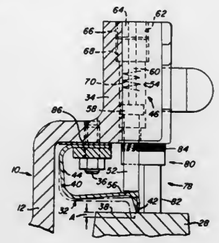
1. An oil reclamation device comprising:
(a) housing means having a longitudinal axis and including at one end thereof oil inlet means to receive oil to be reclaimed and at the other end thereof oil outlet means to discharge reconditioned oil,
(b) filter means disposed at said one end of the housing means defining a mechanical filtration zone to receive said oil,
(c) evaporator plate means disposed within the housing means adjacent the mechanical filtration zone, and
(d) heating means disposed at the other end of the housing means adjacent the evaporator plate means to define an evaporation chamber therebetween,
(e) said evaporator plate means including upwardly projecting evaporation wall means defining a plurality of curved vaporizing surfaces laterally displaced radially with respect to each other to form a fluid traveling surface therebetween,
(f) said heating means including heat transmitting means having downwardly projecting heating wall means defining a plurality of curved heating surfaces located between the curved vaporizing surfaces and directed toward said fluid traveling surface,
(g) said evaporation wall means and said heating wall means defining a plurality of curved paths along the fluid traveling surface from said longitudinal axis outwardly along said evaporator plate means,
(h) said evaporator plate means including passageways extending from the mechanical filtration zone to deliver substantially all of the oil being treated at a centermost portion of the plate means,
(i) said evaporation wall means and said heating wall means providing a structural configuration effective to guide the oil from said centermost portion outwardly along said curved paths to said oil outlet means.

4,189,352

COKE OVEN DOOR

Walter Stanke, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers, GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 706,532, Jul. 19, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,329
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1975, 2536291
Int. Cl.[2] C10B *25/06, 25/16*
U.S. Cl. 202—248 **9 Claims**



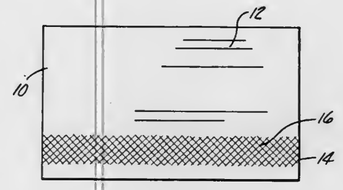
1. A coke oven door assembly for a coke oven comprising,
an elongated door body portion having a peripheral edge portion,
a resilient generally U-shaped seal member having a body portion and a pair of spaced leg portions, one of said leg portions secured to said door body portion, said resilient seal member secured to and extending around the periphery of said door body portion,
a coke oven door jamb having a peripheral sealing surface,
said resilient generally U-shaped seal member having a sealing edge extending from said other leg portion, said sealing edge arranged to abut said coke oven door jamb peripheral sealing surface to provide a seal between said door body portion and said coke oven door jamb peripheral sealing surface,
said resilient seal member leg portions spaced from each other a preselected distance in a relaxed position, said resilient seal member other leg portion being arranged to be deflected so that said leg portions are spaced at a distance less than said preselected distance,
resilient abutment means secured to said door body portion adjacent said peripheral edge portion of said door body portion, said resilient abutment means having an end portion arranged to be positioned in abutting relation with said resilient seal member other leg portion adjacent said resilient seal member sealing edge so that said resilient abutment means end portion urges said resilient seal member sealing edge into sealing relation with said sealing surface of said door jamb,
adjustable latching means mounted on said door body portion adjacent the upper and lower portions of said door body portion for urging said door upper and lower portions toward said coke oven door jamb,
a plurality of stop mechanisms positioned on the periphery of said door body portion adjacent said resilient seal member seal edge portion,
said stop mechanism arranged to abut said door jamb peripheral sealing surface, said stop mechanisms having a length which is less than said preselected distance between the spaced leg portions of said resilient seal member in a relaxed position so tht said resilient seal member is deflected and maintained in a compressed state and said resilient seal member sealing edge is urged into sealing relation with said door jamb peripheral sealing surface,
said stop mechanisms each including a stop member positioned between said coke oven door peripheral edge portion and the peripheral sealing surface of said door jamb with one end portion of said stop member contacting said peripheral sealing surface of said door jamb,
a plurality of supporting disks positioned between said peripheral edge and the opposite end portion of said stop member, and
said supporting disks arranged to maintain a preselected distance between said coke oven door peripheral edge portion and said door jamb peripheral sealing surface to limit bending of said door body portion and the jamb and maintain said seal member in a compressed state and said seal member sealing edge portion in a sealing relation with said door jamb peripheral sealing surface.

4,189,353

METHOD AND DEVICE FOR TRANSMITTING CONFIDENTIAL INFORMATION THROUGH THE MAIL

Russell H. Harriman, 30335 Woodhaven, Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 742,769, Nov. 18, 1976, abandoned. This application May 15, 1978, Ser. No. 905,989
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—6 **3 Claims**



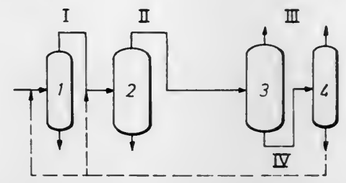
1. A device for conveying confidential information through the mail at post card rates from a first party to a plurality of second parties, said form made by first printing information common to all the second parties on the form, printing a camouflage background portion in one predetermined color on one part of the form, printing selectable specific information pertaining only to individual second parties on said form, a portion of said selectable information comprising printing said confidential information over said predetermined color, said colors selected so that when the confidential information is viewed by said second party through a transparent filter medium of a color similar to the first predetermined color the confidential information is rendered intelligent to the second party but when viewed by anyone without the filter medium the confidential information is unintelligent.

4,189,354

PROCESS FOR THE PRODUCTION OF DIISOCYANATODIPHENYL METHANE ISOMERS WITH AN ADJUSTED CONTENT OF CHLORINE COMPOUNDS

Gunther Ellendt, Krefeld; Hermann Fischer, Leverkusen, and Peter Fischer, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 811,819, Jun. 30, 1977, abandoned. This application May 22, 1978, Ser. No. 908,319
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631168
Int. Cl.[2] B01D *3/10;* **C07C** *119/04*
U.S. Cl. 203—81 **6 Claims**



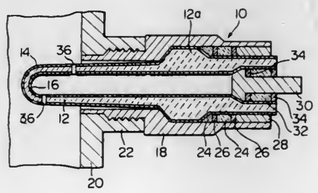
1. A process for the production of diisocyanatodiphenyl methane isomers having an adjusted content of chlorine compounds comprising the steps of:
(a) subjecting a polyisocyanate mixture of the diphenyl methane series to a first distillation stage whereby diisocyanatodiphenyl methane isomers are obtained as head product;
(b) subjecting said head product to a second distillation stage using a recycle ratio of from 0.1 to 10 and wherein from 0.5 to 10% by weight of the feed into said second distillation stage is removed as the sump product;
(c) subjecting the head product of said second distillation stage to a third distillation stage whereby readily volatile impurities are freed therefrom; and
(d) working up the sump product of said third distillation stage to obtain purified 2,4'- and 4,4'-diisocyanatodiphenyl methane.

4,189,355

METHOD FOR DETECTION OF FLUCTUATION IN AIR/FUEL RATIO OF AIR-FUEL MIXTURE FED TO INTERNAL COMBUSTION ENGINE

Takeshi Fujishiro, and Toru Kita, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 746,790, Dec. 2, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,409
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **8 Claims**



1. A method of detecting the occurrence of a fluctuation in the air/fuel ratio of an air-fuel mixture fed to an internal combustion engine across the stoichiometric air/fuel ratio, the method comprising the steps of:
disposing a sensor in a stream of the exhaust gas of the

engine, said sensor having a layer of an oxygen ion conductive solid electrolyte and porous and electron conductive first and second electrode layers of a metal having catalytic ability on oxidation reactions of carbon monoxide and hydrocarbons contained in the exhaust gas formed respectively on first and second sides of the electrolyte layer, no external voltage being applied to said first and second electrode layers; contacting said stream of the exhaust gas with the first side of said electrolyte layer of said sensor through said first electrode layer;

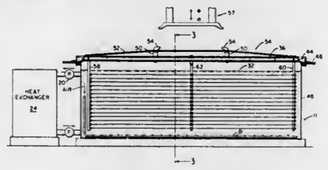
contacting the exhaust gas with the second side of said electrolyte layer through said second electrode layer with a time lag behind the contact of the exhaust gas with said first side; and detecting the development of a fluctuating electromotive force across said electrolyte layer indicating the existence of a difference between oxygen partial pressure on said first side and oxygen partial pressure on said second side, said difference resulting from the occurrence of a fluctuation in the oxygen concentration in the exhaust gas and the existence of said time lag, whereby the occurrence of said fluctuation in said air/fuel ratio is detected.

4,189,356

METHOD FOR PLATING COPPER ON STEEL RODS

Donald E. Merony, Portland, Tenn.; William W. Hicks, Barington, and Gregory T. Parkos, Providence, both of R.I., assignors to Whittaker Corporation, Los Angeles, Calif.

Division of Ser. No. 751,258, Dec. 17, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,582
Int. Cl.[2] C25D *5/10, 7/00, 3/38, 17/08*
U.S. Cl. 204—25 **6 Claims**



1. The process of electroplating copper on steel rods, comprising the steps of

electrolytically depositing on the rods a strike coating sufficient to seal the steel surface against attack by acid,

and electrolytically depositing copper on the rods from phosphorized copper anodes in a bright acid copper sulfate bath while maintaining the bath at a temperature exceeding 110 degrees F., the rods being held stationary and continuously immersed in the bath during copper plating, the electrical current density at the rod surfaces exceeding 120 amperes per square foot.

4,189,357

METHOD OF TREATING A SUBSTRATE MATERIAL TO FORM AN ELECTRODE

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Oct. 10, 1978, Ser. No. 949,974
Int. Cl.[2] C25D *9/06*
U.S. Cl. 204—29 **6 Claims**

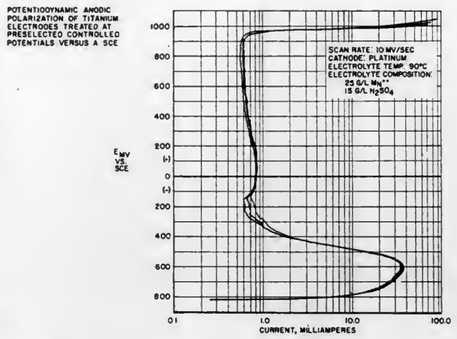
1. A method for the electrodeposition of manganese dioxide which comprises:

treating a substrate material selected from the group consisting of titanium, tantalum, zirconium, niobium, hafnium and their alloys by providing an aqueous electrolyte containing at least 25 gm/l fluoride ions and from about 800 to 1200 gm/l of at least one other compound selected from the group consisting of acetic acid, ethylene glycol and a mixture of nitric acid and phosphoric acid;

providing a reference cell comprising a standard calomel electrode positioned in such manner as to be in ionic contact with the aqueous electrolyte;

placing said substrate material in contact with said aqueous electrolyte;

electrolyzing said electrolyte at sufficient anodic current density to maintain a preselected control potential in the range of from about 7 to about 9 volts between the substrate material and the reference cell to produce a treated substrate material;



placing the treated substrate material in an electrolytic cell as an anode for the electrodeposition of manganese dioxide, said cell containing an electrolyte comprising an aqueous solution of manganous ion in a concentration of from about 15 to 50 gm/l and from about 10–40 gm/l sulfuric acid;

electrolyzing the aqueous solution at an anodic current density of from about 5 to 30 amps per square foot to effect electrodeposition of manganese dioxide on the treated substrate material; and

recovering said electrodeposited manganese dioxide.

4,189,358

ELECTRODEPOSITION OF RUTHENIUM-IRIDIUM ALLOY

Anthony J. Scarpellino, Jr, Tuxedo, N.Y., and William G. Borner, Ringwood, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,632
Int. Cl.[2] C25D *3/50;* **C25B** *11/08, 11/10;* **C25C** *1/00*
U.S. Cl. 204—43 N **38 Claims**

1. An aqueous electrolytic acid bath for electrodeposition of a ruthenium-iridium alloy, said bath comprising a soluble ruthenium compound, a soluble iridium compound, a soluble fluoborate salt, and fluoboric acid.

4,189,359

PROCESS FOR THE ELECTRODEPOSITION OF FERRO-NICKEL ALLOYS

Armand Limare, and Guy Plancqueel, both of Rambouillet, France, assignors to Societe Metallurgique le Nickel-SLN, Paris, France

Continuation-in-part of Ser. No. 713,431, Aug. 11, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 937,935
Claims priority, application France, Aug. 13, 1975, 75 25177
Int. Cl.[2] C25D *3/56, 17/10, 17/12*
U.S. Cl. 204—43 T **29 Claims**

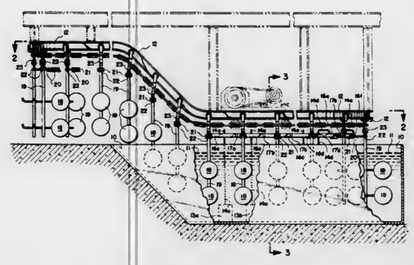
1. A process of electro-depositing a layer of a ferro-nickel alloy from an electrolytic bath comprising using, as the anode therein, a soluble anode consisting of an anodic basket filled with ferro-nickel shot, having a Ni/(Ni+Fe) ratio ranging from about 20 to 90% by weight, and containing between 0.1 and 1% by weight of at least one granulating adjuvant selected from the group consisting of silicon, carbon, manganese, magnesium and aluminium, said shot having been prepared by a water granulating process and being of a composition substantially identical to that of the layer to be deposited.

4,189,360

PROCESS FOR CONTINUOUS ANODIZING OF ALUMINUM

Jack L. Woods, and Craig P. Woods, both of P.O. Box 1559, Ogden, Utah 84402

Filed Mar. 12, 1979, Ser. No. 19,348
Int. Cl.[2] C25D *11/04, 17/00, 17/04*
U.S. Cl. 204—58 **10 Claims**



1. A process for the continuous anodization of aluminum and aluminum alloy articles which comprises suspending the articles in an anodizing electrolyte and sequentially making the articles anodic by a series of two or more positive electrical currents emanating from separate electrical power supplies wherein the positive terminals of each power supply are electrically isolated from the positive terminals of every other power supply.

4,189,361

ELECTROLYSIS OF SODIUM CHLORIDE

Toru Seita; Takao Satoh, and Akihiko Shimizu, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 22, 1978, Ser. No. 962,991
Claims priority, application Japan, Dec. 14, 1977, 52-149338
Int. Cl.[2] C25B *1/16, 1/26, 13/04, 13/08*
U.S. Cl. 204—98 **9 Claims**

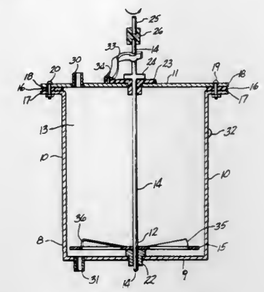
1. In an electrolysis of sodium chloride by feeding an aqueous solution of sodium chloride into an anode compartment of an electrolytic cell having an ion exchange membrane, for partitioning the cell into an anode compartment and a cathode compartment, between the anode and the cathode, the improvement which comprises using a cation exchange membrane prepared by: treating one surface of a membrane of a perfluorocarbon polymer having sulfonyl halide groups on branched chains with a diamine or a polyamine; heating the treated polymer membrane at a temperature in the range of from 170° C. up to the deterioration temperature of the membrane; hydrolyzing the so-treated membrane; immersing the hydrolyzed membrane in a diene derivative having a carboxyl group or a group which can be converted to a carboxyl group; after immersion, partially polymerizing the diene derivative; dipping the membrane into an organic solvent which is water miscible and has a boiling point of higher than 120° C. at 760 mm Hg; holding the treated membrane between smooth plates and heating the membrane at a temperature in the range of from 80° to 180° C.; and converting any group on the diene derivative, which can be converted to a carboxyl group, into a carboxyl group.

4,189,362

METHOD OF PURIFYING AQUEOUS SOLUTIONS OF ALKALI METAL HYDROXIDES

Ronald L. Dotson, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 15, 1979, Ser. No. 3,151
Int. Cl.[2] C02C *5/12;* **C25B** *1/16*
U.S. Cl. 204—149 **16 Claims**



1. A process for purifying an aqueous solution of an alkali metal hydroxide containing an impurity of a soluble complex comprised of a heavy metal cation and a plurality of anions in an electrolytic cell having an electrolytic chamber containing therein an anode and a rotatable cathode assembly separated from each other by a gap distance, which comprises:

(a) charging said aqueous solution into said electrolytic chamber,

(b) passing an electric current between said anode and said cathode assembly to reduce heavy metal cations to a separate phase in elemental form, to oxidize said anions to a separate phase in elemental form and to form a slurry of said phases of elemental forms in said aqueous solution,

(c) removing said slurry from said electrolytic chamber, and

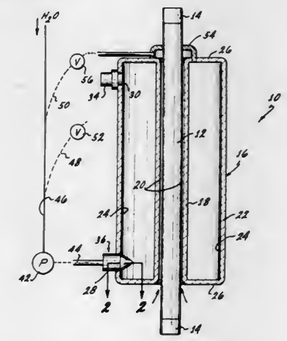
(d) separating said phases of elemental forms from said aqueous solution.

4,189,363

PROCESS OF PRODUCING OZONE IN WATER

Stuart S. Beitzel, Santa Ana, Calif., assignor to Stuart Enterprises, Santa Ana, Calif.

Filed Feb. 21, 1979, Ser. No. 13,145
Int. Cl.[2] A61L *1/00;* **B01J** *1/10;* **C01K** *1/00*
U.S. Cl. 204—157.1 R **12 Claims**



9. A process for exposing a gas-liquid mixture to actinic light by passing said mixture adjacent to an elongated source of actinic light in which the improvement comprises:

compressing said gas-liquid mixture while concurrently breaking up any gas bubbles within said mixture under such conditions that the mixture at the time it is com-

pressed and at the time the bubbles are broken up are subject to turbulence and a shearing type action so as to produce a gas-liquid mixture in which the broken up gas bubbles are less than about 0.5 mm. in diameter, and

swirling the so produced gas-liquid mixture in a spiral manner around a source of actinic light in such a manner that the mixture as it is swirling travels along the length of said source of light and under such conditions that there is turbulence within said mixture.

4,189,364

METHOD FOR PREPARING HYDROPHILIC POLYMERS AND POLYMER GRAFTS INCLUDING IRRADIATION

Rene Aelion, Concord, Mass., and Edward Ferezy, Merrick, N.Y., assignors to Hydroplastics, Inc., Merrick, N.Y.

Division of Ser. No. 252,622, May 12, 1972, Pat. No. 3,854,982. This application Jan. 17, 1974, Ser. No. 434,026

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.22 **1 Claim**

1. The process for forming hydrophilic polymers comprising the steps of preparing a monomer system comprising hydroxyalkyl methacrylate and a cross linking agent sufficient to polymerize the monomer system upon irradiation, and exposing said monomer system to high energy irradiation of a dose sufficient to polymerize said monomer system, and at a dose rate sufficiently small to not create voids, wherein said irradiation steps comprise the step of sequentially irradiating said monomer system with fields of monotonically increasing strength.

4,189,365

PHOTOPOLYMERIZABLE COMPOSITIONS BASED ON ACRYLIC OR METHACRYLIC ACID ESTERS CONTAINING ORGANIC PHOSPHITES

Werner Schmitt; Robert Purrmann, both of Starnberg, and Peter Jochum, Hechendorf, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,779

Claims priority, application Switzerland, Mar. 16, 1977, 003278/77

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **10 Claims**

1. A photopolymerizable composition consisting essentially of acrylic or methacrylic acid esters which can be polymerized by ultraviolet light and which contain mono- or polyfunctional acrylic or methacrylic acid ester compounds and as ultraviolet initiators, a monoketal of an aromatic 1,2-diketone compound and from about 0.1 to about 20 percent by weight of the photopolymerizable ester compounds of an aliphatic, aromatic or mixed aliphatic-aromatic organic phosphite compound.

4,189,366

RADIATION CURABLE COMPOSITIONS CONTAINING 5-HALO-6-HALOMETHYLURACIL DERIVATIVES AS PHOTOINITIATORS

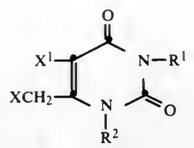
Gordon C. Newland; Edward U. Elam; James G. Pacifici, all of Kingsport, and Hobert M. Beard, Jr., Jonesboro, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,568

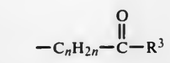
Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **6 Claims**

1. A photocurable composition comprising ethylenically unsaturated, polymerizable material containing a total of from about 0.1% to about 5.0% based on monomer weight, of one or more photoinitiators of the formula:



wherein R^1 and R^2 each is selected from hydrogen; straight or branched alkyl of 1–20 carbons which may be substituted with lower alkoxy or phenoxy; alicylic of 5–10 carbons; aromatic of 6–12 carbons which may be substituted with up to four lower alkyl groups; and



groups wherein n is 1–20, R^3 is lower alkyl, aromatic of 6–12 carbons or the radical —O—R^4 where R^4 is lower alkyl or aromatic of 6–12 carbons; and wherein X and X^1 are each selected from chlorine and bromine.

4,189,367

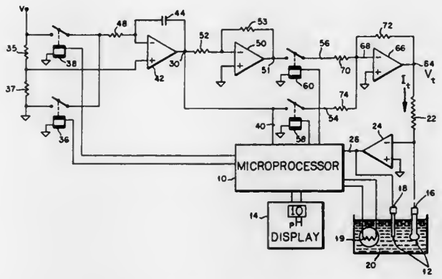
METHOD FOR TESTING ION SELECTIVE ELECTRODES IN CONTINUOUS MEASURING SYSTEMS

James G. Connery, Ambler; Robert D. Jurenko, and Earl W. Shaffer, Jr., both of Lansdale, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 19, 1978, Ser. No. 952,758

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 G **7 Claims**



1. A method for testing the integrity of the ion selective membrane of an ion selective electrode system while continuously measuring the concentration of said ion in a solution, comprising the steps of:

passing a first current through said electrode system;

passing a second current through said electrode system in an opposite direction to said first current and of magnitude and duration sufficient to cancel any charge remaining in said electrode system as a result of said first current; and

measuring the total change in voltage across said electrode system as a result of the flow of current so that a measured voltage change to a value below that expected for an electrode system having an intact membrane indicates damage to said membrane.

4,189,368

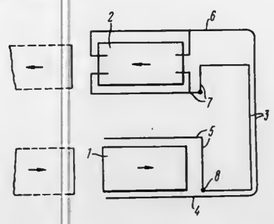
SYSTEM OF BUSBARS FOR ALUMINIUM-PRODUCING ELECTROLYZERS

Zinovy I. Gnesin; Svetozar V. Evdokimov; Ilya G. Kil; Vladimir P. Nikiforov; Valentin I. Ryabov; Alexandr N. Smorodinov, and Igor K. Tsybukov, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti, Leningrad, U.S.S.R.

Filed Apr. 18, 1978, Ser. No. 897,267

Int. Cl.[2] C25C *3/16, 3/06*

U.S. Cl. 204—243 M **3 Claims**



1. In a system of current-supply buses in aluminum-producing electrolyzers having transverse walls and located at the beginning and at the end of a plurality of series-connected electrolyzers arranged in at least two parallel rows along spaced longitudinal axes, wherein said system comprises left and right stacks of cathode buses located at the left and at the right with respect to each of said longitudinal axes of said electrolyzers viewing in the direction of current flow through the electrolyzers, and wherein a busbar jumper connects the left and right stacks of cathode buses of one row of series-connected electrolyzers with the left and right stacks of cathode buses of the other parallel row of series-connected eletrolyzers respectively, wherein the improvement comprises:

a first left stack of cathode buses located at the end of the row of electrolyzers at the current outlet, between the rows of electrolyzers, and arranged adjacent to said busbar jumper;

a first right stack of cathode buses located at the end of the row of electrolyzers at the current outlet, and arranged opposite to said first left stack of cathode buses;

a first portion of said first left stack of cathode buses extending along the entire length of said transverse wall of the electrolyzers located at the end of the row at the current outlet, said portion extending toward said first right stack of cathode buses;

and a second portion of said first left stack of cathode buses extending parallel to said first right stack of cathode buses to a junction with said busbar jumper.

4,189,369

DIAPHRAGM OF HYDROPHILIC FLUOROPOLYMERS

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,466

Int. Cl.[2] C25B *13/08;* **C08F** *8/42, 8/40*

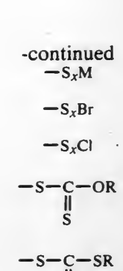
U.S. Cl. 204—296 **3 Claims**

1. A diaphragm for a chlor-alkali cell comprising a hydrophilic fluoropolymer containing nonterminal units represented by the structure



where Z is

-continued



where

M is hydrogen, sodium, potassium, lithium, calcium or magnesium;

R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and

x is 1, 2, 3, 4 or 5, the hydrophilic fluoropolymer having a sulfur or phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C., and a fibrous material resistant to attack by the cell liquor.

4,189,370

PROCESS FOR OBTAINING GELS OF N-METHYLOL-ACRYLAMIDE COPOLYMERS AND APPLICATION OF SAID GELS FOR THE STEPPED GRADIENT SEPARATION OF SERIC LIPOPROTEINS

Egisto Boschetti, Chatou, France, assignor to Societe Sebia, Issy les Moulineaux, France

Filed Jun. 21, 1978, Ser. No. 917,549

Int. Cl.[2] G01N *27/26, 27/28*

U.S. Cl. 204—299 R **20 Claims**

1. A process for preparing gels stratified upon a film, said gels being adapted for electrophoretic separation of seric and plasmatic lipoproteins, said gel further being a high polymer of N-Methylol-Acrylamide, said process comprising the steps of:

(a) disposing upon said film a first gel comprising a high polymer of N-Methylol-Acrylamide, said first gel being formed from a first monomer concentration; and

(b) disposing upon said film a second gel comprising a high polymer of N-Methylol-Acrylamide said second gel being formed from a second monomer concentration different than said first monomer concentration, so as to form a discontinuous gradient between said first gel and said second gel; whereby electrophoretic separation of seric and plasmatic lipoproteins is enhanced by said discontinuous gradient.

4,189,371

MULTIPLE-STAGE HYDROGEN-DONOR COAL LIQUEFACTION PROCESS

Peter S. Maa, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 716,036, Aug. 20, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,669

Int. Cl.[2] C10G *1/00, 1/08*

U.S. Cl. 208—8 LE **13 Claims**

1. A multiple-stage hydrogen-donor liquefaction process for producing liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises:

(a) contacting said carbonaceous solids with a first stream of hydrogen-donor solvent and a hydrogen-containing gas

under liquefaction conditions in a first liquefaction zone to produce a liquefaction effluent;

(b) separating said liquefaction effluent into a vaporous stream and a liquid stream, said liquid stream consisting of a high molecular weight liquid fraction composed of substantially all mineral matter and substantially all liquids boiling above at least about 650° F. including substantially all high molecular weight unconverted coal constituents, and a low molecular weight liquid fraction;

(c) separating a sufficient amount of said low molecular weight liquid fraction from said high molecular weight liquid fraction to form a heavy bottoms stream containing substantially all of said high molecular weight liquid fraction, including substantially all of said mineral matter and substantially all of said unconverted coal constituents, and less than about 50 weight percent of said low molecular weight liquid fraction based on the weight of said high molecular weight liquid fraction;

(d) contacting said heavy bottoms stream with a second stream of hydrogen-donor solvent and a hydrogen-containing gas under liquefaction conditions in a second liquefaction zone;

(e) separating the effluent from said liquefaction zone into a vaporous fraction and a liquid fraction; and

(f) recovering liquid hydrocarbonaceous products from said vaporous and said liquid fractions.

4,189,372

PROCESS FOR THE HYDROCONVERSION OF COAL

Roger A. Baldwin, Warr Acres; Robert E. Davis, and Raymond C. Janka, both of Oklahoma City, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed May 22, 1978, Ser. No. 907,933
Int. Cl.[2] C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **10 Claims**

1. A process comprising:

mixing in a first mixing zone a process solvent with a coal feed;

introducing said coal feed and said process solvent into a liquefaction zone maintained at elevated temperature and pressure to effect at least a partial conversion of the coal into coal liquefaction products;

introducing said coal liquefaction products into a fractionation zone to produce a coal liquefaction products residuum comprising substantially non-distillable soluble coal products and insoluble coal products;

introducing the coal liquefaction products residuum into a second mixing zone;

providing a deashing solvent, said deashing solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

introducing said deashing solvent into said second mixing zone;

mixing said coal liquefaction products residuum with said deashing solvent to provide a prepared mixture;

withdrawing said prepared mixture;

introducing said prepared mixture into a first stage settler;

maintaining said first stage settler at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level of from about 600 psig to about 1000 psig to effect a separation of said prepared mixture in said first stage settler into a first heavy phase comprising insoluble coal products, some soluble coal products and some deashing solvent and a first light phase fraction comprising soluble coal products and deashing solvent;

withdrawing said first heavy phase from the first stage settler;

withdrawing said first light phase from said first stage settler;

introducing said withdrawn first light phase into a second stage settler;

maintaining said second stage settler at a temperature level in the range of from about 450 degrees F. to about 800 degrees F. and a pressure level in the range of from about 400 psig to about 1000 psig to effect a separation of said first light phase in said second stage settler into a second heavy phase comprising heavy soluble coal products and some deashing solvent and a second light phase comprising light soluble coal products and deashing solvent;

withdrawing said second heavy phase from said second stage settler;

withdrawing said second light phase from the second stage settler;

introducing the withdrawn second light phase into at least a third stage settler;

maintaining said third stage settler at an elevated temperature level and pressure level selected to provide a differential in the deashing solvent density existing within the second stage settler and the third stage settler sufficiently large to cause the second light phase to separate into a third heavy phase comprising light soluble coal products and some deashing solvent a third light phase comprising deashing solvent;

withdrawing said third heavy phase from said third stage settler;

withdrawing said third light phase from said third stage settler for recycle to second mixing zone to aid in providing said prepared mixture;

introducing at least a portion of said third heavy phase into a hydrogen addition zone;

treating said third heavy phase in said hydrogen addition zone to form a hydrogen-rich donor fraction;

withdrawing said hydrogen-rich donor fraction from said hydrogen addition zone; and

recirculating at least a portion of said withdrawn hydrogen-rich donor fraction to supplant at least a portion of said process solvent employed in preparing the coal liquefaction products.

4,189,373

PROCESS FOR THE PRODUCTION OF ASHLESS LIQUID FUELS

Hidemasa Honda; Yasuhiro Yamada, and Hitoo Kakiyama, all of Tosu, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 802,804, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 549,360, Feb. 12, 1975, abandoned. This application Oct. 24, 1978, Ser. No. 954,107
Claims priority, application Japan, Feb. 14, 1974, 49-18376
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 LE **1 Claim**

1. A process for producing an ashless liquid fuel from coal and a residual oil having an atomic ratio of C/H in the range from 0.57 to 0.75 obtained from the distillation of crude oils which comprises the steps of

(a) subjecting the residual oil to a heat treatment at a temperature in the range from 400° to 450° C. to form a pitch material having an atomic ratio of C/H in the range from 0.90 to 1.20,

(b) mixing the pitch material with finely divided coal powder in a weight ratio of at least 50 parts of the pitch material per 100 parts of the coal powder,

(c) subjecting the mixture of the pitch material and the coal powder to a heat treatment at a temperature in the range from 400° to 450° C. to effect substantial dissolution of the coal in the pitch material whereby the ash contained in the coal coagulates together with the insoluble optically anisotropic microspherules produced in the pitch material, and

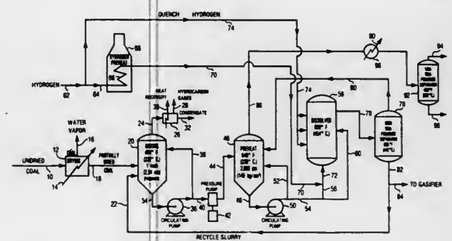
(d) removing the thus coagulated material from the mixture.

4,189,374

COAL LIQUEFACTION PROCESS EMPLOYING INTERNAL HEAT TRANSFER

Lawrence J. Kirby; Thomas E. Richardson, both of Littleton; Bruce K. Schmid, Denver, and John V. Ward, Arvada, all of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,160
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 LE **5 Claims**



1. A coal liquefaction process comprising passing wet feed coal to a coal predrying zone to remove a portion of the moisture content thereof; passing partially dried feed coal from said predrying zone together with recycle slurry comprising normally solid dissolved coal, liquid coal and mineral residue to a backmixed feed slurry mixing vessel operated at a pressure below process pressure; venting vapor from said feed slurry mixing vessel independently of removal of mixing vessel effluent slurry to release water vapor formed thereon; pressurizing to process pressure mixing vessel effluent slurry and passing said mixing vessel effluent slurry to a preheater vessel to increase the temperature thereof to a level at which at least a portion of the coal dissolves; passing preheater vessel effluent slurry together with hydrogen to a dissolver zone to exothermically hydrocrack normally solid dissolved coal to liquid coal and hydrocarbon gases; passing hot dissolver zone effluent slurry through high temperature vapor-liquid separator means to remove an overhead vapor stream comprising hydrogen, hydrocarbon gases and naphtha from a separator slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; recycling a portion of said separator slurry to said mixing vessel; passing said overhead vapor stream at process pressure to said preheater vessel for direct admixture with the slurry therein to quench said overhead vapor stream and heat the slurry therein; and venting vapor from said preheater vessel independently of removal of effluent slurry from said preheater vessel.

4,189,375

COAL LIQUEFACTION PROCESS UTILIZING SELECTIVE HEAT ADDITION

Lawrence J. Kirby; Thomas E. Richardson, both of Littleton; Bruce K. Schmid, Denver, and John V. Ward, Arvada, all of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,161
Int. Cl.[2] C10G *1/00, 1/08*
U.S. Cl. 208—8 LE **8 Claims**

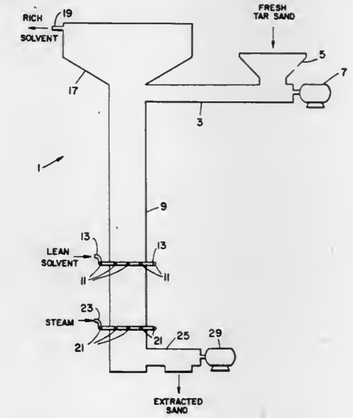
1. A coal liquefaction process comprising passing feed coal together with recycle slurry comprising normally solid dissolved coal, normally liquid coal and mineral residue to a feed slurry mixing vessel operated at a pressure below process pressure; pressurizing mixing vessel effluent slurry to process pressure and passing said mixing vessel effluent slurry at process pressure to a preheater vessel; heating the slurry within said preheater vessel; preheating a first portion of a process hydrogen stream employing heat from outside of the process; mixing said preheated hydrogen with a first portion of preheater vessel effluent slurry to form a hydrogen-slurry mixture; passing said preheated hydrogen-slurry mixture to the upstream region of a dissolver zone to exothermically hydrocrack normally solid dissolved coal to liquid coal and hydrocarbon gases thereby increasing the temperature in the dissolver zone; passing a second and relatively cool portion of process hydrogen at a temperature below the temperature in the dissolver zone to a downstream region of said dissolver zone; passing a second portion of preheater vessel effluent slurry at a temperature below the temperature in said dissolver zone to a downstream region in said dissolver zone; passing a hot dissolver zone effluent stream through high temperature vapor-liquid separator means to remove an overhead stream comprising hydrogen, hydrocarbon gases and naphtha from a separator slurry comprising normally liquid coal and normally solid dissolved coal with suspended mineral residue; passing a portion of said separator slurry to product separation means; and recycling an other portion of said separator slurry to said mixing vessel.

4,189,376

SOLVENT EXTRACTION PROCESS

David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 833,330, Sep. 14, 1977, abandoned. This application May 26, 1978, Ser. No. 909,890
Int. Cl.[2] C10G *1/04;* B01D *11/02*
U.S. Cl. 208—11 LE **12 Claims**



1. A method for solvent-extracting an extractable component from a mixture including said extractable component and subdivided solids, comprising the steps of:

(a) maintaining a vertically extending continuously or intermittently downwardly moving packed bed comprising said solids in a vertically extending extraction zone and introducing said mixture into an upper portion of said bed;

(b) introducing into said upper portion of said bed a vaporizable liquid solvent capable of extracting at least a portion of said extractable component from said mixture;

(c) providing a substantially continuous gaseous phase in contact with a lower portion of said bed;

(d) maintaining a substantially continuous liquid phase comprising said solvent in contact with at least a lower part of said upper portion of said bed above said gaseous phase, said liquid phase and said gaseous phase having an inter-

face at a vertically intermediate level of said bed, extracting said extractable component from said mixture of passing said solvent through said upper portion of said bed, and removing from said zone a liquid including said solvent and said extractable component;

(e) preventing said liquid phase from flowing downwardly through said lower portion of said bed by maintaining said gaseous phase at a pressure sufficient to support said liquid phase thereon and a temperature sufficient to vaporize solvent adhering to solids in said lower portion of said bed; and

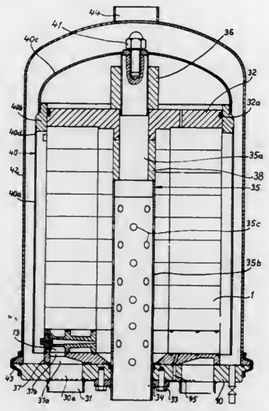
(f) removing from said zone solids in said lower portion of said bed.

4,189,377

MULTIPLE CYCLONE SEPARATOR

Bengt I. Dahlberg, Uttran; Aurel J. Fecske, Huddinge, and Kjell G. Jacobson, Hagersten, all of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 6, 1978, Ser. No. 883,724
Claims priority, application Sweden, Mar. 9, 1977, 7702639
Int. Cl.² B04C *5/28*
U.S. Cl. 209—211 **2 Claims**



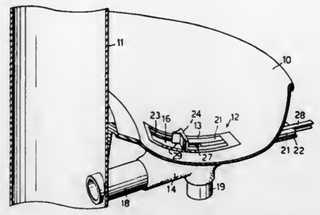
1. A multiple cyclone separator comprising a plurality of groups of conical separators, the cyclone separators of each group being arranged in a circular ring in a common, integral, annular block with the longitudinal axes of the separators disposed in a common plane and directed towards a common center, each said block having at least one inlet opening extending therethrough from both sides thereof and also having radially extending outlet openings for separated components, each block being provided on both sides with sealing surfaces surrounding said inlet opening and adapted to cooperate with corresponding sealing surfaces of adjacent, generally identically shaped blocks, and clamping means for clamping a plurality of said blocks together into sealing engagement with each other and including two pressure plates and a tension rod interconnecting said plates, said rod being tubular and forming an outlet for a discharged separated fraction.

4,189,378

SPIRAL SEPARATORS

Douglas C. Wright, Terranora, and Sidney N. Roberts, Banora Point, both of Australia, assignors to Minore Pty. Ltd., Murwillumbah and Rosidium Pty. Ltd., Banora Point, both of, Australia

Filed Jul. 7, 1978, Ser. No. 922,804
Claims priority, application Australia, Jan. 16, 1978, PD3039
Int. Cl.² B03B *5/52*
U.S. Cl. 209—459 **3 Claims**



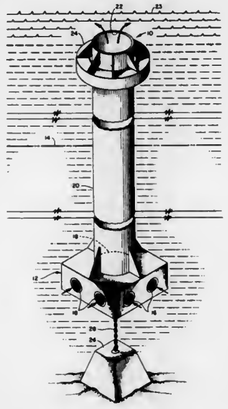
1. An improved spiral separator for mineral separation, of the type having a helical sluice or spiral, means for feeding a pulp of water and minerals to be separated to the upper part of the spiral, and take-off openings in the spiral to withdraw mineral bearing strata of the pulp, wherein said improvement comprises: a take-off opening of the spiral in the form of a slot in the bottom part of the spiral, said slot being transverse to the direction of flow; an infinitely variable throat gap adjustment member adapted to be advanced or retracted for varying the throat gap between it and one end of said slot, while closing off the remainder of the slot during flow of product; said throat gap adjustment member is a tongue slidably engaged in, and closing an outer part of, said slot; a splitter blade extends upwardly from the end of said tongue defining one end of said throat gap and is adapted to separate and deflect into said throat gap a part of the flow of pulp; and a second slot is formed in said tongue, transverse to the direction of flow through said spiral.

4,189,379

METHOD FOR BRINGING NUTRIENT-RICH WATER FROM THE APHOTIC ZONE OF THE OCEAN TO THE PHOTIC ZONE

Warren T. Finley, 10352 Miralago Pl., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 833,939, Sep. 16, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,675
Int. Cl.² B01D *13/00, 13/02*
U.S. Cl. 210—22 D **3 Claims**



1. A method of bringing nutrient-rich ocean water from the aphotic zone of the ocean up to the photic zone to increase the concentration of nutrients in the photic zone, comprising:

submerging a water desalinating means into the aphotic zone of the ocean;

introducing seawater from the aphotic zone into said desalinating means;

at least partially desalinating the seawater introduced into said desalinating means while leaving a high concentration of nutrients in said desalinated seawater; and

increasing the concentration of nutrients in the photic zone by conducting the nutrient-rich desalinated water thereby produced into the photic zone.

4,189,380

SALT ADDITION IN ULTRAFILTRATION PURIFICATION OF SOLUTIONS OF POLYMERIC COLORANTS

Robin G. Booth, Palo Alto, and Anthony R. Cooper, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Nov. 18, 1976, Ser. No. 743,204
Int. Cl.² C09B *1/20, 3/10, 5/14, 39/00*
U.S. Cl. 210—23 F **15 Claims**

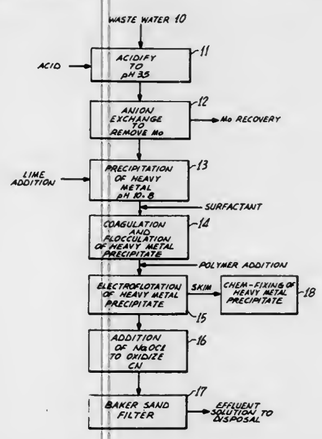
1. In the process for purifying a solution of a polymeric colorant wherein an aqueous feed solution comprising polymeric colorant of molecular weight above 1000 Daltons, polymeric colorant, and polymeric colorant precursors and degradation products, and inorganic salts of molecular weight below 1000 Daltons is brought in contact with a semipermeable membrane under ultrafiltration conditions in a diafiltration mode for a plurality of diavolumes thereby forming an ultrafiltrate comprising polymeric colorant, polymeric colorant precursors and degradation products and inorganic salts of molecular weight below 1000 Daltons and a retentate comprising polymeric colorant of molecular weight above 1000 Daltons, the improvement which comprises maintaining the salt content of the feed solution above 1% by weight for at least two diavolumes by addition of salt directly to said ultrafiltration feed, and said ultrafiltration feed comprising at least 50% by weight water.

4,189,381

WASTE WATER TREATMENT

John M. Laferty, Wheatridge; Gary G. Van Riper, Morrison, and Weldon P. Zundel, Lakewood, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 7, 1978, Ser. No. 940,065
Int. Cl.² C02C *5/08*
U.S. Cl. 210—28 **6 Claims**



1. An environmental pollution control process for treating waste water containing over 2 ppm Mo and at least one heavy metal impurity selected from the group consisting of over 2 ppm Fe, over 1 ppm Mn, over 0.05 ppm Cu, over 0.2 ppm Zn, and over 0.015 ppm Cd, and containing over 0.025 ppm CN ion which comprises:

passing said waste water having an adjusted pH value ranging from about 3 to 4 through an ion-exchange resin column selective to the removal of Mo to a level not exceeding about 2 ppm to provide an ion-exchange effluent containing said at least one heavy metal impurity and said CN ion,

adjusting the pH value of said effluent to a range of about 7 to 11, the pH value selected being sufficient to precipitate that heavy metal impurity having the highest pH requirement for precipitation,

subjecting said precipitate to electrocoagulation and flocculation and provide a flocculated dispersion of said precipitate,

subjecting said flocculated precipitate-containing effluent to electrolysis using insoluble electrodes to form micro bubbles of electrolytic oxygen and hydrogen and effect electroflotation of said flocculated precipitate and form a froth thereof,

skimming off said froth to provide a substantially clean effluent containing residual amounts of cyanide in excess of 0.025 ppm,

adding a small but effective amount of an oxidizing agent selective to the oxidation of said contained cyanide sufficient to reduce it to a value not exceeding about 0.025 ppm,

and then filtering said effluent,

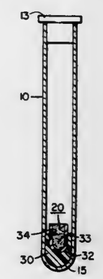
whereby a cleaned liquor is obtained containing not more than 2 ppm Mo and not more than 2 ppm Fe, 1 ppm Mn, 0.05 ppm Cu, 0.2 ppm Zn, 0.015 ppm Cd, and 0.025 ppm CN ions.

4,189,382

BLOOD COAGULATION AND SEPARATION

Anthony R. Zine, Jr., Corning, N.Y., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 521,740, Nov. 7, 1974, abandoned. This application Apr. 3, 1978, Ser. No. 892,992
Int. Cl.² B01D *21/26*
U.S. Cl. 210—46 **15 Claims**



1. An improved method of collecting a sample of whole blood within a vessel having a sidewall terminating at first and second ends, coagulating the blood to form intermixed serum and red cell phases, and simultaneously separating said phases and partitioning said phases with a quantity of thixotropic material having a density intermediate the densities of said phases, including the steps of initially positioning the thixotropic material within the vessel adjacent the first end thereof, partially submerging energizer means for directing the flow of said thixotropic material within said thixotropic material, introducing the sample of blood into said vessel through the second end thereof, activating the clotting factors of said blood at inner surface portions of said vessel to form intermixed

serum and clotted red cell phases, and applying centrifugal force to said sample of blood, thixotropic material and energizer means to simultaneously separate said phases, move said energizer means into said thixotropic material, and to move said thixotropic material from said first vessel end to a position partitioning said phases, wherein the improvement comprises the steps of:

removably applying to said energizer means a quantity of particles made from material which promotes the clotting of blood, each of said particles having a density and size sufficient to be suspended in said sample of whole blood as said sample is supplied to the vessel and to be sedimented from said serum phase during the application of centrifugal force to separate said sample into said serum and red cell phases;

simultaneously with said step of supplying said sample of blood to said vessel, suspending said particles in said sample, to establish a plurality of sites for the contact activation of clotting of blood throughout said blood sample whereby the time for complete coagulation is substantially reduced; and,

concurrently with the step of applying centrifugal force to separate said serum and red cell phases, centrifugally forcing said particles into said red cell phase, whereby said separated serum is free from said powdered means.

9. An apparatus for centrifugally separating blood into serum and clotted red cell phases and for simultaneously partitioning the phases comprising:

partially evacuated vessel means for collecting a sample of fresh blood to be coagulated and thereafter separated into serum and clotted red cell phases under the influence of centrifugal force, said vessel means having first and second ends, with said first end having a needle-pierceable closure inserted therein in an air-tight sealed relationship therewith;

gel-like means for forming a partition between said blood phases simultaneously with their centrifugal separation, said gel-like means being chemically inert with respect to blood and having a density intermediate the serum and clotted red cell phases of blood, and said gel-like means being initially positioned within said second end of said vessel means;

energizer means, initially partially submerged within said gel-like means, for directing the flow of said gel-like means during the centrifugal separation of the phases;

powder means for establishing coagulation activation sites at a plurality of positions dispersed generally throughout the sample of whole blood as the blood is supplied to the vessel means, said powder means being initially removably applied to said energizer means; and,

said powder means comprising a plurality of particles of material which promotes coagulation of whole blood, said particles having a density and a selected particle size sufficient to allow the particles to be initially suspended within said sample of blood as said sample is collected within said vessel means and to remain suspended therein during coagulation, and said particles having a density greater than the density of said serum phase and a minimum particle size sufficient to allow all of said particles to be separated from the serum phase of said blood sample into the clotted red cell phase simultaneously with the centrifugal separation of said phases.

4,189,383

NOVEL COMPOSITIONS OF MATTER FOR USE IN THE TREATMENT OF AQUEOUS SYSTEMS

Peter Miles, Stockport; Norman Richardson, Middleton, and Michael A. Finan, Macclesfield, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

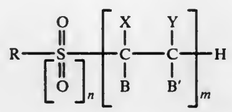
Division of Ser. No. 707,126, Jul. 20, 1976, Pat. No. 4,111,804. This application Jun. 26, 1978, Ser. No. 919,118

Claims priority, application United Kingdom, Jul. 23, 1975, 30718/75

Int. Cl.[2] C02B *5/06*

U.S. Cl. 210—58 **7 Claims**

1. A method of inhibiting scale formation by salts of calcium, magnesium, barium and strontium from aqueous solutions which comprises adding to the aqueous solution an amount within the range of from 0.2 part to 500 parts per million, based on the water to be treated, of a product comprising a telomer of formula I



(I)

or a salt thereof, wherein X is COOH when Y is H, or Y is COOH when X is H; B and B′ are each hydrogen, or B is CH_3 when B′ is H, or B′ is CH_3 when B is H; m is an integer from 2 to 100; n is 0 or 1; and R is alkyl having from 1 to 22 carbon atoms substituted by one or more hydroxy groups.

4,189,384

GAS TREATMENT OF LIQUID

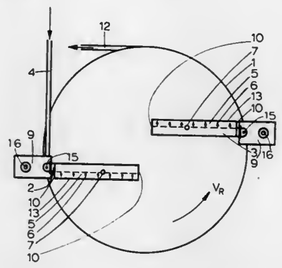
Freerk J. Fontein, Heerlen, and Hubertus F. Jennekens, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 24, 1975, Ser. No. 571,352

Claims priority, application Netherlands, Apr. 26, 1974, 7405628

Int. Cl.[2] C02B *1/34*

U.S. Cl. 210—60 **5 Claims**



1. A process for dissolving a gas such as air in a body of liquid such as waste water contained in a basin comprising supplying the gas under pressure to a generally bell-shaped gas chamber placed below the surface of the liquid to thereby form a gas space in the chamber said gas space overlying a portion of the body of liquid, introducing a liquid stream in the form of at least one liquid jet into the gas space so that the jet passes through at least a portion of the gas space and strikes the liquid residing below the gas space thereby driving gas from the space into the liquid, the quantity of gas supplied to the chamber being equal to the quantity of gas driven into the liquid by the liquid jet.

4,189,385

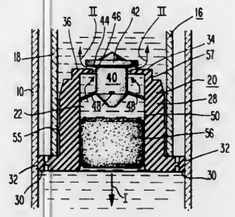
METHOD AND APPARATUS FOR SEPARATING SERUM OR PLASMA FROM THE FORMED ELEMENTS OF THE BLOOD

Donald J. Greenspan, 235 Pavilion Ave., Riverside, N.J. 08075

Filed May 3, 1977, Ser. No. 793,282

Int. Cl.[2] B01D *33/00*

U.S. Cl. 210—136 **31 Claims**



1. A separator tube adapted to be pushed into a collection tube containing blood for separating serum or plasma from the formed elements of the blood, said separator tube comprising:

a tubular member,

means adapted to form a seal with the collection tube as the separator tube is pushed into the collection tube,

a valve seating portion having a valve opening therein, said valve opening permitting serum or plasma to flow into said tubular member when the separator tube is plunged into the collection tube,

a movable valve member adapted to seat on said seating portion on one side of said opening so as to close said valve opening in the presence of serum or plasma in said tubular member,

bias means comprising at least one flexible strand maintained under tension connected between said valve member and said valve seating portion on the other side of said opening for maintaining a substantial seating force on said valve member when said valve opening has closed, and

said valve seating portion, said valve member and said bias means being integrally molded to form a unitary structure.

4,189,386

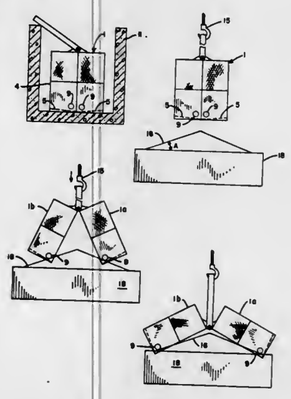
DEBRIS SEPARATION AND DISPOSAL SYSTEM

Arcadio J. Aman, 2310 Bell Dr., Reading, Pa. 19609

Filed Oct. 3, 1978, Ser. No. 948,260

Int. Cl.[2] B01D *35/08*

U.S. Cl. 210—235 **13 Claims**



1. A debris disposal system comprising:

a strainer having a plurality of cooperative sections adapted to abut together in mating relationship to define an open container, at least one of the sections including a perforate portion;

means for pivotally mounting each section with respect to the other whereby they are free to rotatably disengage from abutment;

each section configured so that, in abutment with each other, the net moment on the section about its pivot axis, due to the weight of the section alone and of any material contained therein, urges the sections toward abutment to a substantially closed position;

means for operatively associating a lifting means with the strainer; and

means for opening the sections by rotation of at least one of the sections out of abutment position with another of the sections comprising

at least one cam-follower means mounted on the exterior of at least one of the strainer sections, and

a cam for engagement by the cam-follower means, the cam being separate from and positionable remotely from the strainer in association with a debris container.

4,189,387

LUBRICANT COMPOSITIONS BASED ON ZIRCONIUM POLYMERS

James P. King, 904 Breezewood La., Lansdale, Pa. 19446

Filed Aug. 31, 1978, Ser. No. 938,459

Int. Cl.[2] C10M *5/24, 5/22, 5/14, 7/46*

U.S. Cl. 252—32.7 E **8 Claims**

1. A lubricant composition comprising a liquid lubricant thickened with a zirconium polymer having a structural formula selected from the group consisting of

$$[Zr_4O_4(OH)_{8-y}(XPRR'X)_y]_n$$

and

$$[Zr_4O_4(OH)_{8-y}(OOCR)_y]_n$$

where

R and R′ are hydrogen, alkyl, aryl, fluorinated and perfluorinated alkyl and aryl groups;

X is oxygen or sulfur;

y is equal to 0.1 to 7.9; and

n is ranging from 2 to 30.

4,189,388

SYNTHETIC AIRCRAFT TURBINE OIL

Roberta Yaffe, Glenham, and Russell R. Reinhard, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,984

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—46.7 **9 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(b) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms,

(c) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(d) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.01 to about 5.0 percent by weight of a N,N'-dialkylthio dipropionamide wherein each alkyl radical is a straight or branched chain alkyl radical containing from 4 to 20 carbon atoms therein.

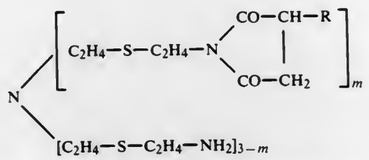
4,189,389

NOVEL ALKENYL SUCCINIMIDES AND PROCESS FOR THEIR PREPARATION

Gerard Soula, Meyzieu, France, assignor to Orogil, Courbevoie, France

Filed Jan. 9, 1979, Ser. No. 2,240
Claims priority, application France, Jan. 11, 1978, 78 00625
Int. Cl.² C10M *1/38*
U.S. Cl. 252—47.5 **9 Claims**

1. A novel composition based on alkenyl succinimide, comprising at least one alkenyl succinimide of the formula:



in which R represents an alkenyl group containing from about 20 to 200 carbon atoms and m is a whole number from 1 to 3.

3. A novel process of preparing a composition according to claim 1, which process comprises reacting an alkenyl succinic acid anhydride in which the alkenyl group contains from about 20 to 200 carbon atoms, with tris(5-amino-3-thia-pentyl)amine, in a ratio of number of equivalents of amine to number of equivalents of acid of between about 0.4 and 0.6, at a temperature between about 120° and 230° C.

6. A novel lubricating composition, having desirable dispersion, anti-rust and anti-foam properties, comprising an oil containing between about 1 and 10 percent by weight of a novel lubricant additive composition according to claim 1.

7. A novel lubricating composition, having desirable dispersion, anti-rust and anti-foam properties, comprising an oil containing between about 1 and 10 percent by weight of a novel lubricant additive composition according to claim 1.

8. A gasoline engine oil, having desirable dispersion, anti-rust and anti-foam properties, containing between about 1 and 7 percent by weight of a novel lubricant additive composition according to claim 1.

4,189,390

ONE-COMPONENT MAGNETIC DEVELOPER POWDER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND METHOD OF MAKING SAME

Koji Noguchi, Kumagaya; Toshio Kumakura, Omiya; Akio Mukoh, Hitachi; Yasuki Mori, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 659,360, Feb. 19, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,890
Claims priority, application Japan, Feb. 21, 1975, 50/20989
Int. Cl.² G03G *9/14*
U.S. Cl. 430—111 **13 Claims**

1. A one-component magnetic developer powder for developing an electrostatic latent image formed according to an electrophotographic process by the magnetic brush method, the particles of the developer powder being substantially spherical and having an electrically conductive multi-layer structure, said structure having a core portion and a surface layer, said core portion consisting essentially of 40–55% by weight of a plastic binder, 0.5–8% by weight of electric conductive particles dispersed throughout said binder and the balance of magnetite, said core portion having an electric resistivity ranging between 10^2 and 10^{12} ohm-cm in a 100 volts/cm D.C. electrical field, said surface layer comprising additional electrically conductive particles embedded in the surface of the spherical particle forming a greater concentration of electrically conductive particles in the surface layer; the total conductive particles being 1.5–10% by weight; the resistivity of the surface layer of said spherical particle being less than that of the core portion; and the average electric resistivity of said developer powder being in the range of 10^2 and 10^8 ohm-cm in a 100 volts/cm D.C. electrical field.

4,189,391

ELECTRICAL INSULATING OIL COMPOSITIONS

Shoji Kimura, Chigasaki; Noboru Ishida, Sagamihara; Midori Masunaga, Tokyo, and Yoshiki Kohno, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 791,280, Apr. 27, 1977, abandoned. This application May 8, 1978, Ser. No. 904,098
Claims priority, application Japan, May 1, 1976, 51-49405
Int. Cl.² H01B *3/22*
U.S. Cl. 252—63 **10 Claims**

1. An electrical insulating oil composition consisting essentially of (I) 50–95 parts by weight of a mineral oil-derived electrical insulating oil, the mineral oil being obtained from at least one member selected from the group consisting of naphthenic, mixed and paraffinic base crude oils, (II) 5–50 parts by weight of at least one oil selected from the group consisting of (1) diarylalkanes, (2) polybutene, (3) an oil having a refractive index of (n_d^{20}) 1.56–1.60 obtained by hydrofining a distillate contained in a fraction having a boiling range of about 250°–400° C. at atmospheric pressure obtained by the steam cracking or thermocracking of petroleum at about 600°–900° and (4) an oil obtained by hydrofining a distillate contained in a fraction having a boiling range of about 230°–450° C. at atmospheric pressure obtained as a by-product at the time of reforming a hydrocarbon oil in the presence of a noble metal catalyst, and (III) 0.001–1.0% by weight, based on the total weight of the oils (I) and (II), of a hydrocarbon-derived pour point depressant which is at least one member selected from the group consisting of (1) copolymers of ethylene and α-olefin having the general formula CH_2=CH—R wherein R is an alkyl group having at least one carbon atom, (2) styrene-butadiene copolymers in hydrogenated form and (3) alkylated polystyrenes obtained by the reaction of a polystyrene having a number average molecular weight of 10,000–150,000 with an alkyl halide of the formula RX wherein R is an alkyl group having 6–20 carbon atoms and X is a halogen atom.

4,189,392

TRACKING RESISTANT HV INSULATION MATERIAL CONTAINING FLUORINE-SUBSTITUTED COMPONENT TO INHIBIT EROSION

Richard J. Penneck, "Treeve," Westway, Lechlade, Gloucestershire, and John M. Senior, 70 Caulfield Rd., Swindon, Weltshire, both of England

Filed Jul. 26, 1977, Ser. No. 819,165
Claims priority, application United Kingdom, Aug. 3, 1976, 32271/76
Int. Cl.² H01B *3/46, 3/44, 3/42, 3/40*
U.S. Cl. 252—63.2 **60 Claims**

1. An electrical insulating material suitable for high voltage applications which is resistant to tracking and spark erosion comprising a polymeric material having incorporated therein an anti-tracking filler and an erosion inhibiting, hydrophobic, non-ionic, fluorine-substituted compound, the compound having at least one fluorine-substituted aliphatic carbon chain linked to a group having an affinity for the polymeric material and/or the anti-tracking filler, said group being selected from groups compatible with said polymeric material so as to render the compound soluble in said polymeric material, miscible with said polymeric material, or resistant to leaching from said polymeric material and groups capable of interacting with the surface of the anti-tracking filler to form a layer thereon, said material having initial tracking voltage of at least 2.5kV as measured by ASTM D2303.

4,189,393

HEAT STORAGE MATERIAL COMPRISING LITHIUM CHLORATE-TRIHYDRATE AND A NUCLEATING AGENT

Johann Schröder, and Klaus Gawron, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,827
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731573
Int. Cl.² C09K *5/06*
U.S. Cl. 252—70 **6 Claims**

1. A heat storage material comprising lithium chlorate-trihydrate as the storage medium and potassium perchlorate and/or sodium potassium or barium hexafluorosilicate as a nucleating agent.

4,189,394

HEAT STORAGE MATERIAL COMPRISING CALCIUM CHLORIDE-HEXAHYDRATE AND A NUCLEATING AGENT

Johann Schröder, and Klaus Gawron, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,824
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731572
Int. Cl.² C09K *5/06*
U.S. Cl. 252—70 **6 Claims**

1. A heat storage material comprising calcium chloride-hexahydrate as the storage medium and barium carbonate, strontium carbonate, barium fluoride, barium fluoride-hydrofluoride and/or strontium fluoride as a nucleating agent.

4,189,395

CLEANSING PAD AND METHOD OF MAKING THE SAME

Frederick H. Bland, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 19, 1978, Ser. No. 870,021
Int. Cl.² C11D *17/04;* C02B *1/44*
U.S. Cl. 252—91 **11 Claims**

1. An improved cleansing pad of the type which has incorporated therein a surfactant cleansing material wherein the improvement comprises incorporating said surfactant cleansing material as a coating composition comprising: water-insoluble cured acrylic latex resin having suds-forming, grease-cutting nonionic surfactant blended therein to provide a 3:1 to 1:8 weight ratio of resin to nonionic surfactant.

4,189,396

DETERGENT COMPOSITIONS

Roger Brace, and Christopher J. Adams, both of Birkenhead, England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 22, 1978, Ser. No. 907,657
Claims priority, application United Kingdom, May 25, 1977, 22067/77
Int. Cl.² C11D *7/14, 7/38, 7/56, 7/18*
U.S. Cl. 252—99 **10 Claims**

1. A detergent composition consisting essentially of a detergent active and a water-soluble titanium or zirconium peroxo compound in a sufficient quantity to develop a building and/or bleaching action in an aqueous solution of the composition.

4,189,397

STABILIZATION OF 1,1,1-TRICHLOROETHANE COMPOSITIONS AGAINST METAL-INDUCED DECOMPOSITION WITH A POLYALKYLENE GLYCOL MONOALKYL ETHER

Christopher S. Allen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 15, 1977, Ser. No. 860,948
Claims priority, application United Kingdom, Dec. 24, 1976, 54112/76
Int. Cl.² C23G *5/02;* C07C *17/42*
U.S. Cl. 252—171 **13 Claims**

1. A stabilised solvent composition consisting essentially of 1,1,1-trichloroethane with a stabilising amount of from 0.01% to 5% by weight of a stabiliser which is a polyalkylene glycol monoalkyl ether of formula



where R is an alkyl group containing 1 to 4 carbon atoms, R' is hydrogen or a methyl group and n is 2 or 3.

4,189,398

NUCLEAR FUEL COMPOSITION

Alexander L. Feild, Jr., Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1965, Ser. No. 448,546
Int. Cl.² C09K *3/00*
U.S. Cl. 252—301.1 R **4 Claims**

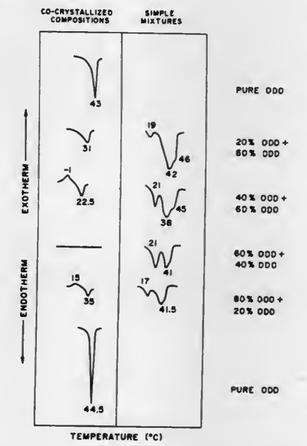
1. A high temperature graphite-uranium base nuclear fuel composition containing from about 1 to about 5 weight percent rhenium metal.

4,189,399

CO-CRYSTALLIZED ACETYLENIC COMPOUNDS

Gordhanbhai N. Patel, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 19, 1977, Ser. No. 817,069
Int. Cl.² C09K *9/02*
U.S. Cl. 252—408 **18 Claims**



1. A composition consisting essentially of at least two co-crystallized acetylenic compounds, of different chemical structures, each containing at least one —C≡C—C≡C— group and substituents selected from the group consisting of sulfo-

nate, urethane, and alcohol radicals, at least one of the compounds capable of undergoing a contrasting color change upon exposure to actinic radiation or thermal annealing wherein the composition exhibits a substantially different thermogram than the sum of thermograms of the individual components as obtained by differential scanning calorimetry, and wherein the composition exhibits a higher or lower rate of color change upon exposure to actinic radiation or thermal annealing than the individual compounds.

4,189,400

COMPOUND USEFUL IN CHOLESTEROL ASSAY PROCEDURES

Gary J. Proksch, 5514 N. Greenview Dr., Indianapolis, Ind. 46220, and Dean P. Bonderman, 586 W. 77th N. Dr., Indianapolis, Ind. 46260

Filed Aug. 17, 1977, Ser. No. 825,202
Int. Cl.[2] G01N *33/16;* **G09K** *3/00;* **G01N** *31/14*
U.S. Cl. 252—408 **43 Claims**

1. A substantially human serum for use as a standard or reference material in assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, a compound comprising a water soluble ester of cholesterol having the formula:

R_1-R_2-[Cholesterol Base]

in which:

R_1 is a nonionic polyether radical having esterifiable hydroxyl groups; and

R_2 is an aliphatic dicarboxyl group having more than three carbon atoms and is bonded by ester linkages to R_1 and to the 3 beta position of the Cholesterol Base, R_1 and R_2 together having a molecular weight of from about 200 to about 3,000.

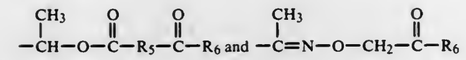
19. A substantially human serum for use as a standard or reference material in assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, a compound comprising a water soluble pregnenolone derivative having the formula:

R_3-[Pregnenolone Base]-R_4

in which:

R_3 is attached at the 3 beta position of the Pregnenolone Base and is a radical selected from the group consisting of a hydroxyl group and an ester group having from about 2 to about 17 carbon atoms; and

and is a radical selected from the group consisting of



in which R_5 is an alkane having between 1 and about 8 carbon atoms and R_6 is selected from the group consisting of chloride and serum albumin.

4,189,401

METHOD OF STORING A BIOLOGICAL REFERENCE CONTROL STANDARD AND BIOLOGICAL REFERENCE CONTROL STANDARD OBTAINED THEREBY

Allan L. Louderback, Temple City, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 17, 1978, Ser. No. 925,482
Int. Cl.[2] C09K *3/00;* **G01N** *33/16*
U.S. Cl. 252—408 **10 Claims**

6. A frozen blood serum reference composition for use in analysis of biologically similar unknowns upon thawing, said composition comprising in its non-biological component from about 40 to about 85 weight percent water, from about 15 to about 60 weight percent of at least one alkylene polyol having from 2 to 5 carbon atoms, the remainder being chiefly at least one labile natural biological material selected from a group consisting of blood serum, enzymes, metabolites, electrolytes, and hormones.

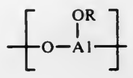
4,189,402

SUPPORTED CATALYST FOR OLEFIN POLYMERIZATION

Louis J. Rekers, Wyoming, and Anthony N. Speca, Cincinnati, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation of Ser. No. 800,585, May 25, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,574
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—428 **5 Claims**

1. A catalyst comprising a silica xerogel having a surface area in the range of 200 to 500 m^2/g and a pore volume greater than about 2.0 cc/g, a major portion of the pore volume being provided by pores having diameters in the range of 300 to 600 A, having coated thereon a polymeric hydrocarbon aluminate having at least one



unit, wherein R is a hydrocarbyl radical having up to about 10 carbon atoms, and heat activated in a non-reducing atmosphere at a temperature of from 200° F. up to the decomposition temperature of the support.

4,189,403

CATALYST FOR CYCLODIMERIZATION OF ISOPRENE

Cornelis F. Roobeek, and Petrus W. N. M. van Leeuwen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 869,563, Jan. 16, 1978. This application Feb. 16, 1979, Ser. No. 12,932
Claims priority, application United Kingdom, Jan. 19, 1977, 2100/77
Int. Cl.[2] B01J *31/22*
U.S. Cl. 252—431 P **18 Claims**

1. A catalyst prepared by a process which comprises mixing (a) substituted trihydrocarbyl phosphite, substituted trihydrocarbyl arsenite or substituted trihydrocarbyl antimonite, wherein at least one of the three hydrocarbyl groups is a substituted hydrocarbyl group of the general formula

$$CF_3—(CF_2)_n—C(H)(R)— \quad (I)$$

wherein n is equal to zero or an integer of at least one and R represents a substituted or unsubstituted hydrocarbyl group wherein the substituents are fluorine, chlorine, bromine, alkoxy or phenoxy, and (b) a nickel compound in which the nickel has an oxidation number of zero.

4,189,404

CATALYST AND PROCESS OF ITS PREPARATION

Carl D. Keith, Summit; John J. Mooney, Wyckoff, both of N.J.; Robert E. Kenson, Guilford, Conn., and Daniel L. Bair, Roselle Park, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Jan. 6, 1977, Ser. No. 757,145
Int. Cl.[2] B01J *21/04, 23/10, 23/40, 23/74*
U.S. Cl. 252—462 **32 Claims**

1. In a process of preparing a catalytic composition the steps comprising depositing on the surface of a macrosize composite an aqueous solution having dissolved therein a major amount of an aluminum compound which is a precursor of catalytically-active alumina and a minor amount of a precursor of rare earth oxide, said amounts being on a non-aqueous basis, said composite consisting essentially of a catalytically-effective amount of catalytically-promoting metal, catalytically-active, refractory oxide support and a relatively catalytically-inactive carrier, the amount of said aluminum compound in solution in said aqueous solution deposited being sufficient to increase the resistance of the catalytic composition to poisoning by extraneous materials, and drying said composition subsequent to said deposition.

4,189,405

INTERMETALLIC CATALYSTS

Arthur G. Knapton, Henley on Thames, and Ian R. McGill, Thatcham, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jan. 27, 1978, Ser. No. 872,747
Claims priority, application United Kingdom, Feb. 4, 1977, 4656/77; Feb. 16, 1977, 6455/77
Int. Cl.[2] B01J *23/10, 23/42, 23/44, 23/46*
U.S. Cl. 252—462 **12 Claims**

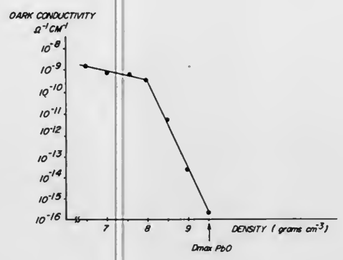
1. A catalyst comprising a substrate having deposited thereon a first coating containing a refractory metal oxide and having deposited upon the said oxide one or more intermetallic compounds of the general formula A_xB_y where A is selected from the group consisting of Ru, Rh, Pd, Ir and Pt, and B is selected from the group consisting of Al, Sc, Y, the lanthanides, Ti, Zr, Hf, V, Nb, and Ta, and where x and y are integral and may have values of 1 or more.

4,189,406

METHOD FOR HOT-PRESSING PHOTOCONDUCTORS

Armin K. Weiss, and Edward Carnall, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,653
Int. Cl.[2] G03G *5/04*
U.S. Cl. 252—501.1 **8 Claims**



1. A lead monoxide element having a density greater than about 85% of the theoretical density of lead monoxide, said element being produced by the method comprising the steps of:

(a) placing powdered lead monoxide in a mold formed of a substance inert to said lead monoxide; and

(b) simultaneously applying heat and pressure to said powdered lead monoxide in said mold for a time period of from about 5 to about 45 minutes, said pressure being in the range of from about 10,000 pounds per square inch to about 55,000 pounds per square inch, and said heat being in the range of from about 300° C. to about 500° C.

4,189,407

CHLORINATED HYDROCARBONS AND POLYSULFIDE RUBBER SEALANT COMPOSITIONS INCORPORATING SAME

Cyril J. Yaggi, Jr., Pittsburgh, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,039
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 R **16 Claims**

1. An improved polysulfide rubber sealant formulation comprising

a liquid polysulfide polymer; and

a chlorinated hydrocarbon plasticizer in an amount effective to plasticize said polysulfide polymer and consisting essentially of a chlorinated hydrocarbon selected from chlorinated paraffins containing from 16 to 20 carbon atoms per molecule, chlorinated alpha-olefins containing from 16 to 20 carbon atoms per molecule, and mixtures thereof; the chlorine content of the chlorinated hydrocarbon ranging from 52 to 58 weight percent; the chlorinated hydrocarbon plasticizer having a combination of (a) number of carbon atoms per molecule and (b) chlorine content sufficient to provide a non-fogging and compatible plasticizer in a polysulfide rubber sealant formulation; the polysulfide rubber sealant formulation being stable when cured.

4,189,408

CHLORINATED HYDROCARBONS AND IMPROVED RUBBER SEALANT COMPOSITIONS INCORPORATING SAME

Cyril J. Yaggi, Jr., Pittsburgh, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 734,039, Oct. 20, 1976. This application Dec. 8, 1977, Ser. No. 858,831
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 R **24 Claims**

1. An improved polysulfide rubber sealant formulation comprising

a liquid polysulfide polymer; and

a chlorinated hydrocarbon plasticizer in an amount effective to plasticize said polysulfide polymer and consisting essentially of a chlorinated hydrocarbon selected from chlorinated paraffins containing from 14 to about 15 carbon atoms per molecule, chlorinated alpha-olefins containing from 14 to about 15 carbon atoms per molecule, and blends thereof; the chlorine content of the chlorinated hydrocarbon ranging from 50 to 59 weight percent; the chlorinated hydrocarbon plasticizer having a combination of (a) number of carbon atoms per molecule and (b) chlorine content sufficient to provide a non-fogging and compatible plasticizer in a polysulfide rubber sealant formulation; the chlorinated hydrocarbon plasticizer having a viscosity of less than about 25,000 centipoises at 25° C. and having a heat loss value of less than about 0.5 weight percent;

and the polysulfide rubber sealant formulation being stable when cured.

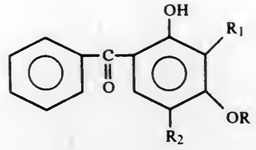
4,189,409

PROCESS FOR PREPARING A METHYLENEBIS(2-HYDROXY-4-ALKOXYBENZOPHENONE) AND ACYLOXYMETHYL 2-OH 4-ALKOXY BENZOPHENONES

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Urawa, and Toshihiro Shibata, Omiya, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,710
Int. Cl.[2] C08K *5/13;* **C07C** *45/00, 69/28, 69/16*
U.S. Cl. 260—23 XA **19 Claims**

1. A 2-hydroxy-4-alkoxyacyloxymethylbenzophenone represented by the formula:



in which R is an alkyl group having 1 to 12 carbon atoms, and R_1 and R_2 are independently hydrogen atoms or saturated aliphatic acyloxymethyl groups having 2 to 9 carbon atoms, provided that R_1 and R_2 are not simultaneously hydrogen.

4,189,410

PRODUCTION OF SYNTHETIC RESINS AND THEIR USES IN PRINTING INK COMPOSITIONS

James J. Laurito, Coraopolis, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 839,408, Oct. 5, 1977, which is a continuation of Ser. No. 434,270, Jan. 17, 1974, Pat. No. 4,056,498. This application Aug. 4, 1978, Ser. No. 931,094

Int. Cl.[2] C08F *222/00, 222/08*

U.S. Cl. 260—23.7 C **17 Claims**

1. A dibasic acid-modified hydrocarbon resin suitable for use in heat-set and gravure printing ink compositions which resin consists essentially of the reaction product of at least one ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride with a base resin consisting essentially of a polymerized mixture of:

(a) a predominant amount of dicyclopentadiene; and lesser amounts of

(b) at least one hydrocarbon-containing material selected from the group consisting of debutanized aromatic concentrates, C_5 olefins and acyclic, conjugated C_5 dienes; and (c) at least one member selected from the group consisting of fatty acid-containing materials and rosin acid-containing materials; the dibasic acid-modified resin having a Ring and Ball softening point of from about 130° C. to about 175° C.; a Gardner color of from about 9 to about 15; a definite Stoddard solubility of from about 0° C. to about 120° C.; an Acid Number of from about 10 to about 30; Gardner-Holdt solution viscosities at 25° C. (bubble seconds) of from about 0.92 to about 15.0 (60% resin in 42 Kauri butanol gravure ink solvent) and from about 8.00 to about 100 (50% resin in Magie 470 oil); and a number average molecular weight of from about 820 to about 1520.

4,189,411

MODIFIED POLYPHENYLENE ETHER COMPOSITIONS HAVING LOWER MELT VISCOSITIES

William R. Haaf, Voorhesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 19, 1978, Ser. No. 870,729

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 R **1 Claim**

1. A thermoplastic molding composition comprising, in admixture:

(a) a polyphenylene ether resin in intimate admixture with a styrene resin, and

(b) a phenolic-modified pentaerythritol ester of rosin having a softening point above the heat distortion temperature of the final composition, said ester being present in an amount at least sufficient to lower the melt viscosity of (a) while molten with retention of the heat deflection temperature level in the composition after molding.

4,189,412

SEALANT COMPOSITION

Edwin C. Klabunde, Sparks, Nev., assignor to Superior Products Company, Inc., Sparks, Nev.

Filed Oct. 17, 1978, Ser. No. 952,123

Int. Cl.[2] C08C *91/00*

U.S. Cl. 260—28.5 AS **1 Claim**

1. A composition consisting essentially of:

A. from about 40% to about 85% of a coal tar pitch boiling from about 355° C. to about 450° C.,

B. from about 2% to about 25% PVC,

C. from about 2.0% to about 25% of a solid particulate filler, and

D. from about 5% to about 55% of an additive blend, said additive blend comprising from 15%–30% of an aromatic petroleum-based distillate boiling from about 260° C. to about 535° C., from about 15%–30% of a petroleum-based distillate boiling from about 220° C. to about 650° C., and from about 40% to about 70% of an aromatic petroleum-based distillate boiling from 285° C. to about 395° C.

4,189,413

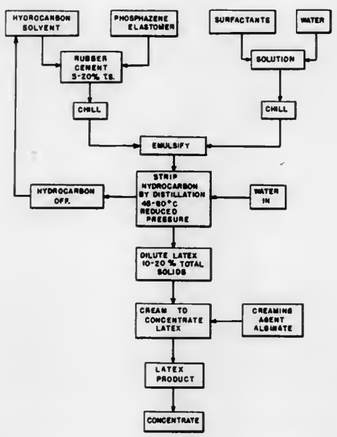
PHOSPHAZENE RUBBER LATICES

George B. Mitchell, Canton, and Arthur E. Oberster, N. Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

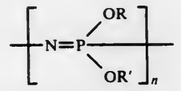
Filed Apr. 11, 1978, Ser. No. 895,169

Int. Cl.[2] C08J *9/30*

U.S. Cl. 260—29.2 M **7 Claims**



1. A stable synthetic rubber latex having a solids content between about 40% and 80% by weight and exhibiting a pH in the range of 8.5–11.5, from which coatings and open cell foams possessing superior smoke and flammability properties are produced wherein the synthetic rubber is a linear polyphosphazene represented by the formula



where n is between about 20 and about 50,000 and OR and OR' each represent a monovalent group selected from the group consisting of alkoxy, substituted alkoxy, aryloxy and substituted aryloxy and OR and OR' may be either the same group or may each be one or more different groups and may include some unsaturation and OR and OR' are randomly distributed along the -P-N- chain.

4,189,414

COATING COMPOSITIONS FOR ARCHITECTURAL USE

Kiyoshi Kikuchi, Hiratsuka; Takeo Okano, Zama; Yukio Terakawa, Tokyo; Akira Nishihara, Tokyo, and Koji Kono, Tokyo, all of Japan, assignors to Kowa Chemical Industry Ltd., Japan

Filed Oct. 13, 1978, Ser. No. 951,033

Claims priority, application Japan, Oct. 18, 1977, 52-124832

Int. Cl.[2] B05D *3/02;* **C08L** *61/20*

U.S. Cl. 260—29.4 R **12 Claims**

1. A coating composition for architectural use comprising (a) a quaternary ammonium silicate having a silica content of from 10 to 60% by weight, (b) a liquid epoxide resin, (c) pigments and fillers and (d) water, the amount of component (b) being in the range of from 2 to 30 parts by weight as calculated on the basis of a solid content of 50% by weight per 100 parts by weight of component (a) as calculated on the basis of a silica content of 30% by weight.

4,189,415

AQUEOUS VINYLCHLORIDE/VINYL ACETATE/ETHYLENE COPOLYMERS AND PROCESS

Herbert Eck; Christof Kemenater; Wilhelm Kaiser, and Manfred Hannebaum, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,623

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2734656

Int. Cl.[2] C08L *23/00*

U.S. Cl. 260—29.6 WA **9 Claims**

1. A stable aqueous vinyl chloride copolymer dispersion having a solids content of from 30% to 70% by weight, said dispersion containing a copolymer consisting of

50% to 85% by weight of vinyl chloride units

5% to 35% by weight of vinyl acetate units

5% to 30% by weight of ethylene units, and

0 to 5% by weight of mono-olefinically unsaturated N-methylolamide units, and, as sole protective colloid, from 2% to 15% by weight, based on the dispersion weight, of at least one polyvinyl alcohol having a saponification number of between 20 and 240 and a polymerization degree of between 300 and 2000.

4,189,416

COMPOSITION CONTAINING AN AQUEOUS SOLUTION OF A MIXED SALT OF AN INTERPOLYMER OF STYRENE/MALEIC ANHYDRIDE/VINYL ACETATE

Charles R. Williams, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 92,915, Nov. 25, 1970, which is a division of Ser. No. 885,319, Sep. 4, 1969, Pat. No. 3,585,070, which is a continuation-in-part of Ser. No. 755,726, Aug. 27, 1968, abandoned. This application Apr. 5, 1973, Ser. No. 348,435

Int. Cl.[2] C08L *35/06, 33/02*

U.S. Cl. 260—29.6 TA **8 Claims**

1. A composition of workable viscosity for treating textile materials which comprises an aqueous solution of a mixed salt of an interpolymer; wherein said interpolymer consists of:

(a) 1.0 molar proportion of maleic anhydride,

(b) from 0.1 to 3.0 molar proportion of styrene, and

(c) from zero to X molar proportion of vinyl acetate the total of monomers (b) and (c) being at least 1.0 molar proportion; wherein the specific viscosity of the interpolymer determined at 25° C. on a solution of 0.5 gram of interpolymer per deciliter of dimethyl formamide is in the range from about 2 to 8, and wherein

(a') from 40 to 50 percent of the free carboxyl groups of said interpolymer are combined with at least one fixed base selected from the group consisting of non-volatile monobasic amines and alkali metal bases, and

(b') from 5 to 60 percent of the free carboxyl groups of said interpolymer are combined with at least one fugitive base selected from the group consisting of ammonia, ammonium bases and volatile monobasic amines, to provide a workable viscosity for application of the solution to the textile material.

4,189,417

PROCESS FOR THE POLYMERIZATION OF ALKENYL AROMATIC MONOMERS IN THE PRESENCE OF POLYPHENYLENE OXIDES

John C. Goossens, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,669

Int. Cl.[2] C08L *25/06*

U.S. Cl. 260—29.6 NR **10 Claims**

1. In a process for the polymerization of an alkenyl aromatic monomer in the presence of a solution of a polyphenylene oxide, the improvement which comprises adding to the polymerization mixture an amount of an additive selected from the group which consists of alumina, a monobasic acid anhydride, and mixtures of alumina and water, said amount being sufficient to accelerate the polymerization of the alkenyl aromatic monomers.

4,189,418

CAN END SEALING RUBBER COMPOSITION CONTAINING A STYRENE-BUTADIENE RUBBERY COPOLYMER, A TACKIFIER AND A FILLER

Hiroshi Ueno, Yokosuka; Shunji Kojima, Yokohama; Masanori Aizawa, Yokohama, and Akira Kishimoto, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Dec. 7, 1977, Ser. No. 858,208

Claims priority, application Japan, Dec. 16, 1976, 51-150294; Aug. 29, 1977, 52-102644

Int. Cl.[2] C08L *9/08*

U.S. Cl. 260—29.7 R **6 Claims**

1. A can end sealing rubber composition

(A) consisting essentially of a styrene-butadiene rubbery copolymer latex obtained by emulsion polymerization at 35° to 70° C., a tackifier and a filler, and

(B) having (1) a creep resistance coefficient K defined by the following equation of at least 0.1 but not exceeding 0.6,

$$K = \log J_{90}^{C}(10) - \log J_{90}^{C}(1)$$

wherein $J_{90}^{C}(10)$ is the creep compliance measured 10 minutes after exerting a load when a fabricated article of the composition as a specimen is compressed in water at 90° C. by a parallel plate plastometer, and $J_{90}^{C}(1)$ is the creep compliance measured 1 minute after exerting a load when the specimen is compressed in water at 90° C. by a parallel plate plastometer,

and (2) a creep compliance J_{25}^{C} (1) of at least 3×10^{-9} cm^2/dyne but not exceeding 1×10^{-6} cm^2/dyne, the creep compliance being measured 1 minute after exerting a load when the specimen is compressed in water at 25° C. by a parallel plate plastomer.

4,189,419

PRESSURE-SENSITIVE ADHESIVES BASED ON CARBOXYLATED SBR EMULSION

Shiro G. Takemoto, Glendora, and Owen J. Morrison, Pasadena, both of Calif., assignors to Avery International Corporation, San Marino, Calif.

Filed Aug. 14, 1978, Ser. No. 933,161
Int. Cl.[2] C08L *9/08, 93/00*
U.S. Cl. 260—29.7 NR **12 Claims**

1. An emulsion pressure-sensitive adhesive composition comprising:
(a) an aqueous emulsion having from about 40 to about 50 percent by weight on a dry basis of carboxylated styrene butadiene rubber polymer having a bound styrene content of less than about 50 percent and at least about 0.5 percent carboxylation; and
(b) an aqueous emulsion having from about 50 to about 60 percent by weight on a dry basis of tackifying resin.

4,189,420

POLYOLEFIN RESIN COMPOSITION AND METHOD FOR MAKING POLYOLEFIN FILM

Masaaki Sugimoto; Yoshio Matsumoto; Nobushige Ikeya, and Koichi Hasegawa, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 928,965
Claims priority, application Japan, Aug. 4, 1977, 52-93522
Int. Cl.[2] C08K *5/11*
U.S. Cl. 260—31.6 **15 Claims**

1. A polyolefin resin composition, comprising:
(a) 89 to 98.6% by weight of polyethylene or ethylene-vinylacetate copolymer containing less than 20% by weight of vinyl acetate;
(b) 1 to 6% by weight of a polybutene material having a number average molecular weight ranging from 450 to 3,000; and
(c) 0.4 to 5% by weight of a mixed glyceride having at least one acyl group containing 2 to 6 carbon atoms and at least one acyl group containing 8 to 22 carbon atoms.

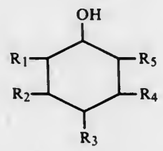
4,189,421

CROSSLINKING AGENT FOR POWDER COATINGS

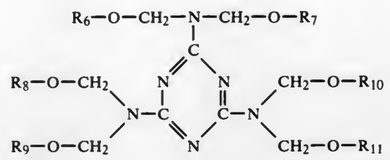
Greg D. Shay, Country Club Hills, and James H. Griffith, Homewood, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 566,859, Apr. 10, 1975, abandoned, which is a division of Ser. No. 427,604, Dec. 26, 1973, Pat. No. 3,904,623. This application May 20, 1977, Ser. No. 799,032
Int. Cl.[2] C08L *61/34;* **C08K** *3/22*
U.S. Cl. 260—38 **12 Claims**

1. A curable polymeric powder coating consisting essentially of a polymer containing unreacted carboxyl, anhydride, hydroxy, epoxy or amide functional groups and an effective amount ranging up to about 35% by weight of said polymer of a low molecular weight solid crosslinking agent; said crosslinking agent characterized as a non-gelled addition product having a softening point above 100° F. obtained by reacting
(a) approximately 1.8 to 2.2 moles of at least one monohydroxy aromatic compound having the formula:



wherein the substituents R_1, R_2, R_3, R_4 and R_5 are either the same or different and are selected from the class consisting of hydrogen, alkyl radicals of 1 to 4 carbon atoms, alkoxy radicals of 1 to 4 carbon atoms and NO_2 radicals provided that at least one of the R substituents is hydrogen and
(b) approximately 1.0 mole of an amino-triazine having the formula:



wherein the R substituents R_6, R_7, R_8, R_9, R_{10} and R_{11} are either the same or different and are alkyl radicals of 1 to 4 carbon atoms.

4,189,422

POLYESTER COMPOSITION

David E. Wakeford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 14, 1975, Ser. No. 595,752
Claims priority, application United Kingdom, Jul. 31, 1974, 33698/74
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—40 R **9 Claims**

1. A polyester composition comprising a mixture of a thermoplastic polyester, from 2 to 70% by weight of the composition of an inorganic filler and at least one oxide of calcium or strontium, wherein the concentration of oxide by weight of the composition is at least about 0.05% and not greater than about 3%, and is sufficient to improve the stability of the composition under melt conditions by at least 20%, the improvement being determined by comparing a Degradation Value for said compositions with a Degradation Value for identical compositions not containing said oxides, the Degradation Value being determined by measuring the percentage change in melt flow index obtained after maintaining said compositions under melt conditions for 15 minutes relative to the melt flow index of identical compositions not containing said oxides maintained under identical melt conditions for 5 minutes, the measurements being made according to the procedure of ASTM method 1238-74 (Procedure A) using a total load of 2.16 kg and a die diameter of 2.095 mm.

4,189,423

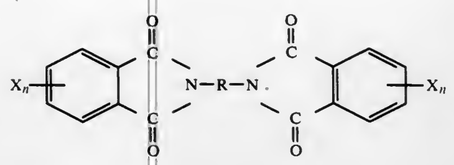
PROCESS FOR THE PREPARATION OF POLYOLEFIN MOLDINGS

Isao Kumano; Hiromitsu Katsura; Tuneo Tanaka; Takashi Kanno, and Shigeru Suzuki, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

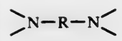
Filed Jul. 31, 1978, Ser. No. 929,485
Int. Cl.[2] C08K *5/34, 3/22, 3/30, 3/04*
U.S. Cl. 260—42 **6 Claims**

1. In a process for producing a dimensionally stable polyolefin molding, the improvement comprising the use of a member selected from the group consisting of (A) at least one compound (I) as the dimensional stabilizer and (B) a mixture of the

at least one compound (I) with at least one ordinary pigment as the colorant, the at least one compound (I) being represented by the following general formula:



wherein



is the residue of an organic diamine containing 1 to 3 aromatic rings, X is a halogen atom and n is an integer from 1 to 4, said compound (I) being used in an amount of 0.0001% to 1% by weight of polyolefin.

4,189,424

FRICTION MATERIAL FOR BRAKES OF BICYCLES OR THE LIKE

Masatoshi Takamatsu, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Apr. 17, 1978, Ser. No. 897,095
Claims priority, application Japan, Apr. 18, 1977, 52-44678
Int. Cl.[2] C08K *3/22, 9/06*
U.S. Cl. 260—42.15 **8 Claims**

1. A friction material for brakes used for bicycles and the like, which comprises a base member of synthetic rubber based on silicone or butadiene blended with one or more of titanium oxide, tin oxide and cobalt oxide, the latter being present in a ratio of 50 to 75 Wt. % with respect to the total weight of the friction material.

4,189,425

METHOD OF PRESERVING BLOOD PLASMA I

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 796,924, May 16, 1977, Pat. No. 4,105,650, and a continuation of Ser. No. 567,372, Apr. 11, 1975, abandoned. This application Jnn. 12, 1978, Ser. No. 914,354
Int. Cl.[2] A61K *37/02*
U.S. Cl. 260—112 B **1 Claim**

1. The method of preserving blood plasma coagulation factors and other proteins during freezing and thawing of plasma for improving the recovery of coagulation of proteins thereafter comprising the steps of:
(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of alpha-hydroxy-omega-hydroxy-poly(oxyethylene)poly (oxypropylene)poly(oxyethylene) block copolymer or mixtures of the same with polyethylene glycol to a concentration of from about 0.1 to about 25 grams of polyol per liter of plasma;
(b) thereafter freezing the blood plasma containing said preservative; and
(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,189,426

RECOMBINANT HORMONAL COMPOSITIONS AND METHOD

Choh H. Li, Berkeley, Calif., assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 892,571, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 842,437, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 675,668, Apr. 12, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,278
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **18 Claims**

1. A recombinant composition having essentially the equivalent conformation, immunoreactivity and biological activity of a single chain peptide hormone selected from the group consisting of human growth hormone, human chorionic somatomammotropin and prolactin having a molecular weight of greater than about 5,000, said composition containing two peptide fragments in non-covalent complementation relationship to each other and said peptide fragments each having a sequence corresponding to a different portion of said peptide hormone.

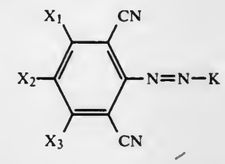
4,189,427

AZO DYESTUFFS FROM BENZENE DIAZO COMPONENT FUSED TO AN ALIPHATIC RING AND CONTAINING TWO CYANO SUBSTITUENTS ORTHO TO THE AZO GROUP

Klaus Komorowski, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1974, Ser. No. 495,110
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1973, 2340569
Int. Cl.[2] C09B *29/06, 29/24, 29/32, 29/34*
U.S. Cl. 260—156 **7 Claims**

1. Azo dyestuff of the formula



wherein
X_1 and X_2 taken together have the formula $—(CH_2)_n-$ and form the remaining members of a carbocyclic ring system;
n is 3, 4 or 5;
X_3 is H; and
K is the radical of a coupling component.

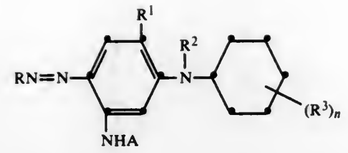
4,189,428

THIAZOLYLAZO AND BENZOTHIAZOLYLAZO COMPOUNDS FROM CYCLOHEXYLAMINOACYLANILIDES

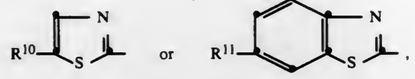
Max A. Weaver; James M. Straley, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 660,287, Feb. 23, 1976, Pat. No. 4,049,643, which is a continuation of Ser. No. 514,964, Oct. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 833,743, Jun. 16, 1969, abandoned. This application Jul. 25, 1977, Ser. No. 818,690
Int. Cl.[2] C09B *29/08, 29/26, 31/04, 31/08*
U.S. Cl. 260—158 **12 Claims**

1. A water-insoluble azo compound having the formula



wherein
R is either



wherein
R^{10} is lower alkyl, lower alkoxy, nitro, halogen, lower alkylsulfonyl, carbamoyl, lower alkylcarbamoyl, lower alkoxycarbonyl, sulfamoyl, lower alkylsulfamoyl, cyano, thiocyanato or trifluoromethyl; and
R^{11} is hydrogen, lower alkyl, lower alkoxy, nitro, chlorine, bromine, lower alkylsulfonyl, substituted lower alkylsulfonyl, carbamoyl, lower alkylcarbamoyl, lower alkoxycarbonyl, sulfamoyl, lower alkylsulfamoyl, cyano, thiocyanato, lower alkylthio, cyclohexylthio, phenylthio, substituted phenylthio, or trifluoromethyl;
A is formyl; lower alkanoyl; lower alkanoyl substituted with halogen, cyano, lower alkoxy, hydroxy, lower alkylsulfonyl, phenyl, lower alkylphenyl, lower alkoxyphenyl or halophenyl; benzoyl, benzoyl substituted with lower alkyl, lower alkoxy or halogen; cyclohexylcarbonyl; lower alkoxycarbonyl; lower alkoxycarbonyl substituted with hydroxy or cyano; or furoyl;
R^1 is hydrogen, lower alkyl, or lower alkoxy;
R^2 is hydrogen, lower alkyl; or lower alkyl substituted with cyano, lower alkanoyloxy, or cyclohexyl;
R^3 is lower alkyl; and
n is 0, 1, 2 or 3.

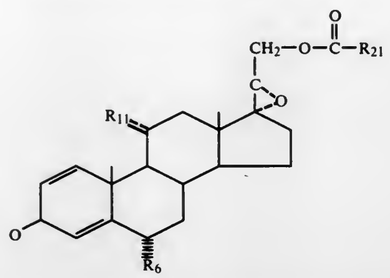
4,189,429
HYDROLYZABLE SILYL-SUBSTITUTED DYESTUFFS FOR TRANSFER PRINTING
Robert L. Lambert, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed May 8, 1978, Ser. No. 903,893
Int. Cl.² C09B *1/16, 23/02, 23/16, 29/08*
U.S. Cl. 260—207.5 **8 Claims**

1. A volatile, hydrolyzable dyestuff of the formula

wherein
A is a dyestuff nucleus which may be unsubstituted or substituted by auxochromic or bathochromic groups and is selected from anthraquinone, naphthoquinone, phenylazophenyl or styryl,
n is 1, 2 or 3,
R is H, alkyl of 1 to 6 carbon atoms, phenyl or Q, and at least one R is Q,
Q is $—R^1—W—Si(R^2)_3$,
R^1 is a divalent aliphatic group of 2 to 10 carbon atoms
W is O, S or NR^3,
R^3 is H, alkyl of 1 to 6 carbon atoms or phenyl and each R^2 is individually the same or different selected from hydrogen, hydrocarbyl, hydrocarbyloxy, chlorohydrocarbyl or bromohydrocarbyl, chlorohydrocarbyloxy, bromohydrocarbyloxy in which the sum of carbons is not greater than 12.

4,189,430
EPOXIDE PROCESS
Kenneth P. Shephard, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Jul. 31, 1978, Ser. No. 929,506
Int. Cl.² C07J *21/00, 5/00*
U.S. Cl. 260—239.55 R **23 Claims**

1. A compound of the formula:

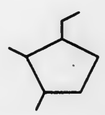


(I)

where R_6 is a hydrogen or fluorine atom or methyl group; R_{11} is β-hydroxyl or oxo; is a single or double bond and when R_{11} is β-hydroxyl is a single bond and when R_{11} is oxo is a double bond; R_{21} is alkyl of 1 thru 3 carbon atoms, phenyl substituted with 0 thru 3 substituents which can be the same or different and are selected from the group consisting of a fluorine or chlorine atom or methyl, methoxy or nitro group.

4,189,431
ALKINYL TERMINATING GROUPS IN BIOGENETIC-LIKE CYCLIZATIONS TO STEROIDS
William S. Johnson, Portola Valley, Calif., and Michael B. Gravestock, Bramhall, England, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.
Continuation of Ser. No. 601,742, Aug. 4, 1975, Pat. No. 4,055,603, which is a continuation-in-part of Ser. No. 375,617, Jul. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,672, Jul. 17, 1971, abandoned. This application Aug. 3, 1977, Ser. No. 821,266
Int. Cl.² C07C *71/00*
U.S. Cl. 260—239.55 R **7 Claims**

1. A method for preparing a cyclization product having a structure B



B

from a substrate having the structure A



A

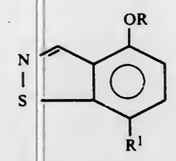
the method comprising:
contacting said substrate in a solvent with from about 1 to 50 equivalents of a Lewis acid per equivalent of said substrate at a temperature in the range of about −50 to 10° C.

4,189,432
N-FORMYL AND N-DESMETHYL LEUROSINE DERIVATIVES
Karola Jovánovics; Kálman Szász; Béla Kellner; Laszlo Németh; Zsuzsa Relle; Emil Bittner; Eszter Dézseri, and János Éles, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary
Filed Dec. 5, 1973, Ser. No. 422,100
Claims priority, application Hungary, Feb. 16, 1973, RI 502
Int. Cl.² C07D *519/04*
U.S. Cl. 260—244.4 **4 Claims**

1. A compound selected from the group consisting of leurosine in which N-methyl is replaced by H or formyl or a pharmaceutically acceptable acid-addition salt thereof.

4,189,433
4-HYDROXY-1,2-BENZISOTHIAZOLES AND THEIR MANUFACTURE
Ulrich Ohnsorge, Goennheim; Helmut Hagen, Frankenthal, and Fritz-Frieder Frickel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Jan. 23, 1978, Ser. No. 871,548
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704793
Int. Cl.² A61K *31/425;* C07D *275/04*
U.S. Cl. 548—207 **6 Claims**

1. 1,2-benzisothiazoles of the formula (I)

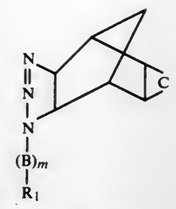


(I)

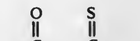
where R^1 is hydrogen, amino, which is unsubstituted or substituted by the acyl radical of a carboxylic acid of 1 to 4 carbon atoms, or nitro, and where R is hydrogen, benzyl, or the acyl radical of a carboxylic acid of 1 to 4 carbon atoms.

4,189,434
POLYCYCLIC NITROGEN-CONTAINING COMPOUNDS
Rolf Platz, Mannheim; Werner Fuchs, Ludwigshafen; Norbert Rieber, Mannheim; Ulf-Rainer Samel, Mutterstadt; Johann Jung, and Bruno Wuerzer, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 28, 1977, Ser. No. 781,767
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615878
Int. Cl.² C07D *487/04*
U.S. Cl. 548—257 **4 Claims**

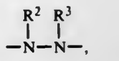
1. A polycyclic nitrogen-containing compound of the formula



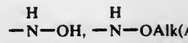
where B denotes the radicals $—SO_2—$,



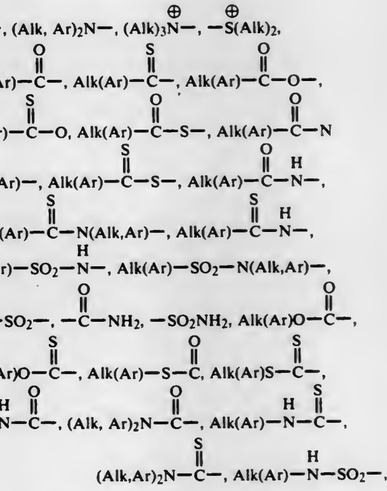
—S—, C denotes the radicals —N=N— or



m denotes one of the integers 0 and 1, hydrogen, alkyl of 1 to 30 carbon atoms, alkenyl of 2 to 30 carbon atoms, or alkynyl of 2 to 30 carbon atoms—all of which may be linear or branched, cyclic or acyclic—unsubstituted of monovalent substituted phenyl, naphthyl, benzyl or phenylethyl, the abovementioned radicals, apart from hydrogen, being unsubstituted or mono- or polysubstituted by halogen (F, Cl, Br, I) or pseudo-halogen (CN, SCN) —OH, —SH,—NO_2, —NO, =N—OH, =N—OAlk(Ar), =S, =NH, =NAlk(Ar), =O,



(I) —COOH or $—SO_3H$ or salts thereof, Alk(Ar)—O—, Alk(Ar)—S—,



$(Alk, Ar)_2—N—SO_2—$, Alk(Ar)—N=N—, alkyl, haloalkyl, haloalkoxy, haloalkylmercapto, or the radical



Alk denoting alkyl and Ar denoting, unsubstituted or substituted phenyl and R^2 and R^3 are identical or different and each denotes $(B)_m$—R^4, R^4 having the same meanings as R^1, and salts of these compounds.

4,189,435

PROCESS FOR PREPARING 5,6-DIHYDRO-2-METHYL-1,4-OXATHIIN DERIVATIVES

Wha S. Lee, c/o 678 Portage St., Ottawa, Ontario, Canada (K1G 1T4)

Division of Ser. No. 839,129, Oct. 3, 1977. This application Sep. 12, 1978, Ser. No. 941,461

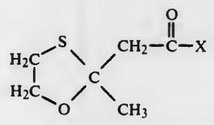
Claims priority, application Canada, May 6, 1977, 277861

Int. Cl.² C07D *327/04*

U.S. Cl. 549—30 **2 Claims**

1. A compound of the formula:

IV



wherein X is an amino group having the formula



wherein R and R′ are the same or different and are selected from the group consisting of hydrogen, phenyl, alkyl having up to 15 carbon atoms, cyclohexyl, nitrophenyl, alkoxyphenyl in which the alkoxy group has up to 4 carbon atoms, benzyl, furfuryl, halophenyl, tolyl, naphthyl, biphenyl.

4,189,436

β-OXO-3-THIOPHENE PROPIONITRILE AND β-AMINO-2-(3)-THIOPHENE ACRYLONITRILES

John W. Hanifin, Suffern, and David N. Ridge, Upper Grandview, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 853,980, Nov. 22, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,443

Int. Cl.² C07D *333/16, 333/00;* **A01N** *9/00*

U.S. Cl. 549—72 **3 Claims**

1. β-Amino-2-thiopheneacrylonitrile.

2. β-Amino-3-thiopheneacrylonitrile.

3. A compound selected from the group consisting of β-oxo-3-thiophenepropionitrile and the pharmacologically acceptable cationic salts thereof.

4,189,437

PHARMACEUTICALLY ACTIVE 2,9-DIOXATRICYCLO[4,3,1,0^{3,7}]DECANES

Peter W. Thies, Hanover, and Akiji Asai, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 732,791, Oct. 15, 1976, Pat. No. 4,089,971. This application Mar. 9, 1978, Ser. No. 884,854

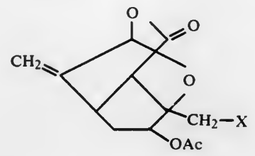
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547205

Int. Cl.² C07D *319/08*

U.S. Cl. 260—340.3 **2 Claims**

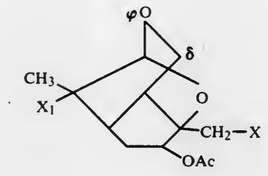
1. A 4-acetoxy-3-halomethyl-10-methylene-8-oxo-2,9-dioxatricyclo [4,3,1,0^{3,7}] decane of the Formula III:

III



2. A 4-acetoxy-3-halomethyl-10-methyl-10-halo-2,9-dioxatricyclo[4,3,1,0^{3,7}] decane of Formula IV:

IV



4,189,438

PHYSIOLOGICALLY ACTIVE SUBSTANCE ESTERASTIN

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya, and Masaaki Ishizuka, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

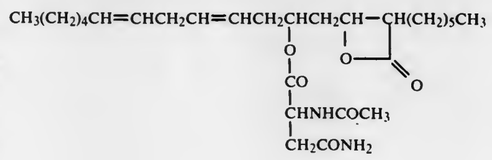
Filed Jan. 30, 1978, Ser. No. 873,350

Claims priority, application Japan, Feb. 8, 1977, 52/12119

Int. Cl.² C07D *305/12*

U.S. Cl. 260—343.9 **1 Claim**

1. The compound having the formula



4,189,439

PROCESS OF THE PREPARATION OF HYDROXYFURENONES

Amnon M. Cohen, Amersfoort, Netherlands, assignor to Polak's Frutal Works, B.V., Amersfoort, Netherlands

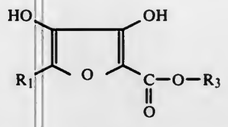
Division of Ser. No. 879,307, Feb. 21, 1978, Pat. No. 4,127,592. This application Aug. 7, 1978, Ser. No. 931,707

Claims priority, application United Kingdom, Mar. 31, 1977, 13636/77; Dec. 20, 1977, 52936/77

Int. Cl.² C07D *307/68*

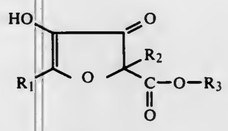
U.S. Cl. 260—347.5 **4 Claims**

1. 2-Carbalkoxy-3,4-dihydroxy-5-alkyl-furan having the structural formula



where R_1 represents an alkyl radical having 1 to 6 carbon atoms and R_3 represents an alkyl radical having 1 to 4 carbon atoms.

2. 2-Carbalkoxy-4-hydroxy-2,5-dialkyl-3-oxo-2H-furan having the structural formula



where R_1 represents an alkyl radical having 1 to 6 carbon atoms, R_2 represents an alkyl radical having 1 to 4 carbon atoms and R_3 represents an alkyl radical having 1 to 4 carbon atoms.

4,189,440

2-BROMO-6β-FLUORO-3-KETO-Δ^{1,4}-STEROIDS OF THE PREGNANE SERIES

Gaetano Palladino, Via Cagliero 7, Milan, Italy

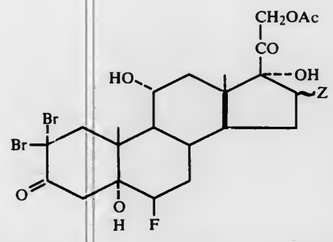
Continuation-in-part of Ser. No. 473,827, May 28, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,779

Claims priority, application United Kingdom, Mar. 8, 1974, 10443/74

Int. Cl.² C07 *5/00*

U.S. Cl. 260—397.45 **20 Claims**

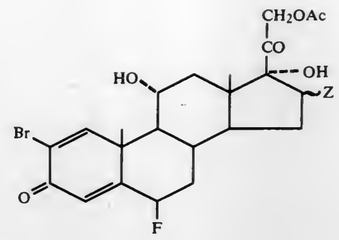
1. A 2,2-dibromo-6β-fluoro-pregnane—5α,11α,17α, 21-tetrol-3,20-dione 21-acetate of the formula:



wherein Ac is acetyl and Z is hydrogen, α-, or β-methyl group.

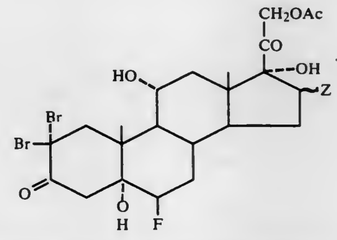
9. A method for the simultaneous introduction of a Δ^{1,4}-double bond into a 2,2-dibromo-3-keto-5α-hydroxy-6β-fluoro-pregnane derivative to prepare a compund of the formula

4



wherein Ac is acetyl and Z is hydrogen, α-methyl, or β-methyl, which comprises heating a compound of the formula

3



with lithium chloride and dimethylformamide at 100°–120° C. under a nitrogen atmosphere to give a compound of structure 4.

4,189,441

PROCESS FOR PREPARING ESTERS FROM ETHERS OR ESTERS OF LOWER HOMOLOGOUS ALCOHOLS

Giuseppe Braca; Glauco Sbrana, both of Pisa, and Guglielmo Gregorio, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 25, 1977, Ser. No. 818,857

Claims priority, application Italy, Jul. 28, 1976, 25782 A/76; Apr. 7, 1977, 22223 A/77

Int. Cl.² C07C *67/28, 67/37*

U.S. Cl. 260—410.9 R **8 Claims**

1. A process for preparing esters having the general formulae:

$$RCOOCH_2R'$$

and

$$R'COOCH_2R$$

wherein R and R′ are linear or branched alkyl radicals either like or unlike each other, and containing from 1 to 16 carbon atoms, wherein carbon monoxide and hydrogen are reacted, at temperatures ranging from 150° to 350° C. and at pressures ranging from 50 to 1000 atmospheres, with a compound selected from the class consisting of an ester of formula RCOOR′, an ester of formula R′COOR and an ether of formula ROR′, or with a mixture thereof, in which R and R′ have the same meanings as specified hereinabove, and in the presence of a catalyst system consisting essentially of a ruthenium carbonyl and a promoter selected from the class consisting of hydroiodic acid, carboxylic acid solutions of inorganic or tetraalkylammonium bromides and iodides, and mixtures of these promoters.

4,189,442
SEPARATION OF FATTY ACID ESTERS

Timothy A. Lubsen, Wyoming, Ohio, and Gustav A. Maag, Mitchell, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 952,439, Oct. 18, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,691

Int. Cl.[2] **C09F** *5/10;* **C11B** *3/00*

U.S. Cl. 260—428.5 **15 Claims**

1. A process for separating a fatty acid ester mixture according to degree of unsaturation, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with macroreticular strong acid cation exchange resin to selectively adsorb fatty acid ester of higher degree of unsaturation and to leave in solution in solvent a fraction of said mixture enriched in content of ester of lesser degree of unsaturation,

(b) removing solution in solvent of fraction enriched in content of ester of lesser degree of unsaturation from contact with resin which has selectively absorbed fatty acid ester of higher degree of unsaturation,

(c) contacting resin which has selectively absorbed fatty acid ester of higher degree of unsaturation with solvent to cause desorption of adsorbed ester and provide a solution in solvent of fraction enriched in content of ester of higher degree of unsaturation,

(d) removing solution in solvent of fraction enriched in content of ester of higher degree of unsaturation from contact with resin;

the solvent in each step having the same composition and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 10.5, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a solutility parameter polar component (on a 25° C. basis) ranging from about 0.2 to about 5.1 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from about 0.3 to about 7.4; said resin having its exchangeable cation substituents consisting essentially of from about 10% to about 90% heavy metal substituents and the remainder alkali metal and/or alkaline earth metal substituents; the solvent and the percentage of heavy metal substituents in the resin being selected to provide selectivity in step (a) and desorption in step (c).

4,189,443
METHOD FOR MAKING A POLYAMINE

Willi Elfler, New Martinsville, W. Va., and Jürgen Ick, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 26, 1974, Ser. No. 464,601

Int. Cl.[2] **C07C** *85/20, 119/04*

U.S. Cl. 260—453 PH **15 Claims**

1. In a process for the preparation of a polyamine wherein an aromatic amine and formaldehyde are condensed in the presence of an acidic catalyst, the improvement which comprises boiling the reaction mixture under reflux at a temperature of at least 60° C. whereby vapors from the mixture are condensed and returned to the mixture, adding an aqueous formaldehyde solution to the said condensed vapors and recovering the resulting polyamine.

15. A process for the preparation of an organic polyisocyanate comprising

(a) adding an aromatic amine and an acidic catalyst,

(b) boiling the mixture under reflux at a temperature of at least 60° C. whereby vapors from the mixture are condensed and returned to the mixture,

(c) gradually adding an aqueous formaldehyde solution to the said returning condensed vapors, and

(d) phosgenating the resulting polyamine to form the corresponding polyisocyanate.

4,189,444
PROCESS FOR THE PREPARATION OF N,N'-DISUBSTITUTED 2-NAPHTHALENEETHANIMIDAMIDE AND INTERMEDIATES USED THEREIN

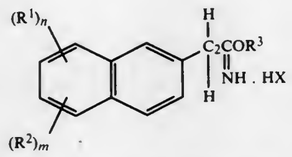
Albert Schuster, and James R. McCarthy, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 921,690, Jul. 3, 1978. This application Jan. 24, 1979, Ser. No. 6,143

Int. Cl.[2] **C07C** *119/18*

U.S. Cl. 260—453 RW **4 Claims**

1. A compound of the general formula



wherein R^1 and R^2 independently represent halo, a lower alkyl of from one to about three carbon atoms, or a lower alkoxy of from one to about three carbon atoms; m and n independently represent the integer 0 or 1; R^3 represents a lower alkyl of from one to about three carbon atoms; and X represents a halide.

4,189,445
SURFACE-ACTIVE PHENOLIC DERIVATIVES

Knut Oppenlaender, Ludwigshafen; Karl Stork, Lampertheim; Ewald Daubach, and Manfred Herrmann, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,349

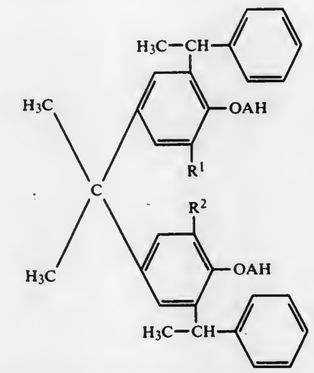
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745449; Nov. 18, 1977, 2751519; Nov. 18, 1977, 2751519

Int. Cl.[2] **C07C** *43/20, 141/14*

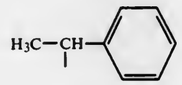
U.S. Cl. 260—458 C **6 Claims**

1. A compound of the formula I

(I)

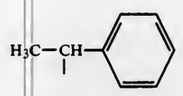


where R^1 and R^2 are identical or different and each is hydrogen or



and A is a radical of a polymer of ethylene oxide or of propylene oxide, or of a block polymer or copolymer of ethylene oxide with propylene oxide, the radical containing a total of from 5 to 250 alkylene oxide units.

2. A compound of the formula I as claimed in claim 1, where R^1 and R^2 are each



4,189,446
MANUFACTURE OF α-HALOETHYLCARBAMYL HALIDES

Karl-Heinz Koenig, Frankenthal, and Christian Reitel, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,174

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732284

Int. Cl.[2] **C07C** *51/58*

U.S. Cl. 260—544 C **5 Claims**

1. A process for the manufacture of an α-haloethylcarbamyl halide which comprises:

reacting vinyl isocyanate with a hydrogen halide in a non-aqueous medium at a temperature of from −78° C. to +80° C.

4,189,447
SUBSTITUTED-HYDROXYTETRAHYDROINDANONES

David R. Parrish, Glen Ridge, and Zoltan G. Hajos, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,127, Sep. 14, 1976, Pat. No. 4,108,898, which is a division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,840

Int. Cl.[2] **C07C** *49/56*

U.S. Cl. 260—586 F **2 Claims**

1. (−)-7aβ-methyl-3aβ-hydroxy-3a,6,7,7a-tetrahydro-5(4H)-indanone.

2. (+)-7aα-methyl-3aα-hydroxy-3a,6,7,7a-tetrahydro-5(4H)-indanone.

4,189,448
POLYPYRIDINERHODIUMCARBONYL AND IRIDIUM CARBONYL HYDRIDE AND HALIDE HYDROFORMYLATION CATALYSTS

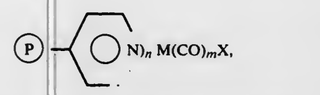
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,600

Int. Cl.[2] **C07C** *45/08*

U.S. Cl. 260—604 HF **6 Claims**

1. A method for isomerizing internal olefins to primary olefins then hydroformylating the primary olefins formed to aldehydes in the presence of a catalyst having the general structure



said isomerization and subsequent hydroformylation both carried out at temperatures of from about 60° C. to about 150° C. and pressures of from about 100 to about 3500 psig in the presence of carbon monoxide and hydrogen, wherein n is from 1 to about 3, m is from 1 to about 2, M is rhodium or iridium, X is selected from the group consisting of chlorine, bromine, iodine, and hydrogen, and Ⓟ is a heterocyclic nitrogen-containing polymer selected from the group consisting of polyvinylpyridine/divinylbenzene copolymers such as 4-vinylpyridine/divinylbenzene, 3-vinylpyridine/divinylbenzene, 2-vinylpyridine/divinylbenzene; also polyphenylquinoxaline/-divinylbenzene copolymer, poly[N-vinylcarbazole]/divinylbenzene copolymer and polyvinylimidazole/divinylbenzene copolymer.

4,189,449
PRODUCTION OF QUATERNARY PHOSPHONIUM HYDROXIDES

Klaus Hestermann, Erftstadt Bliesheim, and Hartfried Vollmer, Erftstadt Liblar, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,709

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732751

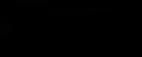
Int. Cl.[2] **C07F** *9/54*

U.S. Cl. 260—606.5 F **6 Claims**

1. In the process for making quaternary phosphonium hydroxides of the general formula:

(I)

in which R stands either for hydrogen or an aliphatic or aromatic hydrocarbon having 1 to 12 carbon atoms and n stands for 1 or 2, wherein a di- or trimethylphosphine is reacted in an aqueous medium with an epoxide of the general formula:



(II)

in which R has the meaning given above, the improvement which comprises: establishing a pH-value of ≧12 in the aqueous medium by means of a base and mixing the starting materials in said medium at −10° to +35° C.

4,189,450
SURFACE-COATING BINDERS AND THEIR USE FOR CATHODIC ELECTROCOATING

Fritz E. Kempter, Mannheim, and Eberhard Schupp, Schwetzingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 969,554

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755906

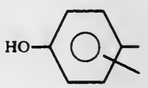
Int. Cl.[2] **C08L** *63/00;* **C25D** *13/06*

U.S. Cl. 525—455 **11 Claims**

1. A surface-coating binder, substantially free from epoxide groups, which has been obtained by reacting (A) a Mannich base obtained from

(a_1) one or more condensed phenols, free from ether groups, which contain two or more phenolic hydroxyl groups per molecule,

(a_2) one or more butadiene or isoprene homopolymers or copolymers which contain one or more



groups per molecule and have a mean molecular weight of from 500 to 6,000,

(a_3) one or more secondary amines which contain one or more hydroxyalkyl groups per molecule, or a mixture of

such secondary amines with another secondary amine, and

(a_4) formaldehyde or a formaldehyde donor, with (B) one or more epoxy resins.

4,189,451

PROCESS AND COMPOSITION FOR POLYMERIZING AND CURING METHYL METHACRYLATE MONOMER-POLYMER SYRUPS IN THE PRESENCE OF METAL SALTS OF HEMI-PERESTERS OF MALEIC ACID

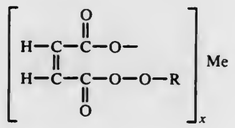
Ronald S. Dudinyak, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,801, Apr. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,722, Sep. 22, 1975, abandoned. This application May 25, 1978, Ser. No. 909,557

Int. Cl.[2] **C08L** *31/02*

U.S. Cl. 525—262 **5 Claims**

1. An improved process for preparing a cured polymeric article which includes curing a syrup consisting essentially of 10–40% by weight of methyl methacrylate polymer, having an inherent viscosity of 0.25–1.0, in monomeric methyl methacrylate, said polymer being selected from the group consisting of methyl methacrylate homopolymer and copolymers of methyl methacrylate with α,β-ethylenically unsaturated compounds, in the presence of a small amount of a metal salt of a hemi-perester of maleic acid having the formula:



wherein

Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;

x is an integer having a value from 1 to the valence of the metal; and

R is a saturated tertiary alkyl radical

wherein the improvement comprises the presence of a salt of an oxo acid of sulfur activator selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts.

4,189,452

POLYESTER RESIN COMPOSITION

George N. Haddad, Tehran, Iran, and Frederick A. Butt, Croton, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 30, 1977, Ser. No. 866,140

Int. Cl.[2] **C08L** *67/06*

U.S. Cl. 525—444 **5 Claims**

1. A polyester resin composition consisting essentially of a blend of a diethylene glycol:neopentyl glycol:maleic:isophthalic acid polyester and a propylene glycol:isophthalic acid:-maleic polyester, together with a copolymerizable monomer in an amount sufficient for reaction with the polyester blend to produce a thermoset article.

4,189,453

PROCESSES FOR THE PRODUCTION OF SULPHUR-CONTAINING ESTERS OF PHOSPHORIC ACID AND PHOSPHOROUS ACID

Horst Zinke, Ernsthofen; Joachim Lorenz, Bensheim; Eberhard Otto, Lindenfels, and Rudolf Maul, Lorsch, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,212

Claims priority, application Switzerland, Mar. 10, 1977, 3029/77

Int. Cl.[2] **C07F** *9/201*

U.S. Cl. 260—976 **11 Claims**

1. An improved process for the production of trithiophosphites, trithiotriphosphates or tetrathiophosphates of the general formula III

$$(X)_mP(SR')_3 \qquad (III)$$

wherein m is 0 or 1, X represents an oxygen or sulphur atom and R′ contains 1 to 24 carbon atoms and represents linear or branched alkyl, alkoxyalkyl, alkylthioalkyl, alkyloxycarbonylalkyl, alkyloxycarbonylcycloalkyl or alkyloxycarbonylaryl; or a cycloalkyl, cycloalkylalkyl, aryl or aralkyl group; or said group substituted by alkyl, by reacting in a molar ratio of essentially 1 to 3 of (a) a phosphorus trihalide with (b) a mercaptan or thiophenol R′SH to give a trithiophosphite where m is 0, and further reacting the resultant trithiophosphite with an oxygen donor to form the trithiotriphosphate or with sulfur to form the tetrathiophosphate where m is 1, wherein the improvement comprises reacting the phosphorus trihalide (a) with the mercaptan or thiophenol R′SH (b) at a temperature of up to about 150° C. in the presence of 0.005 to 5 mol %, based on component (b), of a catalyst selected from the group consisting of the amines, ammonium salts, aromatic and non-aromatic nitrogen-containing heterocyclic compounds and the salts thereof, the amides of carboxylic and thiocarboxylic acids and of the oxyacids of phosphorus, the guanidines, amidines and azomethines as well as the salts thereof, the sulphoxides, phosphines and phosphonium salts, the phosphine oxides and esters of phosphoric acid.

4,189,454

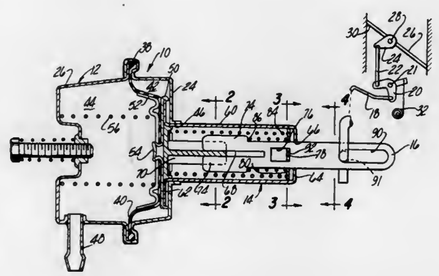
VACUUM MOTOR FOR CARBURETORS

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Oct. 13, 1978, Ser. No. 951,170

Int. Cl.[2] **F02M** *1/10*

U.S. Cl. 261—39 B **4 Claims**



3. A carburetor system for an internal combustion engine including an induction passage, a choke valve in said passage, a temperature responsive member operatively connected to said choke valve and adapted to urge said valve to a closed position with a force inversely proportional to temperature, a vacuum responsive motor operatively connected to the choke valve to urge said valve to a fully closed position when said engine is not operating and to a partially open position in proportion to ambient temperature after said engine is started, said motor including a housing, a movable wall in said housing movable from a rest position towards a choke opening position in response to vacuum in said housing, an output assembly including a carriage member connected to said wall and an output member movable relative to said carriage, biasing means urging said output member in one direction relative to said carriage to urge said choke valve toward a closed position when said wall is in said rest position and resiliently resisting movement of said output member relative to said carriage during movement of said wall in said choke opening direction.

4,189,455

PROCESS FOR THE MANUFACTURE OF DISCONTINUOUS FIBRILS

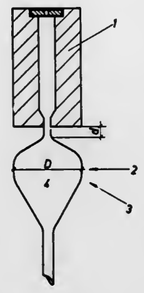
Carlo Raganato, Castiglioncello, Italy, and Georges Voituron, Vilvoorde, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Aug. 1, 1972, Ser. No. 277,032

Claims priority, application Luxembourg, Aug. 6, 1971, 63680

Int. Cl.[2] **B29D** *23/08*

U.S. Cl. 264—12 **22 Claims**



1. In a process for the manufacture of discontinuous fibrils by the abrupt pressure release of a liquid mixture of molten polymer and solvent which is at a temperature and pressure such as to be in the form of a system of two phases consisting of a continuous liquid phase which is poor in polymer and in which is dispersed a second liquid phase which is rich in polymer, the abrupt pressure release being adapted to bring about the instantaneous vaporization of the solvent and the solidification of said polymer to form a continuous fibrillated structure, the improvement which comprises shredding the continuous fibrillated structure so produced, at the moment of its formation, by directing a stream of fluid transversely against such structure.

4,189,456

METHOD FOR FORMING CONTAINERS WITH FOAMED CORNERS

Anders R. Rausing, Via Kenia 22-24, Rome, Italy

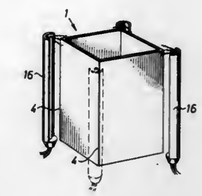
Filed Nov. 1, 1976, Ser. No. 737,514

Claims priority, application Switzerland, Nov. 4, 1975, 14225/75

Int. Cl.[2] **B29D** *27/00, 7/02, 7/20, 25/00*

U.S. Cl. 264—25 **8 Claims**

1. A method for the manufacture of parallelepiped-shaped packing containers having stiffening portions from a packing material, said method comprising forming a packing material of substantially uniform thickness comprising at least one layer of foamed plastic material having spaced, rectilinear zones of a higher density than the density of the juxtaposed areas therebetween into packing containers with at least one of the spaced, rectilinear zones located along a lateral corner edge of the container and heating the containers at least along said at least one rectilinear zone of higher density at a lateral corner edge of the container so that the foamed plastic material thereof expands to form joist-like stiffenings of greater thickness than the juxtaposed areas.



4,189,457

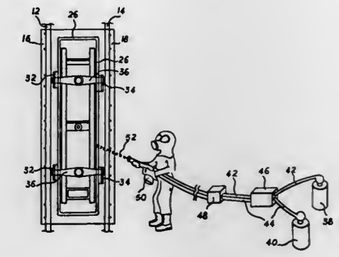
METHOD OF SEALING COKE OVENS

Henry L. Clement, Jr., Pittsburgh, Pa., assignor to H. L. Clement Company, Sewickley, Pa.

Continuation-in-part of Ser. No. 848,035, Nov. 3, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,660

Int. Cl.[2] **F27D** *1/16;* **C10B** *29/00, 25/00*

U.S. Cl. 264—30 **12 Claims**



1. A method of sealing leaks and crevices in a by-product coke oven, said method comprising the steps of:

causing a silicone material to foam to form a foaming silicone composition; and

applying the foaming silicone composition to the leak such that the composition volumetrically expands beyond the total volume of the silicone material before foaming to form a foaming silicone composition sealing the leak.

4,189,458

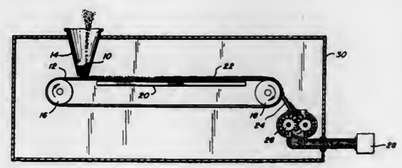
METHOD FOR CONVERTING POLYMER POWDER TO PELLETS

James L. Jezl, St. Charles, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 752,514, Dec. 20, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,402

Int. Cl.[2] **B02C** *18/00*

U.S. Cl. 264—143 **5 Claims**



1. A method to convert thermoplastic polymer particles into pellets comprising:

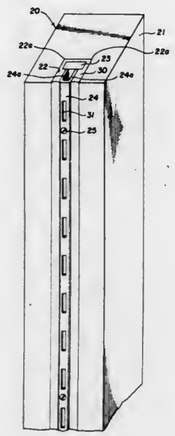
(a) depositing thermoplastic polymer particles onto a continuous platform moving at a generally uniform rate;
(b) heating the polymer particles above the melting temperature of such polymer;
(c) transferring melted polymer without substantial cooling from the moving platform to a gear pump which feeds a thermoplastic polymer pelletizer wherein molten polymer is stranded, cooled and chopped into pellets.

4,189,459

METHOD OF MAKING A SHELF SUPPORT POST

Wilson M. Jones, 1703 N. Beckley, Dallas, Tex. 75203

Continuation-in-part of Ser. No. 803,725, Jun. 6, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,203
Int. Cl.[2] B29D *3/00;* **B29C** *27/30*
U.S. Cl. 264—255 **10 Claims**



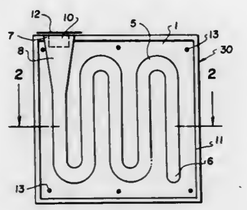
1. A method of fabricating a post assembly for display fixtures comprising:
Securing an anchor plate across an open side of a channel member, in contact with said member and extending laterally beyond said member on two sides thereof, disposing said channel member and said anchor plate in a recess in an elongated member and spaced from surfaces defining said recess, casting hardenable resin in said recess and about said anchor plate and hardening said resin to secure said channel member in said recess.

4,189,460

CHEMICAL OXYGEN GENERATOR AND PROCESS OF MAKING A GENERATOR

William S. McBride, Lubeck, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,058
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650349
Int. Cl.[2] B01J *7/00*
U.S. Cl. 422—165 **3 Claims**



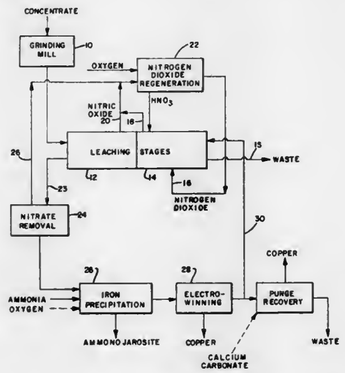
1. An oxygen generator, comprising first and second juxtaposed deformable sheet metal plates, said second plate being formed with a continuous axially elongated serpentine recess covered by said first plate having one end which is closed and an opposite end which is openable for ignition, said first plate being flat, said serpentine recess comprising a plurality of spaced parallel straight leg portions and interconnected curved portions, a granular chemical which generates oxygen by thermal reaction disposed in said recess, an ignition device in said recess adjacent the openable end of said recess for igniting said chemical, said plates being deformed by isostatic pressure to reduce the size of said recess so that said chemical is compacted therein, the cross-section of said recess comprising four arcuate portions which form a fluted surface in said recess, the middle two arcuate portions being spaced from said first plate and the end two arcuate portions being adjacent said first plate at the respective outer peripheral edges, thereby facilitating said compacting of said chemical and providing a moderate oxygen stream over a prolonged period of time as the chemical undergoes the thermal reaction, said depression extending to an edge between said plates and being bevelled outwardly toward said edge, said edge being located at said openable end, and a foil closing said openable end.

4,189,461

METAL LEACHING FROM CONCENTRATES USING NITROGEN DIOXIDE IN ACIDS

Robert E. Lueders, Needham, Mass., and Theodore C. Frankiewicz, Westminster, Calif., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 855,983, Nov. 30, 1977, Pat. No. 4,132,758. This application Feb. 23, 1978, Ser. No. 880,552
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.[2] C01G *3/10, 9/06, 51/10, 53/10*
U.S. Cl. 423—27 **10 Claims**



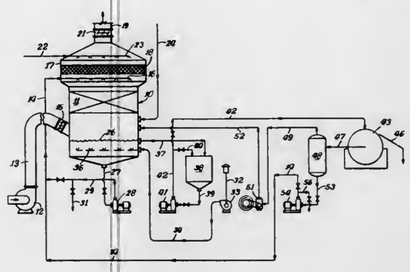
6. A process for leaching metal values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron, and mixtures thereof from a sulfidic mineral thereof comprising the steps of:
A. providing a first stage containing an aqueous acidic leach liquor and adding a particulated sulfidic mineral containing metal values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron and mixtures thereof to said leach liquor in said first stage;
B. delivering said particulated sulfidic mineral from said first stage to a second stage containing an aqueous acidic leach liquor to form a slurry in the second stage; and,
C. adding a nitrogen dioxide containing gas into the slurry in the second stage the amount of nitrogen dioxide gas being at least the stoichiometric amount needed to oxidize the mineral particles and allowing the nitrogen dioxide to oxidize the mineral particles to enable values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron, and mixtures thereof to be solubilized in the leach liquor.

4,189,462

CATALYTIC REMOVAL OF HYDROGEN SULFIDE FROM GASES

Ralph B. Thompson, Oak Brook, Ill., assignor to Air Resources, Inc., Palatine, Ill.

Continuation-in-part of Ser. No. 728,855, Oct. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 551,279, Feb. 20, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,788
Int. Cl.[2] C01B *17/04;* **B01D** *53/34*
U.S. Cl. 423—573 G **14 Claims**



1. In a continuous catalytic oxidation-reduction process for the removal of hydrogen sulfide gas from a gaseous stream by contacting the gaseous stream with an aqueous solution containing an iron chelate catalyst having iron in the ferric state adapted to oxidize the hydrogen sulfide to elemental sulfur and be reduced to the ferrous state, separating said elemental sulfur from said solution, and regenerating said solution by contacting said solution with an oxygen containing gas to convert the ferrous iron to the ferric state; the improvement which comprises;
(a) contacting the gaseous stream containing said hydrogen sulfide with an aqueous solution of chelated iron containing at least two iron chelating agents with at least one of said iron chelating agents being selected from the group of amines consisting of polyamino polycarboxylic acids, polyamino alkyl polycarboxylic acids, polyamino hydroxyalkyl polycarboxylic acids, and poly(phosphonoalkyl) amines, and their alkali metal salts and another of said iron chelating agents being selected from the group of polyhydroxy compounds consisting of monosaccharides, disaccharides, reduced monosaccharides, reduced disaccharides, monosaccharide acids, disaccharide acids, and their alkali metal salts; and
(b) said solution having a pH ranging between about pH 5.5 and about pH 13.

4,189,463

IMMUNOASSAY FOR ZOXAZOLAMINE

William R. Dixon, Dumont, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1978, Ser. No. 894,280
Int. Cl.[2] G01N *33/16;* **A61K** *39/00;* **A61B** *10/00*
U.S. Cl. 424—1 **6 Claims**

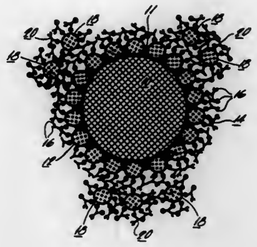
1. An immunogen composition comprising the diazo-conjugate of 4-amino-N-(5-chloro-2-benzoxazolyl)benzamide and an immunogenic carrier material.

4,189,464

HEPATITIS B TESTING REAGENT AND METHOD

Baruch S. Blumberg, Philadelphia, and Irving Millman, Willow Grove, both of Pa., assignors to Institute for Cancer Research, Philadelphia, Pa.

Filed May 5, 1978, Ser. No. 903,238
Int. Cl.[2] G01N *33/16;* **A61K** *43/00;* **G21H** *5/02*
U.S. Cl. 424—1 **23 Claims**



12. A method for determining the presence of HB_sA_g in a test sample which comprises the steps of (a) forming a reagent by coating a substrate with a first coat comprising HB_sA_g washing the HB_sA_g-coated substrate, thereafter substantially completely covering the HB_sA_g with a second coat comprising anti-HB_s, said anti-HB_s substantially completely occupying the reacting sites of the HB_sA_g and leaving a substantial excess of antibody reacting sites remaining free, and washing the reagent thus formed, (b) thereafter exposing said reagent to a test sample which is to be tested for the presence of HB_sA_g thereby allowing HB_sA_s which may be present in the test sample to attach itself to the anti-HB_s on the reagent, (c) washing the reagent, (d) thereafter contacting the reagent thus exposed with radioactively labeled anti-HB_s, (e) washing the reagent, and (f) thereafter testing the reagent thus contacted for radioactivity.

4,189,465

METHOD FOR INHIBITING NITROSAMINE FORMATION

Maurice L. Rosenthal, New York, N.Y., assignor to Robeco Chemicals, Inc., New York, N.Y.

Filed May 8, 1978, Ser. No. 903,817
Int. Cl.[2] A61K *9/06, 47/00*
U.S. Cl. 424—10 **4 Claims**

1. A method for inhibiting the formation of nitrosamines in topical products containing an amine and a nitrosating agent which comprises incorporating into such products at least one percent by weight of squalene based on the overall composition.

4,189,466

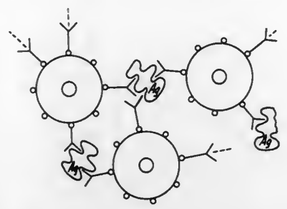
DETECTION OF RHEUMATOID FACTOR BY ANTIBODY SENSITIZED MICROBIAL PARTICLES

Herman Ainis; Charles F. Lange, both of Evanston; Abraham S. Mark, and George H. Scherr, both of Park Forest, all of Ill., assignors to Technical Research Affiliates, Inc., Evanston, Ill.

Continuation of Ser. No. 614,854, Sep. 19, 1975, abandoned. This application Feb. 6, 1978, Ser. No. 875,519
Int. Cl.[2] G01N *33/16, 31/02*
U.S. Cl. 424—12 **6 Claims**

1. A method of testing for the presence of Rheumatoid Factor in a biological specimen of animal origin, comprising

the step of combining the specimen containing the suspected Rheumatoid Factor with a protein A microbial cell suspension



sensitized with free Fc fragments of IgG to which Rheumatoid Factor is specific, with resultant agglutination if positive.

4,189,467

POLYURETHANES HAVING ECTOPARASITICIDAL ACTIVITY

Miklos von Bittera, Leverkusen; Hans U. Sieveking, Cologne; Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,094

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715595; Apr. 7, 1977, 2715596; Dec. 29, 1977, 2758571

Int. Cl.[2] **A01K** *27/00, 29/00;* **A01M** *1/20;* **A01N** *17/08*

U.S. Cl. 424—14 **11 Claims**

1. An animal collar having ectoparasiticidal activity, which comprises a plastic composition comprising from 75 to 98% by weight of a hydrophobic polyurethane which is not swellable in water and from 2 to 25% by weight of an ectoparasiticidal carbamate having a vapor pressure of from 10^{-4} to 10^{-6} mm Hg at 20° C.

4,189,468

CROSSLINKED POLYAMINO-POLYAMIDE IN HAIR CONDITIONING COMPOSITIONS

Guy Vanlerberghe, Claye-Souilly; Henri Sebag, Paris; Jean-Francois Grollier, Paris, and Alexandre Zysman, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 762,804, Jan. 26, 1977, which is a continuation of Ser. No. 528,577, Nov. 29, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,513

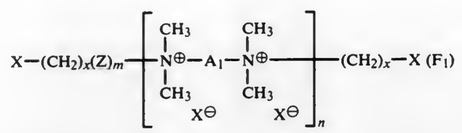
Claims priority, application Luxembourg, Nov. 30, 1973, 68901; France, Mar. 2, 1977, 77 06031

Int. Cl.[2] **A61K** *7/06*

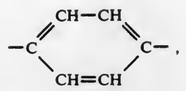
U.S. Cl. 424—70 **24 Claims**

1. A cosmetic composition for the hair comprising an aqueous or hydroalcoholic solution of 0.1–5 percent by weight of said composition of at least one water soluble crosslinked polymer selected from the group consisting of a crosslinked polymer obtained by crosslinking a polyamino-polyamide with a crosslinking agent, said polyamino-polyamide being prepared by the polycondensation of (a) an acidic compound selected from the group consisting of (i) an organic dicarboxylic acid, (ii) ethylenically unsaturated aliphatic mono- or di-carboxylic acid, (iii) ester of said acids of (i) and (ii), and (iv) mixtures of (i), (ii) and (iii) on (b) a polyamine selected from the group consisting of bis-primary and mono- or bis-secondary polyalkylene polyamines, said polyamine (b) being replaceable by a member selected from the group consisting of (1) 0–20 mole percent hexamethylene diamine, (2) 0–40 mole percent bis-primary amine and (3) 0–40 mole percent bis-secondary amine, said crosslinking agent being selected from the group consisting of:

(I) simple bi-functional compounds selected from the group consisting of (1) bis-halohydrins resulting from the reaction of an epihalohydrin with a primary amine, a bis-secondary diamine, a bis-phenol or a bis-mercaptan, (2) a bis-azetidinium, (3) a bis-haloacyl diamine, and (4) an alkyl bis-halide of the formula



wherein X=Cl or Br, Z represents



x=1 to 3, m=0 or 1, n=0 or 1, m and n not representing 1 at the same time, with the proviso that when m=1, x=1, A_1 represents a saturated divalent hydrocarbon radical having 2, 3, 4 or 6 carbon atoms or 2-hydroxy propylene;

(II) an oligomer obtained by the reaction of compound (a) selected from the group consisting of compounds (1), (2), (3) and (4), each defined above, (5) an epihalohydrin, (6) a bis-epoxide and (7) a bis-unsaturated derivative, with a compound (b) which is a bi-functional compound reactive with said compound (a), said compound (b) being selected from the group consisting of a primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b):(a) being between 0.1 and 0.9;

(II-bis) an oligomer obtained by the reaction of compound (a_1) selected from the group consisting of compounds (1), (3), (4) and (6) each defined above, with a bis-tertiary diamine (b_1) which is a bi-functional compound reactive with said compound (a_1), the molar ratio of (b_1):(a_1) being between 0.1 and 0.9;

(III) the quaternization product of compound (a_2) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperazine, a bis-phenol or a bis-mercaptan, (2) a bis-azetidinium, (3) a bis-haloacyl diamine, (4) an alkyl bis-halide of formula F_1 above, (6) a bis-epoxide, (7) a bis-unsaturated derivative, (8) an oligomer II obtained by the reaction of a compound (a_3) selected from the group consisting of compounds (1), (2), (3), (4), (6), and (7) each defined above with a compound (b_3) which is a bi-functional compound reactive with said compound (a_3), said compound (b_3) being selected from the group consisting of a primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b_3):(a_3) being between 0.1 and 0.9, (9) an oligomer obtained by the reaction of an epihalohydrin (a_4) with a compound (b_4) which is a bi-functional compound reactive with said compound (a_4), said compound (b_4) being selected from the group consisting of piperazine, a bis-mercaptan, a bis-phenol and a bis-epoxide of piperazine, the molar ratio of (b_4):(a_4) being between 0.1 and 0.9, and (10) an oligomer obtained by the reaction of a compound (a_5) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperazine, a bis-phenol or a bis-mercaptan, (2) a bis-haloacyl diamine, (3) an alkyl bis-halide of formula F_1 above and (4) a bis-epoxide, with a compound (b_5), said compound (b_5) being a bis-tertiary diamine, the molar ratio (b_5):(a_5) being between 0.1 and 0.9;

said product having a tertiary amine group alkylated with an alkylating agent (c) selected from the group consisting of methyl or ethyl chloride, bromide, iodide, sulfate, mesylate and tosylate, benzyl chloride or bromide, ethylene oxide, propylene oxide and glycidol;

said crosslinking agent being employed in an amount of 0.025 to 0.35 mole per amine group of said polyamino-polyamide,

said crosslinked polymer in said composition being perfectly soluble in a 10 weight percent solution thereof in water without gel formation, said 10 weight percent solution having a viscosity at 25° C. greater than 3 centipoises and said crosslinked polymer being characterized by having no reactive group, having no alkylating property and being chemically stable.

4,189,469

PHARMACEUTICAL COMPOSITIONS

Klaus Gleixner, Taunusstein-Wehen; Roland Müller, and Franz Lehrach, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 6, 1976, Ser. No. 683,795

Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520978

Int. Cl.[2] **A61K** *31/79, 31/70, 31/52;* **A01N** *17/00*

U.S. Cl. 424—80 **18 Claims**

1. An orally-administrable pharmaceutical composition in unit-dosage form which comprises an amount of pharmaceutically-active component having a degree of gastro-intestinal-tract incompatibility which renders it unsafe for oral administration in combination with a sufficient amount of swelling agent to reduce such incompatibility to a level at which the unit dosage is safe for oral administration.

4,189,470

METHOD FOR THE CONTINUOUS REMOVAL OF A SPECIFIC ANTIBODY FROM THE LYMPH FLUID IN ANIMALS AND HUMANS

Sam Rose, Eggertsville, N.Y., assignor to Bio-Response, Inc., Wilton, Conn.

Division of Ser. No. 549,085, Feb. 11, 1975, Pat. No. 4,064,006, which is a division of Ser. No. 349,330, Apr. 9, 1973, Pat. No. 3,964,467, which is a continuation-in-part of Ser. No. 328,048, Jan. 30, 1973, Pat. No. 3,857,393, which is a division of Ser. No. 136,476, Apr. 22, 1971, Pat. No. 3,179,182. This application Nov. 15, 1977, Ser. No. 851,744

Int. Cl.[2] **A61K** *39/42, 39/40, 39/00*

U.S. Cl. 424—85 **3 Claims**

1. A method for the continuous removal of a specific antibody from the lymph fluid free of lymph cells from a subject comprising the steps of

attaching the specific antigen, to which the specific antibody to be removed reacts to a substrate particle;

forming a mixture of the substrate particles to which said antigens are attached and lymph fluid being free of lymph cells and containing said specific antibody;

placing said mixture of substrate particles to which said antigens are attached and lymph fluid free of lymph cells into a thin layer substantially in the form of a cylinder extending about a predetermined longitudinal axis;

centrifuging said thin layer of the mixture about the predetermined longitudinal axis to pack said substrate particles within said thin layer;

disturbing said packed substrate particles to disperse the substrate particles throughout the thin layer;

maintaining the dispersed substrate particles in the thin layer for a preselected period of time;

centrifuging the dispersed substrate particles in the thin layer about the predetermined longitudinal axis to separate said particles from said lymph fluid;

repeating the immediately preceding four steps in the order given a preselected number of times to enable said specific antibody to complex with specific antigen attached to the substrate particles;

periodically collecting a portion of said substrate particles to which said specific antibody and antigen are attached while said substrate particles are dispersed in the thin layer;

adding additional fresh substrate particles to which said specific antigen is attached; and

chemically treating said collected portion of substrate particles to split the specific antigen-antibody complexes attached thereto, thereby freeing said specific antibodies from said complexes; and separating said freed specific antibodies from said substrate particles.

4,189,471

IMMUNOLOGIC GLYCOLIPID ADJUVANTS

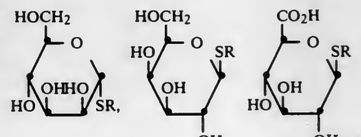
Mitree M. Ponpipom, North Plainfield; John Chabala, and Tsung-Ying Shen, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 11, 1978, Ser. No. 923,520

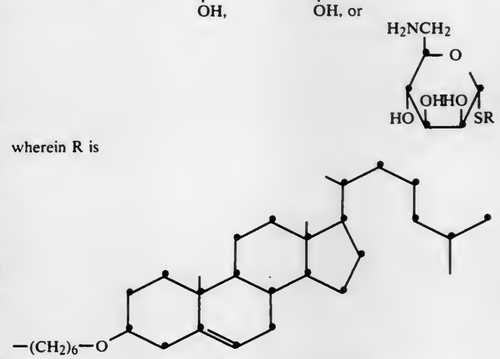
Int. Cl.[2] **A61K** *31/575;* **C07J** *9/00*

U.S. Cl. 424—88 **4 Claims**

1. A compound of the formula



wherein R is



3. A composition comprising an antigenic material and a compound of claim 1.

4,189,472

ANTIBIOTIC C-11924 F-1

Toru Hasegawa, Kawanishi; Mitsuko Asai, and Kazunori Hatano, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 17, 1978, Ser. No. 870,085

Claims priority, application Japan, Jan. 24, 1977, 52-7026

Int. Cl.[2] **A61K** *35/00*

U.S. Cl. 424—117 **2 Claims**

1. Antibiotic C-11924 F-1 which has the following physicochemical properties:

(a) Elemental analysis:
C, 40.81, 40.87, 40.55
H, 5.72, 5.02, 5.55
N, 16.35, 16.58, 16.40
S, 3.95, 3.97, 3.50
Cu, 3.64, 3.46, 3.29

(b) Melting point (decomp.): not lower than 195 degrees centigrade (no definite decomposition point)

(c) Molecular weight: n·(1.0×10^3)(n is an integer) (distilled water, vapor pressure osmosis); 1800±50 (as calculated on the assumption that each molecule contains one atom of copper)

(d) Ultraviolet absorption spectrum: λ_{max}^{H2O}243 ±2 nm ($E_1cm^{1\%}$167±16) λ_{max}^{H2O}297±2 nm ($E_1cm^{1\%}$55±6)
(e) Infrared absorption spectrum (KBr)cm^{-1}): 3350, 2920, 1715, 1650, 1625, 1600, 1550, 1520, 1450, 1370, 1345, 1090, 1060, 1005, 980
(f) Solubility: Readily soluble in water; soluble in methanol; sparingly soluble in ethanol; insoluble in ethyl acetate, butyl acetate, chloroform, benzene, cyclohexane, ethyl ether and petroleum ether.
(g) Color reactions: Positive Sakaguichi, ninhydrin, Ehrlich, Dragendorff, potassium permanganate and Greig-Leaback reactions.
(h) Stability: Stable under neutral conditions; slightly unstable under alkaline conditions; unstable under acid conditions
(i) Acidity, neutrality or basicity; a basic substance.

4,189,473

ANTIBIOTIC MM 13902

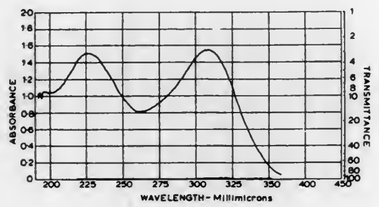
Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 716,668, Aug. 23, 1976, abandoned, which is a division of Ser. No. 559,803, Mar. 19, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,384

Claims priority, application United Kingdom, Mar. 28, 1974, 13856/74

Int. Cl.² A61K *35/00*

U.S. Cl. 424—124 **14 Claims**



1. A process for the preparation of a pharmaceutically acceptable di-basic salt of MM 13902 which is at least 50% pure wherein MM 13902 is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_8N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:
(a) in aqueous solution, it has a characteristic ultra-violet spectrum with absorption maxima at about 305 nm and at about 225 nm substantially as shown in FIG. 1;
(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3450, 2950, 1750, 1620, 1510, 1400 and 1260 cm^{-1};
(c) it has a characteristic N.M.R. spectrum when taken in D_2O which spectrum possesses inter alia (i) a pair of low field doublets centered at approximately 2.85ρ and 4.00ρ with coupling constants of approximately 14 Hz; (ii) a doublet centered at approximately 8.55ρ and (iii) a sharp singlet at approximately 8.00ρ;
(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhi* and *Pseudomonas aeruginosa;* and
(e) when mixed with ampicillin it synergizes its activity against organisms including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus* Russell, which comprises chromatographically separating from a solution of MM 4550 (Complex) which contains MM 13902 and impurities a fraction consisting essentially of a solution of a pharmaceutically acceptable di-basic salt of MM 13902 and thereby obtaining a pharmaceutically acceptable di-basic salt of MM 13902 of at least 50% purity.

4,189,474

DEXTRIN HYDROXYCARBOXYLATO POLYIRON (III) OLATED COMPLEX AND PROCESS FOR THE MANUFACTURE THEREOF

Teikichi Kurosaki, Osaka; Kanzo Ohta, Yao; Hirohide Matsuura, Minoo, and Katsumi Sawada, Higashi-osaka, all of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 30, 1976, Ser. No. 755,649

Claims priority, application Japan, Jan. 1, 1976, 51/256

Int. Cl.² A61K *31/715;* **C08B** *37/02*

U.S. Cl. 424—180 **18 Claims**

2. A dextrin-citrato polyiron (III) olated complex comprising a dark brown, odorless, amorphous powder which hardly dissolves in organic solvents such as ethanol, methanol, acetone or ether, slowly dissolves in cold water, easily dissolves in hot water, and once dissolved, yields a stable solution which does not precipitate even when cooled; a composition of about 14.4% carbon, about 2.4% hydrogen and about 43.5% iron, a residue composition of about 69.3% polyiron (III) residue, about 13.4% dextrin residue [$C_6H_5O_7$], about 12.9% citric acid residue [$C_6H_5O_7$] and about 8.0% free dextrin; an average molecular weight of about 1.4×10^5; by an intrinsic viscosity of about 0.049; a particle size distribution in a liquid phase between about 0.03 and 0.1μ with 90% being between about 0.05 and 0.08μ; and an infrared absorption spectra:
3400 cm^{-1} (OH), 2900 cm^{-1} (CH_2);
1600 cm^{-1} (O═C═O), 1380 cm^{-1} (CO,OH);
1150 cm^{-1} (C—O—C), 1080 cm^{-1} (OH);
1020 cm^{-1} (OH) and 700 cm^{-1} (OH).

3. A dextrin-citrato-polyiron (III) olated complex comprising a dark brown, odorless, amorphous powder which hardly dissolves in organic solvents such as ethanol, methanol, acetone or ether, slowly dissolves in cold water, easily dissolves in hot water, and once dissolved, yields a stable solution which does not precipitate even when cooled; and an iron content of about 46.5%, a dextrin content of about 15.2%, an intrinsic viscosity of about 0.050, and an infrared absorption spectra:
3400 cm^{-1} (OH), 1620 cm^{-1} (O═C═O);
1380 cm^{-1} (CO,OH), 1150 cm^{-1} (C—O—C);
1080 cm^{-1} (OH), 1020 cm^{-1} (OH); and
700 cm^{-1} (OH).

5. A non-oral pharmaceutical composition for treating iron-deficiency anemia which contains a pharmaceutically acceptable carrier and dextrin-citrato-polyiron (III) olated complex as defined in claim 2.

6. A method for treating iron-deficiency anemia in animals which comprises injecting a dosage amount of the pharmaceutical composition of claim 5 in an animal in need of such treatment.

4,189,475

INSECTICIDAL COMPOSITIONS EXHIBITING A SYNERGISTIC EFFECT

Claude Hennart, Seraincourt, France, assignor to Airwick Industries Inc., Carlstadt, N.J.

Filed Dec. 19, 1977, Ser. No. 862,079

Claims priority, application Luxembourg, Dec. 24, 1976, 76473

Int. Cl.² A01N *9/02, 9/12, 9/28, 9/36*

U.S. Cl. 424—200 **4 Claims**

1. An insecticidal composition comprising adjuvants and from about 0.2 to 50%, by weight, of a combination of active ingredients, said combination containing from 0.2 to 5 parts by weight of O,O-dimethyl S-[1,2-bis-(ethoxy-carbonyl)-ethyl] dithiophosphate per part by weight of O,O-dimethyl S-(4-aza-6-chloro-2-oxo-benzoxazol-3-yl)-methyl thiophosphate.

4,189,476

COMBATING PESTS WITH O,S-DIALKYL-O-HALOALKYL-PHOSPHOROTHIOLATES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsuboi, both of Tokyo, all of Japan, assignors to Nihon Takushu Noyaku Seizo K.K., Tokyo, Japan

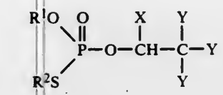
Filed Jun. 16, 1978, Ser. No. 916,164

Claims priority, application Japan, Jul. 25, 1977, 52/88352

Int. Cl.² A01N *9/36;* **C07F** *9/165*

U.S. Cl. 424—224 **14 Claims**

1. An O,S-dialkyl-O-haloalkylphosphorothiolate of the formula



in which
R^1 is alkyl with 1–8 carbon atoms,
R^2 is alkyl with 1–8 carbon atoms or alkoxyalkyl with 2–8 carbon atoms,
X is trichloromethyl, trifluoromethyl or alkoxy with 1–8 carbon atoms, with the proviso that X can also be hydrogen if R^2 is alkyl with 4–8 carbon atoms or alkoxyalkyl with 2–8 carbon atoms, and
Y is chlorine or fluorine.

13. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes, or to a habitat therof, an insecticidally, acaricidally or nematocidally effective amount of an ester according to claim 1.

4,189,477

NOVEL Δ^4-PREGNENES

Lucien Nedelec, Le Raincy; Andrè Pierdet, Noisy-le-Sec, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

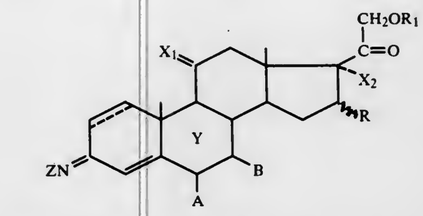
Filed May 8, 1978, Ser. No. 903,600

Claims priority, application France, May 6, 1977, 77 13864

Int. Cl.² A61K *31/56;* **C07J** *1/00*

U.S. Cl. 424—243 **23 Claims**

1. A compound of the formula



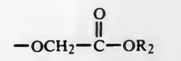
wherein X_1 is selected from the group consisting of ═0 and



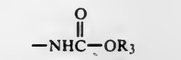
Y is selected from the group consisting of hydrogen and halogen, R_1 is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms, X_2 is selected from the group consisting of hydrogen and —OH, R in the 16α- or β-position is selected from the group consisting of hydrogen, —OH and methyl, Z is selected from the group consisting of (1) —OH, (2) alkoxy of 1 to 12 carbon atoms, (3) cycloalkoxy of 3 to 12 carbon atoms, (4) acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, (5)



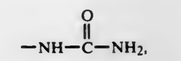
wherein W is a hydrocarbon of 1 to 12 carbon atoms, (6)



wherein R_2 is hydrogen or alkyl of 1 to 12 carbon atoms, (7)



where R_3 is a hydrocarbon of 1 to 12 carbon atoms and (8)



the dotted line in the A ring indicates the optional presence of a double bond in the 1(2)-position and A and B are both hydrogen or A is methyl, chlorine or fluorine while B is hydrogen or A and B may form a double bond in the 6(7)-position with the proviso that if the A ring has a 1(2) double bond, A is hydrogen or fluorine, B is hydrogen, Y is hydrogen or fluorine, X_2 is hydrogen or —OH, R is methyl and Z is not —OH.

11. An anti allergic composition comprising an antiallergically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,189,478

MEDICINAL COMPOSITION AND ITS USE AS ANTIDEPRESSIVE AGENT

Karl Schmitt; Irmgard Hoffmann, Both of Bad Soden am Taunus; Werner Fülberth, Kelkheim, and Willi Stammberger, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

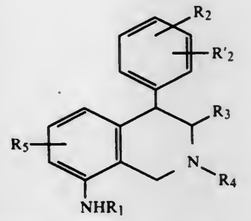
Filed May 30, 1978, Ser. No. 910,782

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724683

Int. Cl.² A61K *31/33, 31/47*

U.S. Cl. 424—244 **2 Claims**

1. A medicinal composition for the treatment of depression comprising, in combination, 2 to 25 parts by weight of 7-chloro-1-methyl-5-phenyl-1H-1,5-benzodiazepine-2,4(3H,5H)-dione together with 5 to 50 parts by weight of a compound of the formula



or a salt thereof with an acid, wherein R_2R_3, and R_4, taken alone, may be the same or different, and are hydrogen, or lower alkyl or aralkyl; R_2 and R_2', taken alone, may be the same or different, and are hydrogen, halogen, hydroxy, trifluoromethyl, lower alkyl, alkoxy, or aralkoxy; or two adjacent substituents, taken together, may be alkylene dioxy; and R_5 is hydrogen, halogen, hydroxy, trifluoromethyl, nitro, or lower alkyl, alkoxy, or aralkoxy.

4,189,479

CEPHALOSPORIN ESTERS

Nobuharu Kakeya, Kawanishi, and Yoshinobu Yoshimura, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Dec. 22, 1977, Ser. No. 863,071
Int. Cl.[2] C07D *501/36*
U.S. Cl. 424—246 **8 Claims**

1. Pivaloyloxymethyl 7β-[2-(2-aminothiazol-4-yl)-acetamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl]thio]methyl]-ceph-3-em-4-carboxylate or its pharmaceutically acceptable acid addition salt.

5. A pharmaceutical composition comprising pivaloyloxymethyl 7β-[2-(2-aminothiazol-4-yl)acetamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl]thio]methyl]-ceph-3-em-4-carboxylate or its pharmaceutically acceptable acid addition salt as an effective ingredient.

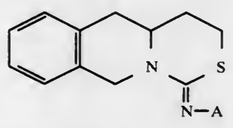
4,189,480

ISOQUINOLINE DERIVATIVES

Daniel Farge, Thiais; Alain Jossin, Saint Cloud; Gerard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 8, 1978, Ser. No. 958,617
Claims priority, application France, Nov. 10, 1977, 77 33890; Aug. 9, 1978, 78 23469
Int. Cl.[2] C07D *279/08*; A61K *31/54*
U.S. Cl. 424—246 **10 Claims**

1. An isoquinoline derivative of the formula:



wherein A represents pyrid-3-yl, isoquinol-5-yl or a 3-alkylisoquinol-5-yl radical in which the alkyl moiety contains 1 to 10 carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

10. A pharmaceutical composition which comprises, as active ingredient, an isoquinoline derivative as claimed in claim **1**, or a pharmaceutically acceptable acid addition salt thereof, in association with at least one compatible pharmaceutically acceptable carrier.

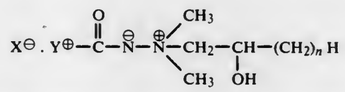
4,189,481

ANTIMICROBIAL COMPOSITIONS

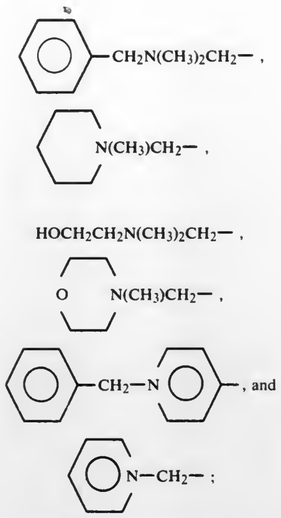
Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, Lansing, Mich.

Filed Nov. 18, 1975, Ser. No. 633,036
Int. Cl.[2] A01N *9/22, 9/20, 9/24*
U.S. Cl. 424—248.54 **6 Claims**

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein Y represents a quaternary nitrogen residue selected from the group consisting of



wherein n is an integer of from 10–16; and X is chloro, bromo or iodo.

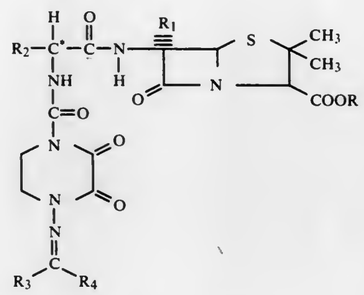
4,189,482

PENICILLINS HAVING AN IMINO SUBSTITUTED PIPERAZINDIONCARBONYLAMINO ACYL SIDECHAIN

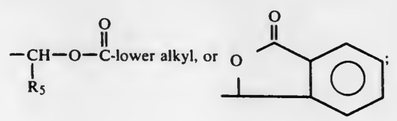
Uwe D. Truener, and Hermann Breuer, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 12, 1978, Ser. No. 950,916
Int. Cl.[2] A61K *31/43*; C07D *499/64, 499/66, 499/68*
U.S. Cl. 424—250 **8 Claims**

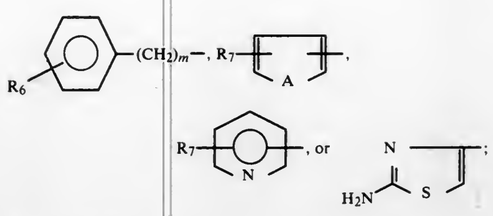
1. A compound of the formula:



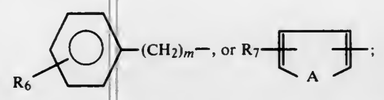
wherein R is hydrogen, sodium, potassium, t-butyl, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, trimethylsilyl, —CH_2—O—lower alkyl,



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is hydrogen, lower alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl,



R_3 is lower alkyl,



R_4 is hydrogen or lower alkyl; R_5 is hydrogen or lower alkyl; R_6 is hydrogen, methyl, ethyl, methoxy, ethoxy, hydroxy, Cl or Br; m is zero, one or two; A is O or S; and R_7 is hydrogen, methyl, ethyl, Cl, or Br.

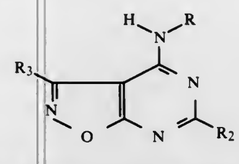
4,189,483

PESTICIDAL COMPOUNDS, COMPOSITIONS AND PROCESSES

Geoffrey D. Snowling, Clarke; John M. Cox, Wokingham; Raymond A. Burrell, Camberley, and Margaret C. Shephard, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 20, 1978, Ser. No. 888,388
Claims priority, application United Kingdom, Mar. 23, 1977, 12211/77
Int. Cl.[2] A01N *9/00, 9/22*
U.S. Cl. 424—251 **4 Claims**

1. A process for combating pests selected from the group consisting of fungi, bacteria, insects and acarids, which comprises applying to plants, seeds, or their loci, a pesticidally effective amount of an isoxazolo [5,4-d] pyrimidine derivative having the formula:



a salt, or optical isomer thereof, wherein R is a group selected from the class consisting of alkyl having from 3 to 10 carbon atoms, aralkyl, and alkoxyalkyl having up to 13 carbon atoms; R_2 is hydrogen or methyl; R_3 is methyl, ethyl, methoxy, methylsulphonyl, methylthio or phenyl.

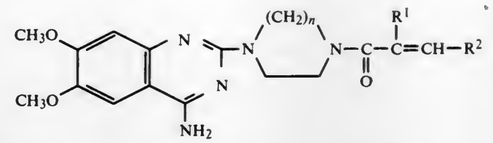
4,189,484

ANTIHYPERTENSIVE QUINAZOLINE DERIVATIVES

Susumu Mizogami; Hidetoshi Hiranuma; Tetsuo Sekiya, and Mitsuo Hanazuka, all of Ami, Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,326
Claims priority, application Japan, Nov. 8, 1977, 52-133105; Feb. 27, 1978, 53-020891
Int. Cl.[2] A61K *31/505*; C09B *23/16, 55/00*
U.S. Cl. 424—251 **38 Claims**

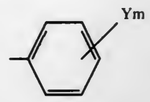
1. A compound having the formula



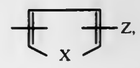
wherein

R^1 is a hydrogen atom or an alkyl group having 1–5 carbon atoms;

R^2 is a group of the formula



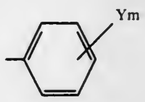
in which Y is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, an alkenyloxy group, a methylenedioxy group, a nitro group, a halogen atom, a trifluoromethyl group, an acyloxy group, a hydroxy group, an unsubstituted or substituted amino group or a condensed benzene nucleus and m is an integer of 1–3 inclusive, or a group of the formula



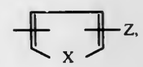
in which X is an oxygen atom, a sulfur atom or a carbon-nitrogen double bond and Z is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, a nitro group or a halogen atom; and

n is an integer of 2–3 inclusive;

provided that, when R^2 is the said group

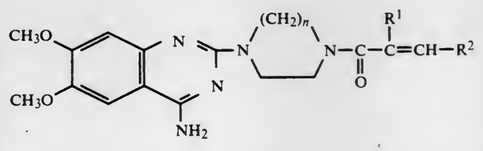


n is 2 and R^1 is a hydrogen atom or, when R^2 is the said group;



n is 2 or 3 and R^1 is a hydrogen atom or the said alkyl group and a pharmaceutically acceptable acid addition salt thereof.

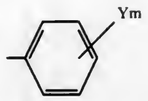
38. An antihypertensive composition which comprises as an active ingredient an effective amount of (i) a compound having the formula



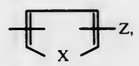
wherein

R^1 is a hydrogen atom or an alkyl group having 1–5 carbon atoms;

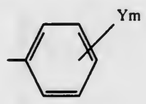
R^2 is a group of the formula



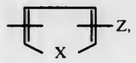
in which Y is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, an alkenyloxy group, a methylenedioxy group, a nitro group, a halogen atom, a trifluoromethyl group, an acyloxy group, a hydroxygroup, an unsubstituted or substituted amino group or a condensed benzene nucleus and m is an integer of 1–3 inclusive, or a group of the formula



in which X is an oxygen atom, a sulfur atom or a carbon-nitrogen double bond and Z is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, a nitro group or a halogen atom; and
n is an integer of 2–3 inclusive;
provided that, when R^2 is the said group



n is 2 and R^1 is a hydrogen atom or, when R^2 is the said group



n is 2 or 3 and R^1 is a hydrogen atom or the said alkyl group or (ii) a pharmaceutically acceptable acid addition salt thereof; and a pharmaceutically acceptable carrier.

4,189,485

PURINE DERIVATIVES

Toshimi Matsuno, Suita, and Kin-ichi Imai, Toyonaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

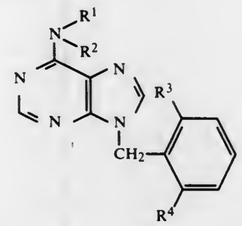
Filed Aug. 7, 1978, Ser. No. 931,437

Claims priority, application Japan, Aug. 23, 1977, 52-101349; Apr. 7, 1978, 53-041470

Int. Cl.[2] **C07D** *473/34*

U.S. Cl. 424—253 **20 Claims**

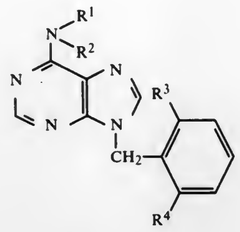
1. A compound of the formula:



wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 3 carbon atoms or allyl, and R^3 and R^4, respectively, mean halogen, or an acid addition salt thereof.

10. An anticoccidial composition comprising as an active ingredient an effective amount of a compound of the formula:

(I)



wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 3 carbon atoms or allyl, and R^3 and R^4, respectively, mean halogen, or a physiologically acceptable acid addition salt thereof, and a physiologically acceptable carrier or diluent therefor.

4,189,486

1-(3-PYRIDYL)-2,2,2-TRIHALOETHYL COMPOUNDS

Fritz Sauter, Vienna, Austria; Otto Eberle, Ottobrunn, Fed. Rep. of Germany; Beate Suss, and Rudolf Weissgerber, both of Munich, Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,980

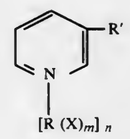
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659117

Int. Cl.[2] **C07D** *213/30;* **A01N** *9/22*

U.S. Cl. 424—263 **15 Claims**

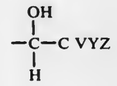
1. A 1-(3-pyridyl)-2,2,2-trihaloethyl compound of the general empirical formula I

I



in which n is 0 or 1, R represents a member of the group consisting of oxygen, hydrogen, an aliphatic radical having from 1 to 12 C-atoms of the group consisting of alkenyl radicals and alkyl radicals of the branched or straight chain type, and an aralkyl radical having from 7 to 12 C-atoms, wherein m is 0 when R is an oxygen atom, and m is ½ or 1 when R is a hydrogen atom or an aliphatic or aralkyl radical, and X represents a negative ion of the group consisting of halogen and SO_3R'' radicals wherein R'' has the meaning of OR, OH, an aryl or an alkyl group, and when R is H, X is a negative ion of an organic or inorganic acid; the radical R′ represents a radical of the general formula II

II



wherein V, Y and Z each represent a chlorine or bromine atom.

4,189,487

USE OF PYRIDINE ALDEHYDES FOR THE PREVENTION AND TREATMENT OF ACNE VULGARIS

Josef Klosa, Janickestrasse 13, 1000 Berlin 37-Zehlendorf, Fed. Rep. of Germany

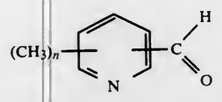
Filed Mar. 15, 1978, Ser. No. 886,820

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2712078; Nov. 22, 1977, 2752134

Int. Cl.[2] **A61K** *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A process for the topical treatment of acne vulgaris in humans which comprises applying to the lesions thereof a therapeutic composition comprising a pharmaceutically compatible topical carrier and an effective amount for treating said acne vulgaris of a pyridine aldehyde having the formula:



where n is 0 or 1, the aldehyde group being in the 2-, 3- or 4-position, and the methyl group being in the 2- or 6-position.

4,189,488

AMIDINOFORMIC AND AMIDINOSULPHINIC ACIDS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

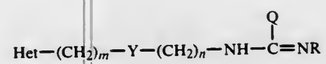
Division of Ser. No. 773,590, Mar. 2, 1977, Pat. No. 4,118,502. This application Jun. 12, 1978, Ser. No. 914,329

Claims priority, application United Kingdom, Mar. 11, 1976, 09750/76

Int. Cl.[2] **A61K** *31/44;* **C07D** *213/53*

U.S. Cl. 424—263 **11 Claims**

1. A compound of the formula



wherein Het is a pyridine ring, which ring is optionally substituted by lower alkyl, halogen, lower alkoxy, hydroxy, trifluoromethyl, hydroxymethyl or amino; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Y is sulphur, methylene or oxygen; R is hydrogen, lower alkyl, or Het—$(CH_2)_m$—Y—$(CH_2)_n$— where Het, m, n and Y are as defined above; Q is —CO_2H or —SO_2H; or a pharmaceutically acceptable acid addition salt thereof.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim **1**.

11. A method of inhibiting gastric acid secretion which comprises administering internally to an animal in need thereof in an effective amount to inhibit gastric acid secretion a compound of claim **1**.

4,189,489

5-ALKOXY-PICOLINIC ACID CALCIUM SALTS AND ANTI-HYPERTENSIVE COMPOSITION CONTAINING 5-ALKOXY-PICOLINIC ACID CALCIUM SALTS AND ANTI-HYPERTENSIVE COMPOSITION THEREOF

Takemi Koeda, Yokohama; Takashi Tsuruoka, Kawasaki; Uichi Shibata, Tokyo; Hiroyasu Asaoka, Yokohama; Mitsugu Hachisu, Kawasaki; Osamu Itoh; Yasuharu Sekizawa, both of Tokyo; Shigeharu Inouye, Kanagawa, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

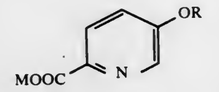
Filed Sep. 30, 1977, Ser. No. 838,180

Claims priority, application Japan, Sep. 30, 1976, 51-116641

Int. Cl.[2] **A61K** *31/445;* **C07D** *213/89*

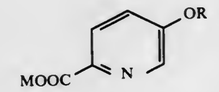
U.S. Cl. 424—266 **6 Claims**

1. 5-Alkoxy-picolinic acid salts represented by the formula



wherein R represents an alkyl group having 1 to 6 carbon atoms and M represents a calcium atom.

4. An antihypertensive composition containing, as an active ingredient, a therapeutically effective amount of at least one 5-alkoxy-picolinic acid salt having the formula



wherein R represents an alkyl group having 1 to 6 carbon atoms and M represents a calcium atom.

4,189,490

2-SUBSTITUTED-3-METHYL-γ-PYRONE TRICYCLIC DERIVATIVES

Adolf H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst McKenna & Harrison Limited, Montreal, Canada

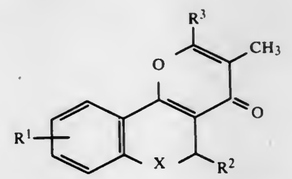
Division of Ser. No. 855,538, Nov. 28, 1977, Pat. No. 4,060,619. This application Jan. 29, 1979, Ser. No. 7,058

Int. Cl.[2] **C07D** *257/10, 493/14, 405/04;* **A61K** *31/35*

U.S. Cl. 424—269 **13 Claims**

1. A compound of formula I

(I)



in which R^1 is hydrogen, halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy; R^2 is hydrogen or lower alkyl; R^3 is 1H-tetrazol-5-yl and X is O, S, SO or SO_2, or a therapeutically acceptable salt thereof.

12. A method for preventing or treating allergic conditions in a mammal which comprises administering to said mammal an effective allergy alleviating amount of a compound of formula I or a therapeutically acceptable salt thereof, as claimed in claim **1**.

4,189,491

TETRAHYDROCANNABINOL IN A METHOD OF TREATING GLAUCOMA

Daniel M. Shapiro, 15 Charles St., New York, N.Y. 10014, and Jean-François Cuendet, 31, Avenue de Rumine, Lausanne, Switzerland

Filed Dec. 16, 1976, Ser. No. 751,079
Int. Cl.[2] A01N *9/22, 9/28*
U.S. Cl. 424—273 R **5 Claims**

1. A method for alleviating the symptoms of glaucoma in a glaucoma patient said method comprising simultaneously
   (a) topically administering to said patient a therapeutically effective amount of a conventional miotic compound selected from the group consisting of pilocarpine hydrochloride and eserine and
   (b) orally administering to said patient a subpsychotropic, but therapeutically effective amount of tetrahydrocannabinol which is about 10–40 mg. of tetrahydrocannabinol per day based on a body weight of about 70 Kg, wherein said therapeutically effective amount of the miotic compound is, when administered along, ineffective to alleviate said symptoms.

4,189,492

ANTIHYPERTENSIVE COMPOSITIONS OF 2-[1-(2,6-DICHLOROPHENOXY)ETHYL]-4,5-DIHYDRO-1H-IMIDAZOLE AND N-(2-CHLOROETHYL)-N-(1-METHYL-2-PHENOXYETHYL)BENZENEMETHANAMINE

Albert Sjoerdsma, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed May 31, 1977, Ser. No. 802,184
Int. Cl.[2] A61K *31/135, 31/415*
U.S. Cl. 424—273 R **6 Claims**

1. An antihypertensive composition in dosage unit form comprising from 0.1 to 1.0 mg of 2-[1-(2,6-dichlorophenoxy)ethyl]-4,5-dihydro-1H-imidazole and a synergistically effective amount of from 0.5 to 15 mg of N-(2-chloroethyl)-N-(1-methyl-2-phenoxyethyl)benzenemethanamine, or each of their pharmaceutically acceptable salts and a pharmaceutically acceptable carrier.

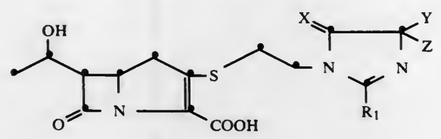
4,189,493

N-HETEROCYCLIC DERIVATIVES OF THIENAMYCIN

Burton G. Christensen, Metuchen; John Hannah, Matawan, and David H. Shih, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 28, 1977, Ser. No. 865,283
Int. Cl.[2] A61R *31/415;* **C07D** *403/12*
U.S. Cl. 424—273 R **3 Claims**

1. A compound having the structural formula:



and the pharmaceutically acceptable salts thereof; wherein:
R_1 is hydrogen, alkyl having from 1–6 carbon atoms or phenyl;
X is imino or oxo;
Y is hydrogen or alkyl having from 1–6 carbon atoms;
Z is hydrogen, alkyl having from 1–6 carbon atoms or alkoxycarbonyl having from 2–7 carbon atoms; and tautomers thereof where Y or Z is hydrogen, and X is amino.

3. An antibiotic pharmaceutical composition comprising, in unitary dosage form, a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

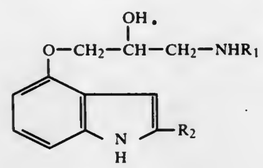
4,189,494

REDUCING FREE FATTY ACID OF THE BLOOD AND SUPPRESSING APPETITE

Günter Engel, Weil, Fed. Rep. of Germany, and Heribert Wagner, Pfeffingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 737,442, Nov. 1, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,345
Claims priority, application United Kingdom, Nov. 6, 1975, 46034/75
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **11 Claims**

1. A method of reducing free fatty acid concentration in the blood of an animal in need of such treatment, comprising administering to said animal a therapeutically effective amount of a compound of the formula I



I

wherein
R_1 is lower alkyl, cycloalkyl having 3 to 4 carbon atoms, phenylalkyl of 8 to 10 carbon atoms or 1-adamantyl, and
R_2 is hydroxymethyl, carboxyl or lower alkoxycarbonyl, or a pharmaceutically acceptable acid addition salt thereof.

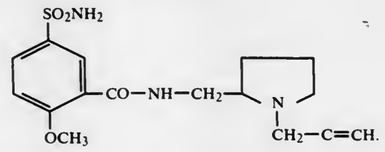
4,189,495

2-METHOXY-BENZAMIDE DERIVATIVES

Jean-Pierre Kaplan, Le-Plessis-Robinson; Bernard M. Raizon, Vigneux-sur-Seine; Daniel C. L. Obitz, Orsay; Philippe M. J. Manoury, L'Hay-les-Roses; Henry Najer; Maurice Jalfre, both of Paris, and Don P. R. L. Giudicelli, Fontenay-sous-Bois, all of France, assignors to Synthelabo, Paris, France

Division of Ser. No. 749,282, Dec. 10, 1976, Pat. No. 4,158,060, which is a continuation of Ser. No. 641,180, Dec. 16, 1975, Pat. No. 4,021,567. This application Oct. 4, 1978, Ser. No. 948,556
Claims priority, application France, Oct. 14, 1974, 74 31334; Dec. 18, 1974, 74 41718; Japan, Nov. 13, 1975, 7534570
Int. Cl.[2] C07D *207/08;* **A61K** *31/40*
U.S. Cl. 424—274 **3 Claims**

1. A compound of the formula:



2. A pharmaceutical agent capable of treating nervous and psychosomatic disorders which comprises an effective amount of the compound of claim 1 for treating said nervous and psychosomatic disorders and a compatible pharmaceutically acceptable carrier.

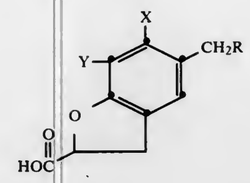
4,189,496

2,3-DIHYDRO-5-THIENYLMETHYL AND FURYLMETHYL-6-SUBSTITUTED AND 6,7-DISUBSTITUTED-BENZOFURAN-2-CARBOXYLIC ACID

Edward J. Cragoe, Jr.; William F. Hoffman, both of Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 16, 1978, Ser. No. 878,503
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.[2] A01N *9/00, 9/28;* **C07D** *333/24, 307/77*
U.S. Cl. 424—275 **7 Claims**

1. A compound having the formula:



wherein
X is halo;
Y is halo, hydrogen or methyl; and
R is



or a 5 or 6 membered heterocyclic ring containing one atom of sulfur or a substituted 5 or 6 membered heterocyclic ring containing one atom of sulfur wherein the substitutent is halo or methyl, and
the nontoxic pharmaceutically acceptable salt, ester and amide derivative thereof.

4,189,497

METHOD OF TREATING ARTHRITIC DISEASE

John W. Hanifin, Suffern, and Adolph E. Sloboda, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 853,943, Nov. 22, 1977, abandoned. This application Aug. 22, 1978, Ser. No. 935,816
Int. Cl.[2] A61K *31/38*
U.S. Cl. 424—275 **4 Claims**

1. The method of inhibiting the progression of arthritis in a mammal which comprises administering to said mammal an effective amount of a compound selected from the group consisting of β-oxo-2-thiophenepropionitrile and the pharmacologically acceptable cationic salts thereof.

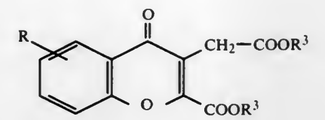
4,189,498

COMBATING PESTS WITH 2-CARBOXYMETHYL-3-CARBOXY-CHROMONES AND ESTERS

Hans-Joachim Kabbe; Paul-Ernst Frohberger, both of Leverkusen, and Peter Roessler, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,129
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731566
Int. Cl.[2] A61K *31/35;* **C07D** *311/04*
U.S. Cl. 424—283 **6 Claims**

1. A method of combating arthropods or fungi which comprises applying to the arthropods or fungi, or to a habitat thereof, an arthropodicidally or fungicidally effective amount of a compound of the formula



in which
R is hydrogen, chlorine or methoxy, and
R^3 is hydrogen or methyl.

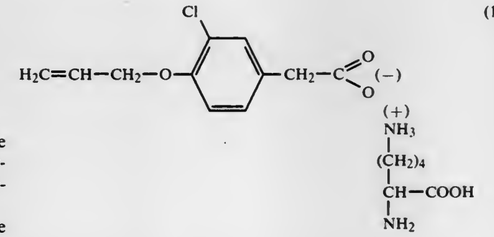
4,189,499

LYSINE 4-ALLYLOXY-3-CHLOROPHENYLACETATE AND METHOD OF ITS PREPARATION

Carlo Tosi, Milan, and Pierarturo Ferlenghi, Plan Di Arese, both of Italy, assignors to Biochefarm S.A., Switzerland

Continuation of Ser. No. 777,896, Mar. 16, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,083
Int. Cl.[2] C07C *101/04;* **A61K** *31/205*
U.S. Cl. 424—316 **4 Claims**

1. Lysine 4-allyloxy-3-chlorophenylacetate having the following structural formula:



(1)

corresponding to the empirical formula $C_{17}H_{25}O_5ClN_2$ with molecular weight 372.79.

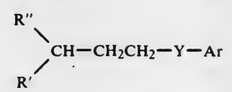
4,189,500

ARYL SUBSTITUTED DIKETONES

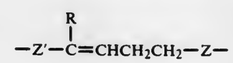
Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 740,358, Nov. 10, 1976, Pat. No. 4,093,736, which is a continuation-in-part of Ser. No. 545,486, Jan. 30, 1975, which is a continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, which is a continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Mar. 13, 1978, Ser. No. 885,353
Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73
Int. Cl.[2] C07C *49/84;* **A01N** *9/24*
U.S. Cl. 424—331 **6 Claims**

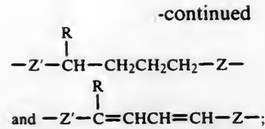
1. A compound of the formula



wherein
Y is selected from the group consisting of



-continued



R′ and R″ are lower-alkanoyl of 2 to 6 carbon atoms;
R is hydrogen or lower-alkyl of 1 to 4 carbon atoms;
Z is a single bond, vinylene only when the remainder of Y is unsaturated, or ethylene only when Y is saturated;
Z′ is a single bond, methylene or ethylene; and
Ar is benzyloxyphenyl.

4,189,501

COMPOSITION AND METHOD FOR THE TREATMENT OF ACNE

James E. Fulton, Jr., Key Biscayne, Fla., assignor to A. H. C. Pharmacal, Inc., Miami, Fla.

Filed Oct. 7, 1977, Ser. No. 840,339
Int. Cl.² A61K *31/075;* C11D *9/50*
U.S. Cl. 424—338 **18 Claims**

1. A composition, comprising a dispersion of about 10 weight % of benzoyl peroxide in an aqueous solution containing about 20 volume % glycerol to inhibit decomposition of said peroxide, said composition being effective in the treatment of acne.

4,189,502

MARSHMALLOW VARIEGATE FOR FROZEN CONFECTIONS AND FROZEN CONFECTIONS CONTAINING SAME

Irving H. Rubenstein, Owings Mills, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Nov. 15, 1977, Ser. No. 851,761
Int. Cl.² A23G *9/00, 9/02*
U.S. Cl. 426—249 **16 Claims**

1. A marshmallow variegate composition for frozen desserts and the like consisting essentially of:
a. about 40% to 50% by weight of sugar solids;
b. about 1 to 3% by weight of a component which provides to the composition the extensibility characteristic of marshmallow;
c. about 0.2 to 0.8% by weight of an emulsifier having an HLB number of from 3 to 9;
d. about 0.2 to 0.5% by weight of stabilizers from the group consisting of edible gums and gelatin; and
e. the balance being water and flavoring.

4,189,503

METHOD OF DEGERMINATING A KERNEL OF GRAIN BY SIMULTANEOUSLY COMPRESSING THE EDGES OF THE KERNEL

James R. Giguere, Kansas City, Mo., assignor to Cereal Enterprises, Inc., Kansas City, Mo.

Filed May 26, 1978, Ser. No. 909,974
Int. Cl.² B02C *9/02, 9/04*
U.S. Cl. 426—482 **13 Claims**



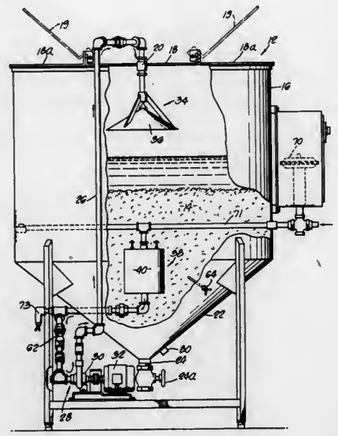
1. A method of degerminating a kernel of grain such as corn having relatively large side surfaces and relatively thin side edges, said method comprising subjecting the kernel to a compressive crushing force applied substantially simultaneously to two opposed side edges in a direction generally toward the center of the kernel while substantially avoiding the application of any crushing force to said side surfaces, the crushing force applied to said edges being of sufficient magnitude to fracture the endosperm portion of the kernel while maintaining the germ portion in a substantially whole condition.

4,189,504

METHOD OF COOKING FOODS

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Continuation of Ser. No. 846,183, Oct. 27, 1977, abandoned, which is a division of Ser. No. 619,837, Oct. 6, 1975, abandoned. This application Jan. 12, 1979, Ser. No. 2,896
Int. Cl.² A23L *1/01, 1/20*
U.S. Cl. 426—508 **3 Claims**



1. A method of cooking discrete particles of corn comprising the steps of:
(a) providing a cooking vessel having an upper, lower and intermediate region;
(b) immersing the corn particles to be cooked in water contained in said vessel to form a homogeneous mass in which each corn particle is surrounded by water;
(c) introducing water at the upper region of said cooking vessel and deflecting said water radially outwardly therewithin, circulating the water throughout the homogeneous mass and removing water from the lower region of said cooking vessel;
(d) providing within the intermediate region of said cooking vessel a steam chamber having a steam inlet and perforated side walls, said side walls being adapted to maintain the corn particles in a spaced relationship with said steam inlet;
(e) introducing live steam into said steam chamber through said steam inlet and directing said steam into the homogeneous mass by deflecting said steam radially outwardly through said perforated side walls of said steam chamber to uniformly raise the temperature of said homogeneous mass and gently agitate the particles of corn;
(f) stopping the flow of live steam into the homogeneous mass when the temperature of the water within said cooking vessel is raised to between approximately 170° F. and approximately 180° F.;
(g) stopping the circulation of water; and then
(h) separating the particles of corn from the water and removing said particles from the vessel proximate the lower region thereof.

4,189,505

PORK-LIKE FLAVORANT AND PROCESS FOR PREPARING SAME

Arthur J. Mosher, Marysville, Ohio, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 25, 1978, Ser. No. 872,247
Int. Cl.² A23L *1/231*
U.S. Cl. 426—533 **23 Claims**

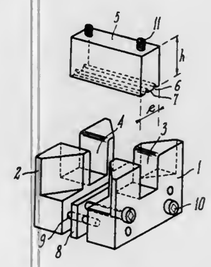
1. A flavorant for imparting a pork-like flavor to foodstuffs, comprising the product obtained by reacting at an elevated temperature in an edible liquid reaction medium a mixture of
(a) a source of amino acid,
(b) a lower aliphatic mercaptocarboxylic acid or a salt thereof, and
(c) oleoresin sage;
said mixture containing from about 5 to about 300 parts by weight of amino acid source per part by weight of mercaptocarboxylic acid and from about 0.005 to about 0.3 part by weight of oleoresin sage per part by weight of mercaptocarboxylic acid, said mixture further being substantially free from added monosaccharide.

4,189,506

ADJUSTMENT OF THE QUANTITY OF IMPREGNATING OR COATING MATERIAL

Georges Chiron, and Maurice R. Giles, both of Chambery, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 20, 1977, Ser. No. 862,502
Claims priority, application France, Dec. 21, 1976, 76 38465
Int. Cl.² B05D *3/12*
U.S. Cl. 427—8 **7 Claims**



1. A method of adjusting the quantity of viscous matter used for impregnating or coating strand or like linear material comprising drawing the impregnated or coated linear material through a treatment zone, subjecting the material so drawn to a succession of compression and decompression steps within the treatment zone so as to cause plastic deformation to the viscous matter, each of said compressions being effective to retard the flow of excess viscous matter, and draining from the treatment zone excess viscous matter so retarded during said decompression steps.

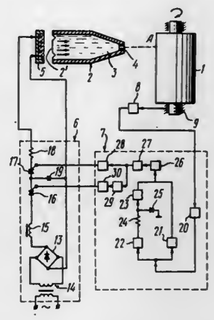
4,189,507

METHOD FOR BALANCING ROTORS

Anatoly A. Gusarov, and Lev N. Shatalov, both of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia, Moscow, U.S.S.R.

Continuation of Ser. No. 668,786, Mar. 19, 1976, abandoned, which is a division of Ser. No. 540,665, Jan. 13, 1975, Pat. No. 3,968,769. This application Oct. 21, 1977, Ser. No. 844,266
Int. Cl.² B05D *3/14*
U.S. Cl. 427—47 **7 Claims**

1. A method of balancing a rotor comprising rotating a rotor having a light point area requiring balancing, detecting vibration of said rotor during rotation indicating unbalance thereof, transducing vibration of said rotor during rotation, indicating unbalance thereof, into an electrical signal, feeding the signal along a first path when exceeding a first threshold value, feeding the signal along a second path when exceeding a second threshold value, producing output signals only in the presence of signals at the outputs of said two paths, generating current pulses from said output signals, feeding said pulses to an electromagnetic inductor to produce a pulsed magnetic field related to the vibration of said rotor, applying the magnetic field to a magnetically responsive material to produce an induced pulse force on said magnetically responsive material acting in a longitudinal direction, displacing said magnetically responsive material in said longitudinal direction in proportion to the magnitude of the applied magnetic field, and applying force in said longitudinal direction to a fast-hardening liquid balancing material in contact with the magnetically responsive material by the longitudinal displacement of said magnetically responsive material for discharging a quantity of said fast-hardening liquid balancing material in said longitudinal direction through a nozzle onto said rotor at the light point area thereof under the controlled action of the pulsed magnetic field to balance said rotor.

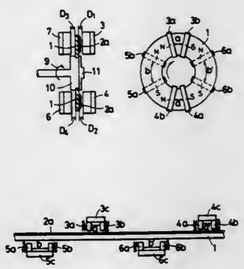


4,189,508

PROCESS FOR THE PREPARATION OF MAGNETIC RECORDING MEDIUM

Katsuyoshi Chiba, Hachioji; Yoshiki Kato, Hinodemachi; Teruo Tsunoda, Nanpeidaimachi; Hajime Fukke, Inagi; Teruaki Kobayashi, Hachioji; Heigo Ishihara, Kokubunji; Waichi Nagashiro, Hachioji, and Munehisa Mitsuya, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 18, 1978, Ser. No. 943,123
Claims priority, application Japan, Sep. 22, 1977, 52/113348
Int. Cl.² H01F *10/02*
U.S. Cl. 427—48 **9 Claims**



1. A process for the preparation of magnetic recording medium comprising applying a magnetic coating material composed of a ferromagnetic fine powder dispersed in a high molecular binder onto the surface of a front side of a nonmag-

netic support member to form a coating layer thereon, and applying a magnetic field of at least greater than the coercive force of said ferromagnetic fine powder over a predetermined length of said coating layer while said support member is moved in a predetermined direction of said coating layer before said coating layer is dried, using magnet pairs, each consisting of two magnets having N pole and S pole at their ends to face to said support member, thereby to magnetically orient said ferromagnetic fine powders in said coating layer, wherein a plurality of sets of magnet pairs are arrayed on both the front and back sides of said support member in a deviated manner by a predetermined distance in the moving direction of said support member such that said magnet pairs will not face to each other, the poles of the magnet pairs arrayed on both the front and back sides of said support member are so arrayed that the neighboring poles of adjacent magnet pairs, on the same side of the support member, are of the same polarity, and a magnetic field is applied by the magnet pairs in such a manner that the magnetic field applied to said coating by the magnet pairs arrayed on the front side of said support member is greater than the magnetic field applied to said coating by the magnet pairs arrayed on the back side of said support member, thereby satisfying the requirement,

$$Do \leqq a, b$$

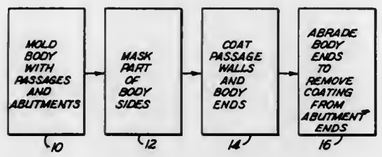
wherein Do represents a distance between the surface of said support member and said magnet pairs, a an average distance between the magnets constituting said magnet pairs arrayed on the front side of said support member, and b an average distance between the magnets constituting said magnet pairs arrayed on the back side of said support member.

4,189,509

RESISTOR DEVICE AND METHOD OF MAKING

David C. Hill, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1976, Ser. No. 721,729
Int. Cl.[2] H01C *17/06, 17/28*
U.S. Cl. 427—102 **13 Claims**



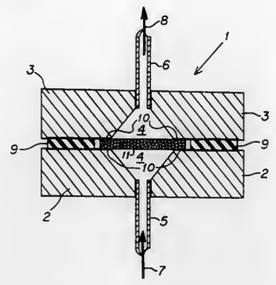
1. A method for making a compact resistor device comprising the steps of providing a body of resistor material of positive temperature coefficient of resistivity having a plurality of passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the passages, having abutments of the resistor material extending around respective ends of alternate ones of the passages at one end of the body, and having abutments of the resistor material extending around respective ends of the others of said passages at the opposite end of the body, coating the inner walls of the passages with an electrically conductive material in ohmic contact relation to the resistor material, coating said one end of the body with an electrically conductive material around the abutments at said one body end for electrically interconnecting the ohmic contact coatings in said other passages at said one body end, and coating said opposite body end with an electrically conductive material around the abutments at said opposite body end for electrically interconnecting the ohmic contact coatings in said alternate body passages at said opposite body end.

4,189,510

REPLACEMENT PLATING PROCEDURE FOR SILVER ON NICKEL

James A. McIntyre; Robert F. Phillips, both of Midland, and Joseph D. Lefevre, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,587
Int. Cl.[2] B05D *1/18;* **C23C** *3/00;* **C23F** *1/00*
U.S. Cl. 427—125 **10 Claims**



1. Two-step procedure for replacement plating silver on at least the interior surface areas of a porous nickel substrate body comprising:

as the first step, etching the surface areas of the porous nickel body over which silver plate is to be laid with an aqueous solution of a mineral acid capable of removing oxide deposits from the nickel on bare elemental nickel on said surface areas to activate same; then subsequently and

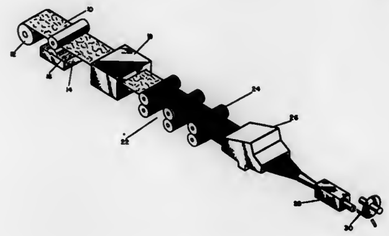
as the second step, contacting the activated nickel surface areas with an aqueous plating solution of a silver salt capable of laying silver plate by displacement of nickel in the substrate and replacement thereof with silver from the solution.

4,189,511

FILTER

William E. Levers, Cumberland, Md., and Charles H. Keith, Charlotte, N.C., assignors to Celanese Corporation, Charlotte, N.C.

Continuation of Ser. No. 627,588, Oct. 31, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,708
Int. Cl.[2] B32B *3/30, 23/10*
U.S. Cl. 428—167 **3 Claims**



1. An intermediate product adapted for use in the manufacture of improved cigarette filters comprising a web of polyolefin filaments and a dried flexing fracturable film of cellulose acetate, said film coating one surface of said web; said web being comprised of a random stereo reticulated array of filaments produced by causing successive portions of the filaments of said web to be looped about and laid down over preceding filament portions, substantially all of said web having a total denier of about 25,000 to about 120,000 and a surface area of from about 0.1 to about 2.0 square meters per gram, said intermediate product having a pattern configuration impressed into at least one surface thereof.

4,189,512

STAPLE FIBRE WEBS

Peter M. Ellis, and Alan Selwood, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 785,941, Apr. 8, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,518
Claims priority, application United Kingdom, Apr. 8, 1976, 14360/76; Apr. 6, 1977, 14552/77
Int. Cl.[2] B32B *7/14*
U.S. Cl. 428—198 **8 Claims**



1. A highly ordered staple fibre web comprising a major proportion of synthetic thermoplastic fibres and having a fibre direction coherence of at least 1.0 g/cm per g/m^2, a cross fibre direction coherence of less than 0.2 g/cm per g/m^2 and a tweezer separation distance of at least 5 cm.

4,189,513

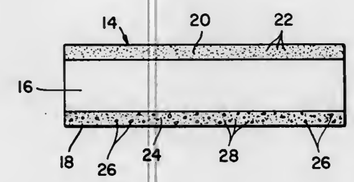
Patent Not Issued For This Number

4,189,514

PROCESS OF MAKING HIGH-TEMPERATURE MAGNETIC TAPE

Robert A. Johnson, Graham, Tex., assignor to Graham Magnetics, Inc., Ft. Worth, Tex.

Filed Mar. 17, 1978, Ser. No. 887,545
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—331 **6 Claims**



1. In a helically-spoolable magnetic tape comprising a substrate, a magnetic recording medium of the type comprising magnetic particles in an organic resin matrix on one face of the said substrate, and anti-static coating on the reverse side of said substrate, the improvement wherein said anti-static coating is formed with a thoroughly crosslinked organic resin binder system containing at least 50% prepolymerized polyester-type polyurethane, and comprising dispersed within said binder an effective quantity of a conductive filler from about 10 to 30% by weight of pyrogenic silica and from about 0.5 to about 3% of a silicone-oil based lubricant such weights based on the weight of organic resin binder, said anti-static coating forming an interface with said magnetic recording medium, said interface providing a means to allow unspooling of the spooled tape without any substantial damage thereto after exposure of the tape to elevated temperature.

3. In a magnetic tape of the type comprising a substrate, an anti-static backing coat, and a face coat comprising ferromagnetic particles in an prepolymerized polyesterurethane resin coating, the improvement wherein said anti-static backing comprises, in addition to a pre-polymerized polyurethane based binder system and a primary filler forming means to dissipate static electricity, (1) a silicone-oil based lubricant and (2) an effective quantity of pyrogenic silica forming means to absorb any excessive lubricant and limit the migration thereof to the surface of said coating said anti-static backing coat forming an interface with said face coat, said interface providing means to allow release of said backing coat from said face coat after exposure to elevated temperatures.

4,189,515

PARTICULATE EXPANDABLE STYRENE POLYMERS HAVING SHORT MINIMUM MOLDING TIMES

Harro Voss; Rolf Moeller; Rupert Schick, all of Ludwigshafen, and Erhard Stahnecker, Ziegelhausen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 28, 1975, Ser. No. 572,421
Claims priority, application Fed. Rep. of Germany, May 13, 1974, 2423071
Int. Cl.[2] B32B *27/08*
U.S. Cl. 428—407 **5 Claims**

1. Particulate expandable styrene polymers having diameters of from 0.1 to 6 mm, having short minimum molding times and coated with from 0.005 to 0.5% by weight, based on the expandable styrene polymer, or a urethane melting below 150° C. and obtained by

I reaction of

(a) aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic and aromatic isocyanates with

(b) linear or branched monoalcohols of from 2 to 24 carbon atoms,

the ratio of NCO groups to the total number of hydroxyl groups being from 0.25 to approximately 1:1; or

II reaction of

(a) linear or branched aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic or aromatic chlorocarboxylates of from 2 to 24 carbon atoms in the alcohol radical, with

(b) aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic and aromatic amines,

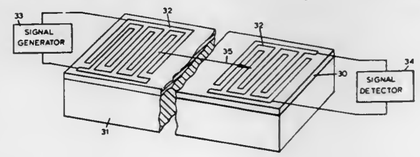
the ratio of amino groups in the amines to chlorocarboxylates being from 2:1 to 1:1.

4,189,516

EPITAXIAL CRYSTALLINE ALUMINIUM NITRIDE

Peter M. Dryburgh, Dalkeith, and Raymond R. Halstead, Edinburgh, both of Scotland, assignors to National Research Development Corporation, London, England

Filed Jul. 17, 1978, Ser. No. 925,351
Int. Cl.[2] C04B *35/58, 35/10;* **H01L** *41/10*
U.S. Cl. 428—409 **4 Claims**



1. Material suitable for a surface acoustic wave device comprising an epitaxial film of aluminum nitride on the surface of a substrate of single crystal aluminum oxide, said surface having the crystallographic orientation 1$\bar{1}$00.

4,189,517

LOW-SHRINK IN-MOLD COATING

Henry Shanoski, Akron, and Donald F. Reichenbach, Massillon, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 8, 1978, Ser. No. 958,771
Int. Cl.² B32B *9/04, 27/40*
U.S. Cl. 428—423.7 **6 Claims**

1. A laminate comprising an adherent, thermoset, in-mold coating composition in-mold coated onto a thermoset glass fiber polyester resin substrate, said coating composition comprising essentially the reaction product of:

(a) an unsaturated aliphatic polyester fumarate diol having an average molecular weight of from about 1,500 to 4,500 and from about 8 to 30 internal aliphatic carbon-to-carbon double bonds,

(b) a saturated aliphatic polyester diol flexibilizer having an average molecular weight of from about 1,500 to 3,000, (b) being present in a minor molar amount as compared to (a),

(c) an aliphatic crosslinking polyol having from 3 to 6 hydroxyl groups and an average molecular weight of from about 92 to 1,000,

(d) a diisocyanate selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, 4,4'-diphenyl methane diisocyanate, 4,4'-dicyclohexyl methane diisocyanate, polymeric forms of TDI, MDI and hydrogenated MDI, xylene diisocyanate, isophorone diisocyanate and hexamethylene diisocyanate and mixtures thereof, said diisocyanate being present in an amount by weight sufficient to provide from about 50 to 120% of the stoichiometric amount of —NCO groups required to react with all of the active hydrogen atoms in said coating composition, and

(e) an ethylenically unsaturated monomer selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene, methyl methacrylate, acrylamide, acrylonitrile, methyl acrylate and mixtures thereof, said monomer being present in an amount sufficient to copolymerize with and crosslink said unsaturated polyester, in admixture with

(f) from about 2 to 20 parts by weight of polyvinyl acetate per 100 parts by weight of said total coating composition.

4,189,518

CURED POLYMERIC COATING MATERIAL, COATED SUBSTRATE, AND PROCESS OF FORMING

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 714,167, Aug. 13, 1976, Pat. No. 4,101,487, which is a division of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, Pat. No. 4,073,788, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application May 1, 1978, Ser. No. 901,871
Int. Cl.² B32B *27/34;* **B05D** *3/02, 5/12*
U.S. Cl. 428—458 **18 Claims**

1. A cured polymeric film material comprising a long chain highly cross-linked aromatic polymer film, said polymer comprising imide groups, amide groups and amine groups and being substantially free of carboxyl groups.

4,189,519

HEAT SEALABLE RESIN BLENDS

William G. Ticknor, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 30, 1978, Ser. No. 938,226
Int. Cl.² C08L *23/08*
U.S. Cl. 428—476 **28 Claims**

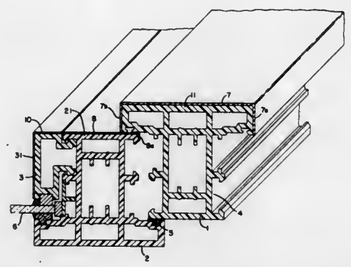
1. A resin blend for producing a peelable heat seal between substrates on which it is carried, comprising: (a) about 50 to 90 weight percent of a copolymer of about 80 to 96 weight percent ethylene and about 20 to 4 weight percent of an ethylenically unsaturated ester; and (b) about 50 to 10 weight percent of a crystalline, isotactic polybutylene having a melt index of about 0.4 to 20, said blend having a heat sealing temperature of about 160° to 300° Fahrenheit, as determined at the sealing jaws, and affording a peel strength of about 0.3 to 3 pounds between resin blend layers heat sealed at said heat sealing temperatures.

4,189,520

SHAPED STRUCTURAL MEMBERS HAVING IMPROVED LIGHTFASTNESS AND WEATHERPROOFNESS

Peter Gauchel, Alzenbach, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 400,020, Sep. 24, 1973, abandoned. This application Nov. 11, 1977, Ser. No. 850,829
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246497
Int. Cl.² B32B *17/08*
U.S. Cl. 428—520 **28 Claims**



1. A process for the production of shaped structural channel-forming members of extrudable thermoplastic synthetic resins for use in the assembly of window frames and like frame assemblies with a surface coating layer having improved weathering characteristics as compared to the surface of the synthetic resin, said coating layer exhibiting improved lightfastness and weatherproofness, which comprises providing a thin coating layer directly onto at least the side of the shaped member to be exposed to outside ambient conditions, of a polymeric material selected from the group consisting of a polymethyl methacrylate homopolymer, a methyl methacrylate copolymer and mixtures thereof, said thin coating layer being provided directly on said shaped member by co-extrusion of said polymeric material simultaneously with extrusion of the shaped member.

4,189,521

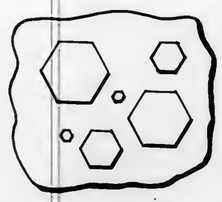
EPITAXIAL GROWTH OF M-TYPE HEXAGONAL FERRITE FILMS ON SPINEL SUBSTRATES AND COMPOSITE

Howard L. Glass, Orange; Frederick S. Stearns, Placentia, and David M. Heinz, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 5, 1977, Ser. No. 812,862
Int. Cl.² C04B *35/00*
U.S. Cl. 428—539 **11 Claims**

1. A composite comprising:

a monocrystalline nonmagnetic spinel substrate having a lattice constant in the range from 8.309Å to 8.381Å, and



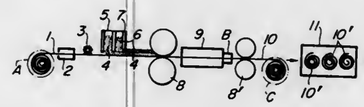
a film of hexagonal ferrite selected from the group consisting of M-type and W-type epitaxially disposed on said substrate.

4,189,522

MULTI-LAYER SLIDING MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Division of Ser. No. 704,034, Jul. 9, 1976, Pat. No. 4,121,928. This application Dec. 8, 1977, Ser. No. 858,874
Claims priority, application Japan, Aug. 8, 1975, 50-96325
Int. Cl.² B22F *5/00*
U.S. Cl. 428—557 **16 Claims**



1. Multi-layer bearing material consisting of a steel plate or a plated steel plate as backing material and two layers of sintered metal powder that is, first or intermediate boundary layer and second or surface alloy layer and said metal powder being laid one after another on and cold compacted and then sintered so as to be bonded to the backing material: wherein said second layer comprises aluminum as a main component and additives of 2 to 40 weight percent in total of the densely worked second layer and consisting of one or more of solid lubricant selected from a group consisting of metal sulphides, metal oxides, metal fluorides, graphite and so on and metal lubricant of low melting point such as Sn, Pb, and mixtures thereof and said additives being substantially uniformly dispersed in the matrix of the sintered aluminum alloy of the second layer in the form of small irregular, partly extended, multi-sided grains; and said first layer contains either aluminum alone or aluminum as a main component and further contains some additive or additives in the second layer but in an amount by less weight percent than that contained in the second layer.

4,189,523

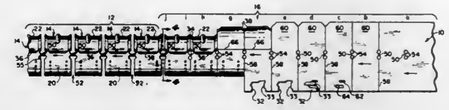
SHEET METAL FASTENER ASSEMBLY AND METHOD OF FORMING THE SAME

Kenneth C. Pearson, Glenview, Ill., assignor to Hartco Company, Lincolnwood, Ill.

Filed May 11, 1978, Ser. No. 904,746
Int. Cl.² A47C *31/02*
U.S. Cl. 428—571 **7 Claims**

1. An elongated unitary assembly of sheet metal clips embodying a series of identical clips disposed in side-by-side relationship with the side edges of each pair of adjacent clips in the series opposing each other in slightly spaced apart relationship so as to provide a gap between adjacent clips and a narrow longitudinally expanded deformed reduced thickness web bridging the gap and serving to maintain such adjacent clips in their spaced apart relationship, said webs, collectively, rendering the assembly flexible for coiling in involute fashion by reason of their reduced thickness.

6. The method of forming a unitary flexible assembly of clips from a longitudinally grained elongated sheet metal strip, said method including the steps of subjecting said strip to interrupted linearly straight slitting operations which divide the



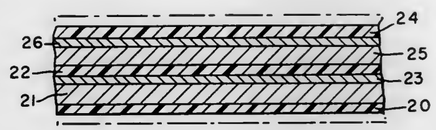
strip into a series of contiguous clip blanks having at least one narrow unslitted connecting portion therebetween, fashioning the clips in situ from the blanks and thereafter deforming the unslitted connecting portions, thereby causing longitudinal elongation thereof so as to spread adjacent fashioned clips apart and establish a narrow gap therebetween.

4,189,524

STRUCTURE FOR MULTILAYER CIRCUITS

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique, Paris, France

Filed Apr. 29, 1977, Ser. No. 792,210
Claims priority, application France, May 6, 1976, 76 13553
Int. Cl.² G23P *3/00;* **B32B** *13/06*
U.S. Cl. 428—622 **8 Claims**



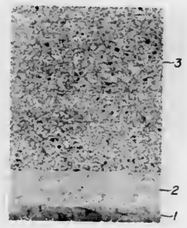
1. A multilayer circuit adapted to withstand temperature elevations of up to 450° C. consisting essentially of a plurality of thin alternating conductive layers stacked with intervening thinner insulating layers of refractory material, said alternating layers being deposited one atop the other, each of the thin conductive layers in turn comprising between a lower thinner insulating layer and an upper thinner insulating layer a thin composite layer consisting of a first layer of a first conductive material of low resistivity and appreciable thermal expansion at said elevated temperatures selected from the group consisting of copper, aluminum, silver, gold and their alloys, and at least one thinner second conductive layer of a second conductive material directly contacting said first layer and being of appreciably higher resistivity and virtually negligible thermal expansion at said elevated temperatures and selected from the group consisting of chromium, beta titanium, vanadium and their alloys or from that formed by nickel and beta cobalt doped with the first material and/or a complementary material which inhibits their magnetic properties, the crystallographic references of said first and second conductive materials being intrinsically and/or epitaxially compatible as regards crystal lattices and crystal size.

5. A multilayer device adapted to withstand temperature elevations up to 450° C. without substantial risk of formation of short-circuits between thin conducting layers thereof separated by thinner intervening insulating layers, consisting essentially of a plurality of thin conductive layers stacked with intervening thin layers of insulating refractory material, each conductive layer comprising a composite of a first layer and a second conductive layer, said first layer having a relatively low resistivity and appreciable thermal expansion coefficient and having one face in contact with one face a first thin insulating material layer and its other face in contact with said second layer, said second layer being a thinner layer of a conductive

material having a relatively high resistivity, a negiligible thermal expansion coefficient and having a crystalline structure closely compatible to the crystalline structure of the first layer as regards lattices and crystal sizes and said second layer being in contact with one face of a second thin insulating material layer.

4,189,525
BEARING METAL FOR LARGE ENGINES
Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 795,331, May 9, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,997
Claims priority, application Japan, Nov. 15, 1977, 52-54620
Int. Cl.[2] B32B *15/00, 15/20*
U.S. Cl. 428—643 **7 Claims**

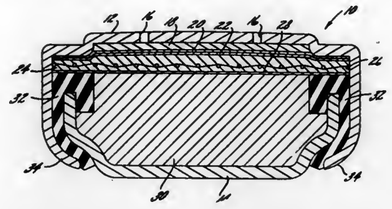




1. A bearing metal for large engines consisting of three layers, a steel backing layer, an aluminum or aluminum alloy middle layer, and a bearing alloy layer; wherein the composition of the bearing alloy layer consists essentially of more than 50% and up to 65% by weight of tin, up to 0.5% by weight of copper and the remainder substantially being aluminum and the said bearing alloy having a hardness at high temperatures exceeding 100° C. lying between that of aluminum-tin bearing alloys which contain up to 50% by weight of tin and that of tin base or lead base white metal bearing alloys.

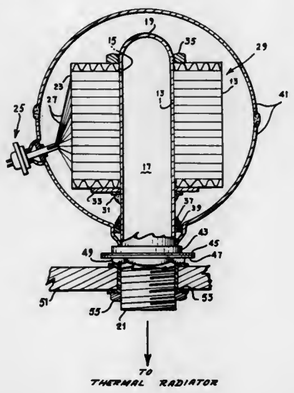
4,189,526
METAL/OXYGEN CELLS AND METHOD FOR OPTIMIZING THE ACTIVE LIFE PROPERTIES THEREOF
John W. Cretzmeyer, Richfield, Minn., and Hans R. Espig, Barrington, Ill., assignors to Gould Inc., Rolling Meadows, Ill.
Filed May 5, 1978, Ser. No. 902,151
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—13 **12 Claims**

1. A gas depolarized electrochemical cell comprising a cell casting having means allowing oxygen ingress therein at a level capable of sustaining a current in excess of 800 microamps, an anode and a cathode disposed in the casing, a separator interposed between said anode and cathode, an electrolyte positioned on the anode side of the separator, an oxygen distribution means providing oxygen across at least the majority of the cathode area, and an oxygen diffusivity-limiting membrane positioned between said cathode and said oxygen distribution means, said membrane limiting oxygen ingress to the cathode



to less than the level required to sustain a current of 800 microamps.

4,189,527
SPHERICAL HEAT PIPE METAL-HYDROGEN CELL
Steven J. Stadnick, Redondo Beach, and Howard H. Rogers, Culver City, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 17, 1979, Ser. No. 4,244
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—26 **5 Claims**

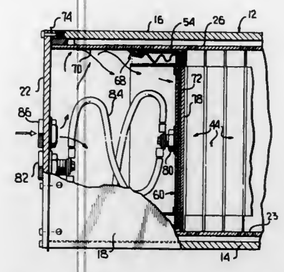


1. A metal-hydrogen cell having superior thermal control and minimum weight to strength ratio, said battery comprising a spherical pressure vessel having an open lower portion, a central heat pipe vertically disposed in said pressure vessel and electrically isolated therefrom, said heat pipe being fixedly positioned in said pressure vessel and including a threaded lower portion extending downward through the opening in said pressure vessel, a stack of positive and negative electrodes positioned in said pressure vessel around said central heat pipe, said positive plates being electrically, mechanically and thermally connected to the outer wall of said heat pipe, said negative electrodes having terminals at the outer edge of said stack connected to a negative terminal extending through the wall of said pressure vessel, and a nut threaded attached to the lower end of said heat pipe to operate as the positive terminal of the cell.

4,189,528
POWER MODULE ASSEMBLY
Ronald I. Klootwyk, San Jose, Calif., assignor to The Continental Group, Inc., New York, N.Y.
Filed Oct. 30, 1978, Ser. No. 955,565
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—70 **12 Claims**

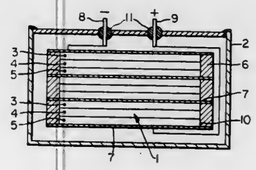
1. In an assembly of the type including an elongated housing,

a plurality of expendable members arranged in stacked relation longitudinally within said housing; a pressure applying device for maintaining said stacked members in constant pressure contact with each other, said pressure applying device comprising a pressure member for applying a constant pressure to the stack, an expandable member secured to said pressure



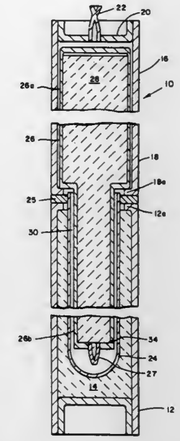
member at one end and to said housing at the opposite end thereof and in combination therewith defining a sealed expansible chamber, said pressure member having a peripheral housing extending therefrom remote from said expendable members, said expandable member having an intermediate portion gathered within said peripheral housing, and means for introducing a fluid under pressure into said chamber.

4,189,529
HIGH TEMPERATURE SECONDARY CELLS
Denis C. P. Birt; Colin R. Feltham; Graham Hazzard, all of Bournemouth, and Leonard J. Pearce, Broadstone, all of England, assignors to National Research Development Corporation, London, England
Filed Mar. 22, 1978, Ser. No. 889,085
Claims priority, application United Kingdom, Mar. 24, 1977, 12464/77
Int. Cl.[2] H01M *4/36*
U.S. Cl. 429—103 **20 Claims**



1. A high temperature secondary cell having:
a. an anode pellet comprising a lithium alloy and an alkali halide electrolyte material including a lithium halide;
b. an electrolyte pellet comprising said alkali halide electrolyte material and an inert immobilizer selected from the group consisting of magnesia and boron nitride;
c. a cathode pellet comprising said alkali halide electrolyte material and an active material selected from the group consisting of iron sulphide, iron disulphide and titanium disulphide;
d. an electrically insulating, inert tube within which the above-mentioned pellets are arranged, the inert tube fitting closely around said pellets; and
e. a respective electrical contact plate for each electrode pellet, said contact plates bounding the cell at each end and extending beyond the inner peripheral surface of the inert tube.

4,189,530
SODIUM INSERT CONTAINER FOR A SODIUM-SULFUR CELL AND METHOD
Stephan P. Mitoff, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Sep. 25, 1978, Ser. No. 945,620
Int. Cl.[2] H01M *6/20*
U.S. Cl. 429—104 **6 Claims**



1. In an improved sodium sulfur cell including means forming a sulfur compartment, means forming a sodium compartment including a main compartment connected to a hollow solid electrolyte separator tube with a closed end extending into said sulfur compartment means, the improvement comprising a reservoir insert container for sodium disposed within said sodium compartment forming means and including a closed-end hollow tubular portion extending into said separator tube, said reservoir tubular portion being spaced apart from said separator tube so that a chamber is formed therebetween, a solid sodium body filling said insert container, an open port communicating with said solid sodium body, said port permitting flow of molten sodium from the interior of said reservoir insert container into said chamber at the temperature at molten sodium.

4,189,531
NA/S REACTANT CONTAINER WITH PROTECTIVE RESIN COATING
Robert R. Dubin, Charlton, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Oct. 26, 1978, Ser. No. 954,961
Int. Cl.[2] H01M *2/32*
U.S. Cl. 429—104 **11 Claims**

1. An improved sodium-sulfur battery having an electrically conducting aluminum surface subject to corrosive attack by the sulfur electrode, the improvement comprising
said aluminum surface coated with a thin layer of a cured phenolic or poly(arylacetylene) polymer containing from about 3 to 50 weight percent of electrically conducting carbonaceous particles.

4,189,532

BATTERY ELECTRODE WITH EXPANDER

Hans-Joachim Golz, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,053

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736750

Int. Cl.² H01M *4/62*

U.S. Cl. 429—215 **4 Claims**

1. A negative electrode for lead storage batteries containing an expander wherein

the expander is present in the electrode in the form of particles which are provided with an encapsulation, the material of which dissolves over the life of the storage battery.

4,189,533

STIPPLED SUBSTRATE FOR PRESSED BATTERY PLATES

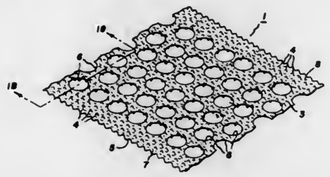
Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 825,046, Aug. 16, 1977, Pat. No. 4,105,832, which is a continuation of Ser. No. 577,419, May 14, 1975, abandoned, which is a continuation of Ser. No. 413,589, Nov. 7, 1973, abandoned. This application May 9, 1978, Ser. No. 904,269

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.² H01M *10/30*

U.S. Cl. 429—223 **6 Claims**



1. An electrolytic cell having a casing; a plurality of alternating positive and negative plates in said casing, at least one of said plates comprising

a. a thin conductive sheet with opposed major surfaces and having continuous uninterrupted edges,

b. an array of spaced perforations extending through said sheet, intermediate said uninterrupted edges,

c. an array of continuous, relatively smooth, closely spaced bosses in said sheet intermediate said edges and said perforations, each said boss comprised of a projection extending from one of said said surfaces, said bosses in said array forming a pattern of alternating projections and recesses in each said surface intermediate said edges and intermediate said perforations, said bosses and said perforation being dimensioned at said surfaces such that the ratio of the cross-sectional dimensions of said perforations to said bosses is substantially greater than 1,

d. a paste comprised of a binder and active material substantially covering said surfaces between said edges and extending through said perforations;

a separator disposed between said positive and negative plates; and

an electrolyte in said casing.

4,189,534

CELL CULTURE MICROCARRIERS

David W. Levine, Somerville; William G. Thilly, Cambridge; Daniel I. C. Wang, Belmont, all of Mass., and Jason S. Wong, Toledo, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 740,993, Nov. 11, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,696

Int. Cl.² C12B *3/00;* **C12K** *9/00*

U.S. Cl. 435—2 **20 Claims**

1. In a method of growing anchorage-dependent cells in microcarrier culture, the improvement of employing microcarriers having an amount of positively charged chemical moieties thereon adjusted to provide an exchange capacity which allows good growth of said cells, said exchange capacity being within the range of between about 0.1 and about 4.5 meq/gram of dry, untreated microcarriers.

4,189,535

SERUM CELL GROWTH PROMOTING MATERIALS

Stephen K. Dinka, Washington Crossing, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 21, 1978, Ser. No. 935,217

Int. Cl.² A01N *1/02*

U.S. Cl. 435—2 **11 Claims**

1. A composition comprising material suitable for promoting cell growth, said material prepared by a method which comprises

(1) contacting serum at a pH in the range of about 8 to 11 with an anion exchanger while the temperature is maintained below about 5° C. to adsorb growth-promoting material thereon, and

(2) eluting said growth-promoting material from the anion exchanger with a gradient salt solution in the pH range of 7.0 to 7.6 or with a gradient pH solution in the range of 10.5 to 4, said elution being carried out after first washing the exchanger until the wash solution shows a low and substantially constant optical density at 280 mμ.

4,189,536

REAGENT SYSTEMS, ENZYMATIC ASSAYS AND COMPOSITIONS THEREFOR

Stanley E. Green, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,790

Int. Cl.² G01N *31/14*

U.S. Cl. 435—12 **31 Claims**

1. In a solid assaying material for assaying a specimen of biological fluid in which hexokinase catalyzes the phosphorylation of glucose and in which glucose-6-phosphate is oxidized in the presence of glucose-6-phosphate dehydrogenase, the improvement comprising said enzymes hexokinase and glucose-6-phosphate dehydrogenase bulked in a bulking agent comprising bovine serum albumin, glycine and taurine and further comprising te compound TMS.

20. A solid assaying material for assaying a specimen of biological fluid for glucose comprising a solid, water-soluble, substantially anhydrous, storage stable mixrture of adenosine triphosphate, a nicotinimide adenine dinucleotide coenzyme, activator, and the enzymes hexokinase and glucose-6-phosphate dehydrogenase bulked in TEA-TPA to provide bulked reagent.

4,189,537

PROCESS OF PRODUCING ANTIBIOTIC BL580Δ WITH *STREPTOMYCES HYGROSCOPICUS*

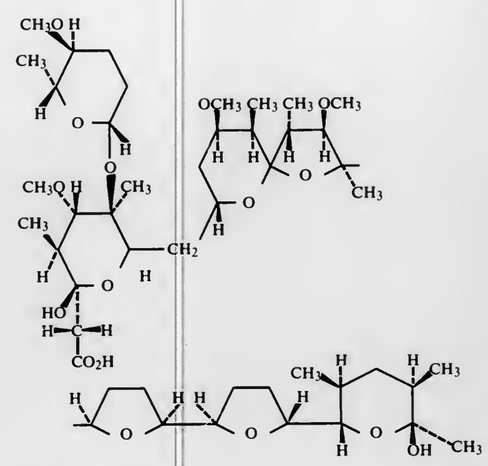
John H. E. J. Martin, New City, and Martin R. Hertz, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 756,659, Jan. 4, 1977, Pat. No. 4,138,481, which is a continuation-in-part of Ser. No. 701,395, Jun. 30, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,574

Int. Cl.² C12D *9/14*

U.S. Cl. 435—75 **1 Claim**

1. A process for the production of antibiotic BL580 Δ of the formula:



which comprises cultivating *Streptomyces hygroscopicus* NRRL 8180 or mutants thereof in an aqueous nutrient medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic conditions until substantial antibiotic activity is imparted to said medium, and then recovering antibiotic BL580Δ therefrom.

4,189,538

METHOD FOR GROWING PSEUDOMYCELIAL YEASTS AND REDUCING BACTERIAL CONTAMINATION IN A YEAST FERMENTATION PROCESS

Constance R. Corbett, White Plains, N.Y.; John A. Ridgway, Jr., LaPorte, Ind., and Helen D. Haller, Ithaca, N.Y., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 755,865, Dec. 30, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 917,896

Int. Cl.² C12B *1/00*

U.S. Cl. 435—247 **12 Claims**

1. In a continuous yeast fermentation process wherein a substrate, nutrients, and an oxygen-containing gas are fed into a fermenter containing an agitated liquid fermentation medium in which foaming of the contents occurs and wherein said yeast forms a pseudomycelial variant, the improvement comprising continually withdrawing foam from the top of the fermenter at a rate sufficient to reduce the concentration of single-cell yeast which preferentially reside therein in order to promote growth of the pseudomycelial variant in the liquid phase and recovering cells enriched in said pseudomycelial variant from said liquid phase.

4,189,539

REACTION PRODUCT OF AN EPOXIDE AND A POLYALKYLENEPOLYAMINE IN BEAD FORM AND A METHOD FOR PREPARING SAME

Eldon L. Ward, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 28, 1978, Ser. No. 919,882

Int. Cl.² C08G *59/02*

U.S. Cl. 521—25 **17 Claims**

1. A method for preparing a normally solid reaction product of a polyamine of an aliphatic, alicyclic or aromatic hydrocarbon or an inertly substituted aliphatic, alicyclic or aromatic hydrocarbon having three or more reactive amino hydrogens and a polyfunctional epoxide, in the form of beads, the method comprising the steps of (1) dispersing a blend of the polyamine and the polyfunctional epoxide in a reaction medium of a concentrated aqueous solution of alkali metal hydroxide and (2) maintaining the dispersed blend at conditions sufficient to cure the blend to discrete, spheroidal beads of the reaction product.

4,189,540

PROCESS FOR PRODUCING CATION EXCHANGE MEMBRANE BY IMPREGNATING A DIENE MONOMER HAVING CARBOXYLIC ACID GROUPS INTO A FLUORINATED MEMBRANE HAVING CATION EXCHANGE GROUPS AND POLYMERIZING

Toru Seita; Kenji Takahashi; Shunichi Asami, and Akihiko Shimizu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jan. 18, 1979, Ser. No. 4,535

Claims priority, application Japan, Feb. 8, 1978, 53-12295

Int. Cl.² C08F *259/08, 265/02, 273/00;* **C08J** *5/22*

U.S. Cl. 521—27 **12 Claims**

1. A process for producing a cation exchange membrane which comprises impregnating a diene derivative having carboxylic acid group and/or carboxylic acid convertible group into a cation exchange membrane of a fluorinated polymer having at least one type cation exchange groups having lower acidity than that of sulfonic acid group wherein a ratio of sulfonic acid groups to total cation exchange groups on one surface (A surface layer) is higher than that of the other surface (B surface layer); performing a partial polymerization of the diene derivative and dipping the resulting membrane into an organic solvent which is miscible with water and has a boiling point of higher than 30° C. at 760 mmHg and

heating the membrane at 50° to 180° C.;

and if the diene derivative having carboxylic acid convertible group is used, converting said groups into carboxylic acid groups.

4,189,541

METHOD FOR PRODUCING HEAT RESISTANT AND FLAME RESISTANT POLYISOCYANURATE FOAMS USING LITTLE OR NO ORGANOSILICONE SURFACTANT

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Katsuhiko Arai, Higashi-Murayama; Akira Suzuki, Hidaka; Minoru Kojima, Ohme; Yoshiko Taniguchi, Higashi-Murayama; Masako Yoshida, Kodaira, and Ryozo Sakata, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,238

Int. Cl.² C08G *18/14*

U.S. Cl. 521—110 **12 Claims**

1. In a method for producing a polyisocyanurate foam by reacting an organic polyisocyanate together with a blowing agent and a catalyst for trimerizing isocyanate, the improvement which comprises using no organosilicone surfactant or adding an organosilicone surfactant in a ratio of less than 0.2% by weight based on the organic isocyanate to form a polyisocyanurate foam having excellent heat resistance and

flame resistance, wherein said organosilicone surfactant is selected from the group consisting of organosiloxanepolyoxyalkylene copolymers and polyalkenylsiloxanes having a polyoxyalkylene side chain.

4,189,542

PROCESS FOR THE PRODUCTION OF FOAM MOLDINGS HAVING AN IMPERVIOUS OUTER SKIN USING SEMI-PREPOLYMER PREPARED FROM ISOCYANATES SUCH AS ISOPHORONE DIISOCYANATE

Helmut Kleimann, Leverkusen; Holger Meyborg, Odenthal-Gloebusch; Hans-Jürgen Lienert, Cologne, and Gerhard Grögler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,303

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737670

Int. Cl.² C08G *18/14*

U.S. Cl. 521—124 **15 Claims**

1. In a process for the production of weather-resistant rigid molded foams based on polyurethanes having a dimensional stability under heat according to DIN 53 432 of at least 70° C. and a compact surface, a cellular core and an integral density distribution throughout the cross-section of the moldings, comprising foaming a foamable reaction mixture of polyisocyanates, polyhydroxyl compounds, blowing agents and, optionally, other isocyanate-reactive compounds, activators and other auxiliaries in a closed mold under the conditions of in-mold foaming, the improvement wherein the polyisocyanates used are reaction products containing isocyanate groups and urethane groups, said reaction products formed by reacting a diisocyanate containing at least one cycloaliphatically bound isocyanate group and no more than one aliphatically bound isocyanate group with sub-stoichiometric quantities of organic polyhydroxyl compounds in the presence of catalyst combinations of amidine catalysts and organometallic compounds.

4,189,543

CATALYST FOR MAKING POLYURETHANES

George A. Doorakian, Bedford; Lawrence G. Duquette, Maynard, both of Mass., and Philip W. McGraw, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1978, Ser. No. 935,233

Int. Cl.² C08G *18/20;* **G08G** *18/14*

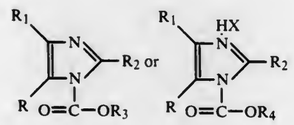
U.S. Cl. 521—128 **9 Claims**

9. A composition foamable in the presence of a blowing agent at elevated temperatures comprising

(a) an organic compound bearing more than one reactive isocyanato group;

(b) an organic compound bearing more than one alcoholic hydroxyl group; and

(c) a catalyst to catalyze the reaction between (a) and (b), said catalyst corresponding to the formula



I

II

wherein R, R_1, and R_2 are each independently H, hydrocarbyl or an inertly-substituted hydrocarbyl; R_3 and R_4 are each independently hydrocarbyl or an inertly-substituted hydrocarbyl; and X is an anion.

4,189,544

POLYISOCYANURATE POLYMERS PREPARED USING CARBAMATE MODIFIER

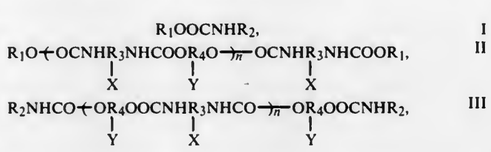
Edward J. Thompson, Watertown, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1979, Ser. No. 13,426

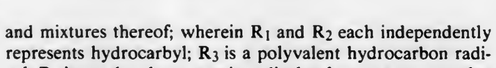
Int. Cl.² C08G *18/14, 18/18*

U.S. Cl. 521—128 **14 Claims**

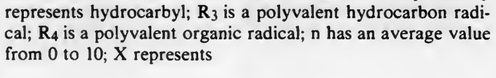
1. In a polymer in which the major recurring unit is isocyanurate which polymer comprises the reaction product obtained by bringing together an aromatic polyisocyanate, and a trimerization catalyst, the improvement which comprises incorporating into the polymer a minor amount of a carbamate modifier selected from the group consisting of



I

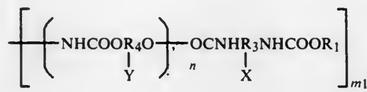


II

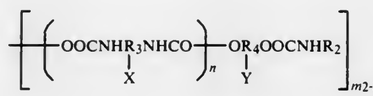


III

and mixtures thereof; wherein R_1 and R_2 each independently represents hydrocarbyl; R_3 is a polyvalent hydrocarbon radical; R_4 is a polyvalent organic radical; n has an average value from 0 to 10; X represents



and Y represents



wherein n is defined above, and m_1 and m_2 represent the valencies of R_3 and R_4 respectively.

4,189,545

SILICONE FOAM COMPOSITION WHICH HAS BURN RESISTANT PROPERTIES

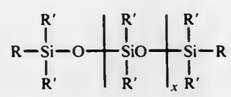
Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,186

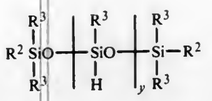
Int. Cl.² C08J *9/12*

U.S. Cl. 521—131 **23 Claims**

1. A silicone foam composition useful as a burn resistant material comprising (a) 100 parts by weight of a base vinyl-containing polymer of the formula,



where R and R′ are selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, aryl radicals, vinyl radicals and fluoroalkyl radicals of 3 to 8 carbon atoms, such that the polymer contains from 0.0002 to 3% by weight vinyl and x varies such that the vicosity of the polymer varies from 100 to 1,000,000 centipoise at 25° C.; (b) from 0 to 200 parts by weight of a filler; (c) from 100 to 15,000 parts per million by weight of water; (d) from 1 to 50 parts by weight of a hydride polymer of the formula,



where R^2 is selected from the class consisting of hydrogen, alkyl radicals of 1 to 8 carbon atoms and aryl radicals, and fluoroalkyl radicals of 3 to 8 carbon atoms, and R^3 is selected from the class consisting of alkyl radicals and aryl radicals of up to 8 carbon atoms, where the hydride polymer has a hydrogen content varying from 0.3 to 1.6% by weight and y varies such that the polymer has a viscosity varying from 5 to 100 centipoise at 25° C., where also there is at least 0.2 moles of the SiH per mole of water, and (e) from 1 to 250 parts per million of a platinum catalyst.

4,189,546

POLYSILOXANE SHAPED ARTICLE FOR USE IN BIOMEDICAL APPLICATIONS

William G. Deichert, Macedon, N.Y.; Kai C. Su, Arlington, Tex., and Martin F. van Buren, Webster, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 878,831, Feb. 21, 1978, Pat. No. 4,153,641, which is a continuation-in-part of Ser. No. 818,783, Jul. 25, 1977, abandoned. This application Dec. 5, 1978, Ser. No. 964,761

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.² C08G *77/04*

U.S. Cl. 528—26 **22 Claims**

1. A fillerless, hydrolytically stable, biologically inert, transparent, oxygen transporting, polymeric, shaped article for use in biomedical applications other than as contact lenses comprising a poly(organosiloxane) monomer α,ω terminally bonded through divalent hydrocarbon groups to polymerized, free radical polymerizably activated, unsaturated groups forming a homopolymer in a cross-linked network.

4,189,547

HYDROCARBON-DERIVED RESINS OF PIPERYLENE AND METHYL BRANCHED TERTIARY OLEFIN HYDROCARBONS BLENDED WITH OTHER HYDROCARBON RESINS

Robert A. Osborn, Stow, and Herbert L. Bullard, Norton Village, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 680,395, Apr. 26, 1976, Pat. No. 4,098,983, which is a continuation of Ser. No. 506,387, Sep. 16, 1974, abandoned. This application Apr. 13, 1978, Ser. No. 895,904

Int. Cl.² C08L *7/00, 9/06, 23/18, 53/02*

U.S. Cl. 525—99 **4 Claims**

1. An admixture comprised of 100 parts by weight hydrocarbon derived resin and about 100 to about 200 parts by weight of a rubber selected from at least one of natural rubber and synthetic rubber; where said synthetic rubber is selected from at least one of butadiene/styrene copolymers, isoprene/styrene copolymers and rubbery cis 1,4 addition homopolymers of 1,3-butadiene or isoprene and where said hydrocarbon derived resin is characterized by having a softening point in the range of about 5° C. to about 20° C. and a viscosity in the range of about 1000 to about 40,000 at about 25° C. which is the product of (i) polymerizing, in the presence of an inert diluent and a catalyst selected from at least one of boron trifluoride and boron trifluoride etherate derived from boron trifluoride and an ether having 2 to 6 carbon atoms, a mixture which consists essentially of (A) about 45 to about 65 weight percent piperylene and, correspondingly, about 55 to about 35 weight percent of at least one methyl branched tertiary monoolefin selected from at least one of the group consisting of 2-methyl-1-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 2,3-dimethyl-1-butene, and 2,3-dimethyl-2-butene and, optionally, (B) up to about 10 parts by weight per 100 parts by weight of said piperylene/branched olefin monomer mixture of at least one of piperylene dimers, piperylene trimers or other unsaturated hydrocarbons selected from the group consisting of 3-methyl-2-pentene, isoprene, and cyclic unsaturated hydrocarbons selected from cyclopentene, cyclohexene and 1,3-cyclopentadiene and (ii) steam stripping the product to remove light oil-like products, unreacted hydrocarbons and diluent.

4,189,548

EPOXY RESIN COMPOSITION

Takeshi Sakashita, Iwakuni, and Ryoichi Miyamoto, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,967

Claims priority, application Japan, Sep. 13, 1977, 52-109419

Int. Cl.² C08L *63/00*

U.S. Cl. 525—109 **31 Claims**

1. An epoxy resin composition comprising

(A) a novel copolymer produced by polymerizing a polymerizable material selected from the group consisting of

(a) substituted or unsubstituted dicyclopentadiene,

(b) a cationically polymerizable unsaturated hydrocarbon-containing fraction obtained by distilling a cracking or reforming product of a petroleum and having a boiling point in the range of −20° C. to 280° C.,

(c) a cationically polymerizable vinyl aromatic hydrocarbon having 8 to 10 carbon atoms,

(d) a mixture of two or three of ingredients (a), (b) and (c), and

(e) a mixture of any one of ingredients (a) to (d) with a cationically polymerizable unsaturated aliphatic hydrocarbon having 4 to 10 carbon atoms

in the presence of a cationic polymerization catalyst with a high-boiling product having a boiling point of at least about 150° C. and an oxygen content of at least 0.5% by weight being introduced into the polymerization system at any stage of the polymerization process or into the resulting polymer, the said high-boiling product being obtained as a residue, comprising a mixture of by-products, in a process comprising oxidizing a benzene or naphthalene ring-substituted with at least one isopropyl group to convert it to the corresponding hydroperoxide, decomposing the hydroperoxide with an acid to produce the corresponding phenol or naphthol, and separating the phenol or naphthol from the resultant reaction mixture to obtain said residue comprising a mixture of said by-products;

(B) a polyepoxy compound; and

(C) a curing agent.

4,189,549

POLYESTER RESIN COMPOSITION

Hiroomi Matsunaga, Kobe; Yukikazu Uemura, Amagasaki; Teruo Saito, and Hiroshi Ishida, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,327

Claims priority, application Japan, Jun. 30, 1976, 51-78092; Jun. 30, 1976, 51-78093

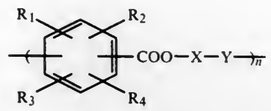
Int. Cl.² C08L *67/02, 69/00*

U.S. Cl. 525—439 **2 Claims**

1. A polyester resin composition comprising 1 to 99% by weight of an aromatic polyesyter produced by polycondensing para-hydroxybenzoic acid or a functional derivative thereof (I), 2,2-bis(4′-hydroxyphenyl)propane or a functional derivative thereof (II), a terephthalic acid or a functional derivative thereof (III) and/or isophthalic acid or a functional derivative thereof (IV) in a molar ratio of (I):(II)=1:100 to 100:1 and (II):(III) and/or (IV)=1:10 to 10:1, and

99 to 1% by weight of a 4,4-dihydroxydiarylalkane polycarbonate having an average molecular weight of 5,000 to 100,000 or a polyalkylene phenylene ester and/or a polyalkylene phenylene ester ether, said polyalkylene pheny-

lene ester and polyalkylene phenylene ester ether having the following formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and are each hydrogen, an alkyl having 1 to 6 carbon atoms, a halogen, an alkoxy having 1 to 6 carbon atoms, an alkoxycarbonyl having 2 to 6 carbon atoms, cyano, amino, sulfonyl, nitro or phenoxy; X is a divalent aliphatic hydrocarbon group having 1 to 10 carbon atoms; Y is —COO— or —O—; and n is 30 to 500.

4,189,550

ANTISTATIC AGENTS FOR THERMOPLASTIC SYNTHETIC RESINS

Werner Schwarze, Frankfurt; Wolfgang Merk, and Volker Binder, both of Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheindeanstalt vormals Roessler, Frankfurt and Henkel & Cie GmbH, Dusseldorf-Holthausen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 653,834, Jan. 30, 1976, Pat. No. 4,070,531. This application Jul. 27, 1977, Ser. No. 819,342

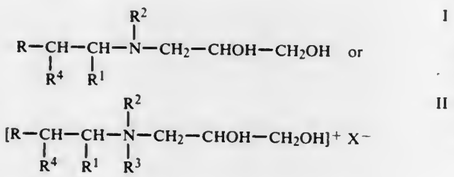
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2504054

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] C08K *5/17, 5/19*

U.S. Cl. 525—6 **48 Claims**

1. A composition consisting essentially of a thermoplastic synthetic resin containing as the sole antistatic agent an antistatically effective amount of a compound having the formula



I

II

where R and R^1 are alkyl groups in which the sum of the carbon atoms in the two alkyl groups is 4 to 30 carbon atoms, with the proviso that not over one of R and R^1 can be hydrogen,

R^2 is hydrogen, lower alkyl with 1 to 5 carbon atoms, 2-hydroxyethyl, 2-hydroxypropyl, 2,3-dihydroxypropyl, benzyl, methylbenzyl, chlorobenzyl, bromobenzyl, C_2 to C_6 aminoalkyl, C_1 to C_6 alkylamino C_2 to C_6 alkyl, 2-hydroxyethylamino C_2 to C_6 alkyl, 2-hydroxypropylamino C_2 to C_6 alkyl, or 2,3-dihydroxypropylamino C_2 to C_6 alkyl,

R^3 is hydrogen or alkyl of 1 to 5 carbon atoms,

R^4 is hydrogen or hydroxy, and

X^- is a monovalent inorganic or organic acid group or one equivalent of a polybasic inorganic or organic acid group.

4,189,551

PROCESS FOR REDUCING ADHESIONS DURING SUSPENSION POLYMERIZATION

Subhash V. Gangal, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,918

Int. Cl.[2] C08F *14/26*

U.S. Cl. 526—74 **4 Claims**

1. In the suspension polymerization of tetrafluoroethylene in an aqueous medium to obtain precipitated polytetrafluoroethylene in the presence of an ionic initiator, which comprises carrying out said polymerization at a temperature of between about 50° C. and 100° C. and at a pressure of between about 10×10^5 and 50×10^5 Pa, the improvement which comprises reducing formation of adhesions by employing in the aqueous medium an aliphatic, substantially non-telogenic carboxylic acid selected from the class consisting of malonic acid, succinic acid, adipic acid, citric acid, acetic acid and formic acid, said acid being present in an amount between 25 and 2500 ppm, based on weight of water present.

4,189,552

METHOD FOR PREPARING VINYL CHLORIDE POLYMERS

Satoshi Kuwata; Kinya Ogawa, and Kazuhiko Kurimoto, All of Ibaragi, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 721,887, Sep. 9, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,581

Claims priority, application Japan, Sep. 11, 1975, 50/110158

Int. Cl.[2] C08F *14/06*

U.S. Cl. 526—84 **6 Claims**

1. A method for the preparation of a polymer product by the polymerization of vinyl chloride or a monomer mixture composed mainly of vinyl chloride in an aqueous medium which comprises adding a first portion of a chain transfer agent selected from the group consisting of alcohols and carboxylic acids each having at least one mercapto group into the polymerization mixture before the conversion of said monomer or said monomer mixture reaches 1%, said first portion being 1.0 to 50% of the total amount of said chain transfer agent, and adding a second portion of said chain transfer agent to said polymerization mixture when the conversion of said monomer or said monomer mixture is between about 1% and 30%, the total amount of said chain transfer agent being in the range of between about 0.001% and 0.5% by weight based on the weight of said monomer or monomer mixture.

4,189,553

HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Donald F. Birkelbach, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,354, Dec. 1, 1976. This application Jun. 2, 1978, Ser. No. 911,741

Int. Cl.[2] C08F *4/52*

U.S. Cl. 526—92 **8 Claims**

1. A process for the polymerization of an α-olefin under the conditions characteristic of Ziegler polymerization wherein a catalytic reaction product of (A) a complex of a trivalent titanium halide with water or an organic electron donor selected from alcohols having 2–8 carbon atoms, ethers having 2 to 20 carbon atoms, ketones having 3–20 carbon atoms, amines having 1–20 carbon atoms, olefins having 2–20 carbon atoms and mixtures thereof, (B) an organomagnesium component selected from (1) an organomagnesium compound or (2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in hydrocarbon, said organomagnesium compound and said complex being represented respectively by the following formulas

MgR_2 and $MgR_2.x\,MR_y$

wherein each R is independently a hydrocarbyl group having from 1 to 8 carbon atoms, M is a metal selected from Al, Zn, Si, Sn and P, y is the number of hydrocarbyl groups and corresponds to the valencey of M and x is about 0.001 to 10 and (C) a halide source selected from (1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or an organic group at least as active as sec-butyl and does not poison the catalyst and X is halogen or (2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group *3a* or *4a* of Mendeleev's Periodic Table of Elements, R is a monovalent organic radical, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y; provided that the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Ti is within the range which is from about 1:1 to about 2000:1, either B, C or a mixture thereof contains aluminum or an aluminum trialkyl or an aluminum alkyl halide is added separately such that the atomic ratio of Al:Ti is within the range from about 0.1:1 to about 2000:1, the atomic ratio of Mg:X is within the range from about 0.01:1 to about 1:1 is employed as a polymerization catalyst.

4,189,554

MAGNESIUM REDUCING AGENT PREPARED IN ABSENCE OF COMPLEXING DILUENT MILLED WITH ORGANOALUMINUM

Oscar D. Nowlin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 686,605, May 14, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,815

Int. Cl.[2] C08F *4/66, 10/02*

U.S. Cl. 526—125 **16 Claims**

1. A process comprising:

reacting an organic halide of the formula RX or $R'X_2$ wherein X is a halogen atom, R is an alkynyl, alkenyl, alkyl, aryl, cycloalkenyl, or cycloalkyl radical or combination thereof having 1 to 12 carbon atoms per molecule, and R' is a saturated divalent aliphatic hydrocarbon radical containing from 2 to 10 carbon atoms per molecule and magnesium metal in the absence of any complexing diluent to form a magnesium reducing agent reaction mixture containing at least 10 weight percent each of a diorganomagnesium compound and a magnesium halide, the ratio of moles of said organic halide to atoms of said magnesium being within the range of 0.25:1 to 1:0.25;

milling under intensive conditions wherein heat is generated and agglomerates are broken up using one of ball milling, rod milling, pebble milling, vibratory ball milling or colloid milling, the total magnesium reducing agent reaction mixture thus produced with an organoaluminum compound having the formula R''_2AlX wherein X is a halogen and R'' is an alkyl or aryl radical having 1 to 12 carbon atoms to give a milled cocatalyst product wherein the atom ratio of aluminum to magnesium is within the range of 0.1:1 to 4:1; and

thereafter contacting said milled cocatalyst product with a titanium tetrahalide to give a catalyst wherein said catalyst has an atom ratio of aluminum to titanium within the range of 20:1 to 10,000:1.

4,189,555

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 639,373, Dec. 10, 1975. This application Sep. 15, 1976, Ser. No. 723,514

Claims priority, application France, Dec. 23, 1974, 74 42810

Int. Cl.[2] C08F *4/48*

U.S. Cl. 526—179 **7 Claims**

1. A process for the continuous solution homopolymerization or copolymerization in a hydrocarbon solvent, initiated by an organolithium initiator, of at least one conjugated diene or of at least one conjugated diene with at least one vinyl aromatic compound in at least one reactor in which the monomers in solution in a hydrocarbon solvent are introduced continuously and from which the solution of homopolymers or copolymers formed and of unreacted monomers is also removed continuously, characterized by the fact that the polymerization reaction is carried out in a reactor of the open type at a temperature of 20° C. to 110° C. and in the presence of a deactivating system which inhibits the formation of gels and which comprises a termination agent which deactivates living macromolecules, said termination agent being a phosphoramide; the components of the deactivating system and the initiator being present in amounts such that the ratio of the deactivation velocities of the living macromolecules to the propagation velocity of the polymerization reaction is between 1×10^{-5} and 5×10^{-3}.

4,189,556

POLYMERIZATION PROCESS

Nicholas M. Karayannis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 16, 1976, Ser. No. 696,813

Int. Cl.[2] C08F *4/66, 10/06*

U.S. Cl. 526—141 **9 Claims**

1. In a process to polymerize alpha-olefins to normally-solid, substantially crystalline polymer utilizing a catalyst comprising transition metal halide and aluminum alkyl, the improvement comprising adding to such catalyst effective amounts of a pyridine, quinoline or pyridine-N-oxide substituted with a compatible electron-withdrawing group selected from the group consisting of nitro, chloro, bromo and carboxy whereby the amount of n-hexane soluble polymeric product is decreased.

4,189,557

MANUFACTURE OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOOLEFINS

Peter Klaerner, Battenberg; Klaus Bronstert, Carlsberg, and Gerhard Staiger, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,195

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722098

Int. Cl.[2] C08F *4/64*

U.S. Cl. 526—159 **17 Claims**

1. A process for the manufacture of a polymer of one or more α-monoolefins of 2 to 6 carbon atoms by polymerizing the monomer or monomers at from 30° to 200° C. under a pressure of from 0.1 to 200 bars by means of a Ziegler-Natta catalyst comprising (I) a titanium trichloride component and (II) an aluminum-alkyl component of the general formula AlR^3 or $ClAlR^2$, where R is alkyl of 1 to 8 carbon atoms, in the atomic ratio of titanium from catalyst component (I) to aluminum from catalyst component (II) of from 1:1 to 1:100, wherein the titanium trichloride component (I) employed is obtained by

(1) first moistening a catalyst component consisting entirely or substantially of titanium trichloride with a hydrocarbon mixture comprising 100 parts by volume of one or more pentanes, hexanes and/or heptanes and from 10 to 1,000 parts by volume of benzene and/or one or more alkylbenzenes which under atmospheric pressure boil at from 80° to 270° C., with the proviso that the weight ratio of catalyst component to hydrocarbon mixture used for moistening is from 1:0.5 to 1:100 and

(2) thereafter drying the catalyst component, moistened with the hydrocarbon mixture, under an inert gas with constant mechanical mixing over a period of from 0.5 to 5 hours under a pressure of from 0.90 to 1.10 bars at a temperature which is from 5 to 50° C. above the boiling point, under atmospheric pressure, of the highest-boiling hydrocarbon present in the hydrocarbon mixture employed for moistening.

4,189,558

PROCESS FOR THE PRODUCTION OF BUTADIENE-PROPYLENE COPOLYMERS

Josef Witte, Cologne; Gerd Sylvester, Leverkusen, and Gunter Marwede, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,649, Feb. 10, 1978, abandoned. This application May 18, 1978, Ser. No. 907,185

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706118

Int. Cl.[2] C08F *4/68*

U.S. Cl. 526—169.2 **3 Claims**

1. A process for producing an alternating copolymer of trans-1,4-butadiene and propylene which comprises solution copolymerization of butadiene and propylene in the presence of a catalyst consisting of a vanadyl dialkoxy halide whose alkoxy groups are branched at the 2-position to the oxygen atom and AlR_3 wherein R is alkyl having from 1 to 8 carbon atoms, the molar ratio of AlR_3 to said vanadyl dialkoxy halide being from 2:1 to 15:1.

4,189,559

MANUFACTURE OF POLYMERS IN BEAD FORM FROM WATER-SOLUBLE, ETHYLENICALLY UNSATURATED MONOMERS

Uwe Bueltjer; Dietmar Jung, both of Ludwigshafen; Hans-Uwe Schenck, Wachenheim, and Herbert Spoor, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,253

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634486

Int. Cl.[2] C08F *2/32, 2/20*

U.S. Cl. 526—203 **3 Claims**

1. In a process for the production of polymers, in bead form, of water-soluble ethylenically unsaturated monomers by forming a water-in-oil suspension of an aqueous solution containing at least one water-soluble ethylenically unsaturated monomer in an inert hydrophobic liquid organic dispersion medium and polymerizing the suspended monomer in the presence of a protective colloid and a polymerization initiator, the improvement which comprises using as protective colloid a reaction product obtained by reacting an oily or resinous polymer having a molecular weight of from 750 to 50,000 of a member selected from the groups consisting of an olefin and a diolefin having two to six carbon atoms, said polymer containing hydrogen in the allyl position, with 2 to 30% by weight, based on the oil and/or resin, of maleic anhydride, said reaction product being soluble in the inert hydrophobic liquid organic dispersion medium.

4,189,560

CROSSLINKABLE POLYMERS OF UNSATURATED IMIDES

Martin Roth, Basel; Roland Darms, and Josef Pfeifer, Both of Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 696,349, Jun. 15, 1976, Pat. No. 4,115,368. This application Jun. 21, 1978, Ser. No. 917,620

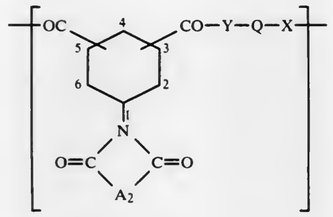
Claims priority, application Switzerland, Jun. 18, 1975, 7954/75

Int. Cl.[2] C08G *73/12, 73/14, 73/16*

U.S. Cl. 526—259 **17 Claims**

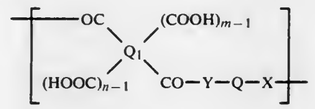
1. A crosslinkable polymer which has an average molecular weight of at least 1,000, or the corresponding cyclized imide derivative, which is characterized in that it consists of 0.5 to 100 mol % of recurring structural elements of the formula III

(III)



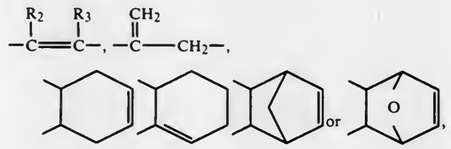
and 0 to 99.5 mol % of recurring structural elements of the formula IV

(IV)



and contains at least three structural elements of the formula III, and the —CO— groups in formula III are bonded to the benzene ring in the 2,3-, 3,4- or 3,5-position, m and n independently of one another represent the number 1 or 2,

A_2 represents a radical of the formula



R_2 and R_3 independently of one another represent hydrogen, chlorine or bromine, X and Y are both —O— or one of X and Y is —O— and the other of X and Y represents



where

R_4 is hydrogen, alkyl with 1 to 4 carbon atoms or phenyl,

Q represents an aliphatic radical with at least 2 carbon atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, and

Q_1 represents an aliphatic radical or represents a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical in which the carbonyl and carboxyl groups are bonded to different carbon atoms and the carboxyl groups are each in the ortho-position relative to a carbonyl group.

4,189,561

RESIN COMPOSITION

Gary L. Burroway, Doylestown, and Michael J. Maximovich, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 827,196, Aug. 23, 1977, Pat. No. 4,153,592, which is a division of Ser. No. 680,818, Apr. 28, 1976, Pat. No. 4,064,092, which is a continuation of Ser. No. 520,829, Nov. 4, 1974, abandoned. This application Feb. 26, 1979, Ser. No. 14,800

Int. Cl.[2] C08F *220/06, 220/46, 222/02, 222/06*

U.S. Cl. 526—317 **2 Claims**

1. A resin, suitable for use in a water reducible composition having a Ring and Ball softening point in the range of about 100° C. to about 300° C. prepared by the method which comprises free radical aqueous emulsion polymerizing, in an aqueous medium having a pH in the range of about 2 to about 7, or free radical organic solution polymerizing a monomer method which comprises, based on 100 weight percent of monomers

(A) about 60 to about 95 weight percent of at least one hard segment hydrophobic enhancing monomer selected from styrene, α-methyl styrene, acrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride,

(B) about 0 to about 35 weight percent of at least one soft segment hydrophobic enhancing monomer selected from at least one acrylate selected from methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, laural acrylate, isodecyl methacrylate, butyl methacrylate, isobutyl methacrylate, at least one vinyl ether selected from ethyl, butyl, octyl, decyl and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said dienes of monomer part (B) and said monomer part (A) vinyl chloride and vinylidene chloride are not mixed together and copolymerized, and (C) about 3 to 15 weight percent of at least one hydrophilic enhancing organic acid selected from acrylic, methacrylic, fumaric, itaconic and maleic acid.

4,189,562

POLYHYDROXY COMPOUNDS CONTAINING URETHANE ARYL SULFONIC ACID HYDROXYALKYL ESTER GROUPS

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,617

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2735032

Int. Cl.[2] C08L *81/00*

U.S. Cl. 528—75 **20 Claims**

1. A mixture of polyhydroxyl compounds containing at least two hydroxyl groups and at least one sulfonic acid ester group and having an average molecular weight of from 300 to 12,000, wherein at least one hydroxyl containing compound contains a urethane aryl sulfonic acid hydroxyalkyl ester group.

4,189,563

DRY MANNICH QUATERNARY AMMONIA SALT POLYMERS

Kenneth G. Phillips, River Forest, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 15, 1979, Ser. No. 3,069

Int. Cl.[2] C08F *6/22*

U.S. Cl. 528—493 **4 Claims**

1. A method for the preparation of solid agglomerates of quaternary modified acrylamide polymers which method comprises the steps of:

(A) preparing a water-in-oil emulsion containing polytrimethyl amino methylol acrylamide chloride;

(B) adding to said water-in-oil emulsion a water miscible organic liquid from the group consisting of acetone, methanol, ethanol and isopropanol or mixtures thereof;

(C) contacting said water-in-oil emulsion with said water miscible organic liquid in the presence of agitation whereby the polymer contained in the water-in-oil emulsion is precipated; and then,

(D) recovering solid agglomerates of polytrimethyl amino methylol acrylamide chloride.

4,189,564

NON-CRYSTALLIZING EPOXY RESIN ACCELERATOR

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,868

Int. Cl.[2] C08G *59/56*

U.S. Cl. 528—94 **11 Claims**

1. As a composition of matter, an accelerator combination for accelerating the curing of a polyglycidyl ether of a polyhydric phenol cured with an amine, said accelerator combination comprising piperazine, N-aminoethylpiperazine and an alkanolamine.

4,189,565

PROCESS FOR POLYMERIZING TRIOXANE

Akitoshi Sugio, Omiya; Akira Amemiya; Tetsuya Abe, both of Tokyo; Tomotaka Furusawa, Matsudo; Takeo Suzumori, Tokyo; Mutsuhiko Takeda, Matsudo; Masaharu Kimura, Tokyo; Yoshiharu Ohtsuki, Urawa; Katsumasa Tanaka; Toshikazu Umemura, both of Tokyo; Kiyokazu Kawaguchi, Yokkaichi, and Michio Ohba, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 20, 1978, Ser. No. 971,565

Claims priority, application Japan, Dec. 24, 1977, 52-156212

Int. Cl.[2] C08G *2/10;* **C07D** *317/0*

U.S. Cl. 528—232 **10 Claims**

1. A process for polymerizing trioxane made from an aqueous solution of methanol-containing formaldehyde by a conventional method or copolymerizing the trioxane with another monomer, comprising

cooling the trioxane to crystallize,

allowing the trioxane in a crystalline state to stand in an open system in an atmosphere of air or an inert gas to remove polyoxymethylene dimethoxide from the trioxane,

melting the trioxane, and

polymerizing the trioxane or copolymerizing the trixane with said another monomer.

4,189,566

POLYMERIZATION OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal; Otto H. Huchler, Limburgerhof, and Herwig Hoffmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,118

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801578; Jan. 17, 1978, 2801792

Int. Cl.[2] C08G *65/20*

U.S. Cl. 528—408 **10 Claims**

1. A process for the preparation of polybutylene glycol carboxylic acid diesters of the formula

$$R—CO—O—CH_2CH_2CH_2CH_2—O_nCO—R^1$$

where R and R^1 are identical or different and each is alkyl, a carboxyl-containing aliphatic radical which may or may not be ethylenically unsaturated, or a carboxyl-containing aromatic radical and n is an integer from 2 to 200, by polymerizing tetrahydrofuran, wherein the tetrahydrofuran, after removal of the catalyst used in the preparation of the tetrahydrofuran, is treated, before polymerization, with a strong mineral acid, an organic sulfonic acid, silica gel and/or a bleaching earth and is then polymerized in the presence of one or more carboxylic acids and/or carboxylic acid anhydrides and a polymerization catalyst.

4,189,567

PROCESS FOR PREPARING POWDERED RUBBER

Paul Branlard, Grenoble, and Jean-Pierre Merle, Echirolles, both of France, assignors to Distugil, Paris, France

Filed Apr. 5, 1978, Ser. No. 893,682
Claims priority, application France, Apr. 7, 1977, 77 10524
Int. Cl.[2] C08F *6/22*
U.S. Cl. 528—485 **6 Claims**

1. A process for the recovery of free-flowing powders of rubber with a mean particle size lower than 5 mm, from a latex thereof, said rubber consisting essentially of a homopolymer of butadiene, a homopolymer of chloroprene, a copolymer of butadiene with styrene, a copolymer of butadiene with acrylonitrite, or a copolymer of chloroprene with 2,3-dichloro-1,3-butadiene, comprising flocculating the latex in a flocculating bath with the aid of an aqueous solution of aluminum polyhydroxychloride while maintaining the flocculating bath at a temperature of between 70° C. and 100° C., then separating the powder from the aqueous phase and drying said powder.

4,189,568

ANTIBIOTIC PURIFICATION PROCESS

David L. Johnson, and Terrence W. Doyle, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 8, 1978, Ser. No. 875,972
Int. Cl.[2] C07H *15/24*
U.S. Cl. 536—17 A **2 Claims**

1. A process for providing the antibiotic carminomycin 1 in purified form from crude fermentation solids containing said antibiotic which comprises the consecutive steps of

(1) slurrying crude fermentation solids containing carminomycin 1 with methylene chloride and filtering said slurry to recover the filter cake;
(2) washing the filter cake with water;
(3) extracting the filter cake from step (2) with methanol and recovering a solid from the concentrated filtered extract by concentration to dryness or precipitation with an antisolvent;
(4) dissolving the solid from step (3) in equal volumes of the upper and lower phases of the solvent system consisting of methylene chloride, ethanol, carbon tetrachloride and water (2:1:2:1 v/v); said dissolution being accomplished by first dissolving the solid in a 1:1 (v/v) mixture of methylene chloride and ethanol and then adding to this solution ethanol, carbon tetrachloride, solvent upper phase of the system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v) and water in that order in an amount sufficient to provide a final solvent system as defined above;
(5) subjecting said solution of step (4) to a countercurrent distribution procedure, said procedure comprising the consecutive steps of:
(a) providing a countercurrent distribution apparatus having a plurality of packed solvent columns connected in series, said columns being packed with conventional glass or ceramic column packing material;
(b) filling all except the first column with the upper phase of the solvent system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v);
(c) filling the first column with the upper phase of the solution from step (4);
(d) dispersing the lower phase of the solution from step (4) through the columns while collecting samples of the effluent from the last column until all of the solvent has been employed;
(e) dispersing the lower phase of the solvent system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v) through the columns while collecting samples of the effluent from the last column until thin layer chromatographic analysis of the various samples and solutions in the columns indicates cessation of any significant separation of components;
(f) analyzing the samples taken and the solutions from the columns by thin layer chromatography to detect the carminomycin 1-rich solvent fractions;
(g) combining the carminomycin 1-rich solvent fractions and recovering the impure carminomycin 1 solids from said combined fractions;
(6) dissolving the solids from step (5) in chloroform:methanol (17:3) (v/v);
(7) adsorbing the solution from step (6) on silica gel which has been slurried with chloroform:methanol (17:3) (v/v) and adjusted to a pH of about 7–9; and
(8) eluting the components of the impure carminomycin 1 mixture with a solvent system consisting of chloroform:methanol (17:3) (v/v) to produce purified carminomycin 1.

4,189,569

SELDOMYCIN FACTOR 5 DERIVATIVES

Ronald E. Carney, Gurnee, and James B. McAlpine, Libertyville, both of Ill., assignors to Abbott Laboratories, Chicago, Ill.

Continuation-in-part of Ser. No. 721,615, Sep. 8, 1976, abandoned. This application Jul. 5, 1978, Ser. No. 922,134
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 536—17 R **7 Claims**

3. A compound selected from the group consisting of seldomycin factor 5 per-N-ethoxycarbamate-3′mesylate, 3′-epi-seldomycin factor 5-1, 3, 6′, 2″, 3″-penta-N-ethoxycarbamate-2′, 3′-cyclic-carbamate, 3′-epi-seldomycin factor 5-1-N-3-N-ureide and 3′-epi-seldomycin factor 5.

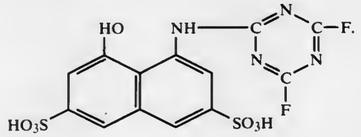
4,189,570

DIFLUORO-S-TRIAZINYLAMINO-HYDROXYNAPHTHALENE-SULFONIC ACID

Emil Bonometti, Basel, and Herbert Seiler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,762
Claims priority, application Switzerland, Oct. 21, 1976, 13307/76
Int. Cl.[2] C07D *251/44*
U.S. Cl. 544—211 **4 Claims**

1. The compound of the formula



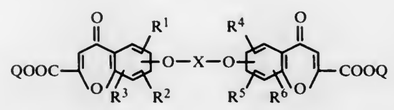
4,189,571

ESTERS OF CROMOGLYCATES

Nicholas S. Bodor, and Jack A. Zupan, both of Lawrence, Kans., assignors to Fisons Limited, London, England

Filed Feb. 7, 1978, Ser. No. 875,902
Int. Cl.[2] C07D *311/22;* **A61K** *31/35*
U.S. Cl. 542—427 **11 Claims**

1. A compound of formula I,



I

in which
R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and each represent hydrogen, halogen, hydroxy, alkyl C 1 to 6, alkoxy C 1 to 6, hydroxy-alkoxy C 1 to 6, or alkoxy C 1 to 6-alkoxy C 1 to 6,
X is a straight or branched C 2 to 10 hydrocarbon chain which may be substituted by an —OH group,

Q is a group —CHR—Z,
R is hydrogen, alkyl C 1 to 8, or phenyl,
Z is a group —O—CO—Ra, —CO—ORa or —CONRbRc,
Ra is cyclohexyl or cyclopentyl; straight or branched alkyl C 1 to 12, unsubstituted or substituted by cyclohexyl or cyclopentyl; alkenyl C 2 to 6, unsubstituted or substituted by phenyl; or, when Z is —CO—ORa, hydrogen, and
Rb and Rc, which are the same or different, are each alkyl C 1 to 12.

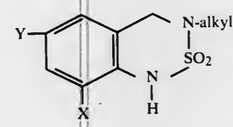
4,189,572

PREPARATION OF 1H-BENZO(2,1,3)THIADIAZINE-3,4-DIHYDRO-2,2-DIOXIDES

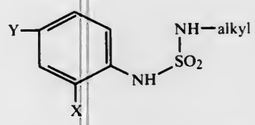
R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1978, Ser. No. 973,051
Int. Cl.[2] C07D *285/16*
U.S. Cl. 544—11 **4 Claims**

1. A method for preparing a compound corresponding to the formula



wherein an N-aryl N′-alkylsulfamide corresponding to the formula



in which alkyl represents a 1 to 4 carbon straight- or branched-chain alkyl group, X represents H, CH_3, F, Cl, Br, CF_3 or NO_2 and Y represents H, F, Cl, Br or carboethoxy is mixed with trioxane at a temperature about −20° C. to about 80° C., in the presence of an organic sulfonic acid solvent in amount sufficient to provide an acidic reaction medium together with a solubilizing amount of another organic solvent.

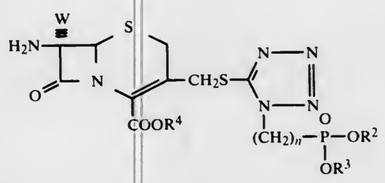
4,189,573

7-AMINO-3-(PHOSPHONOALKYL AND ESTERIFIED PHOSPHONOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 737,971, Nov. 2, 1976, Pat. No. 4,112,086. This application Aug. 14, 1978, Ser. No. 933,363
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—21 **10 Claims**

1. A compound of the formula:



in which:
W is hydrogen or methoxy;
n is one to five;
R^2 and R^3 are each hydrogen or alkyl of from one to four carbon atoms; and
R^4 is hydrogen or a protecting group.

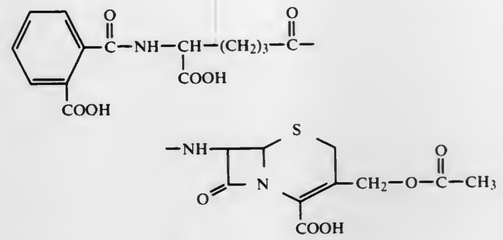
4,189,574

CEPHALOSPORIN DERIVATIVES AND PROCESS

Pierre Barthelemy, Barbery, France, assignor to Roussel Uclaf, Paris, France

Filed Sep. 7, 1978, Ser. No. 940,274
Claims priority, application France, Sep. 29, 1977, 77 29303
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—30 **6 Claims**

1. A compound selected from the group consisting of the compound of the formula



salts thereof selected from the group consisting of alkali metal, alkaline earth metal, ammonium, amine and quaternary ammonium salts.

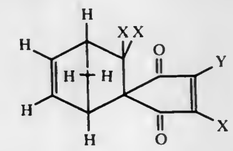
4,189,575

HALOGENATED SPIRO COMPOUNDS

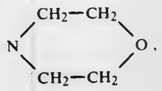
Valery V. Simonov, ulitsa Bljukhera, 14, kv. 20; Anatoly F. Anischenko, ulitsa Bljukhera, 18, kv. 48; Emilia N. Popova, ulitsa Bljukhera, 14, kv. 13; Tamara P. Dunaeva, ulitsa Bljukhera, 14, kv. 63; Raif T. Gazizov, ulitsa Mira, 23, kv. 36, and Vadim D. Simonov, ulitsa Bljukhera, 18, kv. 38, all of Ufa, U.S.S.R.

Filed Jan. 23, 1978, Ser. No. 871,454
Claims priority, application U.S.S.R., Feb. 1, 1977, 2449178
Int. Cl.[2] C07C *265/38, 49/54, 49/80, 87/45*
U.S. Cl. 544—70 **9 Claims**

1. Halogenated spiro compounds of the formula:



wherein X is Cl, Y is selected from the group consisting of Cl, p-chlorophenoxy,



and



wherein R is H, and

R_1 is selected from the group consisting of H, alkyl, alkenyl, cycloalkyl, aralkyl, aryl and m-bromophenyl.

4,189,576

PROCESS FOR MONOACYLATING WATER-SOLUBLE ORGANIC AMINO COMPOUNDS

Fritz Altorfer, Basel; Sandor Gati, Birsfelden, and Gert Hegar, Schonenbuch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,865

Claims priority, application Switzerland, Oct. 15, 1976, 13092/76

Int. Cl.² C07D *251/44*

U.S. Cl. 544—211 **8 Claims**

1. A process for the monoacylation of water-soluble aminoaryl sulfonic or carboxylic acid, with 2,4,6-trifluoro-s-triazine, which comprises introducing all reactants simultaneously and continuously in the amounts necessary for the required throughput into the reaction space and removing the resultant reaction products continuously therefrom.

4,189,577

IMIDAZOLE-ISOCYANURIC ACID ADDUCTS

Natsuo Sawa; Tadao Nomoto, both of Kagawa; Keiko Iuchi, Tokushima; Toshihiro Suzuki, Marugame, and Shunichi Kawata, Kagawa, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

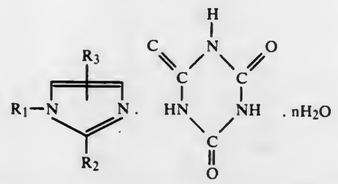
Filed Mar. 13, 1978, Ser. No. 885,948

Claims priority, application Japan, Mar. 18, 1977, 52-30886

Int. Cl.² C07D *251/30*

U.S. Cl. 544—222 **14 Claims**

1. An imidazole-isocyanuric acid adduct represented by the following formula:



wherein R_1 is a member selected from the group consisting of a hydrogen atom, a β-cyanoethyl group, a benzyl group and a β-[3,5-diamino-s-triazinyl-(1)]-ethyl group, R_2 stands for a monovalent hydrocarbon group having up to 17 carbon atoms, R_3 is a member selected from the group consisting of a hydrogen atom and an alkyl group having up to 4 carbon atoms, with the proviso that when R_1 is a hydrogen atom, R_2 is a methyl or phenyl group and R_3 is a hydrogen atom and when R_1 is a β-cyanoethyl group, R_2 is a phenyl group and R_3 is a hydrogen atom, and n is a number of from 0 to 2.

4,189,578

3-(O-HYDROXYPHENYL)-5-FORMYLHYDRAZINO-Δ^2-PYRAZOLINES

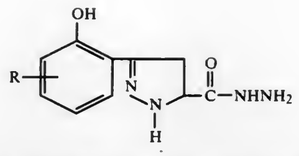
Sidney H. Levinson, Philadelphia, and Wilford L. Mendelson, King of Prussia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 948,731, Oct. 5, 1978, which is a continuation-in-part of Ser. No. 843,371, Oct. 19, 1977, Pat. No. 4,152,517. This application Mar. 1, 1979, Ser. No. 16,470

Int. Cl.² C07D *237/14, 231/06*

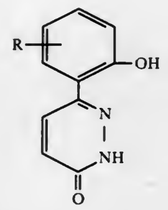
U.S. Cl. 544—239 **6 Claims**

1. The compound of the formula:



in which R is hydrogen, methyl, ethyl, methoxy, ethoxy, methylthio, halo or trifluoromethyl.

3. The method of preparing a compound of the formula:



in which R is hydrogen, methyl ethyl, methoxy, ethoxy, methylthio, halo or trifluoromethyl in which a compound of claim 1 is heated at about 170°–175° with one mole equivalent of hydrazine hydrate in the presence of base in ethylene-glycol until the reaction is complete.

4,189,579

AMINOALKYLTHIOPURINES

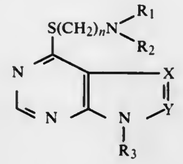
Joseph E. Dunbar, and Louis E. Begin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 799,018, May 20, 1977, Pat. No. 4,139,705. This application Nov. 20, 1978, Ser. No. 962,525

Int. Cl.² C07D *473/38*

U.S. Cl. 544—276 **2 Claims**

1. A compound of the formula



wherein n represents an integer of from 1 to 3; R_1 and R_2 represent a lower alkyl group of from 1 to about 4 carbon atoms; R_3 represents hydrogen, a lower alkyl having 1 or 2 carbon atoms, phenyl, or substituted phenyl having one or two halo substituents selected from the group consisting of chloro and bromo; and Y represents a carbon atom with its respective hydrogen and X represents nitrogen and the pharmaceutically-acceptable salts thereof.

4,189,580

PROCESS FOR THE PREPARATION OF NITRILES

Kurt Findeisen, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,599

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737210

Int. Cl.² C07C *20/00*

U.S. Cl. 544—301 **8 Claims**

1. A process for the preparation of a nitrile of the formula

$$R—(CN)_{n'}$$

wherein R represents unsubstituted alkyl or substituted alkyl substituted by chlorine, bromine, methoxy, alkoxy, nitrilo, methoxycarbonyl, or ethoxycarbonyl, unsubstituted cycloalkyl or substituted cycloalkyl substituted by chlorine, bromine, methoxy, ethoxy, nitrilo, methoxycarbonyl, ethoxycarbonyl, methyl, ethyl, propyl or isopropyl, unsubstituted aryl radical or substituted aryl substituted by chlorine, bromine, nitro, methoxy, ethoxy, nitrilo, methoxycarbonyl, ethoxycarbonyl, methyl, ethyl, propyl, isopropyl or tert.-butyl or unsubstituted 5- or 6-membered heterocyclic radical or substituted 5- or 6-membered heterocyclic radical which may additionally be fused with a benzene ring where the substituents are methyl, ethyl, chloro, bromo, nitro, methoxycarbonyl, ethoxycarbonyl or nitrile and n' represents 1 to 6 which comprises contacting a carboxylic acid of the formula

$$R—(COOH)_{n'}$$

wherein R and n' have the meanings given above with cyanogen chloride and/or cyanogen bromide at a temperature in the range of 100° to 300° C.

4,189,581

2-ACYLAMINO-4-AMINO-5-(3,4,5-TRIMETHOXYBENZYL)-PYRIMIDINES

Peter Scharwaechter, Moorrege; Klaus Gutsche, Rellingen, and Friedrich-Wilhelm Kohlmann, Moorrege, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

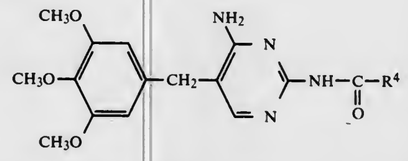
Filed Feb. 24, 1978, Ser. No. 880,884

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709634

Int. Cl.² C07D *239/48*

U.S. Cl. 544—324 **1 Claim**

1. Benzylpyrimidines of the formula I



wherein R^4 denotes hydrogen; carbalkoxy of 1 to 4 carbon atoms in the alkyl radical; alkyl of 1 to 11 carbon atoms; alkyl of 1 to 11 carbon atoms which is substituted by carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkyl radical, alkoxy of 1 to 4 carbon atoms in the alkyl radical, nitrile, amino, chlorine, phenoxy, phenoxy which is mono- or disubstituted in the phenyl radical by halogen, methyl or methoxy, or by cycloalkyl of 5 to 6 ring carbon atoms; alkenyl of 2 to 11 carbon atoms; methoxyethoxymethyl; phenyl; benzyl; phenylethyl; phenyl, benzyl or phenylethyl which is mono- to trisubstituted in the phenyl radical by halogen, methyl or methoxy; phenyl, benzyl or phenylethyl which is substituted in the phenyl radical by carboxy or carbalkoxy of 1 to 4 carbon atoms in the alkyl; cyclopropyl; cyclopentyl; cyclohexyl; tetrahydronaphthyl; cyclohexenyl; cyclopropyl, cyclopentyl, cyclohexyl, tetrahydronaphthyl or cyclohexenyl which is substituted by carboxy; adamantyl; isoxazolyl; thienyl; pyridinyl; or adamantyl, isoxazoyl, thienyl or pyridinyl which is substituted by methyl.

4,189,582

PROCESS FOR UPGRADING THE COLOR VALUE OF 3,4,9,10-TETRACARBOXYLIC ACID N,N'-BIS-METHYLIMIDE

Helmut Hoch, and Heinrich Hiller, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,332

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727484

Int. Cl.² C07D *471/06;* **C09B** *9/00;* **C09C** *3/06*

U.S. Cl. 546—37 **9 Claims**

1. A process for the manufacture of a red pigment from perylene-3,4,9,10-tetracarboxylic acid N,N'-bis-methylimide which has been obtained by methylating the corresponding diimide or by fusing naphthalic acid N-methylimide with an alkali metal hydroxide, which comprises

vatting a suspension of said N,N'-bis-methylimide with 0.5–1.5 times by weight of an alkali metal dithionite in the presence of up to 4 times by weight of an alkali metal hydroxide relative to the quantity of said ditionite, at a temperature of from room temperature to 100° C., to obtain the corresponding leuco compound,

cooling the resulting solution to 20°–40° C.,

isolating and subsequently washing said leuco compound with fresh vatting solution until the solution is virtually colorless and clear and then,

oxidizing said leuco compound.

4,189,583

SYNTHESIS OF 4A-ARYL-DECAHYDROISOQUINOLINES

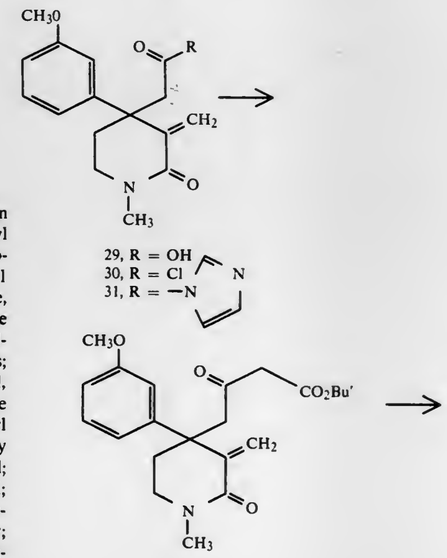
Henry Rapoport, Berkeley, Calif.; Dwight D. Weller, Champaigne, Ill., and Richard D. Gless, Oakland, Calif., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,275

Int. Cl.² C07D *211/26, 217/24*

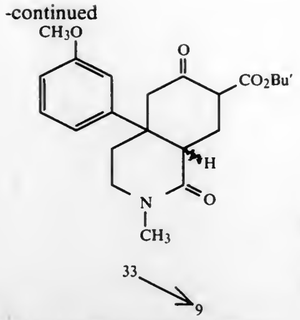
U.S. Cl. 546—141 **2 Claims**

1. In a process of preparing 4a-aryldecahydroisoquinolines the steps consisting essentially of the conversion of nipecotates to substituted methylenepiperidone and carboxylic ring formation according to the following reaction system:



32

-continued



wherein 4-carboxymethyl-4-(3′-methoxyphenyl)-1-methyl-3-methylene-2-piperidone (29) is converted to an imidazolide (31) by the action of carbonyldiimidazole in $CHCl_3$/THF and subsequently with the magnesium enolate of tert-butyl hydrogen malonate to produce tert-butyl 4-[4′-[4′-(3″-methoxyphenyl)-1′-methyl-3′-methylene-2′-oxopiperidyl]]-3-oxobutyrate (32) and this material 32 is cyclized by an alkali metal methanolate dissolved in methanol to tert-butyl 1,6-dioxo-4a-(3′-methoxyphenyl)-2-methyl-decahydroisoquinoline-7-carboxylate (33) and subsequently 33 is treated with trifluoroacetic acid in benzene and subsequent recovery by recrystallization from a benzene-hexane mixture to produce trans 1,6-dioxo-4a-(3′-methoxyphenyl)-2-methyl-decahydroisoquinoline (9).

4,189,584

PROCESS FOR THE PRODUCTION OF 2-BROMO-3-CYANO-4,6-DIAMINOPYRIDINE

Robert Portmann, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,780

Claims priority, application Switzerland, Mar. 8, 1977, 2869/77

Int. Cl.² C07D *213/57*

U.S. Cl. 546—289 **6 Claims**

1. An improved process for the production of 2-bromo-3-cyano-4,6-diaminopyridine by cyclisation of malodinitrile with hydrogen bromide, which comprises reacting malodinitrile in lower aliphatic hydrogenated hydrocarbons with hydrogen bromide used in an excess of 1 to 10% above the stoichiometric amount at temperature of $-10°$ C. to $+30°$ C.

4,189,585

PROCESS FOR THE PREPARATION OF PYRIDINE AND 2,6-LUTIDINE

Egidius J. M. Verheijen, Sittard, and Nicolaas L. G. Duys, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 567,763, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 400,668, Sep. 25, 1973, abandoned, which is a continuation of Ser. No. 203,475, Nov. 30, 1971, abandoned. This application Apr. 21, 1978, Ser. No. 898,883

Claims priority, application Netherlands, Dec. 4, 1970, 7017718

Int. Cl.² C07D *213/06*

U.S. Cl. 546—349 **5 Claims**

1. In a process for producing a mixture of pyridine and 2,6-lutidine by the catalytic demethylation of a starting material consisting essentially of α-picoline in the gaseous phase in a reaction zone with steam and at a temperature of up to 360° C., the improvement comprising, in combination:

(a) introducing α-picoline into the reaction zone and conducting said demethylation at a temperature of 250° to 360° C.,

(b) in the presence of hydrogen in an amount of 2 to 20 moles of hydrogen per mole of α-picoline and a metallic hydrogenation catalyst consisting essentially of nickel supported on silicagel, aluminum oxide or both,

(c) with from 4 to 25 moles of steam per mole of α-picoline, and,

(d) using a contact time of 0.5 to 15 seconds, to convert at least 80% of the reacted picoline into pyridine thereby producing a mixture of pyridine and 2,6-lutidine.

4,189,586

PREPARATION OF BIOTIN

Enrico G. Baggiolini, Nutley; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

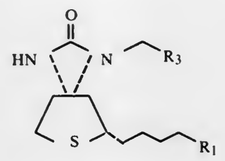
Division of Ser. No. 822,119, Aug. 5, 1977, Pat. No. 4,130,713. This application Sep. 28, 1978, Ser. No. 946,675

Int. Cl.² C07D *495/04*

U.S. Cl. 548—303 **3 Claims**

1. A compound of the formula:

IX



or the racemate thereof, wherein R_1 is methyl or $-CH_2OR_4$, where R_4 is lower alkyl or benzyl; and R_3 is aryl selected from the group consisting of phenyl, naphthyl, anthryl, phenanthryl and azulyl, said aryl being unsubstituted or substituted in one or more positions with lower alkylenedioxy, halogen, nitro, lower alkyl or lower alkoxy.

4,189,587

1,3-DIAMINOMETHYL-HYDANTOIN ADDITIVES FOR LUBRICATING OILS

Brian Holt, Stretford, and Peter I. Lee, Prestwood, Nr. Great Missenden, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,712

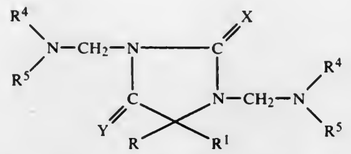
Claims priority, application United Kingdom, Apr. 5, 1977, 14344/77

Int. Cl.² C07D *233/72, 235/26;* **C10M** *1/32, 1/38*

U.S. Cl. 548—312 **6 Claims**

1. A compound of the formula IA

IA



wherein X and Y are the same or different and each is an oxygen or sulphur atom; R and R^1 are the same of different and each is hydrogen, a straight or branched chain alkyl group having from 1 to 18 carbon atoms, an alkenyl or alkynyl group having from 3 to 18 carbon atoms, cycloalkyl having from 3 to 12 carbon atoms; said cycloalkyl substituted by methyl; aryl having from 6 to 10 carbon atoms, said aryl substituted by alkyl of 1 to 4 carbon atoms, by one or two chloro groups or by alkoxy of 1 to 4 carbon atoms; aralkyl having from 6 to 10 ring carbon atoms, said aralkyl substituted by methyl, by methoxy or by one or two chloro groups; a heterocyclic residue containing from 3 to 10 ring members or R and R^1 together with the carbon atoms to which they are attached form a mono, di-or poly-cyclic ring having from 4 to 12 carbon atoms, these rings may be saturated or unsaturated, they may also be interrupted by heteroatoms; R^4 and R^5 are the same or different and each is a straight or branched alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 8 carbon atoms, a cycloalkyl group having from 3 to 6 ring carbon atoms or benzyl.

4,189,588

METHOD FOR PREPARING 6-PHENYL-TRIAZOLO OR IMIDAZOLO-(1,3,4)-BENZOTRIAZEPINES AND THE NOVEL INTERMEDIATES USED THEREWITH

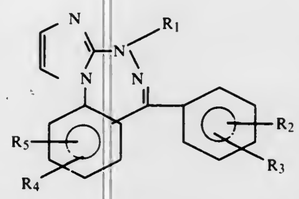
Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 818,683, Jul. 25, 1977, Pat. No. 4,144,233, and a continuation-in-part of Ser. No. 769,125, Feb. 16, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,912

Int. Cl.² C07D *487/04*

U.S. Cl. 548—324 **4 Claims**

1. A compound of the formula



wherein R_1 represents a lower alkyl or substituted lower alkyl wherein the substituent is selected from the group consisting of hydroxy, diloweralkylamino morpholino, piperidino, and pyrrolidino and R_2, R_3, R_4 and R_5 independently represent hydrogen, lower alkyl, lower alkoxy, halo, or loweralkylthio and further including pharmaceutically-acceptable salts thereof.

4,189,589

PHENYL-BENZIMIDAZOLYL-FURANES

Hans R. Meyer, Binningen, and Kurt Weber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1978, Ser. No. 876,587

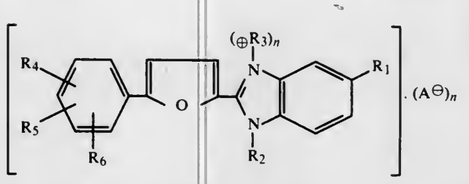
Claims priority, application Luxembourg, Feb. 22, 1977, 76819

Int. Cl.² C07D *405/04*

U.S. Cl. 548—327 **18 Claims**

1. A 2-phenyl-5-benzimidazol-2′-yl-furane of the formula

(1)



in which R_1 is a sulphonic acid group or an ester or amide thereof, a carboxylic acid group or an ester or amide thereof, a cyano group, a trifluoromethyl group or an alkyl- or aryl-sulphonyl group, R_2 is alkyl having 1 to 8 carbon atoms, alkenyl having 3 or 4 carbon atoms, cyclohexyl, hydroxyalkyl having 2 to 4 carbon atoms, alkoxyalkyl having a total of 3 to 6 carbon atoms, carboxyalkyl having 2 to 6 carbon atoms, carbalkoxyalkyl having a total of 3 to 6 carbon atoms, cyanoalkyl having 2 to 4 carbon atoms, carbamoylalkyl which has 1 to 6 carbon atoms in the alkyl moiety and is unsubstituted or substituted on the nitrogen atom by 1 or 2 alkyl having 1 to 3 carbon atoms, benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl having a total of 3 to 7 carbon atoms or phenethyl and, if n is the number 0, also hydrogen, R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, hydroxyalkyl having 2 or 3 carbon atoms, cyanoalkyl having 2 to 4 carbon atoms, carboxyalkyl having 2 or 3 carbon atoms, carbamoylmethyl which is unsubstituted or substituted on the nitrogen atom by 1 or 2 alkyl having 1 to 3 carbon atoms, alkoxycarbonylalkyl having a total of 3 to 6 carbon atoms, alkenyl having 3 or 4 carbon atoms or benzyl which is unsubstituted or substituted by chlorine or methyl, R_4 is hydrogen, chlorine, bromine, fluorine, carboxyl, carbalkoxy having a total of 2 to 5 carbon atoms, alkoxyalkoxycarbonyl having a total of 4 to 6 carbon atoms, benzyloxycarbonyl, cyano, sulpho, alkylsulphonyl having 1 to 4 carbon atoms, carbamoyl or sulphamoyl which are unsubstituted or substituted by 1 or 2 alkyl groups having 1 to 4 carbon atoms, or sulphonic acid phenyl ester or trifluoromethyl, R_5 is hydrogen, chlorine or methyl, R_6 is hydrogen or chlorine, n is the number 0 or 1 and $A^{\ominus}$ is a colourless anion equivalent to the cation of the fluorescent brightener.

4,189,590

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES—C_8 MODIFICATIONS

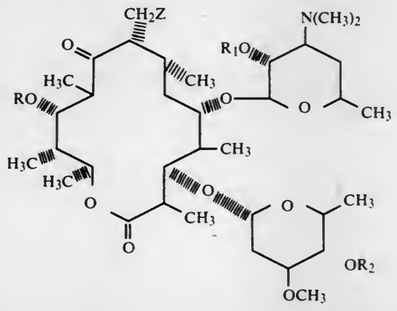
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 894,897, Apr. 10, 1978, which is a division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Jan. 4, 1979, Ser. No. 833

Int. Cl.² C07H *17/08*

U.S. Cl. 548—336 **2 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms; and

Z is imidazol-1-yl.

4,189,591

METHOD OF PREPARING 4-METHYL-5-HYDROXYMETHYL-IMIDAZOLE

Hans-Rudolf Müeller; Werner Küendig, both of Schaffhausen, and Alfred Hedinger, Thayngen, all of Switzerland, assignors to Eprova Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jan. 25, 1979, Ser. No. 6,533

Claims priority, application Switzerland, Apr. 7, 1978, 3755/78

Int. Cl.² C07D *233/64*

U.S. Cl. 548—342 **4 Claims**

1. In a method of preparing 4-methyl-5-hydroxymethyl-

imidazole by reaction of 4-methyl-imidazole with formaldehyde the improvement in the reaction conditions which comprises:

(a) an alkaline reaction medium having a pH value between 11 and approximately 13;
(b) a reactiontemperature between 20° and 60° C.; and
(c) an amount of said formaldehyde not greater than 1.5 moles per mole of said 4-methyl-imidazole.

4,189,592

PREPARATION OF 4-METHYL-5-[(2-AMINOETHYL)-THIOMETHYL]-IMIDAZOLE DIHYDROCHLORIDE

Klaus Halbritter, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 7,005

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814355

Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 **2 Claims**

1. A process for the preparation of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole dihydrochloride, wherein 4-methylimidazole, in excess aqueous concentrated hydrochloric acid, is reacted with cysteamine and formaldehyde or a formaldehyde oligomer, or with thiazolidine or bis-(N-thiazolidinyl)-methane, in a closed system, at from 110° to 170° C.

4,189,593

PROCESS FOR MAKING IMIDAZOLINES

Joseph R. Wechsler, 7621 Sheridan, Chicago, Ill. 60626; Thomas G. Baker, 3500 Forest, Wilmette, Ill. 60091; George T. Battaglini, 582 White Pine Rd., Buffalo Grove, Ill. 60090, and Frank L. Skradski, 161 Park Ave., Grayslake, Ill. 60030

Filed May 1, 1978, Ser. No. 901,712

Int. Cl.[2] C07D *233/16*

U.S. Cl. 548—352 **17 Claims**

1. A process for making a substituted imidazoline which is substantially free from diamide and which contains not more than about 2 weight percent on a total product weight basis of byproduct ester, said process comprising the steps of:

(A) contacting in an inert gaseous atmosphere under anhydrous conditions at least one methyl ester of an aliphatic monocarboxylic acid containing from about 6 to about 20 carbon atoms per molecule with aminoethyl lower alkanolamine, the initial mole ratio of said methyl ester to said aminoethyl lower alkanolamine ranging from about 1:1.1 to 1:2.0, while maintaining a temperature ranging from about 160° to 170° C. for a time at least sufficient to substantially completely convert said methyl ester into an aliphatic monoamide by elimination of methanol as a result of reaction between the ester group of said methyl ester and the primary amine group of said aminoethyl lower alkanolamine,

(B) thereafter conducting a first heating step under conditions consisting of heating the composition resulting from step (A) to a temperature ranging from about 195° to 210° C. while maintaining the reaction zone under a pressure gradually decreasing from about 140 to about 60 mm Hg over a period of time which is sufficient to substantially completely remove therefrom the theoretical water resulting from a substantially complete conversion of said monoamide into a substituted imidazoline but which time is insufficient to cause appreciable production of byproduct ester, said pressure during this heating period being continuously reduced from an initial pressure to a lower terminal pressure within the pressure range above indicated, and then conducting a

(C) second heating step of the resulting composition under conditions consisting of maintaining said resulting composition at a temperature ranging from about 200° to 175° C. under a pressure ranging from about 60 to about 20 mm Hg for a time which results in a product composition containing not more than 2 weight percent of ester and from about 0.5 to 3 weight percent of aminoethyl lower alkanol amine and not less than about 94 weight percent of substituted imidazoline on a 100 weight percent total composition basis said pressure being continuously reduced from an initial pressure to a lower terminal pressure within the pressure range above indicated, said temperature being continuously reduced from an initial temperature to a lower terminal temperature within the temperature range above indicated.

4,189,594

NOVEL DERIVATIVES OF 1,3-DIPHENOXYPROPANE-2-ON, PROCESS OF THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Helmut Grill, Vaterstetten; Roland Loser, Gauting; Josef Wagner, Grunwald, and Rainer H. Zschocke, Munich,all of Fed. Rep. of Germany, assignors to Klingepharma GmbH & Co., Munich, Fed. Rep. of Germany

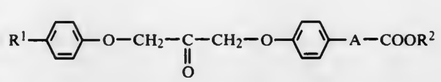
Filed Aug. 1, 1978, Ser. No. 930,087

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735856

Int. Cl.[2] C01B *25/16*

U.S. Cl. 560—53 **5 Claims**

1. A derivative of 1,3-diphenoxypropane-2-on having the formula (1)



(1)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is —Cl, —Br, $CH(CH_3)_2$, or $-C(CH_3)_3$;

A is a single bond, —CH=CH—, or $-CH_2-CH_2-$;

R^2 is hydrogen, the cation of a pharmaceutically acceptable salt or a straight or branched, saturated or unsaturated alkyl radical comprising up to three carbon atoms, which may have a methoxy group in the end position.

4,189,595

[N-BENZYL-O-(2,6-DICHLOROANILINO)PHENYL]ACETIC ACID DERIVATIVES

Ryozo Sakoda; Kazuo Nagano; Yumiko Ando, all of Funabashi; Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, all of Japan, assignors to Nissan Chemical Industries, Ltd. and Sagami Chemical Research Center, both of Tokyo, Japan

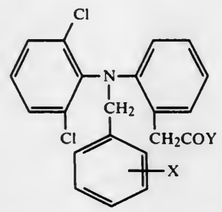
Filed Aug. 30, 1978, Ser. No. 938,252

Claims priority, application Japan, Sep. 20, 1977, 52/112210

Int. Cl.[2] C07C *153/11, 101/48, 101/50*

U.S. Cl. 560—47 **13 Claims**

1. A compound of the formula



(I)

wherein X represents H, Cl, Br or a C_1–C_4 alkyl group and Y is OH, OR or SR and R represents a C_1–C_4 alkyl group.

4,189,596

PREPARING 2-ARYLALKANOIC ACID DERIVATIVES

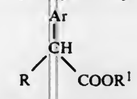
Verlan H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 777,598, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 689,366, May 24, 1976, abandoned. This application May 2, 1977, Ser. No. 792,771

Int. Cl.[2] C07C *63/52, 69/76*

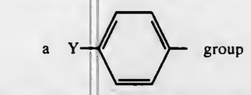
U.S. Cl. 560—105 **14 Claims**

1. Process for preparing a compound of the formula



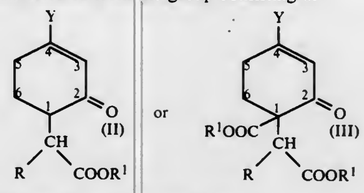
(I)

wherein R is hydrogen or C_1 to C_4-alkyl; R^1 is hydrogen, C_1 to C_6-alkyl or mixtures thereof; and Ar is



a group

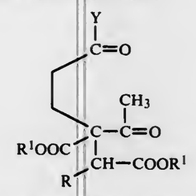
which is bonded to the alkanoic acid carbon atom adjacent to the carboxyl group at an aryl ring carbon atom, which comprises heating at a temperature of from about 75° C. to about 130° C. a mixture containing (A) at least one compound having a formula selected from the group consisting of



(II) or (III)

wherein R and R^1 are as defined above;

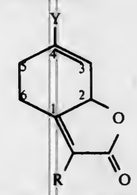
Y is C_3 to C_5-alkyl or hydrogen;



(IV)

wherein R, R^1 and Y are as defined above;

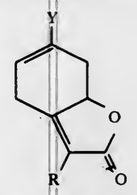
a compound of the formula



(V)

wherein R and Y are as defined above; and

a compound of the formula

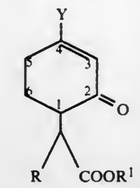


(VI)

wherein R and Y are as defined above; and

(B) a C_1 to C_{12}-sulfonic acid or a C_1 to C_{12}-hydrocarbon phosphonic acid in a non-polar organic liquid which azeotropes with water for removing water from the reaction mixture during the heating operation, for a time sufficient to form a compound of formula I.

12. Process which comprises (a) forming a mixture containing a compound of the formula



(II)

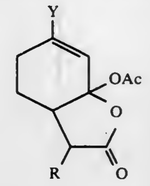
where Y is C_3 to C_5-alkyl or hydrogen;

R is hydrogen or C_1 to C_4-alkyl; and

R^1 is hydrogen, C_1 to C_6-alkyl or mixtures thereof; and

acetic anhydride, in the presence of an acid scavening base which does not destroy the reactants

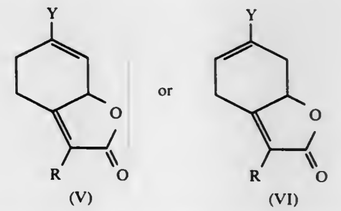
(b) allowing the mixture to stand for a time sufficient to form an acetate intermediate of the formula



(XI)

which Ac denotes an acetyl group and R, Y and Z are as defined above,

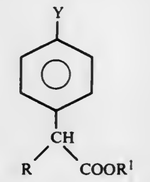
(c) heating the mixture from step (b) at a temperature of from about 75° C. to about 130° C. for a time sufficient to form a mixture containing at least one compound of the formula



(V) or (VI)

(d) adding acetyl chloride and about one stoichiometrically equivalent of water, relative to the original acetic anhydride content of the mixture to form acetic acid and hydrogen chloride acid in the mixture, and then

(e) heating the mixture from step (d) to form about 75° C. to 130° C. for a time sufficient to form a compound of the formula



(I)

where R, R^1 and Y are as defined above.

4,189,597

11-(2-HYDROXYETHYLTHIO)PROSTENOIC ACID E SERIES DERIVATIVES

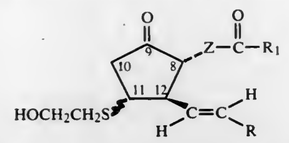
Martin J. Weiss, Oradell, N.J., and Gerald J. Siuta, Yonkers, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 782,853, Mar. 30, 1977, Pat. No. 4,085,272. This application Oct. 17, 1977, Ser. No. 843,083

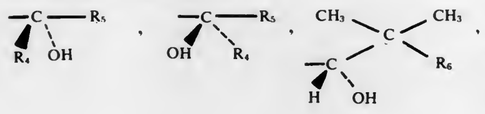
Int. Cl.[2] C07C *177/00*

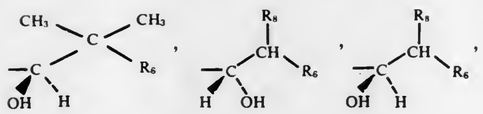
U.S. Cl. 560—118 **5 Claims**

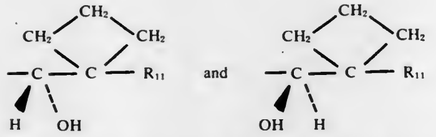
1. An optically active compound of the formula:



wherein Z is $-(CH_2)_6-$; R_1 is selected from the group consisting of hydroxy and C_{1-C6} alkoxy; and R is a moiety selected from the group consisting of







and

wherein R_4 is selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of C_4-C_7alkyl, R_6 is selected from the group consisting of C_3–C_5 alkyl, R_8 is selected from the group consisting of C_1–C_2 alkyl, and R_{11} is selected from the group consisting of C_3–C_7 alkyl; the racemic mixture thereof; the mirror image thereof; and when R_1 is hydroxy, the pharmaceutically acceptable salts thereof, with the proviso that the substituent at the carbon-11 position is β-(2-hydroxyethylthio).

4,189,598

PHENOXYBENZYL 2-[2-(2-HYDROXY)INDANYL]-3-METHYL-BUTANOATES

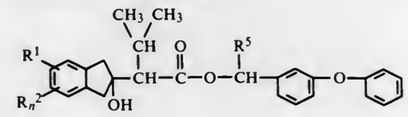
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Aito, Calif.

Filed Jul. 24, 1978, Ser. No. 927,315

Int. Cl.[2] C07C *69/76, 121/75*

U.S. Cl. 560—56 **11 Claims**

1. A compound of the formula:



wherein,

n is zero, one, two or three;

each of R^1 and R^2 is independently selected from hydrogen, chloro, fluoro, bromo, lower alkyl, lower alkoxy and lower haloalkyl; and

R^5 is hydrogen, cyano, methyl or ethynyl.

4,189,599

PREPARATION OF DIMETHYL ADIPATE BY THE HYDROGENATION OF DIMETHYL HEX-3-ENDIOATE

Haven S. Kesling, Jr., Drexel Hill, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 898,235, Apr. 20, 1978, abandoned. This application Nov. 24, 1978, Ser. No. 963,531

Int. Cl.[2] C07C *69/44*

U.S. Cl. 560—190 **13 Claims**

1. A process for the preparation of dimethyl adipate by the hydrogenation of dimethyl hex-3-endioate, having the formula $CH_3O_2CCH_2CH{=}CHCH_2CO_2CH_3$, derived from the liquid phase oxidative carbonylation of 1,3-butadiene with a mixture of carbon monoxide and oxygen or an oxygen-containing gas and at least a stoichiometric amount of an acetal, ketal, carboxylic ortho ester, trialkylorthoborate or 1,1-dialkoxycycloalkane, at a temperature of from about 60° C. to 200° C. and pressures of from about 15 psig to about 5000 psig in the presence of a catalytic mixture of a platinum group metal compound or mixtures thereof and a copper (I), copper (II), iron (II) or iron (III) oxidant salt compound which comprises reacting under liquid phase conditions the dimethyl hex-3-endioate at a temperature of from about ambient to about 150° C. under a hydrogen pressure of from about 10 psig to 1000 psig in the presence of an effective amount of a hydrogenation catalyst to produce dimethyl adipate, and recovering said dimethyl adipate while at the same time recycling between about 20 weight percent and 80 weight percent of the dimethyl adipate produced by said hydrogenation of the dimethyl hex-3-endioate to the hydrogenator to control the temperature and remove the exothermic heat of reaction.

4,189,600

MANUFACTURE OF GLYCOL ACETATE

Hans-Martin Weitz, Bad Durkheim; Juergen Hartig, Ludwigshafen; Ludwig Vogel, Frankenthal;, and Helmuth Grube, Bad Durkheim, allof, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,737

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636669

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—246 **4 Claims**

1. An improved process for the manufacture of an acetic acid ester of 1,2-diol by reacting an olefin with acetic acid and molecular oxygen in the presence of a catalyst in a reactor, wherein the improvement comprises:

dissolving the oxygen in at least one liquid reactant or in the recycled liquid reaction mixture outside the reactor,

charging the reactor with said liquid reactant or liquid reaction mixture containing dissolved oxygen, and

carrying out the reaction of the olefin and acetic acid with oxygen while simultaneously removing any gas formed in the reactor, whereby the formation of a gas phase in the reactor is prevented

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4,189,601

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

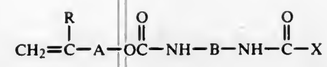
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,645

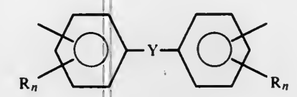
Int. Cl.[2] C07D *125/06*

U.S. Cl. 560—24 **2 Claims**

1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group; A is a carbonyloxyalkylene group having 2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $-(CH_2)_n-$; n=0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of p-nitroaniline.

4,189,602

ACID OXIDATION PROCESS

John H. Atkinson, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 2, 1978, Ser. No. 902,108

Claims priority, application United Kingdom, May 13, 1977, 20240/77

Int. Cl.[2] C07C *39/06*

U.S. Cl. 568—801 **2 Claims**

1. A process for the oxidation of para-toluic acid to a product containing meta-cresol comprising contacting a liquid phase containing para-toluic acid and benzoic acid in a weight ratio of 3:1 to 1:3, with oxygen and steam at a temperature greater than 200° C. and significantly below 249° C. and in the presence of a copper compound catalyst selected from the group consisting of cupric oxide, cupric benzoate, cupric paratoluate and cupric acetate, wherein the quantity of copper compound is such that the concentration of copper in the reaction medium is 0.5 to 10% by weight of the combined weight of benzoic acid and para-toluic acid.

4,189,603

PROCESS FOR PRODUCING HIGH-QUALITY TEREPHTHALIC ACID SUITABLE FOR USE IN DIRECT POLYMERIZATION

Motoo Shigeyasu; Hatsutaro Yamazaki, and Takehiko Kitamura, all of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc. and Maruzen Oil Co., Ltd., both of Osaka, Japan

Filed Sep. 20, 1978, Ser. No. 944,216

Claims priority, application Japan, Sep. 20, 1977, 52-113715

Int. Cl.[2] C07C *51/42*

U.S. Cl. 562—417 **23 Claims**

1. A process for producing terephthalic acid of high quality for use in direct polymerization, which comprises oxidizing a para-dialkylbenzene and/or an oxidized intermediate thereof in the liquid phase with molecular oxygen or a molecular oxygen-containing gas in the presence of an oxidation catalyst containing a heavy metal in a lower aliphatic carboxylic acid solvent, wherein the reaction is carried out in the presence of a phenol in an amount of 3×10^{-5} to 700×10^{-5} mole of phenol per liter of the lower aliphatic carboxylic acid solvent at a reaction temperature of about 80° to about 230° C.

4,189,604

BESTATIN

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomohisa Takita, Asaka; Rinzo Nishizawa, and Tetsushi Saino, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

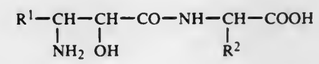
Continuation-in-part of Ser. No. 800,820, May 26, 1977, abandoned, which is a continuation of Ser. No. 703,863, Jul. 9, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,835

Claims priority, application United Kingdom, Jul. 22, 1975, 30632/75; Japan, Jul. 21, 1976, 51-85992

Int. Cl.[2] C07C *79/46;* **A01N** *9/20*

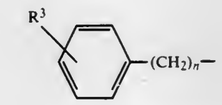
U.S. Cl. 562—437 **22 Claims**

1. A compound having the formula



wherein

R^1 is



wherein R^3 is hydrogen, chloro, methyl, nitro, hydroxy or amino and n is 0 or 1 and

R^2 is (lower)alkyl having 1 to 6 carbon atoms, hydroxy(lower)alkyl, alkylthioalkyl, carboxamido(lower)alkyl or carboxy(lower)alkyl provided that when R^1 is benzyl and R^2 is isobutyl the configuration of the compound is (2S,3R,2′R), (2S,3S,2′S) or (2S,3S,2′R).

4,189,605

3-NITRO-4-BROMOMETHYL BENZOIC ACID

Daniel H. Rich, Madison, Wis., and Sweet K. Gurwara, Williamsville, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 748,948, Dec. 9, 1976, Pat. No. 4,101,721, which is a division of Ser. No. 575,478, May 7, 1975, Pat. No. 4,062,746. This application Nov. 10, 1977, Ser. No. 850,141

Int. Cl.[2] C07C *79/46*

U.S. Cl. 562—438 **1 Claim**

1. The compound 3-nitro-4-bromomethyl benzoic acid.

4,189,606

13-AZAPROSTAGLANDINS

Duccio Favara, Como, and Umberto Guzzi, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

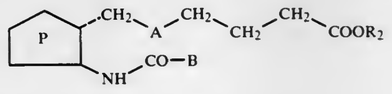
Division of Ser. No. 765,039, Feb. 2, 1977. This application Mar. 22, 1979, Ser. No. 22,766

Claims priority, application United Kingdom, Feb. 23, 1976, 7043/76

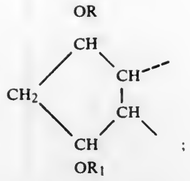
Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—455 **1 Claim**

1. A compound of the formula



wherein the five-membered ring P represents



R, R_1 and R_2 each represents hydrogen; the symbol A represents cis-CH=CH—; and the symbol B represents —W—R_3 wherein W represents —CHOH-CH_2—O— and R_3 represents p-fluorophenyl.

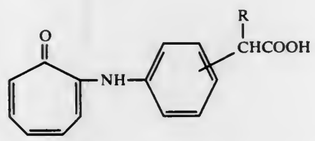
4,189,607

ANILIONOTROPONE DERIVATIVES

Takehiro Amano, Urawa; Kensei Yoshikawa, Kitamoto; Jiro Sawada, Kodaira, and Michitada Sasajima, Higashimurayama, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 24,110
Int. Cl.² C07C *101/453;* A01N *9/20*
U.S. Cl. 562—457 **7 Claims**

1. Anilionotropone derivatives represented by the following formula:



wherein R is hydrogen or methyl, and pharmaceutically acceptable salts thereof.

4,189,608

CARBOXYLIC ACID PREPARATION

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 659,303, Feb. 19, 1976, abandoned. This application May 17, 1978, Ser. No. 906,713
Int. Cl.² C07C *51/14*
U.S. Cl. 562—519 **4 Claims**

1. A process for preparing 3-butenoic acid which comprises contacting allyl alcohol with carbon monoxide and a palladium chloride catalyst at a temperature between about 50° and 300° C. and under superatmospheric pressure and wherein the reaction is carried out in a substantially anhydrous C_2–C_{10} carboxylic acid liquid solvent.

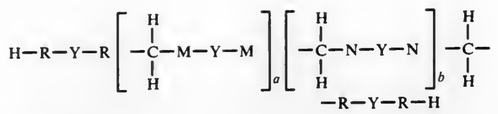
4,189,609

MULTI-BLOCK COUPLED POLYOXYALKYLENE COPOLYMER SURFACTANTS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 654,268, Feb. 2, 1976, Pat. No. 4,072,704, which is a continuation-in-part of Ser. No. 498,670, Aug. 19, 1974, abandoned. This application Nov. 28, 1977, Ser. No. 855,598
Int. Cl.² C07C *43/30, 43/32*
U.S. Cl. 568—601 **2 Claims**

1. A polyformal compound having the formula

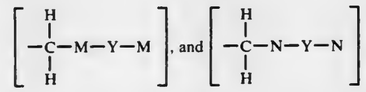


wherein

Y is the residue of an ethylene glycol or propylene glycol minus the terminal hydrogen atoms,

M is a hydrophilic chain of units selected from the group consisting of oxyethylene and oxyethylene-oxypropylene units wherein the oxyethylene content of said hydrophilic chain is from about 75 to 100 weight percent and the oxypropylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in M being from about 2 to about 15,

N is a hydrophobic chain of units selected from the group consisting of oxypropylene units and oxyethylene-oxypropylene units wherein the oxypropylene content is from about 75 to 100 weight percent and the oxyethylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in N being from about 2 to about 10, wherein



are linked together either in a random or an ordered manner,

R is M or N, and

a and b are integers from 2 to 20 in a ratio between 1:9 to 9:1.

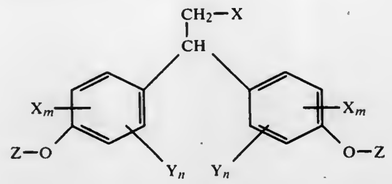
4,189,610

PREPARATION OF 4,4-DIOXY-SUBSTITUTED STILBENES

James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 31, 1977, Ser. No. 846,753
Int. Cl.² C07C *39/22, 43/20*
U.S. Cl. 568—646 **21 Claims**

1. A process for the preparation of 4,4'-dioxy-substituted stilbenes which comprises heating an acidic reaction medium comprising a 1,1-bis(4-oxy-substituted aryl)-2-haloethane dissolved in a solution of an aliphatic carboxylic acid and a soluble acid salt to a temperature between about 100° C. and about 250° C., and for a time, sufficient to cause dehydrohalo-genation-rearrangement of the 1,1-bis(4-oxy-substituted aryl)-2-haloethane to yield the 4,4'-dioxy-substituted stilbene, with the aforesaid 1,1-bis(4-oxy-substituted aryl)-2-haloethanes being represented by the formula:



in which X independently represents a halogen selected from the group consisting of chlorine, bromine, and iodine; Y independently represents a non-interfering hydrocarbyl group; Z represents hydrogen or Y; and m and n each independently represent an integer from zero (0) to 4, inclusive, with the

proviso that the sum of m and n, with respect to each aryl ring, does not exceed 4.

4,189,611

ORTHO-NITROPHENYLETHYLENE GLYCOLS

Donnie J. Sam, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 700,968, Jun. 29, 1976, Pat. No. 4,111,960, which is a division of Ser. No. 545,603, Jan. 30, 1975, Pat. No. 3,991,033. This application Jun. 8, 1978, Ser. No. 913,905
Int. Cl.² C07C *31/14;* G03C *1/68*
U.S. Cl. 525—472 **3 Claims**

1. A compound having the formula:



wherein R^1 and R^2 are H or phenyl substituted with up to 5 substituents of lower alkyl or nitro, with the proviso that at least one of R^1 and R^2 is a phenyl group with an orthonitro substituent.

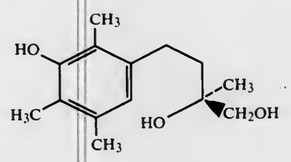
4,189,612

S-(+) 2,3,6-TRIMETHYL-5-(2,2,4-TRIMETHYL-1,3-DIOXOLANE-4-ETHYL)PHENOL

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 895,424, Apr. 12, 1978, which is a division of Ser. No. 797,712, May 17, 1977, Pat. No. 4,113,740. This application Jan. 29, 1979, Ser. No. 7,278
Int. Cl.² C07C *39/10*
U.S. Cl. 568—763 **1 Claim**

1. A compound of the formula:



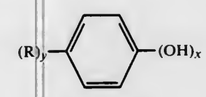
4,189,613

HYDRODEALKYLATION PROCESS

Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 12, 1978, Ser. No. 914,836
Int. Cl.² C07C *39/04*
U.S. Cl. 568—805 **4 Claims**

1. A process for the hydrodealkylation of monocyclic aromatic compounds under conditions such that small amounts of nonrecyclable dehydroxylated monocyclic products are formed which comprises contacting at least one hydroxy-substituted aromatic hydrocarbon having the general formula



wherein x is 1 to 3 and y is 1 to 5 and the sum of x and y is 2 to 6, and R is a hydrocarbyl radical having from 1 to 6 carbon atoms with hydrogen in the presence of a catalyst consisting essentially of a low sodium compound content chromia-alumina composite containing less than 0.02 wt. % sodium at a temperature below about 850° F. and a pressure below about 750 psig which conditions are conducive to the formation of large amounts of phenols and small amounts of nonrecyclable dehydroxylated products such as benzene, toluene, xylenes, and the like.

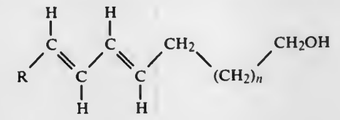
4,189,614

PROCESS FOR THE STEREO SPECIFIC PREPARATION OF SEXUAL PHEROMONES

Daniel Samain, Compiegne; Charles Descoins, Bailly, and Gerhard Kunesch, Orsay, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Feb. 14, 1979, Ser. No. 12,132
Claims priority, application France, Feb. 15, 1978, 78 04257
Int. Cl.² C07C *33/02*
U.S. Cl. 568—908 **11 Claims**

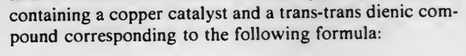
1. A process for the stereoselective preparation of sexual pheromones having an alcohol group and a conjugated diene structure of the trans-trans (E—E) stereochemical configuration corresponding to the following formula:



(I)

in which:

R represents a saturated linear alkyl radical having 1–4 carbon atoms and n is a number from 1 to 5, characterized by two stages, wherein in the first stage a magnesium derivative is prepared in a tetrahydrofuran medium said derivative corresponding to the following formula:

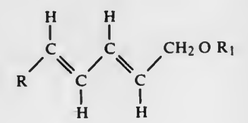


(II)

in which:

X represents halogen which is Br or Cl,

and P is a protective group and in a second stage at a temperature ranging from 0° to −20° C., an excess of said magnesium derivative is added to a tetrahydrofuran solution containing a copper catalyst and a trans-trans dienic compound corresponding to the following formula:



(III)

in which:

R has the same definition as above and R_1 is: —$COCH_3$, —SO_2CH_3 or —$SO_2C_6H_4CH_3$ and lastly, subjecting the product of the second stage to hydrolysis to liberate the protective group.

4,189,615

PREPARATION OF ALCOHOLS BY TREATING ESTERS WITH ALKALI METAL BOROHYDRIDE

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 867,078, Jan. 5, 1978, Pat. No. 4,156,791, which is a continuation of Ser. No. 695,217, Jun. 11, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 972,086
Int. Cl.² C07C *31/34, 27/00, 27/04*
U.S. Cl. 568—842 **24 Claims**

1. A process for preparation of alcohols of the formula $R—(CH_2OH)_a$ which comprises reducing an ester of the formula $R—(COOR^1)_a$ with an alkali metal borohydride and a proton source, wherein said proton source is water, alkanol

R^1OH, or mixture, wherein R is a C_1–C_{10} alkyl or alkylene radical or fluorine substituted alkyl or alkylene radical, R^1 is a C_1–C_8 alkyl or fluorinated alkyl radical, and a is an integer of 1 or 2,

which comprises admixing said ester and said proton source, and adding the resulting admixture slowly at a rate of addition substantially equivalent to the rate being reacted to solid undispersed alkali metal borohydride under reflux conditions employing a ratio of proton source: ester of about 1:1 to 2.5:1 moles of proton source per mole of ester —(COOR') group, and employing about 0.9:1 to 1.5:1 moles of alkali metal borohydride initially present per mole of ester —(COOR^1) group being added.

4,189,616

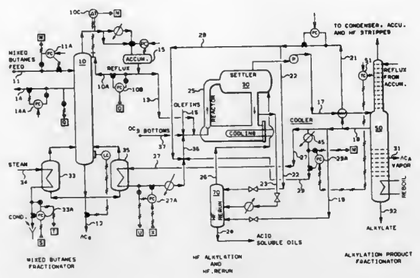
MAXIMUM UTILIZATION OF ENERGY IN ISOPARAFFIN RECYCLE IN ALKYLATION

Timothy C. Liebert, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1978, Ser. No. 874,591

Int. Cl.[2] **C07C** *3/50*

U.S. Cl. 585—701 **17 Claims**



1. In an operating unit in which there is a first fractionator being reboiled with a steam reboiler and with a stream of heat-containing fluid taken from a second fractionator and passed into and through a second reboiler in said first fractionator, wherein said second reboiler is being supplied with said fluid separated from said second fractionator having a locus in a top portion thereof and wherein a maximum use of said fluid to said second reboiler and a minimum use of steam to said steam reboiler are to be provided, the invention which comprises: detecting a change in a controlled variable at said locus in said top portion of said second fractionator and adjusting the rate of flow of said fluid from said second fractionator to said second reboiler to return said controlled variable to the condition desired in said top portion of said second fractionator.

4,189,617

LIQUID-COOLED ELECTRODE FOR ELECTRIC ARC FURNACES

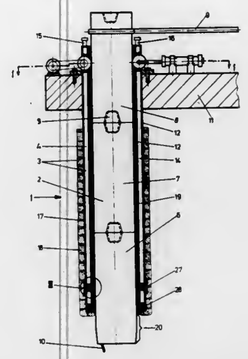
William Schwabe, Cleveland, Ohio; Emil Elsner, and Rudolf Kasper, both of Baden-Baden, Fed. Rep. of Germany, assignors to Korf-Stahl AG, Baden-Baden, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 921,973

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730884

Int. Cl.[2] **H05B** *7/06, 7/10*

U.S. Cl. 13—18 C **20 Claims**



1. A liquid-cooled electrode for electric arc furnaces, comprising: an electrode supporting arm, a cover secured to said electrode supporting arm and adapted to contain cooled metal elements, a core axially displaceable in said cover, a current connection for conducting electric current into said core, said current connection being disposed above said cover, means for electrically insulating said cover from said core and including an insulating layer between said cover and said core, and a device for producing a magnetic field and provided in the lower portion of said cover.

4,189,618

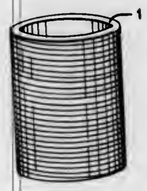
ELECTROMAGNETIC SHIELDING ENVELOPES FROM WOUND GLASSY METAL FILAMENTS

Gerald R. Bretts, Livingston; Dirk A. Timan; Gregory J. Sellers, both of Morristown, and Wayne H. Witte, Martinsville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 31, 1978, Ser. No. 929,483

Int. Cl.[2] **H05K** *9/00;* **B65H** *81/00;* **D03D** *13/00*

U.S. Cl. 174—35 MS **14 Claims**



1. An electromagnetic shielding envelope comprising a shell of a wound metallic glass filament which is primarily glassy and has a maximum permeability of at least about 25,000, said filament being embedded in a matrix.

11. The method for making electromagnetic shielding envelopes of claim 1 which comprises winding a metallic glass filament which is primarily glassy and has a maximum permeability of at least about 25,000 around a mandrel having the desired shape of the envelope, applying a liquid resin composition curable to the solid state to the wound filament to embed the filament therein, followed by curing the resin composition to the solid state and withdrawing the mandrel.

4,189,619

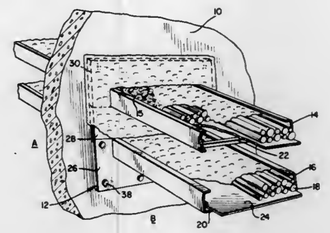
FIRE PROTECTIVE MASTIC AND FIRE STOP

J. Watson Pedlow, P.O. Box 33, Media, Pa. 19063

Filed Jan. 27, 1978, Ser. No. 872,820

Int. Cl.[2] **H02G** *3/04;* **C09D** *5/18;* **B32B** *5/16, 9/04*

U.S. Cl. 174—48 **15 Claims**



1. Fire protective heat insulating mastic for coating upon electrical cables and for forming or coating upon fire protective panels to be mounted in neighboring structures near electrical cables, said mastic comprising an essentially halogen-free mixture of solids and thermoplastic binder resins dispersed as an emulsion in water, said solids including heat intumescing and expanding substances in approximate quantity of 4 to 25% to expand the mastic to porous heat insulating form, ceramic frits in approximate quantity of 5 to 40% to provide a ceramic glaze upon the surface of the dry expanded mastic when exposed to high temperatures developed by fire, hydrated substances in approximate quantity of 10 to 40% and having bonded water evolvable only by application of sufficient heat to decompose and evolve water vapors, fire protective solids of the character of antimony oxide and zinc borate activated by the heat of a fire to a fire protective form in approximate quantity of each of about 2 to 15%, and a resinous thermoplastic binder in approximate quantity of 5 to 40% to bind said solids to a flexible film in coated form of the mastic, said binder being dispersed as an emulsion in water, there being sufficient water in the emulsion to convert said solids into a fluidized form for application as a coating upon said cables and panels, said percentages being by weight, the said solids quantity being based on the total solids of the composition.

6. A fire stop panel comprising a moulded board formed of the dried mastic as defined in claim 1.

8. A fire protective panel, comprising a heat insulating board having an outer coating of a mastic as defined in claim 1.

9. A fire stop comprising a wall through which electric cables pass in groups, said cables being disposed as separated cables in trays and passing through an opening in said wall, each of the cables in said trays being surrounded and separated by a dry coating of a fire protective mastic as defined in claim 1 the wall being closed about said cables by fire resistant panels filling said opening and shaped to fit about the cables and trays passing therethrough, the crevices and cracks between panels, trays and cables being filled with said mastic.

4,189,620

CABLE TERMINATION DEVICE

William F. Stange, 1501 W. Clifton Blvd., Lakewood, Ohio 44107

Filed Apr. 10, 1978, Ser. No. 895,267

Int. Cl.[2] **H01R** *11/00;* **H02G** *15/02*

U.S. Cl. 174—79 **11 Claims**

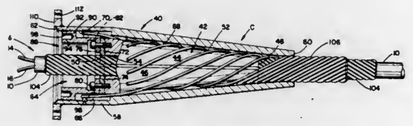
1. A termination appliance installation for an elongated cable member, said installation comprising in combination:

a first set of helical elements generally of a predetermined

internal diameter and pitch length wrapped in an encircling relationship about said cable member for at least a predetermined distance therealong in a helical lay of one hand;

a cable member receiving collapsible wedge having a generally frusto-conical outer side wall configuration extending between a smaller diameter lead end and a larger diameter rear end with a substantially cylindrical central bore passing therethrough between said ends, said wedge being positioned with said first set and cable member received through said bore and extending outwardly therefrom at both said wedge lead end and said wedge rear end;

a second set of helical elements generally of a predetermined internal diameter and pitch length closely wrapped in a generally encircling relationship along said wedge outer side wall from at least adjacent said rear end to said lead end and then in an encircling relationship with said first set and cable member for at least a predetermined distance therealong outwardly from said wedge lead end whereby said wedge is secured to said first set and cable member and provides a protuberance therealong, the helical lay of said second set being of the opposite hand from the lay of said first set;



an elongated housing having first and second ends with a passageway communicating between said ends, said passageway having a generally cylindrical portion extending inwardly from said second end and merging into a generally frusto-conical portion tapering inwardly toward said first end, said frusto-conical portion closely and at least substantially receiving said wedge and said second set of helical elements closely wrapped in an encircling relationship with said outer side wall of said wedge, said cable member and said first and second sets of helical elements passing outwardly from said passageway at said housing first end; and,

retainer means positioned in said generally cylindrical portion of said passageway for acting against said wedge outwardly of said first set of elements for urging said wedge into said frusto-conical portion of said housing and toward said first end thereof to grip said second set of helical elements between said outer side wall of said wedge and the surface of said frusto-conical portion of said housing and to collapse said wedge for gripping said first set of elements within said bore.

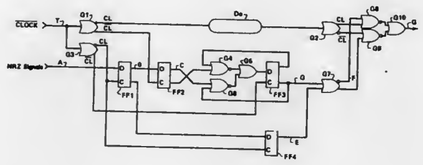
4,189,621
CMI-ENCODER
Peter M. Scott, Edinburgh, Scotland, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 3, 1978, Ser. No. 874,719
Claims priority, application United Kingdom, Feb. 9, 1977, 5408/77
Int. Cl.[2] H03K *13/24*
U.S. Cl. 178—67 **8 Claims**

1. An encoding circuit for encoding digital data in a two amplitude level signal in accordance with the "coded mark inversion" (CMI) format, i.e. in which binary 0 is encoded so that both amplitude levels are obtained consecutively, each for half a unit time interval, and binary 1 is encoded by either of the amplitude levels for one full unit time interval, in such a way that the level alternates for successive binary 1's, all negative transitions of the binary signals occurring at a time coincident with the start of a binary unit time interval, said encoding circuit providing such encoded digital data in response to substantially synchronous input data received in a non-return-to-zero (NRZ) format and from clock related pulses received via input signal channels, said encoding circuit comprising:

first signal channel means for providing clock related pulses on an output control line in response to input clock pulses received on said input signal channel; said clock related pulses being defined as being substantially equivalent to the clock signal or its logical complement;

second signal channel means coupled to said first signal channel means having at least one flip-flop, for deriving reclocked NRZ data in response to the input data received in an NRZ format and the clock related pulses via said first signal channel;

third signal channel means, coupled to said first and said second signal channel means and having gating and flip-flop circuits for deriving a commutating control signal which changes logic states only in response to the representation of one binary value, i.e. either one or zero, in the train of NRZ input data and upon occurrence of one



preselected kind of transition in said clock related pulses, i.e., either a rising or falling signal edge;

output circuit means coupled to said first, second and third signal channel means for providing the CMI coded output signals by selectively gating the clock related pulses to an output terminal in response to a pair of complementary output control signals;

output control means coupled to said third signal channel means and said output circuit means and having inverting and non-inverting outputs for providing said complementary output control signals in response to said commutating control signal; and

all flip-flop circuits of the first, second and third signal channel means, the output circuit means and the output control means being exclusively triggered by signal edges of the clock related pulses provided by said first signal channel means, thereby minimizing the distortion of clock information in the CMI encoded output signals.

4,189,622
DATA COMMUNICATION SYSTEM AND BIT-TIMING CIRCUIT
James J. Foshee, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 623,518, Oct. 17, 1975, abandoned. This application Nov. 1, 1977, Ser. No. 847,529
Int. Cl.[2] H04L *7/04, 5/22;* **H04J** *3/06;* **H02B** *1/00*
U.S. Cl. 178—69.1 **7 Claims**

1. A circuit for synchronizing an incoming digital data bit stream clocked by a PRESENT CLOCK signal with a BEST-FIT clock signal, comprising:

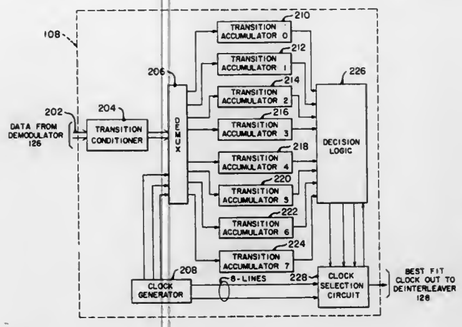
dividing means for dividing each bit period into a plurality of increments, each increment being representative of a different transition phase shift;

transition means operatively connected to said dividing means for counting the number of data transitions which occur during each of said bit increments for a predetermined number of bits;

logic means operatively connected to said transition means for generating a digital code representative of the increment containing the greatest transition count;

clock generation means for generating a plurality of phased clock signals of like frequency but different phase, each clock signal being associated with one of said bit increments;

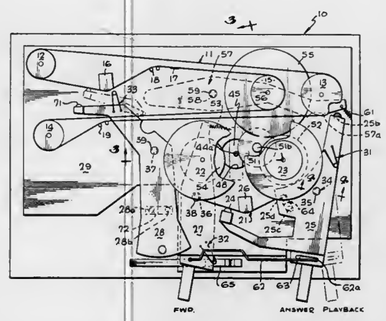
clock signal selection means for comparing said PRESENT CLOCK signal with said digital code for selecting said BEST-FIT clock signal from one of said phased clock signals for synchronizing said data with said BEST-FIT clock signal such that said BEST-FIT clock signal be-



come the PRESENT CLOCK signal for the next comparison; and

data validating means responsive to said transition means for inhibiting said clock signal selection means so as to prevent said PRESENT CLOCK from shifting to become said adjacent phased clock signal when more than one of said bit increments contains transitions counted by said transition means.

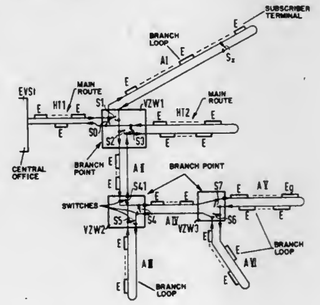
4,189,623
TELEPHONE ANSWERING DEVICE HAVING SIMPLIFIED MECHANICAL CONTROLS
Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406
Division of Ser. No. 766,898, Feb. 9, 1977, Pat. No. 4,118,602. This application Feb. 2, 1978, Ser. No. 874,361
Int. Cl.[2] H04M *1/64;* **F16C** *11/00;* **G05G** *1/08*
U.S. Cl. 179—6 R **4 Claims**



4. A telephone answering device having a molded plastic chassis and at least one control arm formed of plastic, said chassis having, for each control arm, an integrally molded circular boss that extends through a pivot hole in the corresponding control arm to provide a pivotal mounting therefor, the height of each such pivotal mounting boss being slightly greater than the thickness of the corresponding control arm so that the free end of each boss extends beyond the surface of said arm, each such boss having a hole therethrough, and

an expansion fastener extending through each such hole, said fastener having a head diameter that is greater than that of said boss so as to radially overlap a portion of the respective control arm to hold that arm on said boss, the other, expandable end of said fastener expanding with respect to said hole for removable retention of said fastener in said boss.

4,189,624
DIGITAL TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK
Alfred Mattern, Gröbenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 4, 1977, Ser. No. 784,431
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619295
Int. Cl.[2] H04J *3/08*
U.S. Cl. 179—15 AL **2 Claims**



1. In a digital time division multiplex (TDM) telecommunication network having central office means and a TDM highway having its ends connected to said central office means and having a plurality of subscriber terminals connected to said TDM highway in a predetermined order, said central office means transmitting information to said subscriber terminals in an order corresponding to the predetermined order of connection of said subscriber terminals to said TDM highway, each said subscriber terminal including means for passing information intended for other succeeding subscriber terminals, the improvement comprising:

said TDM highway being formed into at least two main route sections, each main route section having at least one branch loop extending from a branch point, each of said branch loops having outgoing and incoming line sections relative to said branch point, each of said incoming line sections being connected at said branch point to either an outgoing line section of another one of said branch loops or one of said main route sections;

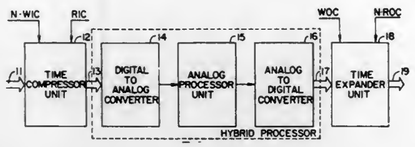
a plurality of switch means located at said branch points for short circuiting individual ones of said branch loops and individual ones of said main route sections, wherein said central office means monitors the information flow on said TDM highway to determine the location of a fault condition in any one of said branch loops or one of said main route sections, selectively operates said plurality of switch means to short circuit the branch loop or the main route section in which the fault condition occurs and suppresses the information intended for the subscriber terminals on the branch loop or main route section which is short circuited by said plurality of switch means.

4,189,625

METHOD AND APPARATUS FOR PROCESSING DUAL FREQUENCY DIGITAL INFORMATION SIGNALS

Terry W. Strandberg, 614 Park Rd., Redwood City, Calif. 94062

Filed Mar. 13, 1978, Ser. No. 886,181
Int. Cl.[2] H04J *3/12*
U.S. Cl. 179—15 BY **119 Claims**



68. A system for encoding a periodic signal having a minimum interval of interest, said system comprising:

means for repeatedly generating a plurality of ordered groups of time encoder time slot signals, each time encoder time slot signal defining a successive time encoder time slot having a period substantially less than said minimum interval of interest, said groups defining successive time encoder time frames each having a duration less than said minimum interval of interest;

means for sensing the level of said periodic signal during at least one of said time encoder time frames;

means for detecting a level transition in said periodic signal;

storage means; and

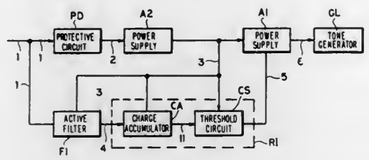
means for storing a signal representative of the level of said periodic signal and the contemporaneous one of said time encoder time slot signals in said storage means when a transition is sensed.

4,189,626

ELECTRONIC TONE RINGER FOR TELEPHONE SETS

Oreste Malerba, Trofarello-Torino, and Antonio Neri, Baranzola-Montevarchi-Arezzo, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 16, 1978, Ser. No. 916,354
Claims priority, application Italy, Jun. 20, 1977, 68421 A/77
Int. Cl.[2] H04M *1/26*
U.S. Cl. 179—84 T **9 Claims**



1. A tone ringer for a telephone set receiving call signals from an exchanger over a line loop normally energized with d-c voltage, said call signals including a lower-voltage signal of relatively high frequency and a higher-voltage signal of relatively low frequency, comprising:

a normally blocked current source connected across said line loop;

filter means with a pass band encompassing the frequencies of said call signals connected across said line loop;

charge-accumulating means connected to said filter means for developing a progressively rising voltage in the presence of a call signal;

a threshold circuit connected to said charge-accumulating means for activation by said progressively rising voltage upon the same attaining a predetermined level, said current source being connected to said threshold circuit for unblocking upon activation of the latter; and

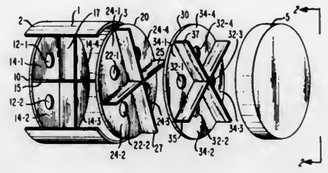
a tone generator connected to said current source for energization thereby.

4,189,627

ELECTROACOUSTIC TRANSDUCER FILTER ASSEMBLY

James L. Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 27, 1978, Ser. No. 963,926
Int. Cl.[2] H04R *1/28*
U.S. Cl. 179—180 **16 Claims**



1. An electroacoustic transducer assembly comprising:

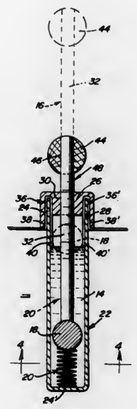
a transducer, a housing having an apertured plate end, an open end, and a longitudinal passageway of predetermined length and cross section therethrough, said housing open end being secured to said transducer; a plurality of apertured plates secured to said housing at spaced intervals along the passageway; and means comprising structural elements in each spaced interval for partitioning said spaced interval into longitudinal sections to inhibit resonance of said housing; said spaced intervals, said apertures and said structural elements being dimensioned relative to said passageway cross section to suppress passage of sound waves outside a predetermined frequency band through said passageway.

4,189,628

TIME DELAY SWITCH

Everett D. Bitner, R.R. #1, Box 160, Trivoli, Ill. 61569

Filed Nov. 30, 1977, Ser. No. 856,162
Int. Cl.[2] H01H *43/00*
U.S. Cl. 200—33 R **9 Claims**



1. A time delay switch, comprising, in combination:

(a) a hollow housing forming a liquid reservoir;

(b) actuator means slidably disposed within the housing for movement relative thereto;

(c) contact means floatingly mounted within the housing for movement relative to the inner housing cavity and separable from but operatively engaged with said actuator means, said contact means assuming a switch open position or a switch closed position in response to the disposition of said actuator means within the housing; and

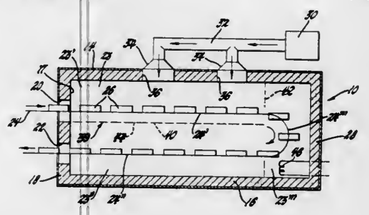
(d) biasing means operatively engaged with the contact means for forcing the contact means through the liquid reservoir in a predetermined time from one of the switch open position and the switch closed position to the other position in response to a change in position of said actuator means, wherein the housing includes a hollow, cylindrical tube forming a cylindrical bore and having a pair of ends, one of which ends is enclosed and the other of which ends is open, and a cup-shaped cap removably arranged in inverted orientation on the open end of the tube, with a hole being provided in the cap and arranged slidably receiving the actuator means.

4,189,629

APPARATUS AND METHOD FOR MICROWAVE HEATING IN A KILN

Mark K. Krage, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1978, Ser. No. 944,911
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A **7 Claims**



1. A microwave kiln comprising a housing having an insulated interior with at least one inlet and outlet opening thereto, microwave means for supplying microwaves to said interior, microwave screen means for separating said interior into a heating zone that traps the microwaves and a heat recovery zone that is screened from the microwaves but from which heat can flow to said heating zone, and conveyor means for successively conveying two or more substances to be heated from said inlet through said heating zone and then through said heat recovery zone to said outlet whereby at least one of the substances is heated in the heating zone by the microwaves and also by the heat radiated by at least another one of the heated substances as it passes through the heat recovery zone while the microwaves are substantially prevented from reheating the heated substances as they pass through the heat recovery zone.

4,189,630

METHOD OF HEATING DEFORMABLE ARTICLES ON A SUPPORT OF VERTICLE FIBERS

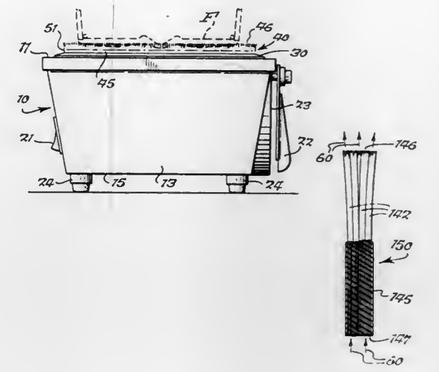
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Division of Ser. No. 752,609, Dec. 20, 1976, Pat. No. 4,104,508.
This application May 22, 1978, Ser. No. 908,207
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—354 **4 Claims**

1. The method of heating an article by infrared radiation without harm to or any marring of the surface of said article comprising the steps of;

supporting said article on the upper resilient tip ends of a myriad of vertically disposed tufts of heat resistant fibers bonded together at their lower tip ends into a rigid support;

passing said radiation upwardly alongside of said fibers as well as;



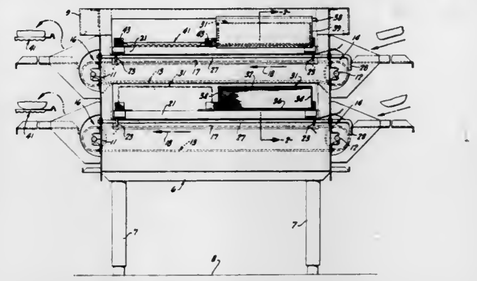
transmitting infrared rays internally through said fibers from their said lower tip ends to their said upper tip ends and to said article.

4,189,631

HAMBURGER BUN STORAGE DEVICE

Edward D. Baker, San Francisco, and Nils Lang-Ree, Los Altos, both of Calif., assignors to NPI Corporation, Burlingame, Calif.

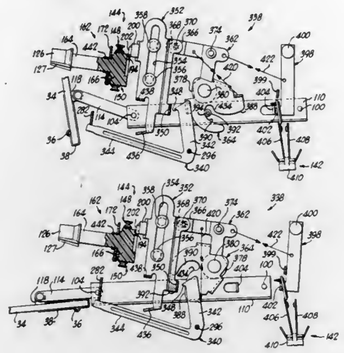
Filed Jun. 8, 1978, Ser. No. 913,651
Int. Cl.[2] H05B *3/00*
U.S. Cl. 219—388 **1 Claim**



1. A hamburger bun storage device comprising a frame; a panel partly closing said frame, said panel having a drawer opening therein; a planar, horizontal conveyor on said frame and movable along the bottom of a cooking tunnel in a predetermined direction; a planar heating element on said frame and disposed at the top of said cooking tunnel; means for raising and lowering said heating element between various vertical positions relative to said frame and to said drawer opening; a drawer enclosure resting upon and carried by said heating element and open transversely of said direction and extending substantially through said drawer opening in said various vertical positions of said drawer enclosure; and a drawer slidable in said drawer enclosure in a direction transverse to said predetermined direction, said drawer including an end closure plate in the closed position of said drawer adapted substantially to

abut said panel and to overlie said opening in said panel in all vertical positions of said drawer enclosure.

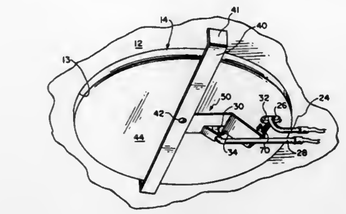
4,189,632
TOASTER OVEN
Charles E. Swanson, Chicago, and Roy W. Hector, Woodridge, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 13, 1976, Ser. No. 750,367
Int. Cl.[2] A47J *37/04, 37/06, 37/08*
U.S. Cl. 219—413 **15 Claims**

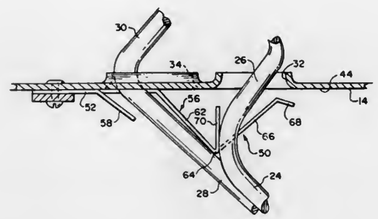


1. A toaster oven comprising a housing defining an oven chamber, said chamber being open on one side,
electric heating means for heating said oven chamber, switch means for energizing said electric heating means,
a door pivotally secured to said housing and to said one side of said chamber,
a food rack slidably secured in said chamber and coupled to said door,
a door opening mechanism including
controlling means for controlling the period of energization of said electric heating means,
a latch member rotatably mounted in said housing, said latch member being held in a first position by said controlling means and released to rotate to a second position at the end of said period of energization of said electric heating means, and
a lever assembly secured to said housing and to said rack, said lever assembly being engagable by said latch member in a first rack retracted position to hold said door closed, said assembly being released by said latch member upon said latch member rotating to said second position to move said rack to partially open said door.

4,189,633
FLEXING DEVICE FOR HOLDING A SURFACE ELECTRIC HEATING ELEMENT IN A RAISED POSITION
Charles A. Skinner, Columbia, Md., assignor to Electro-Therm, Inc., Laurel, Md.
Filed Jun. 12, 1978, Ser. No. 914,874
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—458 **8 Claims**

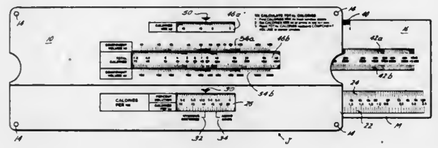
1. In a surface electric heating element assembly of the type including a drip pan and an electric heating element, which is positioned in the pan, the element comprising a first, short terminal leg at one end and a second, longer terminal leg at the other end, the two legs extending generally parallel to each other with the ends thereof being generally in alignment with each other, the element further comprising a planar formation situated in a plane parallel spaced from the plane of the legs, a first connecting portion extending from the short leg to the outer end of the planar formation and a second connecting portion extending from the second leg to the inner end of the planar formation and the pan having passage means therethrough which the connecting portions and terminal legs can extend for positioning the legs beneath the pan when the planar formation is disposed in the pan, the improvement comprising flexing means adapted to be attached to the bottom of the pan,





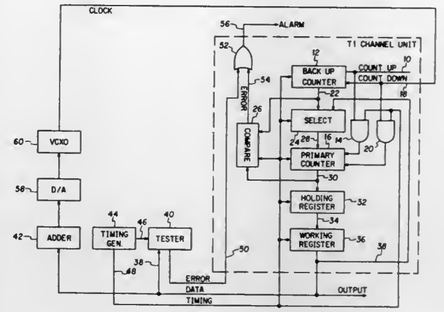
said means including strip-like portions disposed in a position for flexibly engaging the terminal legs and connecting portions of the heating element in a lowered position and, when they are moved to a raised position, said strip-like portions frictionally and resiliently engaging said legs and element for holding the planar formation in a raised position.

4,189,634
SLIDE RULE FOR HYPERALIMENTATION DOSAGE COMPUTATIONS
Larry D. LaBove, 7490 Brompton, Houston, Tex. 77025, and Robert F. Mitchell, III, 6109 Annapolis, Houston, Tex. 77005
Filed Oct. 29, 1976, Ser. No. 736,698
Int. Cl.[2] G06G *1/02;* **G06C** *3/00*
U.S. Cl. 235—70 A **6 Claims**



1. A slide rule for computation of dosages in prescribing hyperalimentation solutions, comprising:
(a) a jacket member having a percentage indicator face panel and a calorie indicator face panel;
(b) a slide member movable in said jacket member and having a final percentage display surface and a calorie availability display surface formed thereon;
(c) said final percentage display surface having thereon a first scale defining various volumes of a component of the hyperalimentation solution;
(d) said percentage indicator face panel of said jacket member having a first aperture therein adjacent said first scale of said final percentage display surface, permitting viewing of same;
(e) said percentage indicator face panel of said jacket member having a total volume scale formed thereon adjacent said first aperture, defining total volumes of the hyperalimentation solution, for alignment with said first scale of said final percentage display surface;
(f) said final percentage display surface further having thereon a final percentage scale defining the final percentage of the hyperalimentation solution represented by a component thereof;
(g) said percentage indicator face panel of said jacket member further having a second aperture formed therein adjacent said second scale of said final percentage display surface permitting viewing of same;
(h) said percentage indicator face panel further having a component percentage scale formed thereon adjacent said second aperture, defining component percentages of components of the hyperalimentation solution, for alignment with said final percentage scale; and
(i) said final percentage scale being formed on said final display surface and said second aperture being located on said jacket member at locations wherein for a chosen hyperalimentation solution said slide member is movable with respect to said jacket member to permit said component volume scale to be aligned with said total volume scale so that the final percentage of the component in the solution may be determined from that portion of said final percentage aligned with said component percentage scale; and
(j) said calorie availability display surface having formed thereon;
(1) a component percentage scale indicating component percentage solution of a hyperalimentation solution; and
(2) a calories per unit volume scale defining calories per unit volume for solutions;
(k) said calorie indicator face panel of said jacket member having a first aperture therein for viewing of said component percentage scale and said calories per unit volume scale;
(l) said calorie indicator face panel having:
(1) a first indicator formed thereon adjacent said first aperture for alignment with said component percentage scale for a chosen hyperalimentation solution; and
(2) a designator formed thereon adjacent said calories per unit volume scale for determination of the available calories per unit volume from the chosen hyperalimentation solution when said first indicator is aligned with a number on said component percentage scale of the chosen hyperalimentation solution;
(m) said calorie availability display surface further having thereon:
(1) a total calories scale defining total calories available in a hyperalimentation solution; and
(2) a second calories per unit volume scale displaying calories per unit volume;
(n) said calorie indicator face panel of said jacket member further having at least one other aperture formed thereon for viewing of said total calories scale and said second calories per unit volume scale; and
(o) said calorie indicator face panel further having:
(1) an indicator formed thereon adjacent said at least one other aperture for alignment with said second calories per unit volume scale; and
(2) component scales defining various component volumes for alignment with said total calories scale, wherein for a chosen hyperalimentation solution said inner slide member is moveable with respect to said jacket member to align said component percentage scale with said first indicator and permit the calories per unit volume to be determined from said designator adjacent said calories per unit volume scale and therefrom to determine the total calories available by alignment of said second calories per unit volume scale with said indicator adjacent said at least one other aperture so that total calories for a component volume defined by said component scales may be read from said total calories scale.

4,189,635
SELF-TEST CIRCUIT APPARATUS
Daniel R. Sheller, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 23, 1978, Ser. No. 871,572
Int. Cl.[2] G06M *3/12*
U.S. Cl. 235—92 EC **5 Claims**

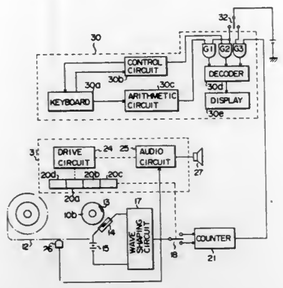


1. Self-test apparatus for testing operation of an up-down counter comprising, in combination:
first means to be checked for counting input signals;
second means for supplying up and down count signals under control, to said first means;
control means, connected to said first means, and said second means, for testing said first means by (1) preventing one of said up and down count signals from being supplied by said second means to said first means, (2) waiting a prescribed interval, and (3) checking to see if the count in said first means coincides with a predetermined count before returning said first means to a normal operation of counting signals from said second means;
alarm means for providing an error output signal when, upon checking, an improper count is detected by said control means;
third means, connected to said second means, for counting input signals therefrom and for testing operation of said first means in normal operation; and
comparison means, connected to said first and third means, for comparing the counts of said first and third means during normal operation and providing an error output signal when the counts do not compare.

4,189,636
TAPE RECORDER PROVIDED WITH A COUNT DISPLAY FOR COUNTING AND DISPLAYING A NUMBER OF REEL ROTATIONS
Ken Satoh, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 14, 1978, Ser. No. 886,442
Claims priority, application Japan, Mar. 15, 1977, 52/31175[U]
Int. Cl.[2] G06M *3/14*
U.S. Cl. 235—92 MP **3 Claims**

1. A tape recorder in which are incorporated:
(a) a tape recorder body including a mechanical device having at least two tape reels used to take up and rewind a magnetic tape;
(b) a desk top calculator body including a display device;
(c) a pulse generator for producing a pulse signal having pulses in a number proportional to a number of the rotations of one of said at least two tape reels; and
(d) an up-down counter for counting up or down the pulses delivered from the pulse generator in a number propor-

tional to a number of the rotations of the tape reel, according as the tape reel makes a normal or reverse rotation,



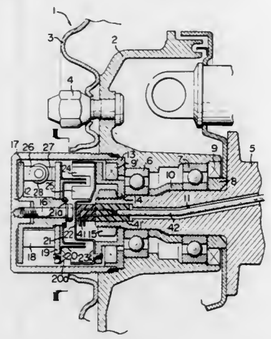
and wherein an output count signal from the up-down counter is conducted to the display device of the desk top calculator to be displayed thereon.

4,189,637

DEVICE FOR DETECTING ANGULAR ACCELERATION OF WHEELS

Hiroshi Takamatsu, Iruma; Makoto Sato, Kamifukuoka; Yoshitaka Miyakawa, Kawagoe; Yutaka Arai, Shiki, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,432
Claims priority, application Japan, Jul. 21, 1977, 52-86678
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 R **12 Claims**



1. A device for detecting angular acceleration of wheels comprising a first member integrally rotating with a wheel whose angular acceleration is to be detected, a second member, resilient means connecting said first and second members for relative rotation in response to angular acceleration of the wheel, detection means for detecting relative rotation of said members, and control means for controlling relative rotation between said members so that actuation of the detection means takes place when the magnitude of angular acceleration of the wheel in either direction exceeds a predetermined magnitude.

4,189,638

WATER INJECTION PROFILING BY NUCLEAR LOGGING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,504
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—259 **12 Claims**

1. A method for determining the characteristics of flow of injection water in and beyond a known size cased well borehole having casing perforations at one or more levels within the well comprising the following steps:

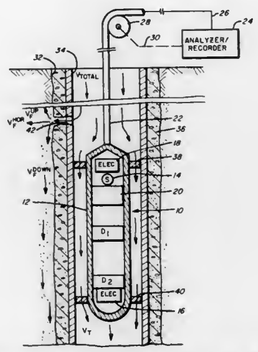
(a) providing a well tool having a source of radiation and at least two detectors longitudinally spaced from said source and each other;

(b) positioning said well tool below a level of casing perforations with said radiation source above said detectors;

(c) irradiating the borehole environs, including injection water being forced into the borehole, by radiation from said radiation source;

(d) detecting radiation from the activated injection water by operation of said detectors and generating signals representative thereof;

(e) distinguishing count rate data from each of said detectors according to two energy ranges of detected radiation;



(f) combining said count rate data according to a first predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly within said casing below said perforation level;

(g) combining said count rate data according to a second predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly behind said casing below said perforation level;

(h) positioning said well tool above said level of casing perforations with said radiation source below said detectors, and repeating steps (c) through (e); and

(i) combining said count rate data according to said second predetermined relationship to derive an indication of the linear flow rate of said activated injection water upwardly behind said casing above said perforation level.

4,189,639

PROCESS FOR ANALYZING CHARGED PARTICLES

Yoshiaki Kai, Moriguchi; Wataru Sakurai, Hirakata, and Fumiya Konishi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1978, Ser. No. 878,875
Claims priority, application Japan, Feb. 21, 1977, 52-18531
Int. Cl.[2] D01D *59/44;* **H01J** *39/34*
U.S. Cl. 250—282 **10 Claims**



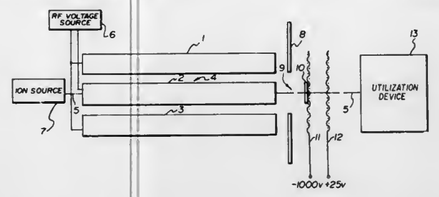
1 A process for analyzing the mass of charged particles characterized by coating over a flat substrate a positive resist film which is sensitive to charged particles, causing the charged particles to impinge against said charged particle sensitive film, dissolving the charged particle sensitive resist in a portion impinged with said charged particles, and determining the quantity of resist impacted by said particles by measuring the quantity of dissolved particle sensitive resist or the quantity of undissolved particle sensitive resist, thereby quantitatively analyzing the charged particles in terms of the quantity of the dissolved charged particle sensitive resist.

4,189,640

QUADRUPOLE MASS SPECTROMETER

Peter H. Dawson, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 27, 1978, Ser. No. 964,059
Int. Cl.[2] B01D *59/44;* **H01J** *39/00*
U.S. Cl. 250—290 **5 Claims**



1. A quadrupole mass spectrometer for charged particles comprising:

four rod-shaped poles positioned symmetrically in parallel about an axis along which charged particles are injected from one end of the poles, opposite pairs of the poles being interconnected and adapted for connection to an rf voltage source; and

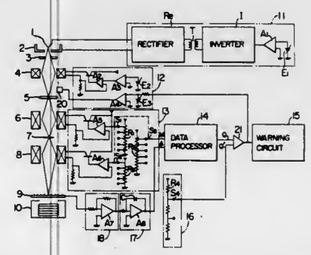
first and second grid means located sequentially at the other end of said poles along the axis, the first grid means being adapted to receive a dc potential for accelerating particles leaving the poles and the second grid means being adapted to receive a dc potential for decelerating the particles passing through the first grid.

4,189,641

ELECTRON MICROSCOPE

Shinjiro Katagiri, Mito; Minoru Shinohara, and Shoji Kamimura, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 1, 1977, Ser. No. 829,916
Claims priority, application Japan, Sep. 3, 1976, 51-104864
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **5 Claims**



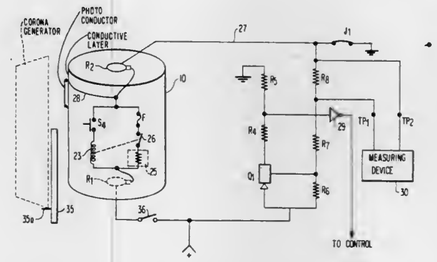
1. An electron microscope comprising means for emitting an electron beam, means for projecting said electron beam so as to focus on a sample and transmit therethrough, means for magnifying the transmitted electron beam, means for converting the magnified electron beam into a visual image; means for setting the power of magnification by said magnifying means; means for detecting the density of the electron beam applied to said converting means; means for producing an electric signal proportional to the product of said detected density of the electron beam, the reciprocal of the square of said set value of the power of magnification, and a period of time during which said electron beam has been projected on said sample; means for producing a control signal when said electric signal reaches a predetermined value; and means responsive to said control signal to control the projection of said electron beam so as to decrease one of the density and the amount of the electron beam on said sample.

4,189,642

METHOD AND APPARATUS FOR DRUM CORONA CURRENT MEASUREMENT AND ALIGNMENT

Dennis J. Justus, Boulder, and Gerald L. Smith, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,707
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—324 **15 Claims**



1. A method of corona alignment for aligning corona in situ in an electrostatic copier which copier includes at least one corona generator, a rotatable image bearing drum with a photoconductor supported on a conductive layer comprising the steps of:

energizing a selected corona generator,

interrupting a normal current return path from said conductive layer,

providing a current path from said conductive layer,

coupling said current path to a measurement device,

masking a selected area of said selected corona generator,

measuring current in said current path with said generator masked,

subsequent to said measuring step, unmasking said selected area and masking a different area, and

again measuring current in said current path with said different area masked.

4,189,643

TREATMENT OF PAPER FOR IMPROVED ELECTROSTATOGRAPHIC FUSING

Francis J. Wieloch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 5, 1977, Ser. No. 841,268
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—326 **4 Claims**

1. A method of treating a paper sheet comprised of a mat of paper making fibers having a smooth, uniform coating of starch or modified starch on its surface to improve the sheet's performance in electrostatographic copiers by enhancing the ability of the copier's roll fuser to cause the permanent adhesion of toner particles to the surface of the sheet, which method comprises exposing the surface of the paper sheet to a direct stream of corona ions prior to imaging the sheet in the electrostatographic copier.

4,189,644

SMOKE DETECTOR IONIZATION CHAMBER

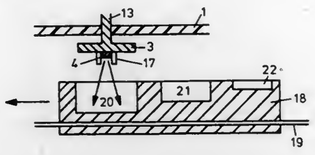
Wolfgang Schubert, Bubikon, and Bernhard Durrer, Stäfa, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Nov. 23, 1977, Ser. No. 854,077

Claims priority, application Switzerland, Dec. 1, 1976, 15144/76

Int. Cl.² G01T 1/18

U.S. Cl. 250—381 **14 Claims**



1. An ionization chamber of the type used in an ionization smoke detector and having two electrodes and one radioactive source for ionizing the electrode gap, the improvement therein comprising

electrode areas with differing geometrical configurations on at least one of said electrodes, and

means for laterally displacing one of said electrodes relative to the other, whereby areas of said one electrode with differing geometrical configurations are brought into the ionization zone of said radioactive source.

4,189,645

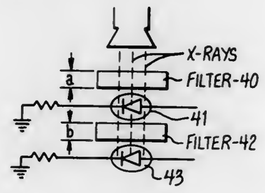
X-RAY MEASURING SYSTEM

Edward L. Chaney, Savannah, Ga., and Douglas C. Wiegman, La Grange Park, Ill., assignors to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Jun. 28, 1978, Ser. No. 919,758

Int. Cl.² H05G 1/26

U.S. Cl. 250—394 **4 Claims**



1. A system for providing measurements of X-ray beam quality including that of determining the half value layer of the X-ray beam applied to an associated X-ray tube, first and second filter means each of selected thickness and composition for filtering said X-ray beams, first and second detector means respectively associated with said first and second filter means, said first filter means positioned intermediate the source of said beams and said first detector to filter the beams before the beams impinge on said first detector, said second filter means positioned intermediate the source of said beams and said second detector to filter the beams before the beams impinge on said second detector, said filter means and detector means mounted in essentially series alignment with the source of X-ray beams in order that the detector means sample essentially the same X-ray beams, the total thickness of the filter means between the source and said first detector being the thickness of the first filter means, and the total thickness of the filter means between the source and said second detector being the thickness of the first filter means plus the thickness of the second filter means, each of said detector means providing a respective electrical output responsive to the beams impinging thereof, means for obtaining the ratio of the electrical outputs from said detectors in accordance with the relation

$$HVL = 0.693 \Delta X / \log R$$

where ΔX is the difference in effective filter thickness between the first and second detectors and R is equal to the ratio of the outputs from the detectors, and means for processing and displaying a signal of said ratio.

4,189,646

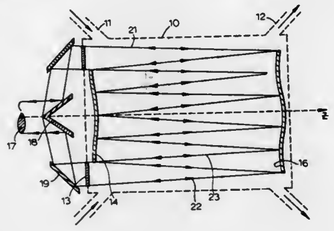
PROCESS AND APPARATUS FOR REACTING LASER RADIATION WITH A REACTIVE MEDIUM

Johannes C. Vanderleeden, 2626 Woodchester Dr., Mississauga, Ontario, Canada (L5K 3Z7)

Filed May 12, 1977, Ser. No. 796,328

Int. Cl.² H01J 39/34

U.S. Cl. 250—423 P **12 Claims**



1. A process for reacting laser radiation with a reactive medium, which comprises:

providing a reaction zone having opposed first and second ends defining a flow path through said zone,

providing at said ends a pair of opposed reflecting surfaces,

flowing the reactive medium through the reaction zone in a direction from said first end to said second end, the medium containing a reactive species having a predetermined distribution profile transverse to the direction of flow,

directing a beam of laser radiation having a predetermined cross-sectional configuration into the reaction zone along a path intersected by one of said reflecting surfaces, and

successively reflecting the beam between said surfaces along successive paths of progressively changing cross-sectional area intersected by respective, contiguous, non-overlapping areas of said surfaces, thereby generating at substantially all transverse cross-sections of the reaction zone a radiation flux density profile which is related in a predetermined manner to the transverse distribution profile of the reactive species.

4,189,647

OPEN CYCLE OCEAN THERMAL ENERGY CONVERSION SYSTEM

J. Michael Wittig, West Goshen, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,572

Int. Cl.² F03G 7/04

U.S. Cl. 290—42 **9 Claims**

1. An open cycle ocean thermal energy conversion system comprising:

a flash evaporator having a casing with an inlet opening and a drain outlet therein, relatively warm ocean water being receivable through said inlet opening, said water being partially flashed into motive steam inside the casing and the remaining, unflashed water exiting the casing through the outlet drain;

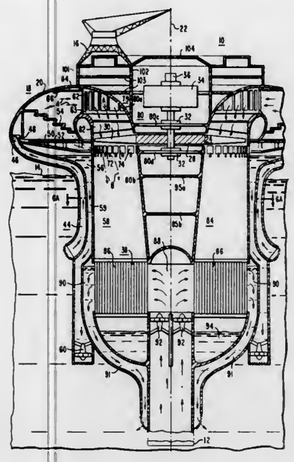
a skirt-conduit structure providing fluid communication between said outlet drain and the ocean, said skirt-conduit

structure being disposed about a vertically extending axis and having a cylindrically shaped, radially inner surface; and

an axial flow turbine comprising

a rotor structure with a vertical axis of rotation, said rotor structure including a rotatable shaft, a disc element circumferentially disposed about and connected to said shaft, and at least one axial row of radially directed blades disposed radially within said cylindrical inner surface, said blades being supported by said disc;

an inner casing structure disposed about said vertical axis; said inner casing structure cooperating with said skirt-conduit inner surface to provide an annular motive steam flowpath of increasing flow area in the downward axial



direction, said turbine flowpath receiving motive steam from said evaporator, said inner casing structure having an upstream portion disposed upstream from said disc element and a downstream portion disposed downstream from said disc element, said inner casing portions' radially outer peripheries cooperating with the radially outer periphery of said disc to provide a downwardly, radially inwardly tapered surface;

an annular row of stationary vanes disposed between said inner casing structure and said skirt-conduit's inner surface across the steam flowpath upstream from said blades for imparting a predetermined flow direction to the motive steam passing therethrough;

a generator coupled to said turbine shaft for producing electrical energy.

4,189,648

WIND TURBINE GENERATOR ACCELERATION CONTROL

Kermit I. Harner, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1978, Ser. No. 916,329

Int. Cl.² F03D 7/04

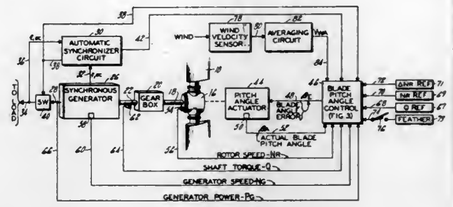
U.S. Cl. 290—44 **6 Claims**

1. In a power generating system including a wind turbine driven source of energy, said wind turbine having a wind driven rotor with a plurality of variable pitch blades, a control for minimizing mechanical stresses in said system during rapid angular momentum changes of said rotor such as during startup and shutdown comprising:

means for sensing a rotational speed of said system and producing a first signal indicative thereof,

means for sensing the velocity of the wind driving said rotor and producing a second signal indicative thereof,

scheduling means receiving said first and second signals and producing as a function thereof a desired blade pitch angle signal,



and blade pitch angle control means receiving said desired blade pitch angle signal and responsive thereto for regulating the pitch angle of said rotor blades.

4,189,649

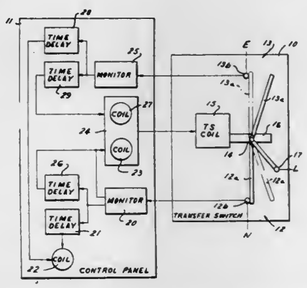
CONTROL PANEL FOR AUTOMATIC TRANSFER SWITCH

Walter C. Przywozny, Whippany, and William A. Moakler, Basking Ridge, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Dec. 1, 1978, Ser. No. 966,187

Int. Cl.² H02J 9/08

U.S. Cl. 307—64 **6 Claims**



1. A control panel for an automatic transfer switch which alternatively connects a load to a normal source of power or starts up an emergency source of power and connects the load to it, the control panel comprising:

(a) means for monitoring the normal source voltage, said monitoring means producing a high output when the normal source voltage is above a pickup level and producing a low output when the normal source voltage is below a dropout level, the pickup level being higher than the dropout level,

(b) means responsive to only the low output from said monitoring means for initiating operation of the emergency source of power,

(c) time delay means between said monitoring means and said responsive means for preventing said responsive means from responding to a low output from said monitoring means for the duration of the time delay imposed by said time delay means, and

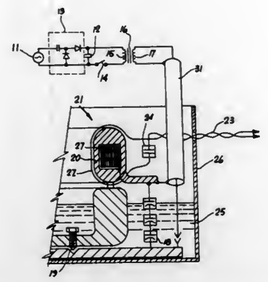
(d) feedback means connected between said time delay means and said monitoring means for causing said monitoring means to produce a high output as long as the normal source voltage is above the dropout level for the duration of the time delay produced by said time delay means.

4,189,650

ISOLATED TRIGGER PULSE GENERATOR

Kristian Aaland, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,252
Int. Cl.² H03K *3/53*
U.S. Cl. 307—108 **4 Claims**



4. A trigger pulse generator for producing a multiplicity of isolated impulses with pico-second simultaneity comprising in combination:

an electrical generator for providing input pulses;

capacitor means coupled to said pulse generator to receive a charging current therefrom;

a transformer, said transformer having a toroidal shaped primary, a toroidal shaped core located within the primary, and a multiplicity of single-turn secondaries spaced around said primary coil;

circuit means including a liquid dielectric spark gap for electrically connecting the capacitor means to the primary of said transformer;

housing means for enclosing the capacitor means, the transformer and the spark gap; and

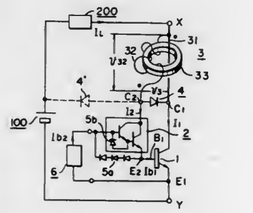
a liquid dielectric contained in said housing means and in which said spark gap is immersed such that voltage breakdown of said spark gap causes electrical impulses to be established in the secondaries of said transformer.

4,189,651

TRANSISTOR SWITCH DEVICE

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 695,029, Jun. 11, 1976, abandoned.
This application Sep. 6, 1977, Ser. No. 831,005
Claims priority, application Japan, Jun. 20, 1975, 50/76008; Jun. 20, 1975, 50/76009
Int. Cl.² H03K *17/02, 17/60*
U.S. Cl. 307—254 **10 Claims**



1. A transistor switch device comprising:

a main power transistor having a collector, a base and an emitter with a voltage drop between the collector and the emitter,

an auxiliary solid-state switch,

a series connected branch comprising said auxiliary solid-state switch and an electricity replenishing means, said series connected branch being connected between the collector and the base of the main power transistor, and said electricity replenishing means generating a voltage, and

shunt means comprising a diode connected in parallel with said electricity replenishing means for by-passing a current of said electricity replenishing means when said auxiliary solid state switch is turned off,

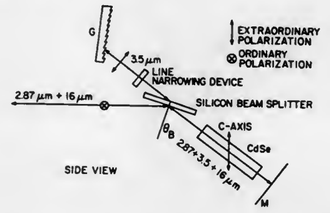
whereby the voltage drop between the collector and the emitter of the main power transistor is reduced.

4,189,652

BEAM SPLITTER COUPLED CDSE OPTICAL PARAMETRIC OSCILLATOR

Nicholas J. Levinos, and George P. Arnold, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,903
Int. Cl.² H07M *5/04*
U.S. Cl. 307—428 **2 Claims**



1. Optical parametric oscillator apparatus for producing narrow band 16 μm coherent radiation which comprises in combination (a) a cavity resonator formed by a pair of spaced reflectors, one of which is a line selecting element disposed at an angle to the axis of said resonator, (b) a CdSe crystal disposed on the axis of said resonator, the C-axis of said CdSe forming a phase matching angle of 72° with the axis of said resonator, (c) means for introducing 2.87 μm coherent radiation from an HF laser into said resonator and through said CdSe to produce 3.5 μm signal radiation and 16 μm idler radiation, (d) temperature controlled silicon flat beam splitter means for separating the 3.5 μm signal radiation from the 2.87 μm pump and 16 μm idler radiation within said resonator, said beam splitter means having a wedge angle less than 20 seconds of arc and said beam splitter means and said grating being so disposed that only said signal radiation is resonant in said cavity resonator, and (e) line narrowing means disposed on the axis of said cavity resonator between said grating and said beam splitter means.

4,189,653

RECTIFIER ASSEMBLY FOR RECTIFYING OUTPUT OF ALTERNATOR FOR INTERNAL COMBUSTION ENGINE

Tomoyosi Hiratuka, and Akihiro Saito, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1978, Ser. No. 887,367
Claims priority, application Japan, Mar. 19, 1977, 52-30748
Int. Cl.² H02K *11/00*
U.S. Cl. 310—68 D **7 Claims**

1. A rectifier assembly for rectifying the output of an alternator for an internal combustion engine, said rectifier assembly comprising:

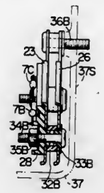
a first set of diodes;

a second set of diodes;

a first arcuate electric conductive plate for cooling said first set of diodes and for connecting one terminal of each of said first set of diodes in common with one pole of an external power source;

a second arcuate electric conductive plate for cooling said second set of diodes and for connecting one terminal of each of said second set of diodes in common with the other pole of said external power source; and

a plurality of first electric conductive connectors each connecting the other terminal of corresponding one of said first set of diodes and the other terminal of corresponding one of said second set of diodes in common with the corresponding one of the phases of an armature winding



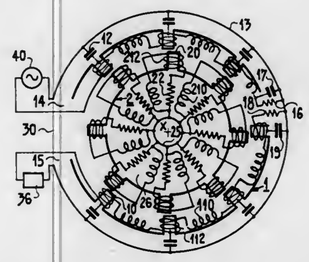
of the alternator so as to connect said first set of diodes and said second set of diodes in a full-wave rectifying circuit, wherein said first connectors are insulated from each other by insulating material and molded integrally and arcuately in a single unit by the insulating material to form a connector assembly, and said first and second arcuate electric conductive plates and said connector assembly are disposed substantially parallel and spaced to each other in a superposed arrangement and insulated from each other to form the rectifier assembly.

4,189,654

ELECTRICAL MACHINE OPERATING AS A GENERATOR OR AS AN AMPLIFIER

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,280
Claims priority, application France, Nov. 7, 1975, 75 34160
Int. Cl.² H02K *11/00*
U.S. Cl. 310—72 **6 Claims**



1. An improved electrical apparatus of the type that comprises:

a stator having n poles;

a rotor having n poles; and

means for inducing relative motion between said stator and said rotor such that at least one of said stator poles is successively juxtaposed to n of said rotor poles, wherein the improvement comprises

a plurality of electrical circuits associated with said stator and disposed to form a line having a pair of input terminals and a pair of output terminals; and

a plurality of electrical circuits associated with said rotor, said circuits including radially connected resistive elements and being electrically coupled to the electrical circuits associated with said stator in the presence of said relative motion, wherein said stator and rotor are circular and disposed about a common axis, said relative motion comprises the rotation of said rotor about said common axis, the electrical circuits associated with said stator comprise a transmission line, including:

a plurality of inductors each at least partially associated with the corresponding stator pole, said inductors being serially connected between an input conductor located upstream of the direction of rotation of said rotor and an output conductor located downstream thereof and separated by a gap from said input conductor;

a common conductor;

a plurality of capacitors each having one plate connected to a tap on the corresponding inductor and the other plate connected to said common conductor; and

at least two resistors each connected between an inductor and said common conductor to damp said line, the electrical circuits associated with said rotor comprises:

a plurality of inductors each at least partially associated with the corresponding rotor pole; and

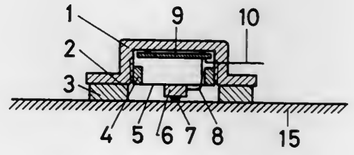
a corresponding plurality of said resistors each connected in parallel with a corresponding inductor and to a common point.

4,189,655

LIGHTWEIGHT PIEZOELECTRIC ACCELEROMETER

Per V. Bruel, Rungsted Kyst, Denmark, assignor to Bruel & Kjaer Industri A/S, Naerum, Denmark

Filed Apr. 14, 1978, Ser. No. 896,185
Int. Cl.² H01L *41/10*
U.S. Cl. 310—329 **8 Claims**



1. An accelerometer housed in a casing having an opening, the combination comprising: diaphragm means including at least one thin circular diaphragm peripherally fixed to the casing across its opening; a small base means located on the exterior side of the diaphragm for mechanical contact with a surface, the mechanical vibrations of which are to be determined; a piezoelectric element; said piezoelectric element, said base means and said diaphragm being connected together with the piezoelectric element located between said base means and said diaphragm so that said diaphragm dynamic mass provides a seismic mass means and with the axis through the center of said diaphragm constituting an axis of symmetry through said seismic mass means, said piezoelectric element and said base means; and vibration absorber means on said case for mounting the case on the surface and dynamically isolating said case from the vibrating surface.

4,189,656

CATHODE STRUCTURE FOR A HIGH POWER LASER

Vahram W. Biricik, Rancho Palos Verdes; Kang R. Chun, Pacific Palisades, and Laurence S. Gresko, Long Beach, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed May 12, 1978, Ser. No. 905,511
Int. Cl.² H01J *1/13, 61/52*
U.S. Cl. 313—37 **4 Claims**

1. A cathode structure for a high power laser comprising:

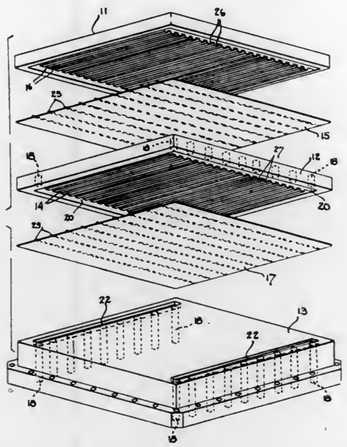
first and second thermally conductive sheets, each having a plurality of side by side longitudinal grooves separated by land portions formed in one of the broad surfaces thereof, the surface of each of said sheets opposite to said one surface thereof being substantially flat,

means for joining said sheets together with the land portions

of said first sheet bonded to the opposite surface of said second sheet, thereby forming a first set of longitudinal channels between said sheets,

a base plate having a substantially flat surface,

means for joining the second sheet to said base plate with the land portions of said second sheet bonded to said flat surface of said base plate, thereby forming a second set of longitudinal channels between said base plate and said second sheet, and



means for feeding cooling fluid to said channels at one end thereof and removing said fluid from said channels at the other end thereof,

the first and second sets of channels being substantially parallel to each other with the second set of channels staggered between the first set of channels in substantially 180° spatial relationship thereto.

4,189,657

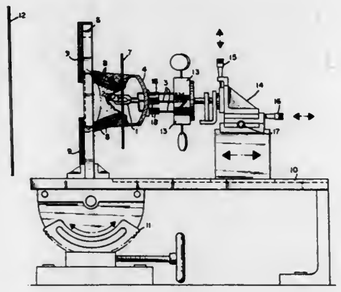
METHOD OF MAKING SEALED BEAM LAMP

Stephen F. Kimball, III, Andover; Robert P. Bonazoli, Hamilton, and Lewis H. Palmer, III, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 20, 1978, Ser. No. 897,999

Int. Cl.[2] H01J *5/16, 61/40;* **H01K** *1/26, 1/30*

U.S. Cl. 313—113 **6 Claims**



1. The method of making an electric lamp, which comprises a tungsten-halogen lamp within a reflector envelope, comprising the steps of: disposing a tungsten-halogen lamp capsule within a curved reflector, the filament or filaments of the lamp capsule being connected to lead-in support wires which protrude rearwardly through holes in the reflector; sealing a front lens to the reflector; mounting the assembly in a focussing apparatus; energizing the filament; moving the support wires relative to the reflector in order to adjust the position of the capsule within the reflector in order to obtain a desired beam pattern; and fixing the capsule in said position by securing the lead-in support wires to the reflector.

5. A sealed beam lamp comprising: an envelope comprising a curved reflector having a front lens attached thereto and metal sleeves attached to the reflector at the rear thereof; a tungsten-halogen capsule disposed in the envelope; lead-in support wires for the capsule extending through the reflector and through clearance holes in the metal sleeves, the lead-in support wires to the metal sleeves being an electrically conductive seal, said seal being made after the front lens has been attached to the reflector and after the capsule has been focussed.

4,189,658

ROTATING ANODE X-RAY TUBE

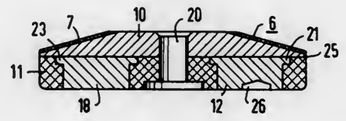
Rudolf Schleinkofer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,477

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646454

Int. Cl.[2] H01J *35/08*

U.S. Cl. 313—330 **10 Claims**



1. A rotating anode for an X-ray tube comprising a rotary anode body having equilibration means applied for the purpose of rotational balancing, characterized in that the rotary anode body comprises a composite construction including a metal disc having a focal spot orbit thereon, and further material secured with said metal disc and having a plurality of recesses at equal spacial intervals from one another and at equal spacial intervals from the center of said rotary anode body, the equilibration means comprising equilibration members inserted in said recesses in said further material of the rotary anode body, said equilibration members being accessible for modification in a reductive fashion without damage to the anode to a degree sufficient to compensate for imbalances.

4,189,659

COLOR-TELEVISION PICTURE TUBE WITH INTERNAL PERMANENT MAGNETS FOR CONVERGENCE CORRECTION

Wolfram Andre, and Hans Muller, both of Aichwald, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,663

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722477

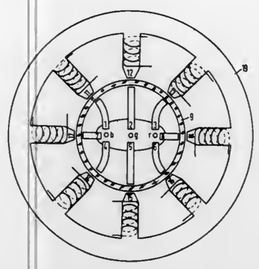
Int. Cl.[2] H01J *29/76, 31/20*

U.S. Cl. 313—412 **5 Claims**

1. In an in-line color-television picture tube having a neck portion including therein three coplanar electron guns generating three separate electron beams for irradiating blue, green and red phosphors on a screen wherein purity adjustment, vertical pincushion correction and static convergence correction are performed by magnetic fields acting on said beams, the improvement comprising:

a plurality of permanent magnets disposed within said tube neck adjacent the output of said electron guns for making the above-mentioned adjustment and corrections, said plurality of permanent magnets consisting of

a first pair of bar-like permanent magnets disposed adjacent each of said electron beams, the permanent magnets of each of said first pair of magnets having their poles on the ends thereof and extend outward from said plane of said electron guns in opposite directions with respect to each other, and



a second pair of bar-like permanent magnets disposed in said plane of said electron guns, the permanent magnets of said second pair of magnets having their poles on the ends thereof, one of said second pair of magnets being disposed adjacent one of the outer ones of said electron guns and the other of said second pair of magnets being disposed adjacent the other of the outer ones of said electron guns.

4,189,660

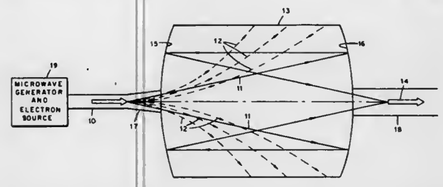
ELECTRON BEAM COLLECTOR FOR A MICROWAVE POWER TUBE

Raphael A. Dandl, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,175

Int. Cl.[2] H01J *23/02*

U.S. Cl. 315—5.38 **2 Claims**



1. An improved device for separating high power microwaves from a high power electron beam comprising a cylindrical electron beam collector with the interior back and front end walls thereof being made in the form of a pair of facing parabolic mirrors; a microwave generator and an electron source, a series connected waveguide and horn coupled between said microwave generator-electron source and said collector through the central portion of the back mirrored end wall of said collector; and an output waveguide coupled to the central portion of the front mirrored end wall of said collector, whereby during operation of said device, the electrons entering said collector spread out and are dissipated in the cylindrical wall of said collector and the microwave energy entering said collector in the form of rays is reflected from the front mirrored end wall to the back mirrored end wall of the collector where said rays are again reflected and are focused and recombined at the entrance to said output waveguide thereby providing an efficient reconstruction of the transmitted mode of the microwave energy in the output waveguide to provide a transmission efficiency of the microwave energy through said collector of at least 94%.

4,189,661

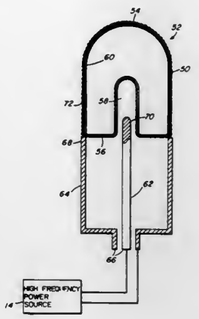
ELECTRODELESS FLUORESCENT LIGHT SOURCE

Paul O. Haugsjaa, Acton, and Edward F. White, Dorchester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 13, 1978, Ser. No. 959,823

Int. Cl.[2] H05B *41/24;* **H01J** *65/04*

U.S. Cl. 315—39 **14 Claims**



8. An electromagnetic discharge apparatus comprising:

an electrodeless lamp having an envelope made of a light transmitting substance said envelope having a phosphor coating which emits visible light upon absorption of ultraviolet radiation and, said envelope enclosing a fill material which emits ultraviolet radiation upon breakdown and excitation; and

a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end adapted for coupling to a high frequency power source and a second end coupled to said electrodeless lamp so that said electrodeless lamp forms a termination load for said fixture and said phosphor coating emits visible light in response to excitation by ultraviolet radiation from said fill material when high frequency power is applied to said fixture.

4,189,662

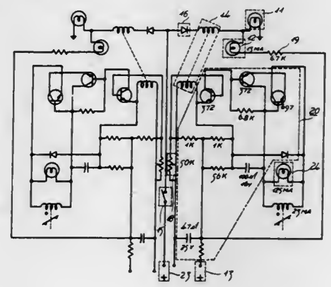
SAFETY DEVICE FOR LAMPS OF MOTOR VEHICLE

Fu-Erh Horng, 116, Hi-Sun Fourth Rd., Hsaio-Kung Hsung, Kao-Hsiung Hsein, Taiwan

Filed May 10, 1978, Ser. No. 904,614

Int. Cl.[2] H05B *37/03*

U.S. Cl. 315—136 **1 Claim**



1. A safety device for indicating the operating conditions of signal lights and switches, comprising:

a plurality of circuit elements forming a first circuit path through one of the signal lights and one of the switches, said plurality of circuit elements including a primary winding of a current transformer coupled to one side of

said one signal light and a rectifying diode in series with said one light, said primary winding, said one switch and a current source;

a second plurality of circuit elements forming a second circuit path through said one light, said second plurality of circuit elements including a checking light connected to said one side of said one signal light, a resistor, and a second current source in series with said one signal light and said checking light, said checking light having a higher resistance than said one signal light, whereby when said one switch is open, current flows through said second circuit path and causes said checking light to glow visibly if said one signal light is in operating condition;

a secondary winding magnetically coupled to said primary winding;

an amplifier circuit coupled to said secondary winding for amplifying current in said secondary winding; and

an indicator light coupled to the output of said amplifier, such that current flowing through said first circuit path induces a current in said secondary winding and causes said indicator light to glow visibly;

whereby if both said one signal light and said one switch are operational, said checking light will glow when said switch is open and said indicating light and said one signal light will glow when said one switch is closed, and if said one signal light is not operational, none of the said lights will glow, and if said one signal light is operational and said one switch is not operational, said checking light will glow continuously.

4,189,663

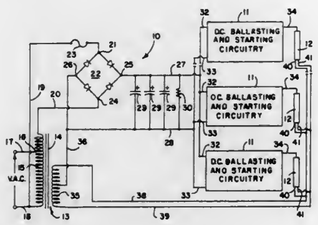
DIRECT CURRENT BALLASTING AND STARTING CIRCUITRY FOR GASEOUS DISCHARGE LAMPS

Joel Schmutzer, Oak Park, Ill., and George D. Elkerton, Edmonds, Wash., assignors to Forest Electric Company, Melrose Park, Ill.

Division of Ser. No. 696,400, Jun. 15, 1976, Pat. No. 4,132,925. This application Sep. 28, 1978, Ser. No. 946,760

Int. Cl.² H05B *41/16*

U.S. Cl. 315—205 **2 Claims**



1. In a system for operating a gaseous discharge lamp from direct current ballasting and starting circuitry, a power conversion circuit for converting alternating current voltage to suitable direct current voltage for said ballasting and starting circuitry, said power conversion circuit comprising:

a power transformer;

a primary winding on said transformer, said primary winding having a tap connected to a portion of said primary winding, said portion of the primary winding being adapted for applying alternating current input voltage thereacross, whereby the alternating current voltage is stepped-up in potential across the entire primary winding;

rectification means for rectifying the alternating current voltage appearing across the entire primary winding;

filtering means connected to said rectification means for filtering the rectified alternating current voltage supplied by said rectification means to provide a direct current voltage at a pair of output terminals across said filtering means to at least one ballasting and starting circuitry;

a secondary winding of said transformer having a center-tap, said center-tap referenced to one of said pair of output terminals of said filtering means, with the ends of said secondary winding providing an alternating current voltage suitable for connection to a cathodic heater element of said lamp, whereby said lamp operates on direct current supplied by rectification of said primary winding and which returns to said primary winding through said secondary winding, the center-tap thereof, and said rectification means, while heating the lamp with alternating current voltage does not cause alternating current voltage modulation of the D.C. regulated current through said lamp.

4,189,664

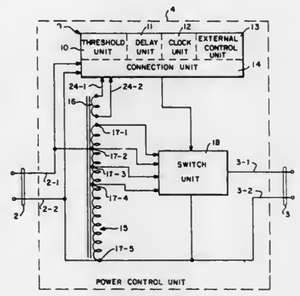
POWER CONTROL UNIT FOR AUTOMATIC CONTROL OF POWER CONSUMPTION IN A LIGHTING LOAD

Richard L. Hirschfeld, 372 Bolinas Rd., Fairfax, Calif. 94930

Filed Oct. 5, 1977, Ser. No. 839,748

Int. Cl.² H05B *41/36*; G05F *1/20*

U.S. Cl. 315—297 **14 Claims**



10. A power control unit connectable to a source of power to receive an input voltage and to automatically control power consumption in a voltage-regulatable load where said load includes one or more fluorescent lamps, comprising,

voltage means connected to said source for providing from said input voltage a number of different voltages including a higher-value voltage capable of starting said fluorescent lamps and including one or more lower-value voltages for reduced power consumption in said load,

switch means for selecting one of said different voltages for connection to said load,

controller means for controlling said switch means to select one of said lower-value voltages to reduce power to said load, said controller means including first means causing said switch means to select said higher-value voltage whenever said input voltage is below a predetermined level and periodically switching between said higher-value voltage whereby said fluorescent lamps are periodically startable and one of said lower-value voltages, whereby power consumption in said load is reduced.

4,189,665

IRRADIATION APPARATUS

Andries van der Meulen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

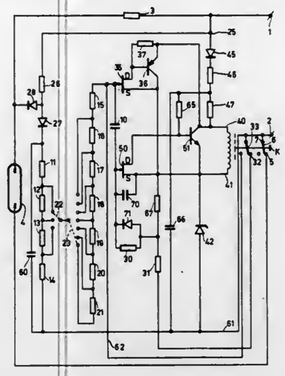
Filed Feb. 17, 1978, Ser. No. 878,825

Claims priority, application Netherlands, Mar. 3, 1977, 7702260

Int. Cl.² H05B *41/36*

U.S. Cl. 315—360 **15 Claims**

1. An irradiation apparatus comprising a pair of input terminals for coupling the apparatus to a source of supply voltage, an electric discharge tube, a timing circuit including a capacitor for automatically reducing, by means of an auxiliary device, the tube irradiation after a predetermined irradiation period, means for coupling the discharge tube, the timing circuit and the auxiliary device to said input terminals, and a safety circuit coupled to said capacitor and to said auxiliary device so as to reduce the tube irradiation in the case of a defect in the timing circuit, said safety circuit comprising a



circuit impedance element connected in series with the capacitor so that the capacitor current flows through the impedance element during an irradiation period, and means coupled to the impedance element and the auxiliary device for monitoring the flow of capacitor current so as to trigger the auxiliary device to reduce the tube irradiation if the capacitor current falls below a threshold level indicative of a defect in the timing circuit.

4,189,666

SPEED CONTROL SYSTEM FOR SMALL SIZE D-C ELECTRIC MOTOR

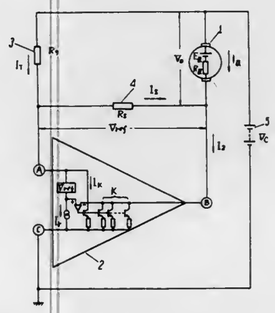
Yoshio Tetsugu; Hiromitsu Nakano, both of Katano; Hiroshi Minakuchi, Shiga; Tomio Oyama, Toyonaka; Isao Yoshida, Neyagawa; Mitsuharu Ota, and Kazutsugu Kobayashi, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1978, Ser. No. 904,984

Claims priority, application Japan, May 19, 1977, 52/58289

Int. Cl.² H02P *5/00*

U.S. Cl. 318—334 **1 Claim**



1. A speed control system for a small size d-c electric motor comprising a three-terminal speed control IC having a first terminal and a second terminal for producing a reference voltage thereacross and a grounded third terminal, the first terminal being adapted to pass therethrough a current in proportion to the current through the second terminal, the d-c motor being connected between a power source positive terminal and the second terminal, and a first resistor and a second resistor serving as external circuit elements for the IC, the first resistor being connected between the power source positive terminal and the first terminal, the second resistor being connected between the first and second terminals, to provide a constant voltage source having a negative internal resistance equal in absolute value to the internal resistance of the d-c motor and thereby render the d-c motor rotatable at a constant controlled speed, the system being characterized in that the first resistor is a metal-film fixed resistor substantially equivalent to the armature resistance of the motor in temperature coefficient.

4,189,667

CONTROL CIRCUITS FOR ELECTRIC TRACTION MOTORS FOR VEHICLES

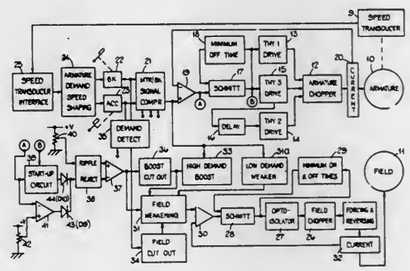
Trevor C. Boxer, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 31, 1977, Ser. No. 847,298

Claims priority, application United Kingdom, Nov. 2, 1976, 45458/76

Int. Cl.² H02P *5/16*

U.S. Cl. 318—338 **7 Claims**



1. A control circuit for an electric vehicle traction motor comprising an armature current control comprising demand means for generating an armature current demand signal, feedback means for generating a feedback signal corresponding to the actual armature current, a first difference amplifier to which said demand signal and said feedback signal are fed, switching means sensistive to the magnitude of the output of the first difference amplifier for switching on and off the current through the armature, and a field current control include a further difference amplifier comparing the output of the first difference amplifier with a fixed reference signal and a field current switch circuit, said further difference amplifier acting to weaken the field current if the output of the first difference amplifier fails to exceed said fixed reference signal.

4,189,668

D.C. MOTOR SNUBBING

Derrick H. Willcock, Germiston; Stanley Marcus, Sandton; Ronald E. Hamm, Edenvale, and David N. Bowden, Alberton, all of South Africa, assignors to Westinghouse-Bellambie (Proprietary) Limited, Alrode, South Africa

Filed Jan. 19, 1978, Ser. No. 870,808

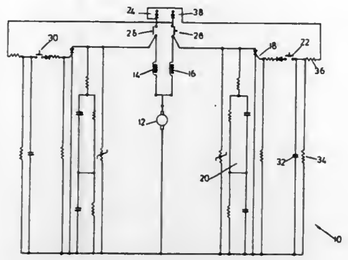
Claims priority, application South Africa, Jan. 20, 1977, 77/0337

Int. Cl.² H02P *3/12*

U.S. Cl. 318—379 **7 Claims**

1. A method of snubbing a D.C. motor which is connected in series with a first field coil to an electrical supply, the method including the steps of storing a quantity of electrical energy,

interrupting the electrical supply to the motor, and electrodynamically braking the motor by utilizing only the stored en-



ergy to actuate switching means which connects a second field coil in series with the motor armature.

4,189,669

CIRCUIT ARRANGEMENT FOR GENERATING A PULSE-WIDTH MODULATED SIGNAL

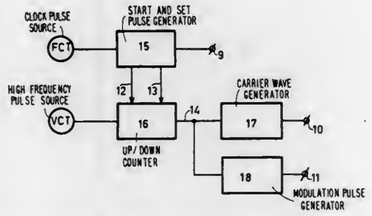
Johannes C. F. van Loon, and Engbert B. G. Nijhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,091

Claims priority, application Netherlands, Apr. 20, 1976, 76604119

Int. Cl.[2] H02P *7/42*

U.S. Cl. 318—811 **21 Claims**



1. A circuit arrangement for generating a load signal comprising a pulse width modulated carrier wave whose modulation depth as a function of time represents a preselected signal waveform, the circuit arrangement comprising a first counter having a count input and a start input, a first input for applying a first clock signal to the start input of the first counter so as to periodically start said counter so that the first clock signal defines a counting period of the counter, a second input for applying to the count input of the first counter a second clock signal independent of the load so that the pulses of said second clock signal are counted by the first counter, and a sequential network coupled to the counter output for consecutively detecting a sequence of preselected counts of the first counter which counts are determined by said preselected signal waveform, said sequential network generating the pulse width modulated carrier wave with a pulse width determined by the time interval between two counts of the first counter which are detected in different counting periods of said counter, the sequence in which the counts are detected being determined by said signal waveform.

4,189,670

POWER CIRCUIT FOR DIFFERENT STABILIZED DC VOLTAGES

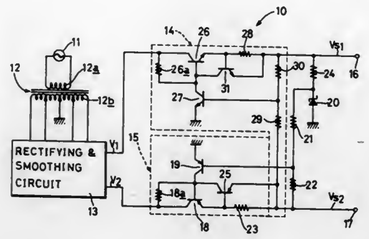
Makoto Tanahashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1978, Ser. No. 915,264

Claims priority, application Japan, Jun. 18, 1977, 52-79937[U]

Int. Cl.[2] G05F *1/58*

U.S. Cl. 323—9 **10 Claims**



1. A power circuit for providing a plurality of different stabilized DC voltages comprising:

a plurality of voltage stabilizing circuits each adapted to provide a respective one of said different stabilized DC voltages;

each of said voltages stabilizing circuits including a voltage control element for regulating a respective output voltage forming said respective stabilized DC voltage, means forming a respective reference voltage, and an output voltage level detecting element for detecting a difference between said respective output voltage and reference voltage and providing a corresponding control signal to said voltage control element;

said means forming the respective reference voltage in one of said voltage stabilizing circuits being responsive to said output voltage in another of said voltage stabilizing circuits; and

connecting means responsive to said output voltage in said one voltage stabilizing circuit for varying the effect, in another of said voltage stabilizing circuits, of the respective control signal on the respective voltage control element so that said output voltage of each of said voltage stabilizing circuits becomes zero whenever the output voltage of any other one of said voltage stabilizing circuits becomes zero.

4,189,671

VOLTAGE REGULATOR AND REGULATOR BUFFER

Raymond C. Yuen, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 893,207

Int. Cl.[2] G05F *5/00*

U.S. Cl. 323—19 **6 Claims**

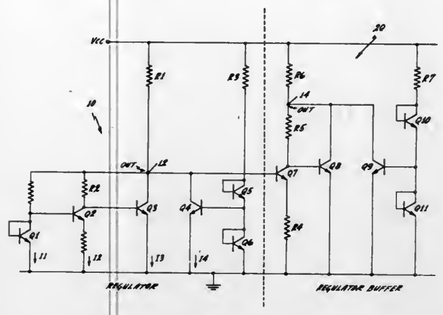
1. A voltage regulator which compensates for variations in power supply voltage of 2.7 V±30% between said power supply and a reference voltage and which supplies CML devices with a constant voltage, comprising:

a plurality of matched transistors connected in parallel with each other but connected in series between said power supply voltage and said reference voltage so as to provide paths of equal current therebetween,

an output node and resistance means in series between said transistors and said power supply voltage,

circuit means including a pair of transistors connected in series between said power supply voltage and said reference voltage so as to be responsive to variations in supply voltage,

the base of one of said plurality of transistors being connected between said pair of transistors whereby said one transistor is responsive to voltage variations in said circuit means and will shunt variations in current due to the variations of power supply voltage through said one transistor holding the current through the other of the plurality of transistors constant so that the voltage at said output node is held constant.



4,189,672

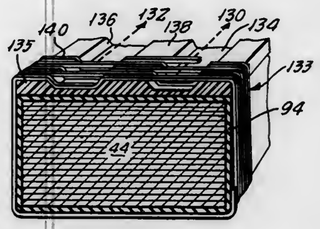
VARIABLE TRANSFORMER METHOD AND APPARATUS FOR PREVENTING SHORT-CIRCUIT CURRENT FLOW

Stanley G. Peschel, Brewster, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,523

Int. Cl.[2] H01F *29/04*

U.S. Cl. 323—43.5 R **21 Claims**



1. A variable transformer comprising:

a core of magnetically permeable material defining at least one loop for magnetic flux to follow,

at least one electrical winding encircling at least a portion of said core, said winding including a plurality of turns,

segments of respective turns of said winding being electrically exposed along its length, with dielectric material filling the spacings between adjacent exposed segments,

a first brush of high electrical conductivity,

a second brush of high electrical conductivity,

means for traversing said first brush along a traverse path past said exposed segments of said winding and for traversing said second brush along a traverse path past said exposed segments of said winding,

the spacings between adjacent exposed segments of said winding along the traverse path of said first brush being greater than the width of said first brush along that traverse path for preventing said first brush from simultaneously contacting two exposed segments,

the spacings between adjacent exposed segments of said winding along the traverse path of said second brush being greater than the width of said second brush along that traverse path for preventing said second brush from simultaneously contacting two exposed segments,

said first and second brushes being so positioned with respect to each other and with respect to said exposed segments of said winding along the respective traverse paths that at all times at least one of said brushes contacts an exposed segment of said winding when said brushes traverse said winding,

output connection means for being connected to an electrical load,

first electrical circuit means connected between said first brush and said output connection means for feeding electrical current between said first brush and said output connection means,

second electrical circuit means connected between said second brush and said output connection means for feeding electrical current between said second brush and said output connection means, and

said first and second electrical circuit means offsetting the voltage differential between two exposed segments of said winding when the two exposed segments are being simultaneously contacted by said first and second brushes, respectively, for electrically isolating said first and second brushes from each other for preventing electrical current from flowing between said brushes,

whereby the flow of short-circuit current through any turn of the winding is prevented when the first and second brushes are simultaneously contacting two exposed segments of the winding, but nevertheless current is conducted from one of said brushes through one of said electrical circuit means to said output connection means for supplying current to an electrical load.

4,189,673

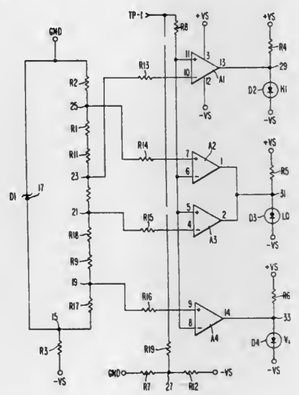
PEN-SHAPED PRECISION MULTI-LEVEL CURRENT MODE LOGIC TEST PROBE

Ken Shintaku, Oreland, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,347

Int. Cl.[2] G01R *19/16, 31/02*

U.S. Cl. 324—133 **8 Claims**



1. A pen-shaped handheld current mode logic testing probe comprising:

a voltage level receiving test point;

high resistance means for biasing said receiving test point to a negative bias voltage level representative of the voltage level of an open circuited current mode logic input;

stablized reference voltage means for generating a precision first, second, third and fourth threshold voltage level, each threshold voltage level thereof being in order increasing more negative, said third threshold voltage being less negative than said negative bias voltage level of said high resistance means and said fourth threshold voltage level being more negative than said negative bias voltage level of said high resistance means;

first comparator amplifier means for comparing said second threshold voltage level with voltage levels received at

said voltage level receiving test point and for generating an output responsive thereto;

second comparator amplifier means for comparing said first threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

third comparator amplifier means for comparing said third threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

fourth comparator amplifier means for comparing said fourth threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

first indicating means coupled to said first comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are relatively more positive than said second threshold voltage level;

second indicating means coupled to said second and said third comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are between said first and said third threshold voltage levels; and

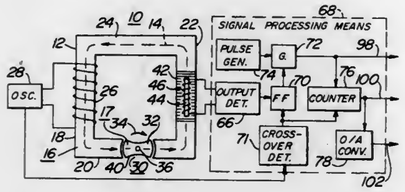
third indicating means coupled to said fourth comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are relatively more negative than said fourth threshold voltage level.

4,189,674

SIGNAL TRANSDUCING MEANS USING A BISTABLE MAGNETIC DEVICE

Richard A. Lathlaen, Hatfield, Pa., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 17, 1978, Ser. No. 925,374
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—208 **25 Claims**



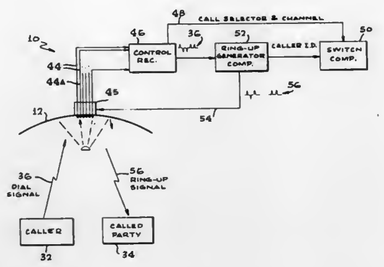
1. A signal transducing means for receiving input signals and delivering output signals comprising a bistable magnetic device which alters its magnetic state when the density of magnetic flux to which it is subject passes through a predetermined value, detecting means providing an output signal responsive to a change in magnetic state of said bistable device, conducting means for magnetic flux for subjecting said bistable magnetic device to conducted magnetic flux, said conducting means comprising a first portion providing a path of high permeability and a second portion providing a path having a permeance which is alterable in response to said input signals for varying the reluctance of said conducting means and the density of magnetic flux to which said bistable device is subject, and an energizing means for providing a time varying magnetic field for inducing magnetic flux in said conducting means and providing a flux density which varies through said predetermined value for altering the state of said bistable device to provide an output signal by said detecting means which is controlled by the variation of reluctance of said conducting means.

4,189,675

SATELLITE PERSONAL COMMUNICATIONS SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Norman B. Reilly, Glendale, and Joel G. Smith, La Canada, both of Calif.

Filed May 30, 1978, Ser. No. 910,707
Int. Cl.[2] H04B *7/20*
U.S. Cl. 325—4 **4 Claims**



1. A communication system for establishing communication between a large number of earth based terminals by means of a satellite, using a limited radio frequency bandwidth, comprising:

a satellite which includes a large reflector, a plurality of signal ports for transmitting and receiving, and means for directing a narrow angle radio wave beam containing signals received from a signal port to one of a multiplicity of sectors on the earth by way of the reflector; and

a plurality of terminals located in different of said sectors of the earth;

said satellite including means for delivering signals containing the same radio frequency band to different ones of said ports, so that the same frequency band can be used in different sectors of the earth;

said satellite including means responsive to a signal received from a sector of the earth by one of said ports, for processing the signal and then delivering it to a port for retransmission to a particular sector of the earth;

each of said terminals is responsive to a different coded ring up signal; and

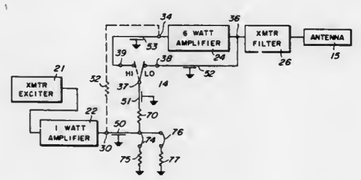
said satellite includes means responsive to a dial signal designating a particular called party, for delivering a corresponding ring up signal to all of said sectors of the earth.

4,189,676

SWITCHING SYSTEM UTILIZING FLEXIBLE CIRCUIT WITH TRANSMISSION LINE FOR MATCHED IMPEDANCE CONNECTIONS

Armando Arias, Tamarac; Ronald L. Scheiderer, Davie, and James T. Wiggenhorn, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 896,109
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—125 **10 Claims**



7. In a radio transmitter adapted to be operated at a first relatively low power level and a second relatively high power level, which transmitter includes a circuit board having a first signal terminal providing the relatively low power level ouput, a power amplifier having input and output terminals on the circuit board, an output filter having an input terminal connected to the output terminal of the power amplifier, and a switch device having first, second and third terminals and switch means selectively connecting the first terminal to the second and third terminals;

a switching circuit for selectively applying the low power level output from the first signal terminal and the relatively high power level output from the output terminal of the power amplifier to the output filter including in combination,

a flat circuit structure adapted to be positioned adjacent the circuit board and the switch device and including an insulating base, an insulating cover and a layer of conductive material forming first, second and third transmission lines,

first means connecting said first transmission line between the first signal terminal and the first terminal of the switch device,

second means connecting said second transmission line between the second terminal of the switch device and the input terminal of the output filter, and

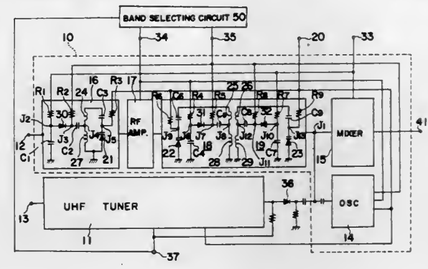
third means connecting said third transmission line between the third terminal of the switch device and the input terminal of the power amplifier.

4,189,678

COMBINATION VHF-UHF TUNER FOR USE IN A TELEVISION RECEIVER

Shuji Sakamoto, Daito, and Shuichi Wada, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 17, 1978, Ser. No. 934,523
Claims priority, application Japan, Aug. 18, 1977, 52/111485[U]
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—459 **2 Claims**



1. A combination VHF-UHF tuner comprising, in combination:

a UHF tuner;

a VHF tuner having an input tuning circuit, a primary interstage tuning circuit, a secondary interstage tuning circuit and a mixer connected in series between a VHF input and a tuner output;

means connected to the UHF tuner for operating the same when UHF channel is tuned in; and

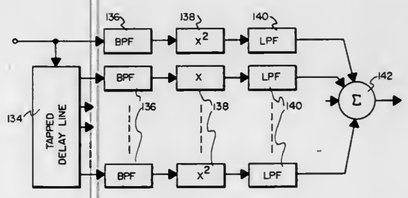
means connected to the VHF tuner for making the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to high band VHF signal when high channel VHF signal is tuned in, for making the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to low band VHF signal when low channel VHF signal is tuned in, and for making at least one of the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to high band VHF signal and the remaining operative to low band VHF signal when UHF channel is tuned in.

4,189,677

DEMODULATOR UNIT FOR SPREAD SPECTRUM APPARATUS UTILIZED IN A CELLULAR MOBILE COMMUNICATION SYSTEM

George R. Cooper; Raymond W. Nettleton, and David P. Grybos, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 13, 1978, Ser. No. 886,098
Int. Cl.[2] H04L *27/30*
U.S. Cl. 325—321 **11 Claims**



1. A signal demodulation unit for a spread spectrum communication system, said demodulation unit comprising:

first means for receiving a spread spectrum input signal that includes waveforms having time chips and demodulating the information contained in the time chips of two adjacent waveforms thereof to produce therefrom a demodulated signal output, said first means including one of a plurality of mixers electrically connected with the input and output of a tapped delay line and a plurality of filters and mixers electrically connected with delays; and

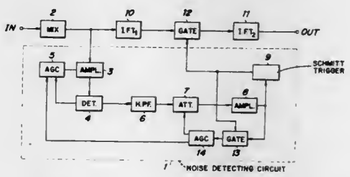
second means connected with said first means to receive said demodulated signal output and responsive to an output therefrom deciding if the input signal is the desired signal and if so decoding the same.

4,189,679

NOISE DETECTING CIRCUIT HAVING NOISE-IMMUNE AGC

Kiyoshi Amazawa, and Masaharu Mori, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 848,494
Claims priority, application Japan, Nov. 8, 1976, 51/133878; Nov. 17, 1976, 51/137908
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—474 **4 Claims**



1. In an audio reproducing system including mixer means, intermediate frequency transformer means, first gate means and audio reproducing means following said first gate means, a noise detecting circuit comprising detector means for detecting a high frequency noise component of the output signal of said

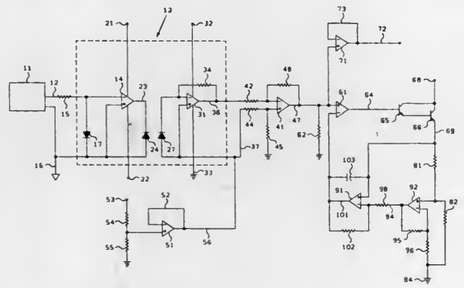
mixer means; first amplifier means for amplifying a signal having said high frequency component from said detector means; pulse generator means for producing a pulse in response to a noise component in the output of said amplifier means; first automatic gain control means for controlling the gain of said amplifier means; second gate means provided between said automatic gain control means and said first amplifier means; and means for applying said pulse to said first and second gate means to operate them to thereby prevent application of said noise component to said audio reproducing means.

4,189,680

ISOLATED SIGNAL CONDITIONER

Vernon R. Clark, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Dec. 28, 1977, Ser. No. 865,167
Int. Cl.[2] H03F *17/00*
U.S. Cl. 330—59 **30 Claims**



1. Apparatus comprising:
an isolation amplifier having an input stage which is optically coupled to an output stage where said output stage has a first power input and a second power input;
means for grounding said second power input;
means for supplying a voltage level of V_2 to said first power input;
means for establishing a reference potential for said output stage of said isolation amplifier at a voltage level $V_2/2$, which is a voltage level other than zero volts, a first signal representative of the output signal from said output stage of said isolation amplifier having a voltage level which ranges from $+(V_2-V_2/2)$ to $-V_2/2$ around said reference potential of $V_2/2$ in response to an optical input signal from said input stage.

4,189,681

BANDPASS FILTER HAVING LOW PASSBAND PHASE SHIFT

Kenneth D. Lawson, Cataumdet, and Neil L. Brown, Falmouth, both of Mass., assignors to Neil Brown Instruments Systems, Inc., Cataumet, Mass.

Filed Sep. 29, 1978, Ser. No. 947,256
Int. Cl.[2] H03F *1/34*
U.S. Cl. 330—109 **8 Claims**

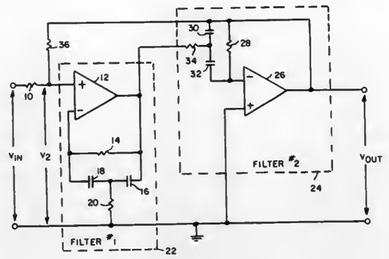
1. A bandpass filter comprising:
a bandpass filter having a transfer function F_1 given by:

$$F_1=(As/s^2+Bs+C)$$

where s is the complex frequency and A, B, and C are selected so that the filter has at least two complex conjugate poles;
a bandpass filter havng a transfer function F_2 given by:

$$F_2=(Ds^2+Es+F/s^2+Gs+H)$$

where D, E, F, G, and H are chosen so that the filter has at least two complex conjugate poles;
means for applying the output signal from a first one of the filters to an input of the second one of the filters; and



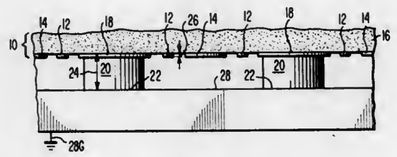
feedback means for providing negative feedback from the output of the second filter to an input of the first filter.

4,189,682

MICROWAVE FET POWER CIRCUIT

Franco N. Sechi, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,626
Int. Cl.[2] H03F *3/193, 3/195;* H03B *5/12*
U.S. Cl. 330—277 **1 Claim**



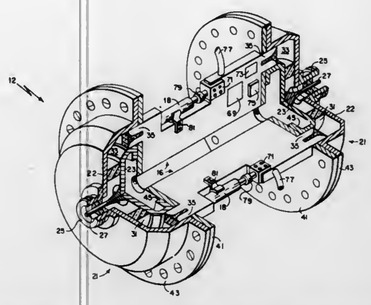
1. A reflection amplifier that includes a three-port circulator with first and second ports thereof adapted for connection to a signal source and a load, respectively, the improvement comprising:
a field effect transistor including pluralities of unit sources, unit drains and unit gates disposed upon a semiconductor substrate;
electrically conductive material plated on each of said unit sources, said plated material on each of said unit sources having a surface with a displacement from said substrate greater than the maximum displacement of said unit gates and said unit drains from said substrate;
a heat sink connecting said surfaces of said plated unit sources to ground;
means for applying a bias voltage to said transistor for causing a higher interelectrode capacitance between said unit gates and said unit drains than between said unit gates and said plated unit sources,
said unit gates, unit sources, and unit drains being connected to form a gate electrode, a drain electrode and a source electrode, respectively, of said transistor; and
an impedance connected to said drain and source electrodes so that said transistor causes a reflection coefficient greater than unity at an input port connected to said gate and drains electrodes, said input port being connected to said third port of said circulator.

4,189,683

SOLID STATE DIODE AMPLIFIER

Matthew Fassett, Billerica; Allen L. Hieber, Waltham; James L. Lampen, Burlington; Lawrence R. Lewis, Bedford, and Jerome H. Pozgay, Needham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 25, 1978, Ser. No. 954,708
Int. Cl.[2] H03F *3/60*
U.S. Cl. 330—287 **3 Claims**



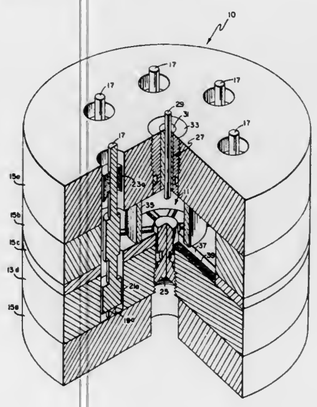
1. An amplifier for radio frequency signals comprising:
(a) a first and a second radial line, each having an E-plane bend formed in the peripheral portion thereof and centrally disposed means for connecting a signal to be amplified to the first radial line and an amplified signal to a load; and
(b) a plurality of like amplifier channels radially disposed between the first and the second radial line, each one of such amplifier channels being coupled to the first and the second radial lines adjacent to the E-plane bend in such lines and incorporating a solid state diode as the active element.

4,189,684

MICROWAVE POWER COMBINER

Allen L. Hieber, Waltham; Clifford A. Drubin, Groton, and George Jerinic, Acton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1978, Ser. No. 957,251
Int. Cl.[2] H03B *7/14*
U.S. Cl. 331—56 **5 Claims**



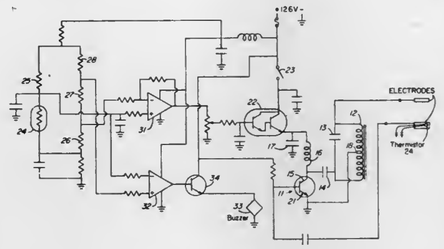
1. A microwave power combiner comprising:
(a) a cylindrical cavity dimensioned to operate in the TM_{020} mode;
(b) means disposed within such cavity to suppress modes other than the TM_{020} mode; and
(c) a plurality of coaxial diode oscillators disposed on the periphery of the cylindrical cavity in a coupling relationship thereto.

4,189,685

SELF-PROTECTING TRANSISTOR OSCILLATOR FOR TREATING ANIMAL TISSUES

James D. Doss, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1978, Ser. No. 886,378
Int. Cl.[2] A61B *17/38;* A61N *1/32;* H03B *5/04, 5/12*
U.S. Cl. 331—62 **1 Claim**



1. Apparatus for applying radiofrequency energy to animal tissues comprising:
an oscillator circuit including a transistor having a base electrode, an emitter electrode, and a collector electrode;
an inductance and capacitance forming a parallel resonant circuit;
capacitor means connecting one end of said parallel resonant circuit to said collector electrode;
a first treatment electrode connected to the second end of said parallel resonant circuit;
grounding means connecting said emitter electrode and a tap on said inductance;
a second treatment electrode capacitively connected to said base electrode and providing radiofrequency feedback to said base electrode;
temperature control means to control the rise in temperature of said animal tissues, said temperature control means including temperature sensing means mounted on one of said treatment electrodes;
bridge means in circuit with said temperature sensing means; and
transistor means having a base electrode in circuit with said bridge means and controlling current to said oscillator transistor collector, having a collector electrode connected to a positive current source and an emitter in circuit with said oscillator transistor collector.

4,189,686

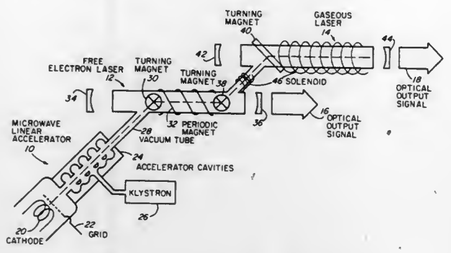
COMBINATION FREE ELECTRON AND GASEOUS LASER

Charles A. Brau; Stephen D. Rockwood, and William E. Stein, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,250
Int. Cl.[2] H01S *3/09*
U.S. Cl. 331—94.5 PE **36 Claims**

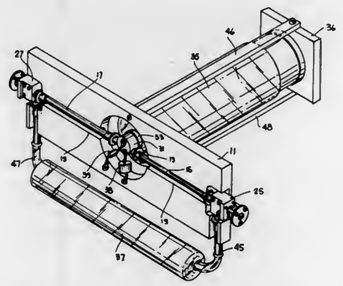
1. A high pulse repetition frequency, high power, combination ultraviolet and tunable infrared laser comprising:
microwave linear accelerator means for producing a relativistic electron beam;
free electron laser means for producing tunable infrared

radiation in response to interaction of said relativistic electron beam with a spatially periodic magnetic field;
gaseous molecular laser means for producing ultraviolet radiation in response to said relativistic electron beam;



means for sequentially directing said relativistic electron beam through said free electron laser means and said gaseous molecular laser means.

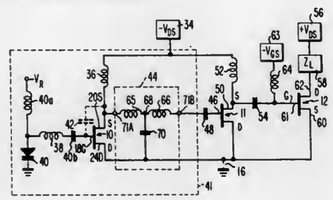
4,189,687
COMPACT LASER CONSTRUCTION
Irwin Wieder, Los Altos, and Robert H. Breedlove, Los Gatos, both of Calif., assignors to Analytical Radiation Corporation, Los Altos, Calif.
Filed Oct. 25, 1977, Ser. No. 845,330
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 D **19 Claims**



1. A self-aligned low inductance laser comprising,
a solid mass of material having an exposed straight slot extending therethrough, and
laser tube means confining a gaseous laser medium and having opposed optical means defining a laser cavity, said cavity having at least one output element, a pumping means, and electrodes for generating a longitudinally excited gas laser discharge, said laser tube means comprising a plurality of pipe sections mutually connected by flexible flanges, said pipe sections disposed in said exposed slot in contact therewith.

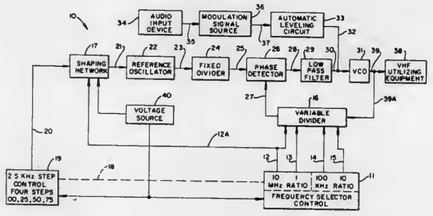
4,189,688
MICROWAVE FET POWER OSCILLATOR
Franco N. Sechi, Lawrenceville, and Raymond L. Camisa, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Jul. 24, 1978, Ser. No. 927,625
Int. Cl.[2] H03B *5/08, 7/06*
U.S. Cl. 331—117 FE **3 Claims**

1. In an oscillator circuit wherein first and second field effect transistors each have pluralities of unit sources, unit drains and unit gates disposed upon a semiconductor substrate, a heat sink connecting said unit sources to ground, the improvement comprising:
means for applying a bias voltage to said first and second transistors for causing a higher interelectrode capacitance between respective unit gates and unit drains thereof than between respective unit gates and unit sources thereof, said unit gates, unit drains and unit sources of said first transistor and second transistor serving as gate, source and drain electrodes, respectively;
a resonator connected between the gate electrode of said first transistor and the respective drain electrodes of said first and second transistors;



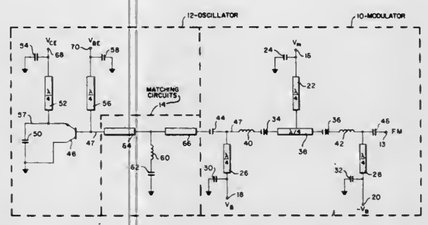
coupling means for coupling the source electrode of said first transistor to the gate electrode of said second transistor, said coupling means and said bias voltage causing the gate input impedance of said first transistor to be of a negative value, said resonator, said first transistor and said coupling means forming a composite network with a Q higher than the Q of said resonator; and
load means connected to the source electrode of said second transistor, said load means and said bias voltage causing the gate input impedance of said second transistor to be of a negative value such that said load means, said composite network and said second transistor oscillate.

4,189,689
AUTOMATIC LEVELING STABILIZED VHF-FM FREQUENCY SYNTHESIZER
Gregory L. Triplett, Olathe, Kans., assignor to Wulfsberg Electronics, Inc., Overland Park, Kans.
Continuation of Ser. No. 811,628, Jun. 30, 1977, abandoned.
This application Nov. 13, 1978, Ser. No. 959,676
Int. Cl.[2] H03C *3/04*
U.S. Cl. 332—18 **10 Claims**



1. An automatic leveling circuit for use in a frequency synthesizer loop wherein direct frequency modulation of the loop output frequency is employed, said loop comprising a phase detector, a voltage controlled output oscillator receiving the output of said phase detector as a frequency controlling input thereto, the output of said voltage controlled oscillator comprising the output of said frequency synthesizer and being additionally applied to a selectively variable frequency divider, the output of a reference oscillator and the output of said frequency divider being applied as respective inputs to said phase detector, loop low pass filter means receiving the output of said phase detector, said voltage controlled oscillator receiving the output of said loop low pass filtering means as a frequency controlling input thereto, said voltage controlled oscillator output comprising a loop defined base frequency which is frequency modulated by a modulation signal source; said automatic leveling circuit comprising a first amplifier connected to receive said modulation signal source as an input thereto; and gain control means for said first amplifier, said gain control means receiving the output of said loop low pass filter and comprising means for developing a DC gain control voltage for said first amplifier as a function of the long term frequency component of the output of said loop low pass filter and exclusive of the FM modulation imposed AC components appearing thereon, and means for summing the output of said first amplifier with the output of said loop low pass filter as applied to said synthesizer voltage controlled oscillator.

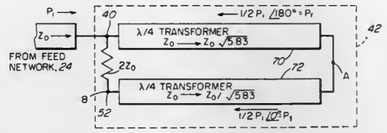
4,189,690
RESONANT LINEAR FREQUENCY MODULATOR
George F. Bock, Fountain Valley, and Bernard L. Walsh, Jr., Northridge, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed May 30, 1978, Ser. No. 910,805
Int. Cl.[2] H03C *3/22*
U.S. Cl. 332—30 V **8 Claims**



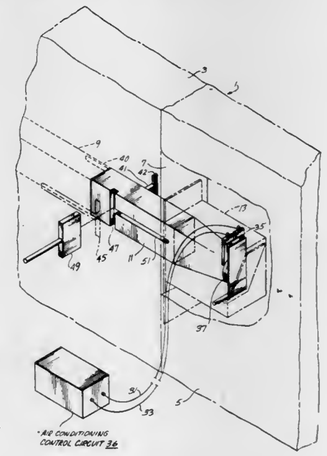
5. A frequency modulator having a first input port, a second input port and an output port, said first input port being adapted to receive an r.f. carrier, and said second input port being adapted to receive a modulating voltage so that there is produced at said output port said r.f. carrier frequency modulated by said voltage, said frequency modulator comprising in combination:
(a) first circuit means in electrical connection with said first input port;
(b) second circuit means in electrical connection with said output port; and
(c) impedance inversion means in electrical connection with and positioned between said first circuit means and said second circuit means and further connected to said second input port, said first circuit means and said second circuit means each being further characterized in that its reactive impedance is a voltage dependent function whereby the reactive impedance of said modulator is a function of an applied modulation voltage.

4,189,691
MICROWAVE TERMINATING STRUCTURE
Robert J. McDonough, Ventura, Calif., assignor to Raytheon Company, Lexington, Mass.
Filed Nov. 11, 1977, Ser. No. 850,744
Int. Cl.[2] H01P *1/26*
U.S. Cl. 333—22 R **14 Claims**

1. A microwave transmission line terminating structure comprising:
(a) a dielectric structure;
(b) a strip conductor defining a constrained electrical path between a first end thereof and a second end thereof, such strip conductor being supported on a first surface of such dielectric structure, such strip conductor having a single input port at the first end adapted for coupling to a transmission line;
(c) a resistive load means for dissipating substantially all radio frequency energy having a predetermined frequency which passes from the transmission line to the single input port of the terminating structure, such load means having a first end electrically connected to second end electrically connected to the second end of the strip conductor, such strip conductor and resistive load means being arranged to enable substantially all of the radio frequency energy passing from the transmission line to the terminating structure to pass solely to the strip conductor and the resistive load means; and
(d) a ground plane supported on a second surface of such dielectric structure.



4,189,692
LOCK CONTROLLED POWER SHUT-OFF SYSTEM
John H. Bonnar, 1630 Calle Vaguero #302, Glendale, Calif. 91206
Filed Feb. 21, 1978, Ser. No. 879,812
Int. Cl.[2] H01H *3/14*
U.S. Cl. 335—205 **5 Claims**



1. A system for reducing wasted power consumption by power consuming equipment used in a building having an openable closure through which access into and out of the building can be gained with the closure being opened, the system comprising:
lock means adapted to be installed in the closure, the lock means including a movable member movable in one direction to a locking position and movable in another direction to an unlocking position, the lock means further including engaging means positioned to be engaged with the movable member while the movable member occupies its locking position with the closure closed and to be disengaged from the movable member while the movable member occupies its unlocking position;
sensing means responsive to the movable member being out of its locking position for disabling the power consuming equipment;
first controllable means projecting from the closure so as to be accessible only from the inside of the building while the

closure is closed, for manually shifting the movable member in either direction between its locking and unlocking position; and

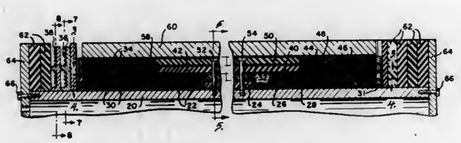
second controllable means, accessible from the outside of the building, for manually shifting the movable member only from its locking position to its unlocking position.

4,189,693

SUPERCONDUCTING MAGNET

John A. Satti, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,345
Int. Cl.[2] H01F *7/22*
U.S. Cl. 335—216 **2 Claims**



1. A superconducting magnet formed on a cylindrical bore tube, the magnet comprising:

a. an open spiral of conducting tape wound on the bore tube;

b. an even number of saddle-shaped spacers disposed on the conducting tape, the number of spacers corresponding to the order of poles in the magnet;

c. a cable of strands of matrix superconducting material wound about the spacers to form saddle-shaped windings on a cylindrical surface tangent to the conducting tape;

d. a plurality of spacers disposed about the windings to complete with the windings a cylindrical surface;

e. a terminal receiving and interconnecting the strands of the cable in a pattern calculated to connect strands from different regions of the magnet to each other and to connect all strands together in series;

f. an external terminal pair connected to the terminal to supply electric current from an external source to the magnet; and

g. means for maintaining the magnet at cryogenic temperatures.

4,189,694

CURRENT LIMITING FUSE WITH IMPROVED LOW CURRENT CLEARING CAPABILITY

Donald D. Blewitt, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,393
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—158 **12 Claims**

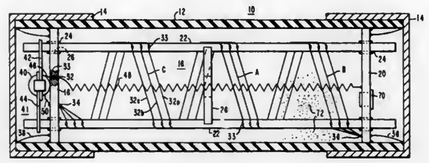
1. A fuse, comprising:

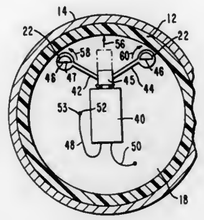
(a) main fuse body means including spaced terminals;

(b) mandrel means disposed within said fuse body means, one portion of said mandrel means being movable relative to another portion of said mandrel means;

(c) fuse element means fixedly disposed upon said mandrel means to said one portion thereof and said another portion thereof, said fuse element means being also disposed in electrical continuity with said spaced terminals to provide electrical continuity therebetween until said fuse element means melts; and

(d) movement providing means disposed to cause movement of said one portion of said mandrel means relative to said another portion thereof when said fuse element means melts to provide tension to said fuse element means between said one portion of said mandrel and said another





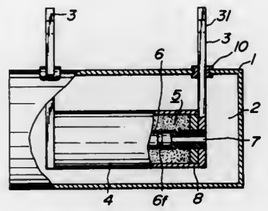
portion thereof to break said fuse element means to provide improved fuse operation.

4,189,695

CURRENT LIMITING FUSE DEVICE EMPLOYING COOLING AND INSULATING MEDIUM

Shigeyoshi Hirahara, Tabata-Shinmachi, Japan, assignor to Hinode Electric Machine Co., Ltd., Tokyo, Japan

Filed May 6, 1977, Ser. No. 794,652
Claims priority, application Japan, Oct. 8, 1976, 51-139949[U]
Int. Cl.[2] H01H *85/40*
U.S. Cl. 337—204 **3 Claims**



1. A current limiting fuse device comprising:

a cylindrical body;

a hollow fuse element inside said cylindrical body having the ends sealed to said cylindrical body and having a bore therethrough in the direction of the longitudinal axis of said cylindrical body, said cylindrical body having a space between said cylindrical body and said hollow fuse element;

an arc supression agent in the space between said cylindrical body and said hollow fuse element;

an outer casing enclosing said cylindrical body and defining a space around said cylindrical body;

a pair of conductive terminals, each electrically connected to a respective end of said hollow fuse element and projecting out of said outer casing; and

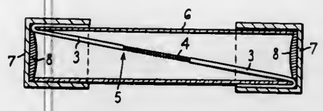
a cooling and insulating medium enclosed in the space between said outer casing and said cylindrical body and said bore of said hollow fuse element.

4,189,696

ELECTRIC FUSE-LINKS AND METHOD OF MAKING THEM

David G. E. Beswick, Corsley, and Stanley Wright, Frome, both of England, assignors to Kenneth E. Beswick Limited, Frome, England

Continuation of Ser. No. 686,873, May 17, 1976, abandoned.
This application Dec. 12, 1977, Ser. No. 859,566
Claims priority, application United Kingdom, May 22, 1975, 22422/75
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—232 **9 Claims**



1. A fuse element comprising:

(a) a thin flexible electrically insulating and heat insulating filament core,

(b) a fuse winding comprising a thin metal fuse wire helically wound with a multiplicity of turns about said core,

(c) said winding including spaced longitudinal sections disposed respectively at opposite ends of said core and spaced apart by an intermediate section of said winding,

(d) each of said spaced sections including multiple turns of said winding, and

(e) means short circuiting the said multiple turns of each of said spaced sections,

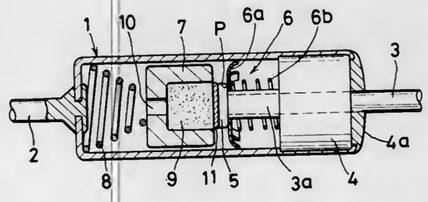
(f) said short circuited turns of said spaced sections being electrically interconnected by the active turns of said intermediate section of said winding.

4,189,697

THERMAL CUT-OFF FUSE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Kawasaki, Japan

Filed Sep. 5, 1978, Ser. No. 939,309
Claims priority, application Japan, Sep. 9, 1977, 52-120625[U]; Mar. 23, 1978, 53-32415
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **3 Claims**



1. A thermal cut-off fuse, which comprises in combination:

a conductive housing serving to maintain electrical continuity on one end thereof with one of the two lead wires;

an opposed contact portion forming an electrical contact at the leading end of the other lead wire entering the the housing at the other end in an insulated state;

a contact means formed of a contact member adapted to come into contact with the aforementioned opposed contact portion and an elastic spring serving to press the contact member against the opposed contact portion;

a thermal pellet accommodated inside the housing and capable of retaining a solid state under the normal condition and melting into a liquid state at a fixed level of temperature;

an actuating means adapted so that the movement thereof is restrained by the thermal pellet retaining its solid state under the normal condition to permit the electrical continuity between the opposed contact portion and the contact means and the restraint of the movement thereof is released by the thermal pellet melting into a liquid state at the fixed level of temperature to separate the contact member of the contact means from the opposed contact portion and thereby break the existing electrical continuity; and

an energizing means adapted to impart movement to the actuating means;

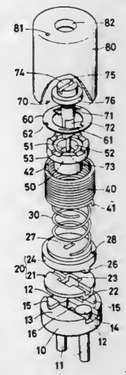
whereby the electrical continuity is maintained under the normal condition and, upon elevation of the ambient temperature to the fixed level, the electrical continuity is broken and the broken state of electrical continuity is maintained thereafter by the actuating means being interposed between the opposed contact portion and the contact means.

4,189,698

RESETTABLE THERMAL CUT-OFF FUSE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Kawasaki, Japan

Filed Oct. 6, 1978, Ser. No. 949,307
Claims priority, application Japan, Oct. 8, 1977, 52-120508
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **3 Claims**



1. A resettable thermal cut-off fuse, comprising in combination:

a housing,

a pair of contacts fixed in position at a distance from each other and connected to respective lead wires,

a switch member adapted to select between the state of closed circuit and that of opened circuit between the contacts by angular rotation,

a coil spring serving to energize the switch member in the circuit-breaking direction,

a check means composed of a ratchet means connected freely rotatably with the switch member and provided with four grooves spaced circularly by a fixed angle of 90° and a catch plate incorporating a resilient claw adapted to engage with the groove of the ratchet means so as to prevent the ratchet means from being rotated in the direction in which it is energized by the coil spring,

a thermal pellet formulated to retain a solid state under normal temperature condition and melt into a liquid state at a prescribed danger temperature level and interposed between the switch member and the check means so as to unite the movement of the switch member and that of the check means while in a solid state and break the united movement while in a molten state, and

a rotating member adapted to permit the switch member, while the fuse is in the state of opened circuit, to be rotated from outside the housing in the direction opposite

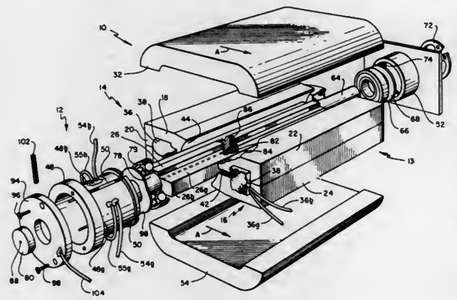
the direction in which the spring coil energizes the switch member, whereby the switch member which retains electrical continuity between the contacts under the normal temperature condition is released from the energizing force of the coil spring and brought into the state of opened circuit when the ambient temperature rises to reach said prescribed danger level and the thermal pellets melts at that temperature and, after the ambient temperature falls and returns to the normal level again, the switch member and consequently the fuse can be reset to the state of closed circuit by rotating the rotating member.

4,189,699

LIMITED-ROTATION MOTOR WITH INTEGRAL DISPLACEMENT TRANSDUCER

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Division of Ser. No. 785,912, Apr. 8, 1977, Pat. No. 4,110,879. This application May 17, 1978, Ser. No. 906,712
Int. Cl.[2] H02K *33/00*
U.S. Cl. 335—229 **5 Claims**



1. A limited rotation motor of the type having an array of pole pieces defining a cylindrical passage and an armature rotatively mounted coaxially in the passage and biased toward a reference position, the improvement comprising

A. a bushing made of an electrically conductive non-ferromagnetic material having an inside diameter that is equal to the diameter of said passage and positioned coaxially with the passage so that the bushing forms an extension of said passage,

B. means defining lengthwise slits in the bushing so as to form at least one pair of tines,

C. means defining a circular cut in the bushing that separates the tines from each other and from the bushing collar so as to electrically isolate the tines, and

D. an integral extension on the armature that projects beyond the pole pieces through the bushing so that the opposing surfaces of the armature and the tines form an armature displacement transducer whereby the differential capacitance between the armature surfaces and the tines provides an indication of armature angular displacement.

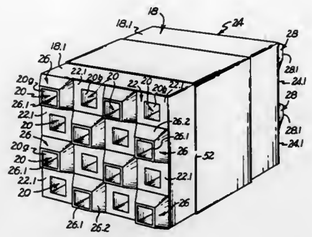
4,189,700

RESISTOR DEVICE

David C. Hill, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 721,729, Sep. 9, 1976. This application May 10, 1978, Ser. No. 904,681
Int. Cl.[2] H01C *7/00*
U.S. Cl. 338—333 **12 Claims**

1. A resistor device comprising a body of electrical resistor material of positive temperature coefficient of resistivity having a plurality of passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the passages, having abutments of the resistor material extending around respective ends of alternate ones of the passages at one end of the body, and having abutments of the resistor material extending around respective ends of the others of said passages at the opposite end of the body, electrically conductive coatings on the inner walls of the passages in ohmic contact relation to the resistor material, an electrically conductive coating on said one end of the body extending around the abutments at said one end of the body



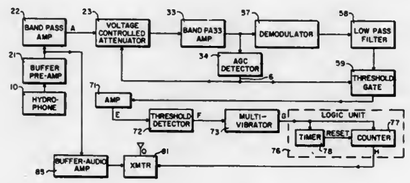
electrically interconnecting the contact coatings in said other passages at said one end of the body, and an electrically conductive coating on said opposite end of the body extending around the abutments at said opposite end of the body electrically interconnecting the contact coatings in said alternate body passages at said opposite end of the body, whereby, when the interconnection coatings are connected to respective power source terminals, current is directed through the webs of resistor material between the contact coatings in said alternate passages and the contact coatings in said other passages.

4,189,701

HYDROACOUSTIC DETECTION SYSTEM

Steve F. Torok, Southampton; Vincent A. Formica, Warminster, and Jasper Caro, Levittown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1971, Ser. No. 122,512
Int. Cl.[2] G08B *13/00*
U.S. Cl. 367—2 **14 Claims**



1. A hydroacoustic detection system for detecting the movement of a body in water, comprising:

hydrophone means;

bandpass means operatively connected to receive the hydrophone means output to provide a filtered output limited to a predetermined frequency band;

detector means operatively connected to receive said bandpass means output for producing a replica output of a modulation frequency therein;

low-pass means operatively connected to receive said detector means output for producing an output below a predetermined cutoff frequency indicative of the movement of said body;

threshold detector means operatively connected to receive said low-pass means output for providing a binary output indicative of exceedence of a predetermined threshold; and

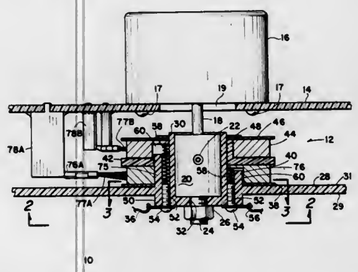
transmitter means operatively connected to receive and transmit said hydrophone means output in response to one state of said threshold detector means output.

4,189,702

COMMUTATOR AND FIBER BRUSH ROTATING DISC

Rex M. Maloy, Broken Arrow, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Sep. 25, 1978, Ser. No. 945,485
Int. Cl.[2] G01S *7/56*
U.S. Cl. 367—109 **10 Claims**



1. In a sonar underwater sound ranging apparatus, including a rotating visual display disc, including means on said disc for generating the initiating pulse to transmit the sonar signal, and including glow discharge tube means for indicating by a pulse of light the instant of reception of a reflected sonar pulse, the improvement in slip ring and brush assembly to carry the electrical reception signal to said glow discharge tube, on said rotating disc, comprising;

(a) a support plate, a driving motor attached to said support plate and having a projecting shaft;

(b) a rotating disc of insulating material, having a front surface and a back surface, and having a central cylindrical hub having a central opening on said back surface, adapted to fit over said motor shaft, and to be removably attahced thereto, the outer contour of said disc hub being cylindrical with two small diameter longitudinal cylindrical projections along diametrically opposite edges of said cylindrical surface; a small diameter hole drilled axially through each of said small projections;

(c) a first conducting ring adapted to be positioned over the outside contour of said hub on said back surface;

(d) contact screw and spring means in the hole in a first small cylindrical projection to connect from the front surface of said disc to said first ring;

(e) a second conducting ring adapted to be positioned over the outside contour of said hub on said back surface;

(f) contact screw and spring means in the hole in the second small cylindrical projection, to connect from the front surface of said disc to said second ring;

(g) flexible brushes of conductive fiber material supported on said support plate and adapted to separately contact one of said first and second rings; and

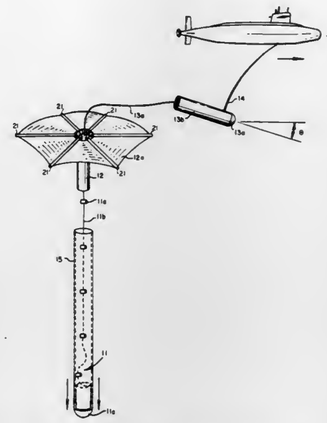
(h) means to mount said glow discharge tube on the front surface of said disc, to connect each of the two terminals of said tube to one or the other of said contact screw and spring means.

4,189,703

SYSTEM FOR DEPLOYING A SENSOR ARRAY FROM TRANSITING VESSEL

Derek J. Bennett, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 777,167, Mar. 14, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 876,906
Int. Cl.[2] B63B *21/56*
U.S. Cl. 367—134 **25 Claims**



1. A system for vertically deploying a sensor array in a body of water from a transiting vessel comprising:

a sensor array including a plurality of sensors interconnected by a flexible connecting cable;

a descent weight physically connected to a first end of said array;

a drag means physically connected to a second end of said array;

means for releasably holding said drag means and descent weight in close proximity to one another;

a length of flexible signal cable physically coupled to said drag means and operatively connected to said plurality of sensors;

cable dispensing means for storing said length of signal cable;

a towing cable connected to said cable dispensing means for towing said means from said transiting vessel;

said cable dispensing means including means for paying out signal cable therefrom to thus enable said descent weight to descend and pull said drag means and sensor array away from said cable dispensing means as said dispensing means is towed by said transisting vessel; and

means for releasing said holding means to enable said descent weight and drag means to vertically separate to extend said sensor array as they descend.

4,189,704

METHOD AND APPARATUS FOR DETERMINATION OF OPTIMUM VELOCITY IN PROCESSING SEISMIC SIGNALS FROM LOW ENERGY SOURCES

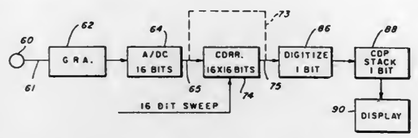
Lincoln A. Martin, Altadena, and William F. Fenley, Jr., Pasadena, both of Calif., assignors to Geophysical Systems Corp., Pasadena, Calif.

Continuation-in-part of Ser. No. 617,859, Sep. 29, 1975, Pat. No. 4,058,791. This application Aug. 29, 1977, Ser. No. 828,778
Int. Cl.[2] G01V *1/24, 01/36*
U.S. Cl. 367—60 **12 Claims**

1. In a seismic prospecting system for generating seismic waves in the earth, having:

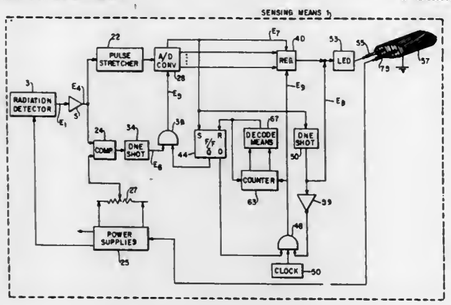
a low energy seismic source;

a plurality of geophones at spaced positionsdistant from said source;
means to amplify and digitize the geophone signals;
the method of operation and processing the seismic data comprising:
(a) operating said source in CDP format, whereby each source operation is at a different spaced-apart independent position,
(b) amplifying and digitizing to one bit a plurality of geophone signals which comprise a plurality of traces, in each of a plurality of records from a plurality of source points;
(c) CDP stacking said 1 bit digitized signals; and wherein
(d) the CDP fold is at least 40; and wherein the process of determining the optimum velocity for said CDP stack includes the steps of:



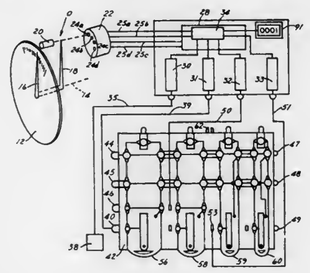
(e) making a first CDP gather of a plurality of traces, centered about a first CDP point;
(f) selecting at least a first seismic velocity as a function of depth;
(g) applying normal movement, using a first selected velocity function, to said traces in said first gather;
(h) stacking said NMO corrected traces and digitizing to 1 bit to form a first 1 bit stacked first CDP trace;
(i) repeating steps (c) to (f) at at least one pair of spaced CD points to obtain at least one pair of first 1 bit stacked CDP traces, corresponding to said first velocity; and
(j) determining the coherence between said at least one pair of first 1 bit stacked CDP traces corresponding to said first velocity.

4,189,705
WELL LOGGING SYSTEM
Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.
Filed Feb. 17, 1978, Ser. No. 879,023
Int. Cl.[2] G01V *1/40*
U.S. Cl. 250—262 **6 Claims**



1. A well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation including means for sensing a condition of the earth formation and providing electrical pulses corresponding in number and peak amplitude to the sensed condition; means connected to the sensing means for stretching the first electrical pulse from the sensing means occurring during each predetermined time period of a plurality of predetermined time periods; means connected to the pulse stretching means for converting each stretched pulse to parallel digital signals; means for providing shift pulses each time period; means for providing reset pulses; said shift pulse means includes clock means for providing clock pulses, an inverter connected to the second one-shot multivibrator for inverting the synchronization pulse to provide an inhibiting pulse, a second AND gate connected to the clock means, to the inverter and to the flip-flop and being controlled by a second control signal provided by the flip-flop at a high logic level upon being set and at a low logic level upon being reset so that said second AND gate passes the clock pulses from the clock means when the second control signal is at a high logic level and there is no inhibiting pulse and blocking the clock pulses when the control signal is at a low logic level or there is an inhibiting pulse so as to provide shift pulses, and counter means connected to the AND gate and to the reset pulse means for counting the pulses passed by the AND gate and providing signals corresponding to the count and being reset by the reset pulses, the reset pulse means includes decode means connected to the counter means for providing a reset pulse in accordance with the signals from the counter means when the count in the counter reaches a predetermined count; register means connected to the converting means and to the second AND gate in the shift pulse means for providing a serial digital signal in response to the shift pulses corresponding to the parallel digital signals; means for providing and electrical synchronization pulse each time period prior to the occurrence of the shift pulses; electrical-to-light converting means connected to the register means and to the synchronization pulse means for converting the synchronization pulses and the serial digital signals to light pulses on a one for one basis, with the intensity of the light pulses corresponding to the amplitudes of the pulses received by the electrical-to-light convering means; means connected to the electrical-to-light converting means for transmitting the light pulses uphole to the surface; and surface electronics including light-to-electrical converting means connected to the transmission means for providing electrical pulses on a one-for-one basis with the light pulses, each electrical pulse having an amplitude relative to the intensity of a corresponding light pulse so that the light-to-electrical converting means provides a synchronizing pulse followed by a serial digital signal each time period, second means connected to the light-to-electrical converting means for providing a set of shift pulses in response to each synchronizing pulse from the light-to-electrical converting means, and output means connected to the light-to-electrical converting means and to the second shift pulse means for providing parallel ouput digital signals corresponding to the sensed condition in accordance with the shift pulses from the second shift pulse means and the serial digital signals from the light-to-electrical converting means.

4,189,706
VEHICLE CONTROL FOR MULTIPLE SPEEDS
Knox, Leonard S., R.R. 1, Box 30, Maxwell, N. Mex. 87728
Filed Mar. 6, 1978, Ser. No. 883,571
Int. Cl.[2] B60Q *1/54*
U.S. Cl. 340—53 **7 Claims**

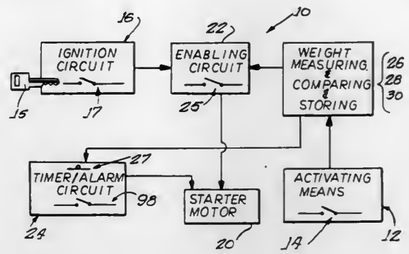


1. A multiple speed detection and control device for vehicles for a plurality of speeds from a predetermined minimum speed to a predetermined maximum speed comprising:
(a) detection means for the speed of a vehicle to which the device is attached;
(b) plural replaceable fuse means, each said fuse means associated with one of said plurality of speeds and being of a different size and being connected in a different electric circuit in the vehicle and not replaceable by one of the other fuse means;
(c) timing means integrally connected between said detection means and each said fuse means, providing a predetermined time prior to the activation of the associated fuse for a particular speed, and,
(d) each said fuse means on activation breaking the associated particular electric circuit of the vehicle, whereby when the vehicle speed in a predetermined speed range exceeds a particular speed for a predetermined time set by said timing means the associated circuit is deactivated.

4,189,707
ENGINE AIR INTAKE WARNING SYSTEM
Ronald A. Ermert, 7980 Elnakay Dr., Evansville, Ind. 47715
Filed Jun. 5, 1978, Ser. No. 912,901
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—60 **8 Claims**

1. A diesel engine warning system for warning an operator of a diesel engine when a vacuum in the air intake system of the engine exceeds a predetermined maximum or falls below a predetermined minimum vacuum comprising:
a vacuum gauge including a pair of spaced electrical contact means, an indicator movable between said electrical contact means, and means responsive to the vacuum in said engine air intake system for moving said indicator,
means for connecting said vacuum gauge to said air intake system of a diesel engine,
an electrical circuit which includes at least one electrically actuable warning signal device, and
means for connecting said electrical contact means to said circuit,
said indicator being movable into engagement with one of said electrical contact means on an increase in vacuum above a predetermined maximum indicating a restriction in said air intake to the engine and into engagement with the other of said electrical contact means on a decrease in vacuum below a predetermined minimum indicating the loss of filtering of the intake air to the engine to actuate said warning signal device to warn said operator of such condition in said air intake system.

4,189,708
METHOD AND APPARATUS FOR CONTROLLING ACCESS TO A FACILITY
Medard Z. Bryll, Palos Park, Ill., assignor to Gateway Industries, Inc.,, Chicago, Ill.
Filed Apr. 25, 1977, Ser. No. 790,597
Int. Cl.[2] B60R *25/04;* **G01G** *19/08, 19/44*
U.S. Cl. 340—64 **5 Claims**

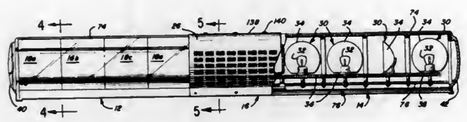


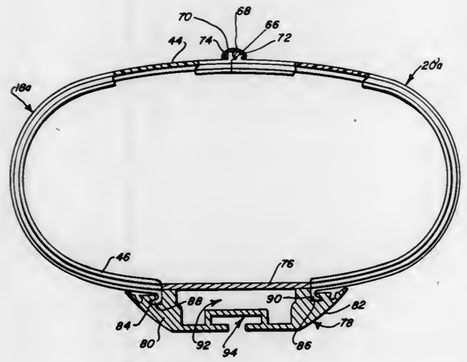
1. An antitheft method for a vehicle having a deflection storing means, a key operated ignition lock and an ignition circuit for operating a starting motor for the vehicle's internal combustion engine, said method comprising the steps of: providing a selectively operable activation switch means for rendering an antitheft system operative, measuring the deflection of a person seated in the driver's seat of the vehicle, storing of the deflection measurement in the storing means of the vehicle subsequent to activation of the antitheft system by operation of said switch means, retaining said deflection measurement even though the person leaves the vehicle seat, measuring the deflection of a person next seated in the driver's seat and next attempting to use a key or other means to operate the ignition lock, comparing the stored deflection measurement with the newly measured deflection measurement for substantial parity therebetween immediately after the operation of the ignition key to operate the ignition lock, and enabling operation of the ignition circuit and the starter motor upon a substantial parity of said deflection measurements.

4,189,709
MODULAR HOUSING ASSEMBLY FOR VEHICLE WARNING LIGHT SYSTEM
Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.
Filed Jan. 13, 1978, Ser. No. 869,286
Int. Cl.[2] B60Q *1/46, 1/00;* **F21Q** *1/00;* **F21V** *5/00, 17/00;* **F21M** *3/22*
U.S. Cl. 340—84 **14 Claims**

1. A vehicle warning light housing assembly system comprising, in combination, a plurality of transparent plastic front dome panel sections positioned in side-by-side relation and interconnected to one another, a plurality of transparent plastic rear dome panel sections positioned in side-by-side relation and interconnected to one another, said front dome panel sections being connected to said rear dome panel sections at upper edge portions to form a longitudinal joint along the top of said

housing assembly, an elongated base member common to said front and rear dome panel sections, and lower ends of said





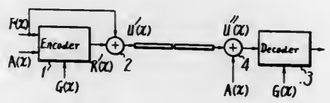
front and rear dome panel sections being connected with said common base member along the length thereof.

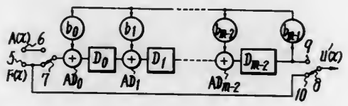
4,189,710

METHOD AND APPARATUS FOR DETECTING ERRORS IN A TRANSMITTED CODE

Akira Iga, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,994
Claims priority, application Japan, May 18, 1977, 52-57281
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AL **4 Claims**





1. A method for detecting errors in a transmitted code comprising the steps of:

adding to an information bit signal a first redundant bit which is not evenly divisible by a generation polynomial expression even when all of the bits of said information bit signal are "0" or "1";

dividing the result of said addition of said first redundant bit to said information bit signal by said generation polynomial expression to obtain a second redundant bit as the residue of the division;

adding said second redundant bit to said information bit signal for providing a resultant code;

transmitting said resultant code;

adding said first redundant bit to the transmitted resultant code as received; and

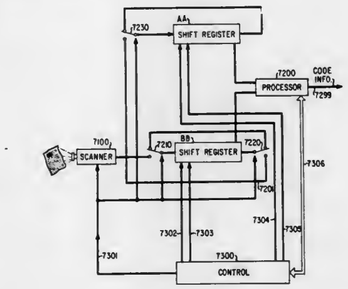
dividing the received resultant code by said generation polynomial expression to detect an error by the existence of a residue of the last-mentioned division.

4,189,711

MULTILEVEL PROCESSING OF IMAGE SIGNALS

Amalie J. Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1977, Ser. No. 849,599
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 H **8 Claims**



1. Apparatus for coding a two-dimensional information field having a plurality of regions, each region having one of a plurality of different graphical values, comprising

scanning means for generating for each scanned region a first binary electric code representative of the length of a constant-value run along a scanning path spanning said field,

means for generating for each region a second binary electric code representative of the graphical value of said region,

means for generating for any other scanning path spanning said field and passing through said region a third binary electric code representative of the connectivity of a constant-value run along said other scanning paths to a constant-value run along an adjacent scanning path, and

means for generating for each region a fourth binary electric code representative of the end of the last scanning path spanning said region.

4,189,712

SWITCH AND LOCK ACTIVATING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rectar St., Metuchen, N.J. 08840

Filed Nov. 9, 1977, Ser. No. 849,785
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—149 A **20 Claims**

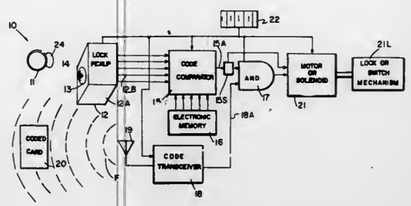
1. An electronic control system for enabling the operation of an electrically operated device, such as a lock opening means or other means, comprising in combination:

first means defining a key adapted to be carried by a person, said key including a support in the shape of a finger ring and having a crown portion and a coded means disposed behind the outer surface of said crown portion,

reading means for the coded means of said first means, said reading means comprising:

radiation generating means for generating and directing radiation toward said first means wherein said coded means of said first means operates to provide modulated radiation directed at said first means, and

sensing means associated with said reading means for sensing said modulated radiation and generating output signals which are representative of the code defined by said coded means,



signal processing means operable to receive said output signals generated by said sensing means and generate a control signal when signals are received thereby or predetermined characteristics,

control means optically connected to receive said control signals and

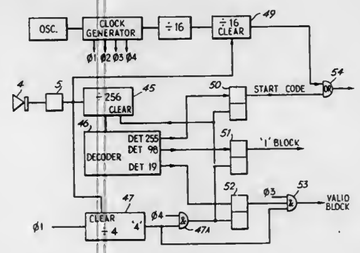
an electrically operated device controlled by said control means and operable to perform a given function when said control signal is generated.

4,189,713

REMOTE CONTROL SYSTEMS

Neil D. Duffy, Glenrothes, Scotland, assignor to Pico Electronics Limited, Glenrothes, Scotland

Filed Jul. 12, 1976, Ser. No. 704,367
Claims priority, application United Kingdom, Jul. 25, 1975, 31329/75
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—168 R **15 Claims**



1. A remote control system having:

a transmitter comprising:

(a) an output transducer,

(b) modulating means coupled to feed the transducer and having input means for receiving a carrier signal of predetermined frequency and for receiving a modulating signal,

(c) modulating signal producing means having a data input for receiving a data signal representing instructions for remote control and a data output connected to said input means for controlling said modulating means to produce, for each instruction, a pulse code modulated signal representing the instruction as a multi-bit digitally encoded word,

(d) wherein said modulated signal comprises pulses of carrier cycles for representing two differently valued bits of said word by one and the other of two predetermined numbers of cycles of the carrier signal; and

a receiver comprising:

(a) an input transducer,

(b) counting means for counting the number of cycles of carrier signal in each received pulse as transmitted by said transmitter and received by the input transducer, and

(c) determining means receiving from said counting means the count of said number of cycles of carrier signal in each received pulse, for determining whether said number of cycles is within a first range of numbers or within a second range of numbers, said first and second ranges of numbers being non-overlapping and including no numbers in common, and

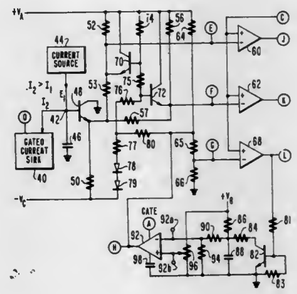
(d) means for converting a received pulse into a signal representing one or another of said differently valued bits whenever said determining means determines that the count of the number of cycles in the received pulse is included in said first or in said second range of numbers, respectively.

4,189,714

ANALOG-TO-DIGITAL CIRCUIT WITH ADJUSTABLE SENSITIVITY

Kenneth C. Adam, Thousand Oaks, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,038
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD **6 Claims**



1. An analog-to-digital converter of the type including a plurality of voltage comparing means, each having a pair of terminals to which is applied, respectively, an analog voltage to be digitized and a reference voltage, for producing an output signal of a first or second value depending on whether the analog or reference voltage is the greater, said reference voltage applied to each voltage comparing means being different from that applied to the others, comprising in combination:

means providing a control signal;

means responsive to said control signal for altering, as a function of time, said reference voltages applied to at least one and less than all of said voltage comparing means; and

means for clamping said altered reference voltages with respect to said reference voltages which are not altered.

4,189,715

μ-LAW TO FLOATING POINT CONVERTER

Donald L. Duttweiler, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 4, 1978, Ser. No. 948,328
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **4 Claims**

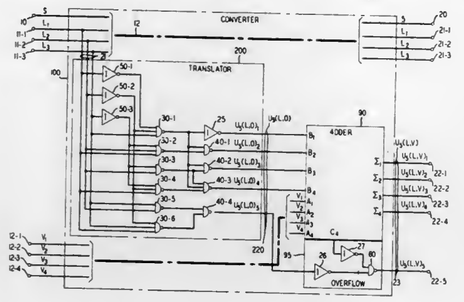
1. A μ-law to floating point converter (**100**) including input terminals (**10, 11-1, 11-2, 11-3, 12-1, 12-2, 12-3, 12-4**) adapted to receive a μ-law code word, said code word including a sign bit representing polarity, characteristic bits representing segment

value, and mantissa bits representing a code word quantizing step;

output terminals (**20, 21-1, 21-2, 21-3, 22-1, 22-2, 22-3, 22-4, 22-5**) adapted to transmit a floating point representation of said code word, said representation including a sign, an exponent and a floating point mantissa;

means (**12**) for extending said polarity and said segment value to first predetermined ones (**20, 21-1, 21-2, 21-3**) of said output terminals and characterized in that said converter further comprises:

a translator (**200**) responsive to said segment value and to a

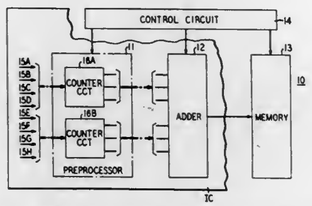


prefixed quantizing step for providing a reference mantissa;

means (**90, 95**) responsive to said reference mantissa and to said code word quantizing step for providing said floating point mantissa;

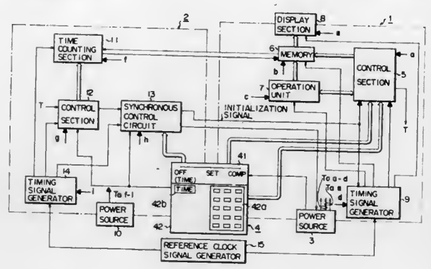
means (**23**) for extending said floating point mantissa to second predetermined ones (**22-1, 22-2, 22-3, 22-4, 22-5**) of said output terminals whereby said floating point representation consists of said sign bit (**20**), said characteristic bits directly extended as said exponent (**21-1, 21-2, 21-3**), and said extended floating point mantissa (**22-1, 22-2, 22-3, 22-4, 22-5**).

4,189,716
CIRCUIT FOR DETERMINING THE NUMBER OF ONES IN A BINARY SIGNAL
Robert H. Krambeck, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation of Ser. No. 780,976, Mar. 24, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,705
Int. Cl.[2] H03K *13/00*
U.S. Cl. 340—347 DD **4 Claims**



1. A circuit arrangement for counting the number of like binary bits in a binary word of $x \geqq 8$ bits, said arrangement comprising at least first and second combinatorial logic circuits including $y_1 > 3 \leqq x/2$ and $y_2 \leqq x - y_1$ factorial logic elements, respectively, and input means adapted responsive to external signals representative of said binary word to apply to said elements of said first and second circuits y_1 and y_2 bits of said binary word, respectively, said circuit arrangement also including an adder circuit for adding together two $N > 3$ bit words produced by said logic circuits, where N equals the larger of y_1 and y_2, each of said first and second circuits being adapted to apply an N bit word to said adder circuit.

4,189,717
SYNCHRONOUS CONTROL APPARATUS IN MULTI-CIRCUIT SYSTEM
Eiichi Takeuchi, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 28, 1977, Ser. No. 855,400
Claims priority, application Japan, Dec. 2, 1976, 51-145144
Int. Cl.[2] G06F *7/38;* **G04B** *19/30*
U.S. Cl. 340—365 E **13 Claims**



1. A synchronous control apparatus in a multi-circuit system, comprising:

mode selecting means (**41**) for selecting one of at least two operational modes;

a first power source (**10**);

a first circuit (**2**) which is always supplied with power from said first power source (**10**), said first circuit including first timing signal generating means (**14**) for generating timing signals to drive the first circuit and synchronous control means (**13**) coupled to said mode selecting means for producing an initialization signal in synchronism with a timing signal from said first timing signal generating means (**14**) every time said mode selecting means (**4**) selects one of said operational modes;

a second power source (**3**); and

a second circuit (**1**) which is supplied with power from said second power source (**3**) only responsive to selection of a given operational mode by said mode selecting means, said second circuit including second timing signal generating means (**9**) and control means (**5**);

said synchronous control means (**13**) of said first circuit (**2**) being coupled to said second timing signal generating means (**9**) and control means (**5**) for feeding said intialization signal thereto for bringing them back to their respective initial conditions and synchronously controlling them responsive to said initialization signal.

4,189,718
ELECTRONIC SIREN
William H. Carson; Gerald D. Smith, and Frank R. Owens, all of Indianapolis, Ind., assignors to Carson Manufacturing Company, Inc., Indianapolis, Ind.
Filed Mar. 2, 1978, Ser. No. 882,606
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 E **29 Claims**

1. In electronic siren apparatus,

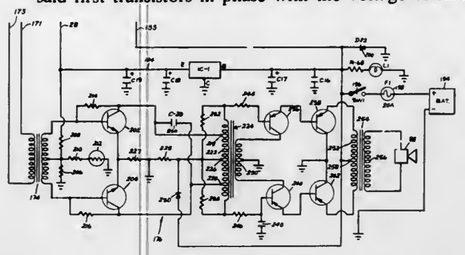
(a) means for generating one of a square wave siren and intelligible audio signal,

(b) a power output amplifier circuit comprising:

(1) a first transistor amplifier means for amplifying a selected one of said signals, said transistor amplifier means includes a pair of transistor devices connected in push-pull circuit configuration, each of said pair of transistor devices being modified Darlington pair circuits, respectively, each Darlington pair circuit including two transistors in which one of the emitter and collector of the first transistor is connected to the base of the second transistor,

(2) first circuit means coupling said signal generating means and the siren signal thereof to the bases of the first transistors of said Darlington pair circuits,

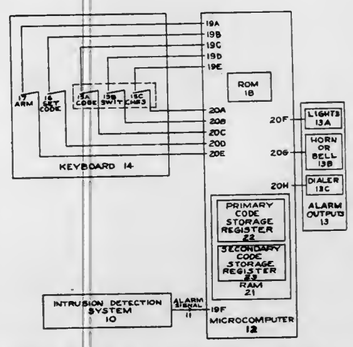
(3) said first circuit means including biasing circuit means for applying a dynamic biasing voltage derived from said siren signal to one of said emitter and collector of said first transistors in phase with the voltage of said



siren signal coupled to the bases thereof, said dynamic biasing voltage being of a magnitude and polarity that overcomes the emitter to collector junction voltage drop of said first transistors and the base to emitter junction voltage drop of the second transistors, respectively, for driving said transistors alternatively between cut-off and saturation, and

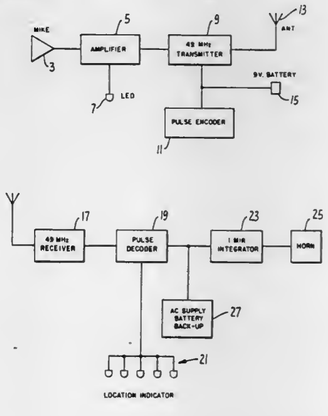
(4) means coupled to the emitters and collectors of said second transistors for audibly reproducing the amplified selected one of said signals.

4,189,719
INTRUSION ALARM SYSTEMS
Donald P. Massa, Cohasset, and James G. Hall, Weymouth, both of Mass., assignors to The Stoneleigh Trust, Cohasset, Mass.
Filed Sep. 19, 1977, Ser. No. 834,644
Int. Cl.[2] G08B *13/16*
U.S. Cl. 340—501 **8 Claims**



1. In combination in an electronically-controlled intrusion-alarm system, detection means for recognizing the presence of an intruder within a specified zone being protected, alarm signal means, means responsive to the recognition of the presence of an intruder within said protected zone for activating said alarm signal means, alarm output means responsive to the presence of said alarm signal means, means associated with said electronic system for entering a first arbitrary code into said system, a first code storage register for retaining the identity of said first entered arbitrary code, means for entering a second arbitrary code into said system, a second storage register for retaining the identity of said second arbitrary code, comparison means for comparing the contents of said first and said second storage registers, means for inhibiting the activation of said alarm output means, said inhibiting means characterized in that it is operative when said second arbitrary code which is entered into said second storage register is identical with said first arbitrary code which was entered and stored into said first storage register.

4,189,720
REPEATER FOR SMOKE AND SIMILAR ALARMS
Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94022
Filed Oct. 7, 1977, Ser. No. 840,320
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—539 **4 Claims**



1. A remote alarm indicator system for a smoke detector alarm and similar alarms which produce, upon actuation, an audible alarm signal for a substantial period of time, said remote alarm indicator system comprising:

(a) transmitter means located near each said smoke detector alarm and including microphone means responsive to said audible alarm signal produced by said smoke detector alarm, amplifier means operatively connected to the output of said microphone means, said amplifier means including band pass filter means having a band pass characteristic compatible with the frequency range of the said audible alarm signal produced by said smoke detector alarm, and R. F. signal transmitting means operatively connected to the output of said amplifier means;

(b) radio receiver means, remotely located from said transmitter means, for receiving the signal transmitted by said R. F. signal transmitting means, said radio receiver means including integrator means for integrating the signal received from said R. F. signal transmitting means over a predetermined time interval and further including alarm warning means, connected to the output of said integrator means, which is activated by the said integrator means to render an alarm indication when the said signal received from said R. F. signal transmitting means persists for the predetermined time interval of said integrator means;

(c) said transmitter means further including signal encoding means and said radio receiver means further including signal decoding means; and wherein,

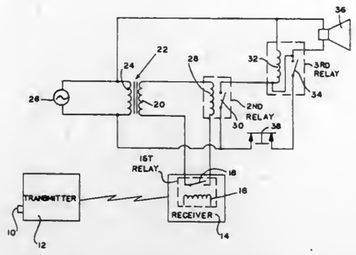
(d) said radio receiver means further includes means to indicate the location of each transmitter means.

4,189,721

PERSONAL ALARM SYSTEM

Raymond Doell, 9601 Shore Rd., Brooklyn, N.Y. 11209

Filed Feb. 21, 1978, Ser. No. 879,787
Int. Cl.[2] G08B *1/08;* **H04Q** *7/00*
U.S. Cl. 340—539 **4 Claims**



1. A personal alarm system, comprising in combination, a receiver unit including a receiver for receiving a signal transmitted from a transmitter and a first relay integrally connected within the receiver unit, said first relay having a first coil energized by said receiver in response to receiving said transmitted signal and a pair of first normally open contacts closeable upon energization of said first coil, a step-down transformer unit having a primary winding for connecting across a source of alternating power and a secondary winding for providing a low voltage alternating output, a second relay having a second coil and a pair of second normally open contacts closable upon energization of said second coil, said second coil connected in series with said pair of first contacts and said secondary winding, a third relay having a third coil and a pair of third normally open contacts closable upon energization of said third coil, said third coil connected in series combination with said pair of second contacts and said series combination connected in parallel across said primary winding, a warning device connected in series circuit with said pair of third contacts and said series circuit connected in parallel across said primary winding, and a coupling circuit connected between the interconnections of said warning device with said pair of third contacts and between the interconnection of said third coil with said pair of second contacts to convert said third relay into a self-holding relay, whereby a momentary transmission of said transmitted signal causes a continuous operation of said warning device.

4,189,722

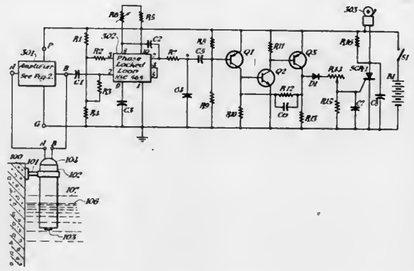
SWIMMING POOL INTRUSION ALARM SYSTEM

Julius O. Lerner, 460 NW. 41 St., Pompano Beach, Fla. 33064

Continuation-in-part of Ser. No. 738,523, Nov. 3, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,437
Int. Cl.[2] G08B *21/00;* **H03B** *5/00*
U.S. Cl. 367—93 **8 Claims**

1. In a swimming pool water intruder signal system, a device for sensing relative pool water level, comprising:
at least one body with a wave resonatable control cavity operatively coupled to pool water for sensing relative pool water level, and
means for exciting resonant frequency waves in said cavity and for sensing said frequency at said pool water level and changes in said pool water level, said means including,
at least one transducer, and
at least one amplifier having an output and an input,
said transducer operatively coupled to said cavity,
said transducer connected to said output and said input of said amplifier to cause a regenerative oscillation signal in said amplifier, said oscillation signal at said output connected to drive said transducer to excite said resonatable control cavity and said resonant frequency wave to provide input to said transducer to drive said amplifier at said cavity resonant frequency, said amplifier provides at said output an electrical phase and frequency signal retracted to pool water level.

5. A swimming pool intruder signal system comprising,
means for sensing and indicating intrusion including a first body with resonatable cavity, said cavity vented to atmosphere and having a duct with predetermined resistance to water flow for admitting water to said cavity when placed in pool water;
a reciprocal sound transducer having an input and output operatively coupled to air space within said cavity for providing drive and an output signal;
an amplifier having an input and output, with said transducer connected to said amplifier input and output as a feedback element to cause said amplifier to oscillate at a frequency responsive to relative average water level as a function of cavity resonant frequency,
an electrical means responsive to phase and frequency



change, said electrical means including an input connected to said output of said amplifier to produce an alarm indicator activating signal output in response to a predetermined increase in relative average water level in said pool occurring within a predetermined time interval, said electrical means comprising
a phase locked loop network with input coupled to the output of said amplifier
a low pass filter network with input connected to the output of said phase locked loop network,
a triggerable pulse forming network with input coupled to the output of said low pass filter network,
a pulse summing network with input connected to the output of said pulse forming network,
a latching switching network with input connected to the output of said pulse summing network, and
an indicating device connected to the output of said switching network, and actuable by said network.

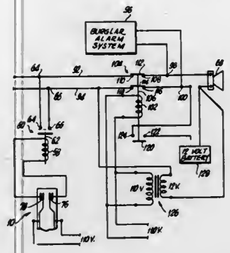
4,189,723

ELECTRICAL RECEPTACLE PROVIDED WITH AN ALARM SYSTEM

Earl A. Hylton, 143-41 101st Ave., Jamaica,Queens, N.Y. 11435

Filed Feb. 28, 1978, Ser. No. 882,258
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—568 **6 Claims**

1. An electrical receptacle comprising:
female socket means having first and second receiving terminals for receiving therein two prongs of a male plug, each of said first and second receiving terminals including first and second electrically separated contact elements;
coupling means for coupling a source of electrical energy between said first contact element of said first receiving terminal and said first contact element of said second receiving terminal;
first switch means coupled between said second contact element of said first receiving terminal and said second contact element of said second receiving terminal, said first switch means having first and second positions respectively corresponding to a presence and absence of a male plug inserted in said female socket means;
alarm means coupled to said first switch means whereby said alarm means is activated upon removal of the male plug from said female socket means;
said first switch means including a first electromagnetic switch having a first relay coil coupled between said second contact elements and a pair of first switch contacts serially connected to said alarm means, said first relay coil being energized by the presence of the male plug in said female socket means which causes current to pass from each first contact element to its associated second contact element in each receiving terminal, said energize first relay coil maintaining said pair of first switch contacts electrically disconnected from each other;



a burglar alarm system being electrically connected to said alarm means in parallel with said first switch means;
second switch means including a second electromagnetic switch having a second relay coil adapted to be energized by the source of electrical energy, and second switch contacts serially interconnecting said alarm means with said first switch means when said second relay coil is energized; and
transformer means providing a main power source for said alarm means from the source of electrical energy, said main power source causing said alarm means to be operative responsive to both said burglar alarm system and said first switch means.

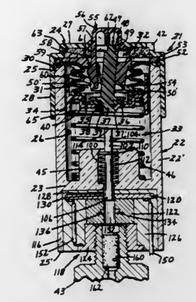
4,189,724

ELECTRIC RESTRICTION INDICATOR WITH A CONTACTLESS SWITCH DEVICE FOR INDICATING A RESTRICTION IN FILTER ELEMENTS

Minoru Onuma, Tokyo; Masayoshi Nakamura, Tachikawa; Takao Yamazaki, and Tatsuo Ohta, both of Tokyo, all of Japan, assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 24, 1978, Ser. No. 880,753
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—607 **15 Claims**

1. A restriction indicator for fluid filters having an intake side and a negative pressure side comprising:
(a) a housing having top and bottom ends and a continuous side wall therebetween;
(b) a flexible bellows-like diaphragm member affixed within said housing and dividing the interior of said housing into first and second pressure chambers, said housing having an aperture in the top end thereof providing fluid communication between said first chamber and the atmosphere and an aperture in the bottom end thereof providing fluid communication between said second chamber and the negative pressure side of the fluid filter, said diaphragm member mounted for extending and retracting movement toward and away from said top end of said housing in response to negative pressure within said second chamber;
(c) spring means for biasing said diaphragm member toward said top end of said housing;
(d) means for providing an electrical signal indicative of negative pressure within said second chamber, said indicating means comprising:
(i) a photointerrupter affixed to said housing at one of said top and bottom ends thereof, said photointerrupter having an axial passageway therethrough, a light receiving means and a light generating means disposed at diametrically opposed positions about said axial passageway so that light generated by said light generating means is transmitted across said axial passageway and detected by said light receiving means;
(ii) a rod disposed for axial reciprocating movement within said axial passageway to selectively interrupt transmission of light across said axial passageway;



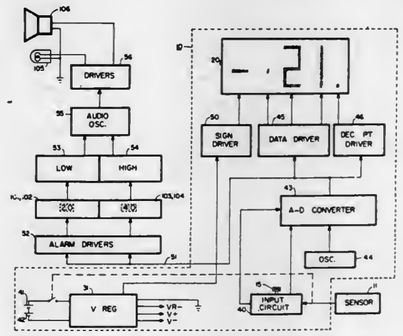
(iii) means for biasing said rod toward a first axial position wherein light transmission in uninterrupted;
(iv) means for transmitting said expanding movement of said diaphragm to said rod whereby said rod is urged toward a second position interrupting light transmission across said axial passageway; and
(v) electric circuit means connected to said light transmitting means and said light receiving means for providing an electrical signal corresponding to presence or absence of increased negative pressure within said second chamber.

4,189,725

BATTERY POWERED CONDITION SENSING AND DISPLAY APPARATUS WITH LOW BATTERY INDICATION

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed May 10, 1977, Ser. No. 795,386
Int. Cl.[2] G08B *21/00, 17/10*
U.S. Cl. 340—636 **5 Claims**



1. Battery powered condition sensing and display apparatus for continuous operation at low battery drain and low battery indication comprising:

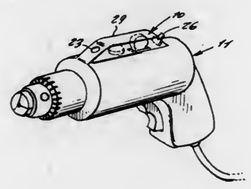
a sensor operative to produce an electrical signal proportional to the condition being monitored;
signal conditioning apparatus including calibration means for adjusting the level of electrical signals from said sensor as a function of a reference standard;
battery supply means for powering said apparatus;
means electively connecting the sensor to said apparatus;
said connecting means including a switch responsive to the connection of said sensor to said apparatus for applying power from said battery supply means to said apparatus and for terminating power to said apparatus upon disconnection of said sensor;
voltage regulator means forming a part of said battery supply means;
said voltage regulator means including at least one normally back biased transistor for regulating the voltage to the apparatus with a minimum of current drain when said battery supply means is at greater than a predetermined minimum value;
an analog to digital converter connected to the output of said signal conditioning apparatus for converting the calibrated signal therefrom into digital form;
display means for displaying in digital form the output of said analog to digital converter;
circuit means for monitoring the output voltage of said battery supply means; and means responsive to the sensing of the falloff of battery terminal voltage below a predetermined level for generating and inserting an additional symbol on said display means while maintaining the correct numerical indication on said display.

4,189,726

AUTOMATIC ORIENTATION CIRCUIT INDICATOR DEVICE FOR PORTABLE POWER TOOLS AND THE LIKE

Frank Rosa, 91-40 89th St., Woodhaven, N.Y. 11421, and Richard L. Miller, 12 Parkside Dr., Dix Hills, N.Y. 11746

Filed Oct. 27, 1977, Ser. No. 845,807
Int. Cl.[2] G08B *13/21*
U.S. Cl. 340—689 **5 Claims**



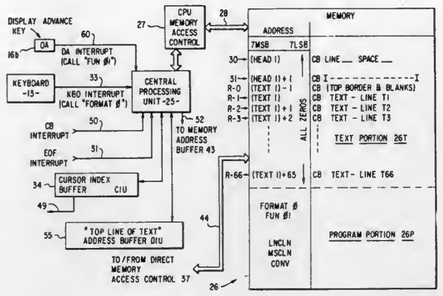
1. An automatic orientation circuit indicator for portable power tools and the like, comprising in combination, a thin cylindrical case having opposing end walls for sealing the case and defining therewith an interior chamber, a thin-walled cylindrical ring member having opposing end faces, said ring member concentrically positioned against the inside of one end wall and extending into said chamber to form one electrical contact, a thin T-shaped member positioned against the inside of the other end wall, the center of said T-shaped member being coaxial with the center of the cylindrical case and the legs radially extending a distance at least equal to the radius of said cylindrical ring member, said T-shaped member forming another electrical contact, a spherical steel ball freely rotatable within said chamber capable of forming an electrical connection between the interiorly directed end face of the ring member and the remote ends of the legs of the T-shaped member when the indicator is in preselected positions, wiring respectively connected to each of said electrical contacts and extending outwardly through said case and connecting to an electrical circuit including a lamp and a power source.

4,189,727

DISPLAY ADVANCE SYSTEM FOR A WORD PROCESSOR

Louis E. Vaughn, Jr., Chatsworth, Calif., assignor to Lexitron Corporation, Chatsworth, Calif.

Filed Jan. 12, 1978, Ser. No. 868,885
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—711 **12 Claims**



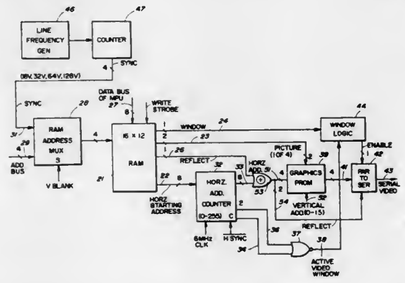
1. In a word processing system having a video screen capable of displaying only a portion of a full page of text, the improvement for advancing the display directly to the next one of a sequence of primarily different text sections into which said full page is fixedly divided, each of said sections being individually, completely displayable on said screen, comprising:
display advance control means, actuated by a "DISPLAY ADVANCE" control, for ascertaining from the currently displayed portion of said text the identity of the next sequential section, and
display circuitry for utilizing said ascertained identity to directly cause said next sequential section of text to be displayed on said screen.

4,189,728

APPARATUS FOR GENERATING A PLURALITY OF MOVING OBJECTS ON A VIDEO DISPLAY SCREEN UTILIZING ASSOCIATIVE MEMORY

David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1977, Ser. No. 862,337
Int. Cl.[2] G06F *3/14;* **G06K** *15/20*
U.S. Cl. 340—725 **3 Claims**



1. Apparatus for generating a plurality of moving objects on a video display screen scanned in successive frames by an image forming beam traversing said screen along a plurality of horizontal lines in response to horizontal and vertical synchronizing signals comprising; memory means having a plurality of addressable memory locations each exclusively associated with one of a plurality of effective horizontal zones on said screen, each of said zones including a plurality of said horizontal lines,

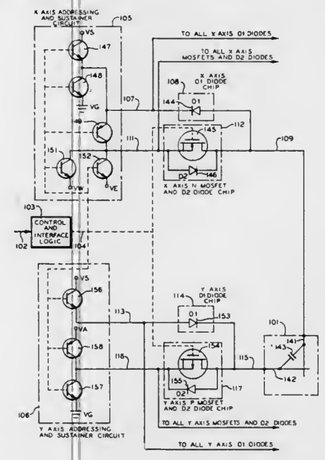
each of said memory locations including stored data indicative of the horizontal starting location of a said object exclusively dedicated to such zone; means for accessing said addressable memory locations of said memory means in accordance with the horizontal line count of said display; and horizontal counter means presettable with said stored data and responsive to each horizontal traverse of said beam for comparing such beam location with said starting location to provide a video display signal.

4,189,729

MOS ADDRESSING CIRCUITS FOR DISPLAY/MEMORY PANELS

Theodore C. Baker, Wayne, and William E. Johnson, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 14, 1978, Ser. No. 896,523
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—777 **8 Claims**



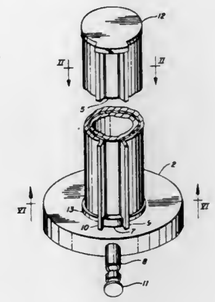
1. In an operating system for a multicelled gas discharge display/memory device, the device including a pair of opposed, spaced apart electrode arrays with proximate electrode portions of at least one electrode in each array defining the cells and the operating system including a sustainer voltage source for imposing an alternating potential voltage having a period and a predetermined maximum potential across each of the cells, an address voltages source for generating write and erase address voltages to manipulate the discharge state of individual cells between an "on state" and an "off state", isolation diodes for applying the sustainer voltage to the electrodes and for isolating the electrodes from each other, switching circuits for selectively applying the address voltages to the electrodes and a source of control signals for controlling the operation of the sustainer voltage source, the address voltages source and the switching circuits, the improvement comprising:
a first substrate having a first plurality of the isolation diodes formed thereon, each one of said first plurality having one terminal connected in common with all others of said first plurality to the sustainer voltage source and another terminal connected to an associated electrode in one of the electrode arrays; and
a second substrate having one of the switching circuits formed thereon including a plurality of solid state switches each having one side connected in common to the sustainer voltage source and the other side connected to an associated electrode in said one electrode array and being responsive to the control signals for selectively applying the address voltages to the associated electrode, said second substrate also having a second plurality of the isolation diodes formed thereon, each one of said second plurality being connected across an associated one of said solid state switches and poled oppositely from said first plurality of the isolation diodes.

4,189,730

DIRECTIONAL ANTENNA SHIELD FOR A SLOTTED OPENING

Arthur W. Murdock, 6413 S. Whipple, Chicago, Ill. 60629

Filed May 26, 1978, Ser. No. 909,949
Int. Cl.[2] H01Q *15/02, 1/52*
U.S. Cl. 343—841 **3 Claims**



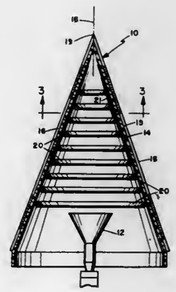
1. A shield for use wth a rotatable elongated receiver comprising an insulator coupled to the outside of the receiver, said insulator having a through-going slot substantially over its entire length and thus exposing a portion of the receiver, a slotted metal shield coaxially coupled to the outside of said insulator and fully insulated from said receiver and having a through-going slot in registry with the slot on said insulator, means for fixing said insulator and shield in fixed relationship to each other and to the receiver and feed means coupled to said receiver.

4,189,731

RADOME WITH TILTED DIELECTRIC STRIPS

Eugene L. Rope, El Cajon, and Gus P. Tricoles, San Diego, both of Calif., assignors to General Dynamics Electronics Division, San Diego, Calif.

Filed Jun. 12, 1978, Ser. No. 914,519
Int. Cl.[2] H01Q *1/42*
U.S. Cl. 343—872 **12 Claims**



1. A radome comprising:
a dielectric material sheet defining a symmetrically curved shell having a vertex and a given axis, and having inside and outside walls;
a first array of thin strips of dielectric material supported edgewise on one wall of the shell, with the supported

edges of the strips being spaced from each other and disposed in radial planes that include the given axis, and with each strip being normal to the one wall, for providing anisotropy favoring parallel polarization components of incident radiation; and

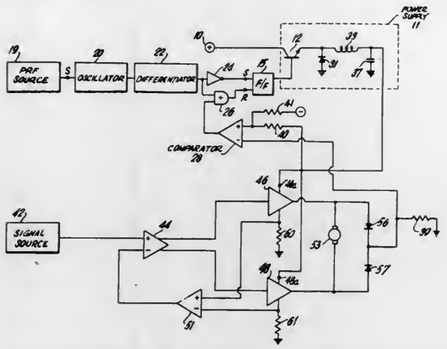
a second array of thin strips of dielectric material supported edgewise on the other wall of the shell, with the supported edges of the strips being spaced from one another and disposed perpendicular to the supported edges of the strips in the first array, and with all of the strips being tilted from the other wall at an acute angle in a common direction away from the vertex for providing anisotropy favoring perpendicular polarization components of incident radiation.

4,189,732

MOTOR ACTUATING CIRCUITRY

Jerrold B. Atwater, North Plainfield, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Mar. 30, 1977, Ser. No. 782,746
Int. Cl.[2] G01S *9/00*
U.S. Cl. 343—5 R **7 Claims**



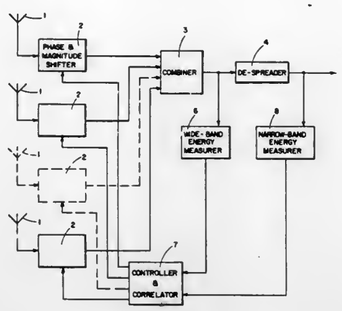
1. In combination in apparatus for variably energizing a motor from a power source, an amplifier having a motor control signal receiving input port, a motor driving output port, and a variable power voltage receiving port; variable output voltage power supply means connected to said amplifier variable power voltage receiving port, said variable output voltage power supply means comprising a variable output voltage switching regulator including series connected controlled switch means and an inductance, a diode connected intermediate said switch means and said inductance and an output capacitor connected to said inductance; and switch controlling means having an output connected to said controlled switch means, a first voltage sensing input connected to said amplifier output port, and a second voltage sensing input connected to the output of said variable output voltage power supply means, further comprising a radar antenna driving motor connected to said motor driving output of said amplifier, and a radar pulse rate pulse source for signalling the radar antenna transmission intervals connected to said switch controlling means for enabling said controlled switch means only during said transmission intervals, whereby electronic switching noise generated by said power supply means occurs only during radar transmission intervals and does not interfere with radar reception.

4,189,733

ADAPTIVE ELECTRONICALLY STEERABLE PHASED ARRAY

Robert Malm, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 8, 1978, Ser. No. 967,572
Int. Cl.[2] H04B *7/00*
U.S. Cl. 343—100 SA **5 Claims**



1. An adaptive receiving antenna system comprising:

a. a plurality of antenna elements for receiving electromagnetic signals,

b. a plurality of signal varying means connected to the outputs of predetermined ones of the antenna elements for varying each of the outputs of said predetermined antenna elements,

c. output combining means connected to the outputs of the signal varying means, and to the antenna elements to which no signal varying means are connected, for receiving and combining the outputs of the predetermined ones of the signal varying means and the outputs of the antenna elements to which no signal varying means are connected,

d. wide-band energy measurement means, connected to the output of the output combining means, for measuring the wide-band energy therein,

e. despreader means, connected to the output of the output combining means, for receiving and despreading the spectrum of the desired signal and for reducing the band-width of the signals emerging from the despreading means,

f. narrow-band energy measurement means, connected to the output of the despreader means, for measuring the narrow-band energy therein, and

g. controller and correlator means connected to the output of the wide-band energy measurement means and to the output of the narrow-band energy measurement means, which correlator and controller means controls each of the signal varying means to introduce variations into the outputs from the signal varying means so as to decrease the output from the wide-band energy measurement means and increase the output from the narrow-band energy measurement means.

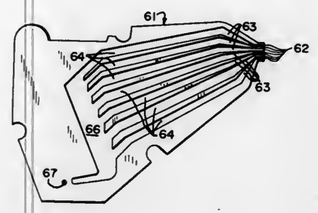
4,189,734

METHOD AND APPARATUS FOR RECORDING WITH WRITING FLUIDS AND DROP PROJECTION MEANS THEREFOR

Edmond L. Kyser, Portola Valley, and Stephan B. Sears, Belmont, both of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 50,445, Jun. 29, 1970, Pat. No. 3,946,398. This application Jul. 19, 1974, Ser. No. 489,985
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—1.1 **15 Claims**

1. In an ink-jet printer having an ink source feeding an ink chamber which opens to a nozzle directed to a recording medium, and drive means for providing asynchronous electrical signals to drive the printer responsive to predetermined patterns, the improvement comprising means responsive to said electrical signals to displace a predetermined quantity of ink from said ink chamber, asynchronously upon receipt of each signal from said drive means, independent of all previous



signals, with sufficient force to project a single droplet of ink to said recording medium in a substantially straight trajectory, wherein the nozzle cross-section is of a size to permit ink to refill the nozzle by capillary action upon ejection of a droplet, and further wherein the nozzle length is 2 to 4 times the average cross-sectional dimensions of the nozzle.

4,189,735

RECORD PLAYBACK APPARATUS AND INFORMATION RECORD THEREFOR

Alan E. Bell, East Windsor; Robert A. Bartolini, Trenton; Rabah Shahbender, and Brown F. Williams, both of Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 881,023
Int. Cl.[2] G01D *15/24, 15/10*
U.S. Cl. 346—135.1 **12 Claims**

1. A record blank, for use with a playback focused beam of light of a given frequency and a first intensity and a recording focused beam of light of said given frequency and a second intensity, said second intensity being greater than said first intensity, said record blank comprising the combination of:

a foundation;

a coating of material exhibiting high thermal diffusivity, overlying a surface of said foundation; and

a coating of material of a given thickness exhibiting absorptivity to light at said given frequency, overlying said coating of high thermal diffusivity;

said coating of high thermal diffusivity presenting a significant heat sink to said absorptive coating;

an absorptive coating of said given thickness being sensitive to a focused beam of light of said first intensity when such absorptive coating overlies said foundation such that said focused beam of light of said first intensity effects disturbances in such absorptive coating overlying said foundation;

said record blank being sensitive to said recording beam of said second intensity such that said recording beam effects disturbances in said absorptive coating of said record blank, said absorptive coating of said record blank being undisturbed in response to a focused beam of light of said first intensity;

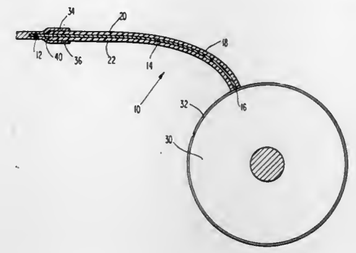
said record blank exhibiting a given signal-to-noise ratio during playback with said playback beam at said first intensity.

4,189,736

FACSIMILE STYLUS ASSEMBLY

Fred A. DeFilipps, Maitland, Fla., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 29, 1977, Ser. No. 828,440
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—139 C **13 Claims**



1. A stylus assembly for use in recording on a document, said stylus assembly comprising:

an electrical conductor terminating at one extremity so as to form an output electrode surface adapted to mark a recording medium in response to an electrical potential between the conductor and the recording medium;

an electrically insulating sheath extending to a plane substantially flush with said electrode surface; and

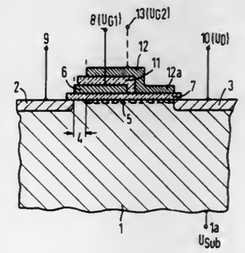
elongated means comprising at least one spring wire and extending substantially parallel to said conductor coupled to said sheath said elongated means comprising a material having a higher modulus of elasticity than said conductor.

4,189,737

FIELD EFFECT TRANSISTOR HAVING AN EXTREMELY SHORT CHANNEL LENGTH

Lothar Schrader, Munich, and Karlheinrich Horninger, Eglharting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,827
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729657
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **12 Claims**



1. Field effect transistor having a short channel length, comprising a doped semiconductor layer of a first conductivity type provided with doped source and drain zones of the opposite conductivity type inserted on the surface side of said substrate, a first gate electrode separated from the semiconductor surface by a first insulating layer, said doped semiconductor layer having a surface-side counter zone doping extending

over the entire semiconductor zone between said source and said drain zones with the exception of a narrow strip-like semiconductor zone which directly adjoins said source zone, said strip-like semiconductor zone and at least an adjoining part of the surface-side counter-doped semiconductor zone being covered by a first gate electrode, a second insulating layer on said first gate electrode and on the drain side edge face of said first gate electrode, a coating on said second insulating layer which also covers that portion of said first insulating layer not covered by said first gate electrode, the source-side edge of said coating determining the drain side boundary of said strip-like semiconductor zone, the source-side edge of said first gate electrode determining the source-side boundary of said strip-like semiconductor zone, and said first gate electrode being provided with a control voltage terminal.

4,189,738

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

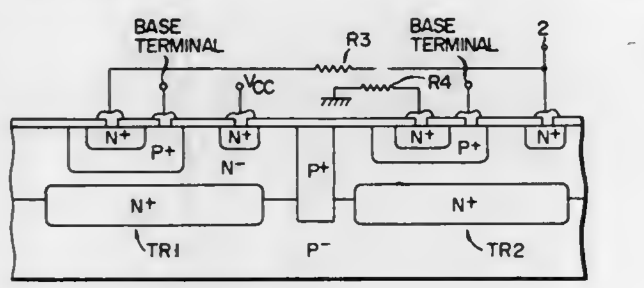
Hajime Sawazaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 778,598, Mar. 17, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,632

Claims priority, application Japan, Mar. 18, 1976, 51-29662

Int. Cl.² H01L *27/02*

U.S. Cl. 357—40 **3 Claims**



1. A semiconductor integrated circuit device comprising:

a Class B push-pull circuit having first and second terminals for connection across a source of power, the second terminal being a ground connection, and first and second power output transistors of the same conductivity type having, respectively, first and second emitter-collector paths successively connected in series between said first and second terminals and first and second bases connected to receive an input signal, said first transistor whose emitter-collector path is connected to said first terminal being formed to have a greater maximum permissible dissipation power compared with said second transistor whose emitter-collector path is connected to said second terminal.

4,189,739

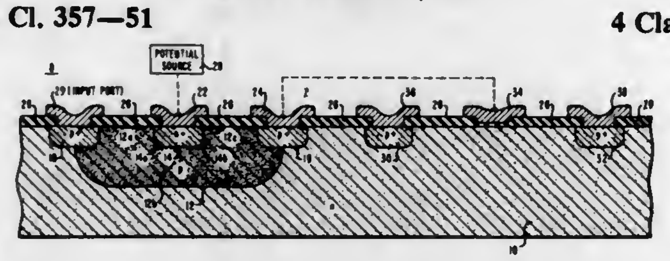
SEMICONDUCTOR OVERLOAD PROTECTION STRUCTURE

John A. Copeland, III, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1978, Ser. No. 884,414

Int. Cl.² H01L *27/02*

U.S. Cl. 357—51 **4 Claims**



1. A semiconductor structure comprising:

a semiconductor body having a major surface and including a bulk portion of a first conductivity type;

a first region located within the semiconductor body and extending to the major surface and being of a second conductivity type;

a second region located within the first region and extending to the major surface and being of the first conductivity type; and

third and fourth regions within the body each contiguous with at least portions of the first region and extending to the major surface and being of the second conductivity type;

the third and fourth regions being of higher impurity concentration than the second region and being separated from each other and from the second region;

the third region having an electrode coupled thereto which serves as an input port;

the fourth region having an electrode coupled thereto which serves as an output port; and

the second region having an electrode coupled thereto.

4,189,740

COMMON CIRCUITRY VIR CONTROL APPARATUS FOR COLOR TELEVISION RECEIVER

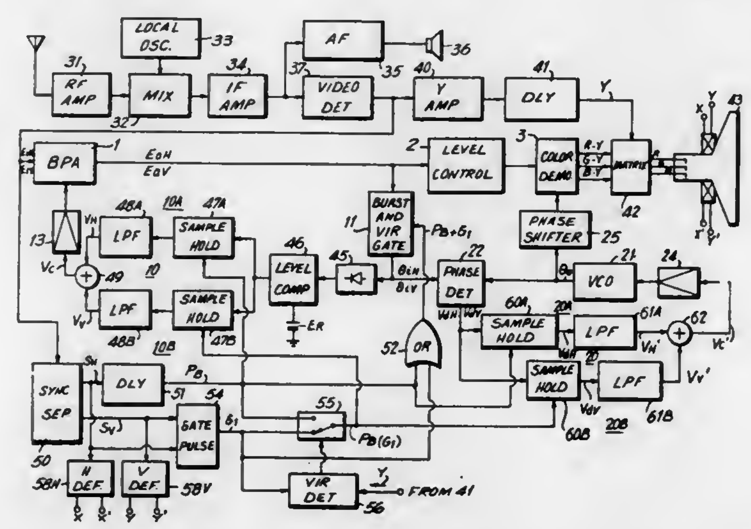
Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,584

Claims priority, application Japan, Feb. 21, 1977, 52/17915; Sep. 29, 1977, 52/126884

Int. Cl.² H04N *9/535*

U.S. Cl. 358—21 V **59 Claims**



1. In color video signal receiving apparatus of the type capable of receiving a color video signal including a VIR signal therein, color control apparatus comprising:

a chrominance channel for processing the chrominance component included in said color video signal, said chrominance component including a burst signal and, if said VIR signal is present, a VIR reference component;

extracting means coupled to said chrominance channel for separating said burst signal and said VIR reference component from said color video signal;

means for detecting a predetermined parameter in said separated burst signal;

means for detecting a corresponding parameter in said VIR reference component if said VIR signal is present;

a common amplifier connected to said respective detecting means for producing an amplified control signal in response to said detected parameters; and

adjustable means responsive to said amplified control signal for adjusting a color characteristic of the processed chrominance component.

4,189,741

APPARATUS FOR IMPROVED COLOR JUDGEMENT IN A COLOR MONITOR FOR ELECTRICAL COLOR CORRECTION

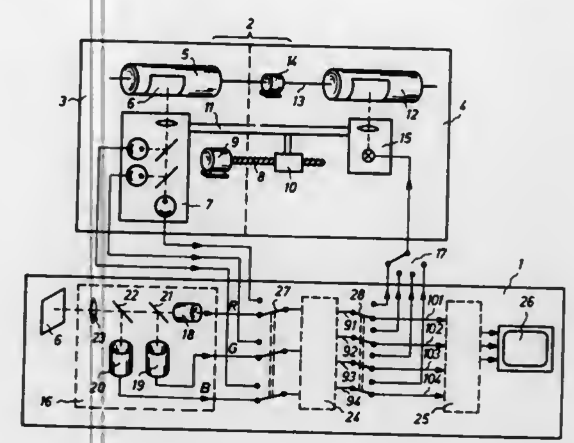
Siegfried Klopsch, Probsteierhagen, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,487

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719821

Int. Cl.² G03F *3/10*

U.S. Cl. 358—76 **4 Claims**



1. Apparatus for improved color evaluation in a color monitor for reproduction of color prints for making color corrections, whereby the color picture is visible on said monitor, comprising a switching arrangement connected to said monitor in order to produce a one color frame border which surrounds the color picture on the picture screen by supplying reference color frame signals to said monitor and including means for varying the color of said one color frame border.

4,189,742

APPARATUS FOR INDICATING OVERCORRECTIONS, IN ELECTRICAL COLOR CORRECTION APPARATUS

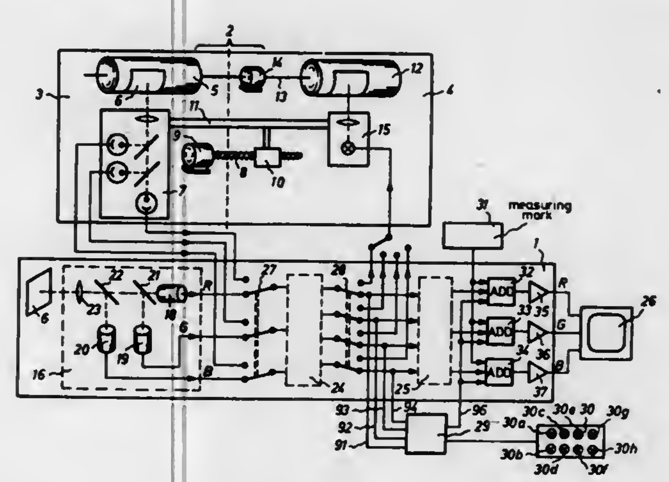
Siegfried Klopsch, Probsteierhagen, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,566

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719387

Int. Cl.² G03F *3/08*

U.S. Cl. 358—80 **7 Claims**



1. Apparatus for detecting overcorrections in an electronic color correction system comprising comparators for each color channel each of which receives a color signal after color corrrection is accomplished, comparing said color signal with at least an upper threshold and comparing said color signal with at least a lower threshold and means for indicating when said color signal exceeds one or more of said thresholds.

4,189,743

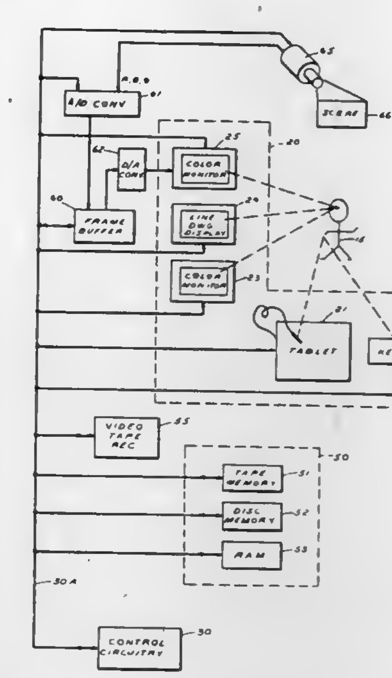
APPARATUS AND METHOD FOR AUTOMATIC COLORATION AND/OR SHADING OF IMAGES

Alexander Schure, Old Westbury; Edwin Catmull, Glen Cove, and Alvy R. Smith, Brookville, all of N.Y., assignors to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,114

Int. Cl.² H04N *7/18*

U.S. Cl. 358—93 **12 Claims**



1. Apparatus for automatic coloration and/or shading of images, comprising:

display means;

graphical input means having a coordinate system adapted to effect display on said display means characters defined by coordinate points selected by an operator;

means for storing coordinate points defining at least one enclosed area of said coordinate system;

means for storing an operator-selected position reference which identifies each enclosed area;

means for storing an operator-selected video content parameter associated with each of said position references;

means for scanning the coordinate points within each enclosed area, the scan for each area initiating from a position which depends upon its associated stored position reference; and

video frame storage means for storing the selected video content parameter for each of the scanned coordinate points within each enclosed area.

4,189,744

APPARATUS FOR GENERATING SIGNALS REPRESENTING OPERATOR-SELECTED PORTIONS OF A SCENE

Garland Stern, Brookville, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,117

Int. Cl.² H04N *7/18*

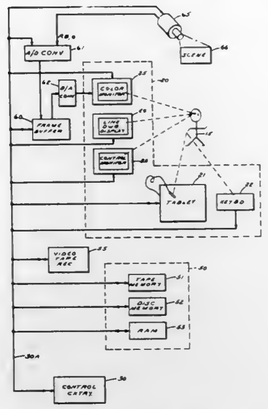
U.S. Cl. 358—93 **15 Claims**

1. Apparatus for generating video-representative signals which represent one or more operator-selected portions of a scene, comprising:

frame storage means for storing an array of elemental pixel values representative of the video content of the individual elemental areas in said scene;

means for interrogating said frame storage means and for tabulating the pixel values stored in said frame storage means;

operator controllable means for selecting one or more of the pixel values of said tabulation; and



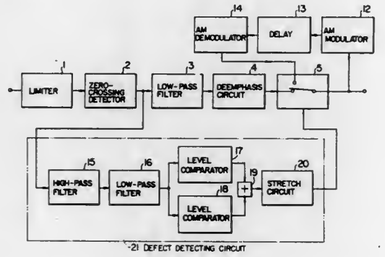
means responsive to said selected values for forming video-representative signals corresponding to those portions of the scene having the selected pixel values.

4,189,745

DEFECT DETECTING APPARATUS

Fusao Ushio, Hirakata, and Noboru Okuno, Sennan, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd, Osaka, Japan

Filed Mar. 10, 1978, Ser. No. 885,331
Claims priority, application Japan, Mar. 16, 1977, 52-29436
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—128.5 **4 Claims**



1. In a system for reproducing from a recording medium a video signal having a predetermined frequency band recorded as a frequency-modulated video signal having a predetermined frequency shift, an apparatus for detecting a signal defective portion in the reproduced video signal which comprises:

a frequency demodulator comprising zero-crossing detector means for frequency-demodulating the reproduced frequency-modulated video signal to produce a frequency-demodulated output signal and a low-pass filter for deriving a video signal of said predetermined frequency band from said demodulated output signal;

filtering means for receiving the demodulated video signal from said zero-crossing detector to produce a filtered output signal, said filtering means having a low cut-off frequency substantially above the highest frequency of said predetermined frequency band of said video signal and having a high cut-off frequency below twice the lower limit frequency of the frequency shift of said frequency-modulated video signal;

a first level comparator for receiving said filtered output to generate a first output signal when said filtered output becomes larger than a first predetermined level;

second level comparator for receiving said filtered output to generate a second output signal when said filtered output becomes smaller than a second predetermined level which is predetermined to be smaller than said first predetermined level; and

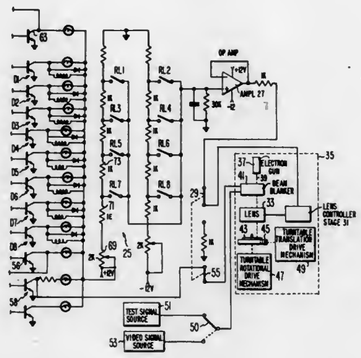
adder means for adding said first and second output signals of said first and second level comparators to produce an output signal representing the signal defective portion in said reproduced video signal.

4,189,746

METHOD AND APPARATUS FOR DETERMINING FOCUS CONDITIONS

John Valachovic, New Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,353
Int. Cl.[2] G11B *7/00*
U.S. Cl. 358—128.5 **14 Claims**



1. A radiant energy beam recording method for obtaining a measure of the focus setting of a radiant energy recorder comprising the steps of:

providing a recording beam of radiant energy;

positioning a radiant energy sensitive record medium relative to said recording beam in a manner causing the record to laterally intersect said recording beam;

establishing a focus setting for said recording beam in a manner causing a spot to be formed on the surface of said record;

establishing relative motion between the record and the recording beam in a manner effecting exposure to the recording beam of selected regions on a first major area of the record surface defining a series of adjacent test bands, the structure of said bands serving as an optical grating, varying said focus setting such that each of said selected regions in each band is exposed at an axial location of the recording beam which is respectively different from the axial location of the recording beam at which said selected regions in respectively other bands are exposed; and

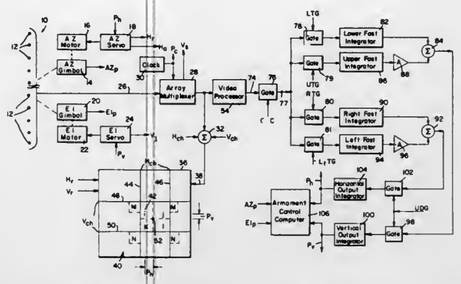
examining the light reflected by the optical gratings of said bands to obtain a measure of the optimum focus setting for said recording beam.

4,189,747

INFRARED TRACKING SYSTEM

Anthony V. Funari, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 15, 1967, Ser. No. 667,979
Int. Cl.[2] H04N *7/18;* **G01J** *1/00;* **H04N** *5/33*
U.S. Cl. 358—126 **18 Claims**



1. A tracking system for determining the relative location of a designated target comprising:

sensor means for providing received video signals that are indicative of the intensity of received infrared energy and for providing sensor position signals indicative of the relative position of said sensor means;

a gated video processor responding to the received video signals for providing digital target signals representative of the image area of targets, said processor having a gate signal input circuit;

gated video tracking means responding to the target signals for generating target position signals indicative of the relative location of a designated target, said gated video tracking means having a plurality of tracking gate input circuits;

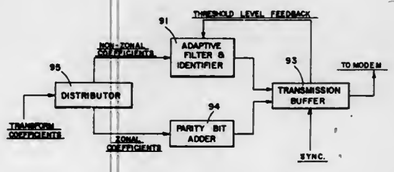
and gate generating means, responding to said target position signals and to said sensor position signals, for applying a plurality of tracking gate signals to said plurality of tracking gate input circuits and for applying processor gates to said gate signal input circuit of said video processor.

4,189,748

VIDEO BANDWIDTH REDUCTION SYSTEM USING A TWO-DIMENSIONAL TRANSFORMATION, AND AN ADAPTIVE FILTER WITH ERROR CORRECTION

James J. Reis, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 23, 1977, Ser. No. 827,083
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—133 **7 Claims**



1. A system for reducing the bandwidth required for the transmission of two-dimensional video data comprising:

two-dimensional transformer means for transforming said video data into arrays of transform coefficients,

transform coefficient compressor means for separating the transform coefficients into zonal coefficients, all of which are transmitted, and non-zonal coefficients of which the largest "n" coefficients are selected for transmission, for arranging the zonal coefficients such that such zonal coefficients may be identified by their position in the stream of data, and for attaching identification data to the non-zonal coefficients; and

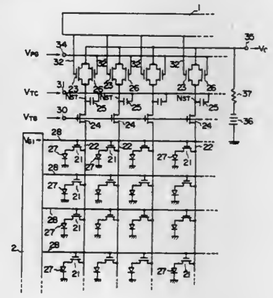
transmitting modem means for transmitting the coefficients output from the transform coefficient compressor.

4,189,749

SOLID STATE IMAGE SENSING DEVICE

Yoshimitsu Hiroshima, Hirakata; Tooru Takamura, Takatsuki; Hirokuni Nakatani, Takatsuki, and Izumi Murozono, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Sep. 13, 1978, Ser. No. 942,134
Claims priority, application Japan, Sep. 16, 1977, 52/111801
Int. Cl.[2] H04N *5/21, 5/30;* **H01L** *29/78, 27/14*
U.S. Cl. 358—167 **3 Claims**



1. A solid state image sensing device comprising:

a group of a large number of photoelectric transducing elements disposed in a matrix with horizontal rows and vertical columns of said photoelectric transducing elements,

a plurality of vertical metal-oxide semiconductor (MOS) switches each one of the vertical MOS switches connected to each of said photoelectric transducing elements,

a plurality of vertical scanning pulse input lines one vertical scanning pulse input line for each of said horizontal rows, each vertical scanning pulse input line being connected to the gates of said vertical MOS switches in common,

a plurality of connecting lines one connecting line for each of said vertical column, each connecting line being connected to the drains of said vertical MOS switches in said vertical column in common,

a plurality of transferring MOS switches one transferring MOS switch for each of said connecting line, the source of each transferring MOS switch being connected to said connecting line,

a transferring-pulse input line, to which the gates of said transferring MOS switches are connected in common,

a plurality of capacitors one capacitor for each of said transferring MOS switch, one end of the former being connected to each drain of the latter,

an auxiliary-transferring-pulse input line to which the other ends of each capacitor are connected in common,

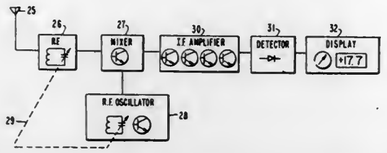
a plurality of horizontal scanning MOS switches one horizontal scanning MOS switch for each of said transferring MOS switch, the sources of the former being connected to the drains of the latter, respectively, and the drains of the former being connected in common to a video signal output terminal,

a plurality of noise eliminating MOS switches one noise eliminating MOS switch for each of said transferring MOS switch, the source of the former being connected to the drain of the latter, the drains of the former being connected in common to a terminal, and

a noise eliminating pulse input line to which the gates of said

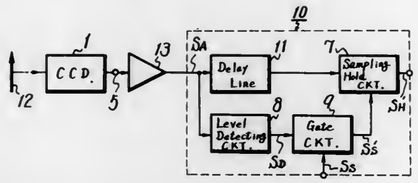
noise eliminating MOS switches are connected in common.

4,189,750
METHOD AND APPARATUS FOR MEASURING TELEVISION SOUND AND PICTURE
Hans Sadel, 274 Riverdale Dr., Fort Lee, N.J. 07024
Filed Dec. 29, 1977, Ser. No. 865,609
Int. Cl.[2] H04N *5/50*
U.S. Cl. 358—192 **83 Claims**



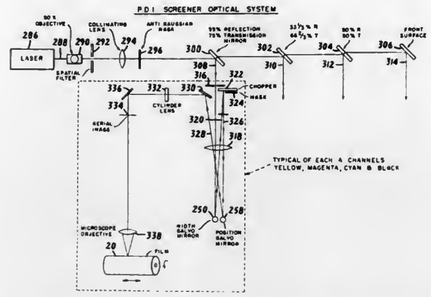
1. In a tuning system for selectively extracting from a composite television signal the modulated picture signal on its carrier or the modulated sound signal on its carrier, the improvement of a circuit for indicating which of the two types of signal is being extracted comprising means for demodulating the extracted modulated signal to derive a signal representative of the envelope thereof, amplifying means tuned to one of the sync frequencies of a television signal for amplifying the signal derived by said demodulating means, and means for detecting the presence of a signal at the output of said amplifying means which exceeds a predetermined threshold level for indicating the presence of an extracted picture signal.

4,189,751
SOLID STATE TELEVISION CAMERA WITH DEFECT COMPENSATION TO REDUCE NOISE
Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 22, 1977, Ser. No. 790,090
Claims priority, application Japan, Apr. 30, 1976, 51-49458
Int. Cl.[2] H04N *3/14, 5/30*
U.S. Cl. 358—213 **8 Claims**



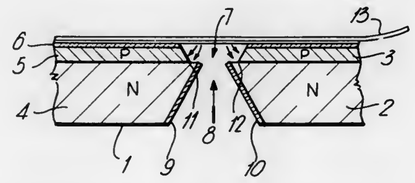
1. A solid state television camera comprising:
a solid state image sensor onto which an image of an object is projected and which produces a derived output signal;
a sampling hold circuit to which said derived output signal is supplied;
a level detecting circuit also having said derived output signal supplied thereto and having means for detecting a level of said derived output signal;
a control circuit supplied with an output from said level detecting circuit and with a sampling signal and having means to control the gating of said sampling signal to said sampling hold circuit; and
said detecting circuit having a detecting level of said derived output signal which occurs at a reference time which differs from the time of occurrence of said sampling signal by a predetermined time interval.

4,189,752
ELECTRONIC SCREENING WITH GALVANOMETER RECORDERS
William W. Moe, Stratford; Robert W. Lotz, Darien; Ethan R. Green, Monroe, and Rodolfo Fazio, Southport, all of Conn., assignors to Printing Developments, Inc., New York, N.Y.
Continuation of Ser. No. 714,483, Aug. 16, 1976, abandoned, which is a division of Ser. No. 414,798, Nov. 12, 1973, Pat. No. 3,983,319. This application Aug. 25, 1978, Ser. No. 936,810
Int. Cl.[2] H04N *1/22*
U.S. Cl. 358—298 **7 Claims**



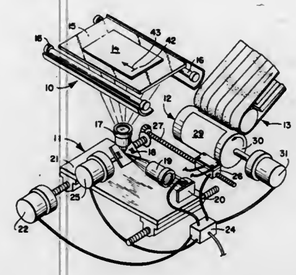
1. Apparatus comprising means for optically scanning an input image, a radiation-sensitive output film, means for generating a beam of electromagnetic radiation for forming halftone dots on said output film by which at least one output image corresponding to said input image is constituted, means including a position mirror and modulator means controlling the orientation of said position mirror for controlling the position of said beam on said output film, and means including a width mirror, modulator means controlling the orientation of said width mirror, and chopper means for independently controlling the width of said beam on said output, said position mirror being optically between said chopper means and said output film and said width mirror being optically between said generating means and said chopper means.

4,189,753
DOCUMENT SCANNING HEAD
Robert R. Parsons, and John S. S. Wei, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jun. 8, 1978, Ser. No. 913,658
Int. Cl.[2] H04N *1/12*
U.S. Cl. 358—294 **14 Claims**



1. A scanning device suitable for use in scanning documents, said device comprising a substrate of semiconductor material having a plurality of apertures therethrough, photodetector means formed in the semiconductor material and presenting active surfaces at the boundaries of the apertures, said semiconductor material being so contoured at the boundaries of the apertures that the photodetector means are substantially shielded from direct incidence of light directed into the apertures from one side of the semiconductor material and intercept a substantial portion of light directed into the apertures from the other side of the semiconductor material.

4,189,754
GRAY TONE REPRODUCTION APPARATUS
Rodger L. Gamblin, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 24, 1978, Ser. No. 963,291
Int. Cl.[2] H04N *1/40, 1/22*
U.S. Cl. 358—296 **16 Claims**

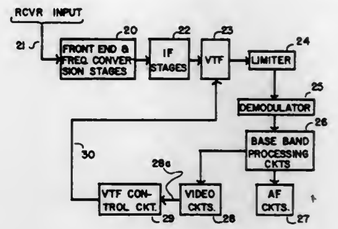


1. Apparatus for recording graytones by selectively placing dots in commonly dimensional matrices, each of which comprises a series of m matrix columns of width p arranged side-by-side in a widthwise direction and extends vertically in a heightwise direction, said apparatus comprising:
(a) an arrangement of n marking elements progressively extending in the widthwise direction at a spacing equal to the width of one of said matrices divided by any non-zero positive integer which evenly divides the number m,
(b) support means for supporting a print receiving sheet in marking relationship to said marking elements,
(c) first transport means for repetitively transporting said recording sheet in the heightwise direction across the active region of said marking elements,
(d) second transport means for causing relative movement of said marking elements in the widthwise direction across said marking elements at a speed such that there is a relative widthwise movement of the distance np during the period of one of said repetitive heightwise cycles.
(e) memory means for storing strings of bits corresponding to columnar sets of dot patterns collectively comprising a set of matrix patterns which when printed represent all gray levels to be recorded.
(f) counting means for counting said repetitive heightwise cycles and generating a counting code representative of said count,
(g) a density code generator for generating a series of gray level codes representative of gray levels to be printed by said marking elements,
(h) address means responsive to said counting codes and said gray level codes for generating addresses indicating the memory locations of said bit strings,
(i) memory control means for causing the bit strings located at said addresses to be written out from said memory, and
(j) shift register means for storing the bit strings written out from said memory and generating control signals for controlling the marking action of said marking elements;
said number n being selected according to the relationship:

$$n = Im \pm 1$$

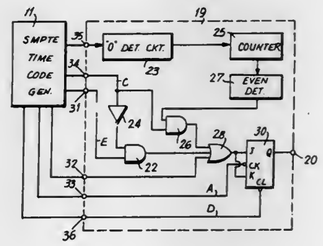
where I is any positive non-zero integer and m is defined as aforesaid.

4,189,755
TELEVISION RECEIVER THRESHOLD EXTENSION SYSTEM BY MEANS OF SIGNAL-TO-NOISE CONTROL OF BANDWIDTH
Michael S. Balbes, Rockville, and John M. Moore, Silver Spring, both of Md., assignors to Microdyne Corporation, Rockville, Md.
Filed Mar. 17, 1978, Ser. No. 887,681
Int. Cl.[2] H04N *5/44*
U.S. Cl. 358—904 **35 Claims**



1. In a receiver,
bandwidth control means for varying the bandwidth passed by said receiver and including an input for receiving a control signal to vary said bandwidth,
signal responsive means responsive to signal strength of signals in said receiver, said signal responsive means having an output,
noise responsive means responsive to noise in said receiver, said noise responsive means having an output, and
control means responsive to both said signal responsive means and said noise responsive means for controlling said bandwidth control means to reduce the receiver bandwidth in response to reduction in the signal-to-noise ratio,
said control means including a divider for dividing one of said outputs by the other to produce said control signal for controlling said bandwidth.

4,189,756
APPARATUS FOR GENERATING BI-PHASE CODED CHARACTERS
Ichiro Ninomiya, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 1, 1978, Ser. No. 956,449
Claims priority, application Japan, Nov. 5, 1977, 52-132853
Int. Cl.[2] H04N *5/78*; G11B *5/06*
U.S. Cl. 360—14 **16 Claims**



1. Apparatus for generating bi-phase coded characters formed of a predetermined number of bi-phase signals representing binary bits "1" and "0" having a constant relation between the phase at the beginning and end of each coded character regardless of the number of "1"s and "0"s included in said coded character, comprising: a source of binary bits for supplying trains of serial bits corresponding to said coded

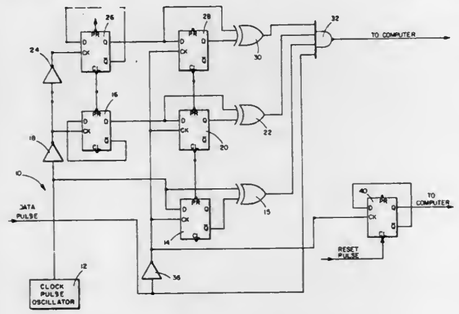
characters; means for supplying a binary bit of predetermined sense in time coincidence with a selected one of the bits in each coded character; bi-phase signal generating means responsive to each of said binary bits supplied thereto for generating a respective bi-phase signal; and means for selectively inserting said binary bit of predetermined sense into the train of binary bits supplied to said bi-phase signal generating means for maintaining said constant relation between the phases at said beginning and end of the bi-phase coded character generated by said bi-phase signal generating means.

4,189,757

SYSTEM FOR DECODING DATA ON A MAGNETIC MEDIUM

George H. Kunstadt, 4450 La Barca Dr., Tarzana, Calif. 91356

Filed Jun. 5, 1978, Ser. No. 912,773
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—51 **8 Claims**



1. A system for reading back data recorded as series of discrete regions of magnetization and including synchronizing data, in a magnetic medium, comprising:

readback means responsive to information on said magnetic medium to provide a read data pulse having a selected period;

clock pulse means for generating clock pulses having substantially constant periods comprising a selected fraction of said data pulse period and comprising a Gray code signal, the output of said clock pulse means being connected to comparison means;

read data pulse recording means connected to said readback means and responsive to a data pulse for recording the time of arrival of the latter and providing an output signal corresponding to said time of arrival plus one-half of said period of said read data pulses, said data pulse recording means output being connected to comparison means; and

comparison means connected to the output of said clock pulse means and to the output of said data pulse recording means, for comparing output from said clock pulse means and output from said data pulse recording means whereby a clock pulse is selected for the system.

4,189,758

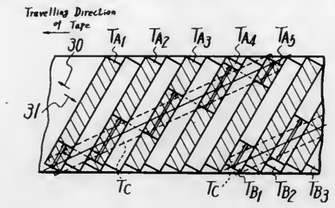
APPARATUS FOR CONTROLLING THE SCANNING PATH OF A ROTARY TRANSDUCER

Minoru Morio, 29-24-801 Sakuragioka-cho, Shibuya-ku, Tokyo; Yukio Kubota, 1-26-4 Minamisenzo-ku, Ohta-ku, Tokyo, and Hidehiko Okada, 5-4-36-102 Yokodai, Isogo-ku, Yokohama-shi, Kanagawa-ken, all of Japan

Filed Oct. 20, 1978, Ser. No. 953,186
Claims priority, application Japan, Oct. 24, 1977, 52-127361
Int. Cl.[2] G11B *21/10, 21/08, 21/18;* **H04N** *5/78*
U.S. Cl. 360—77 **10 Claims**

1. In a signal reproducing system of the type having at least one rotary transducer which rotates along a scannning path across a movable record medium to reproduce, during each pass of said transducer across said record medium, signals which are recorded in parallel record tracks on said medium, apparatus for controlling the scanning path of said transducer when said record medium is moved at a speed different from the recording speed thereof and wherein said transducer scans plural record tracks during each pass thereof across said record medium when said record medium is moved at said different speed, said apparatus comprising:

control signal generating means for producing a periodic tracking control signal synchronized with the speed at which said record medium is moved, said periodic control



signal having a plurality of periods during each pass of said transducer;

adjustable support means for said transducer, said adjustable support means being responsive to said tracking control signal to displace said transducer transversely of said scanning path thereof; and

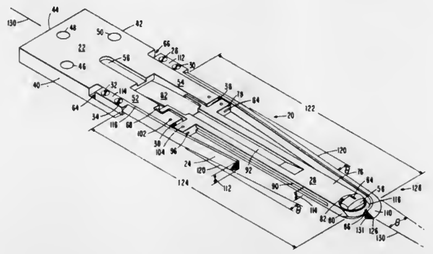
means for applying said tracking control signal to said adjustable support means, such that said transducer scans successive segments of predetermined record tracks during a pass thereof across said record medium.

4,189,759

CANTILEVERED HEAD SUPPORT ARM HAVING INCREASED RESONANCE FREQUENCY

Randall C. Bauck, Longmont; Raymond E. Kellow, Sr.; Richard E. Norwood, both of Boulder, and Donald W. Schaefer, Lakewood, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,494
Int. Cl.[2] G11B *5/48, 21/00*
U.S. Cl. 360—104 **5 Claims**



1. In a flexible random access disk file memory system wherein one or more disks are mounted for rotation about a centrally located axis and a magnetic transducer is mounted to a support arm, said support arm being rigidly mounted to the movable assembly of a linear actuator for movement along a radial line into and out of the disk file memory system, an improved support arm comprising in combination:

a first elongated relatively flat support means having one end rigidly mounted to the movable assembly and the other end cantilevered therefrom;

a second elongated relatively flat support means positioned in end to end alignment with the first support means and operable to support the magnetic transducer, the ratio between the length of the first elongated support means and the sum of the length of the first and the second elongated support means is approximately one to five;

a resilient connecting means operable for joining the first and the second support means, said resilient connecting means being adapted to flex in a first direction orthogonal to the plane of the disks and the first and second support means; and

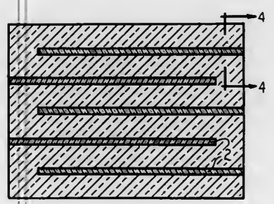
a third relatively flat, u-shaped elongated member rigidly mounted to the first support means and encasing the balance of the first and second support means, said third member being substantially in the same plane as the first and second support means and characterized by an elongated, relatively sharp leading edge positioned in contiguous, adjacent relation with a relatively sharp front edge and a predetermined converging angle relative to the radial line along which movement of the head support arm occurs.

4,189,760

MONOLITHIC CAPACITOR WITH NON-NOBLE METAL ELECTRODES AND METHOD OF MAKING THE SAME

Gilbert L. Marshall, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Continuation of Ser. No. 359,635, May 14, 1973, abandoned.
This application Mar. 31, 1975, Ser. No. 563,640
Int. Cl.[2] H01G *4/12*
U.S. Cl. 361—321 **15 Claims**



1. A monolithic structure comprising:

a sintered unitary body;

1. said body having a matrix of a dielectric ceramic composition and

2. a plurality of vertically spaced nonmetallic strata in said matrix, each stratum extending to one of a pair of edge regions of said body, alternate strata extending to the same edge region, said nonmetallic strata having been positioned in said matrix prior to the sintering of said body and comprising nickel oxide.

4,189,761

NON-AQUEOUS ELECTROLYTIC CAPACITOR ELECTROLYTE

Manuel Finkelstein, North Adams; Franz S. Dunkl, and Sidney D. Ross, both of Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 12, 1977, Ser. No. 824,147
Int. Cl.[2] H01G *9/02*
U.S. Cl. 361—433 **11 Claims**

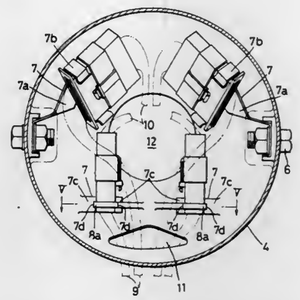
1. An electrolyte for an electrolytic capacitor comprising a non-aqueous electrolytic capacitor solvent and as solute an alkyl substituted-ammonium dialkylphosphate salt selected from the group consisting of those obtained from the reaction of a trialkylphosphate and a cyclic amine or an aliphatic tertiary amine, said reaction effecting the conversion of said trialkylphosphate to a dialkylphosphate ion and the alkylation of said amine to an alkyl-substituted ammonium ion.

4,189,762

HEADLIGHT FOR MOTORIZED TWO-WHEELED VEHICLE

Yoshihiro Nakazawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1977, Ser. No. 832,428
Claims priority, application Japan, Sep. 16, 1976, 51/123367[U]; Sep. 16, 1976, 51/123368[U]
Int. Cl.[2] B62J *5/18*
U.S. Cl. 362—72 **1 Claim**



1. A headlight assembly for a two-wheeled motor vehicle of the type comprising: a reflector and an associated headlight casing covering the rear surface of the reflector; said casing having right- and left-hand wiring chambers; a first pair of metallic supporting members for receiving said right- and left-hand wiring chambers disposed in a space formed in an upper portion of said casing so as to extend from said casing; said first pair of supporting members in said casing are each formed of a strip of metal separately from the casing being attached at its base portion to said casing by a fastening member; a second pair of supporting means disposed at opposite sides of a lower portion of said casing and being formed integral therewith; said second pair of supporting means are formed of synthetic resinous material and having integral extending ridges with opposite surfaces facing one another; said headlight assembly being positioned between right- and left-hand front fork members; output side wire harnesses extending inwardly from said right- and left-hand wiring couplers and being connected to operation switches located on the right- and left-hand steering handles of the vehicle.

4,189,763

DOCUMENT ILLUMINATION APPARATUS

Shigeru Suzuki, and Yuji Yasuda, both of Tokyo, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,587
Claims priority, application Japan, Jan. 25, 1977, 52-6347
Int. Cl.[2] F21V *1/00, 11/00*
U.S. Cl. 362—241 **2 Claims**

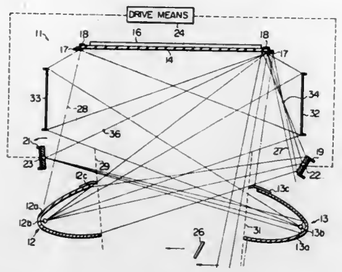
1. An illumination apparatus for illuminating a document on a transparent platen comprising, in combination:

first and second fixed light sources disposed symmetrically with respect to said platen each light source comprising a lamp and a curved reflector, each curved reflector having an elliptical cross section and the respective lamp being disposed at a focus of the elliptical cross section;

first and second rotatable reflectors for reflecting light from the first and second light sources respectively onto the document, the first and second rotatable reflectors being disposed symmetrically with respect to said platen and external of the limits of reflected light from the document, opposite foci of the curved reflectors of the first and second light sources being disposed between the first and second reflectors and the document respectively, light radiated from the first light source to the first rotatable

reflectors intersecting light radiated from the second light source to the second rotatable reflector;

drive means for interlockingly rotating the first and second rotatable reflectors so that light is reflected therefrom onto the document in superimposed relation at all positions of the first and second rotatable reflectors; and



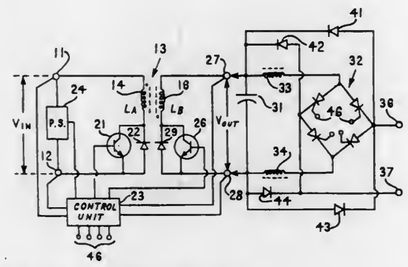
first and second fixed auxiliary reflectors for reflecting light from the first and second light sources respectively onto the document being disposed symmetrically with respect to said platen.

4,189,764

CURRENT CONTROLLED INVERTER

Donald W. Snyder, 2533 Main St., Napa, Calif. 94588

Filed Sep. 26, 1978, Ser. No. 946,095
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—21 **6 Claims**



1. An inverter system comprising

a high frequency non-saturating transformer having a primary and a second winding,

direct current input terminals,

first controllable switching means connecting said primary winding across said input terminals,

a capacitor connected through a first blocking diode across said secondary winding, and

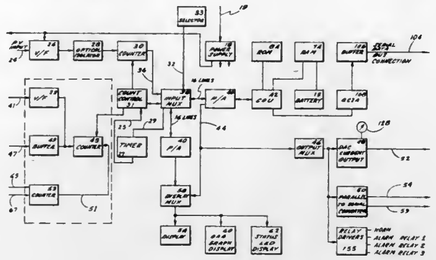
control means connected to operate said switching means in accordance with the amplitude of voltage across said input terminals and in accordance with the variation of voltage across said capacitor from half sine wave voltage values.

4,189,765

DIGITAL CONTROLLER

Richard J. Kotalik, Santa Ana, Calif.; Dale E. Lupfer, Houston, Tex., and Rique L. Pottenger, Los Angeles, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 27, 1978, Ser. No. 890,330
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—120 **41 Claims**



1. A process controller comprising:

process variable signal conversion means for receiving and digitizing an analog process variable input signal, and including

a variable frequency generator frequency modulated in response to an analog voltage,

timing means for providing a strobe signal after a prescribed period of time, and

frequency counting means connected to said timing means and to said variable frequency generator to provide said process variable signal in digitized form as the output of said counter upon the occurrence of each strobe signal,

set point control signal generating means for receiving manual inputs to generate a plurality of digital control signals,

central processor means for receiving said digitized control signals and said digitized process variable input signal and for generating an error of correction output signal responsive thereto,

digital display means for selectively displaying digital representations of said manually generated control signals and said process variable signal, and

analog display means for displaying said process variable input signal and said set point control signal.

4,189,766

RACING CIRCUIT FOR CONTROLLING ACCESS OF PROCESSOR UNITS TO A COMMON DEVICE

Shinju Horiguchi, Tokyo, and Joji Sahashi, Hachioji, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,762
Claims priority, application Japan, May 27, 1977, 52-61103
Int. Cl.[2] G06F *9/18*; H04Q *3/00*; G06F *13/00*
U.S. Cl. 364—200 **5 Claims**

1. A racing circuit for controlling access of a plurality of processor units to a common device, comprising:

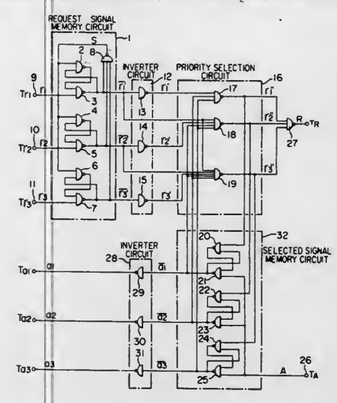
a request signal memory circuit consisting of a plurality of first pairs of NAND gates, the output terminal of one NAND gate of each pair being connected to one input terminal of the other NAND gate thereof, the output terminal of the other NAND gate of said pair being connected to one input of said one NAND gate thereof, an inhibit signal output NAND gate, the other terminal of said one NAND gate of said pair being connected to the output terminal of said inhibit signal output NAND gate, the input terminals of the inhibit signal output NAND gate being connected to the output terminals of each of said other NAND gates in each of said pairs of NAND gates;

a priority selection circuit comprising a plurality of priority

selection NAND gates, a corresponding plurality of first inverter circuits, the outputs of each of the pairs of NAND gates of said request signal memory circuit being respectively connected to (i) the input terminals of corresponding priority selection NAND gates through corresponding ones of said first inverter circuits and to (ii) one or more input terminals of another pair of the priority selection NAND gates;

an output NAND gate having input terminals connected so the output terminals of said priority selection NAND gates and one output terminal for outputting a request signal; and

a selected signal memory circuit comprising a plurality of second pairs of NAND gates, the output terminal of one NAND gate of each of said second pairs being connected to one input terminal of the other NAND gate thereof, the



output terminal of the other NAND gate of each of said second pairs being connected to one input of the one NAND gate thereof, the other terminal of the one NAND gate thereof being connected to one of the output terminals of said priority selection circuit, the other terminal of the other NAND gate thereof being connected to a permission signal input terminal, an output of the other NAND gate thereof being connected to one or more of the input terminals of the priority selection NAND gates coupled to each of said first pairs of NAND gates, a plurality of second inverter circuits, each of said second inverter circuits having an input terminal coupled to an output terminal of a corresponding one of said other NAND gates of said first pairs of NAND gates, whereby the output terminals of the other NAND gates of said signal memory circuit output permission signals through said second inverter circuits.

4,189,767

ACCESSING ARRANGEMENT FOR INTERLEAVED MODULAR MEMORIES

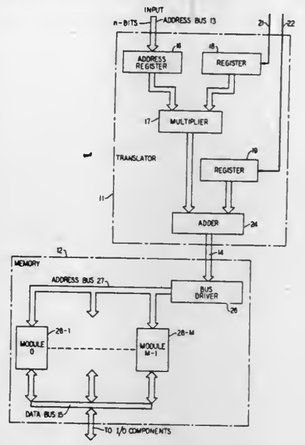
Sudhir R. Ahuja, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1978, Ser. No. 912,369
Int. Cl.[2] G06F *13/00, 7/38*; G11C *8/00*
U.S. Cl. 364—200 **10 Claims**

1. A modular memory system having a plurality of M modules each including a plurality of storage locations wherein each of the individual storage locations in the system is capable of being uniquely accessed via the occurrence of an external physical address, the system comprising:

translating means for converting each external physical address to an internal physical address, said translating means comprising first means connected to receive each external physical address and performing a mathematical computation thereon using the value of M to produce an output indicative of a whole number and a residue, and second means connected to receive said output and increasing same by a predetermined constant of $2^{-(k+1)}$ where $k=[\log_2 M]$ to provide the internal physical address including an integer portion and a fractional portion for selecting an individual storage location;

said plurality of M modules includes a preselected arbitrary number of modules and each of the modules comprises comparing means, connected to receive the fractional portion of the internal physical address, having two predetermined values exclusive to each module for comparing



to its received fractional portion, the comparing means of a particular module responsive to the occurrence of the fractional portion corresponding to one of said predetermined values by producing an enable output, and logical means for each module connected to receive the integer portion of the internal physical address and the output of its corresponding comparing means, the logical means, at a particular module, providing access thereto in response to the occurrence of an enable output and at a storage location indicated by the value of the integer portion.

4,189,768

OPERAND FETCH CONTROL IMPROVEMENT

John S. Liptay, Rhinebeck, and James W. Rymarczyk, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,091
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **3 Claims**

1. In an instruction handling unit for a data processing system handling variable field length (VFL) instructions with a source (SRC) operand address and a destination (DST) operand address, the instruction handling unit having an operand fetch system comprising:

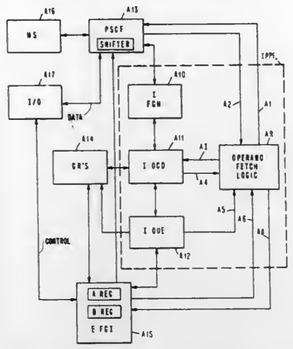
a plurality of address operand pairs (AOPs), each AOP haing a subline request register and a subline buffer register,

duplicate AOP assignment control means for normally initiating the selection of two non-busy AOPs for receiving an aligned first subline to be fetched using the SRC operand address when end-around byte shifting is indicated for SRC operand alignment,

one subline detecting means for detecting that all shifted bytes in said fetched (s) for the SRC operand will occupy only one subline in the DST operand and providing a one subline control output in response thereto,

means for connecting the one subline control output to the duplicate AOP assignment control means to inhibit a

duplicate fetch initiation signal from being provided by the duplicate AOP assignment controls,



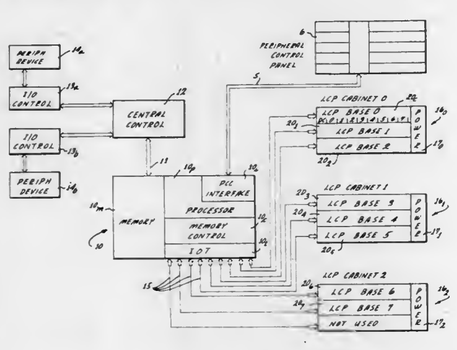
whereby the inhibiting of the AOP assignment control means from providing the duplicate fetch initiation signal for an instruction causes an assignment of one SRC AOP to receive all bytes of the fetched SRC first subline.

4,189,769

INPUT-OUTPUT SUBSYSTEM FOR DIGITAL DATA PROCESSING SYSTEM

Darwen J. Cook, Alhambra, and Donald A. Millers, II, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 728,457, Oct. 28, 1977. This application Jan. 20, 1977, Ser. No. 871,144
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **5 Claims**



1. In a system involving a plurality of remote peripheral terminal units at remote stations, each peripheral terminal of which is connected to its own specific peripheral-controller, said peripheral-controllers being organized into groups designated as base modules at each remote station, and wherein each base module has its own message level interface bus connecting it, via a main system interface unit, to a central main system comprising a processor and main memory, an input-output subsystem comprising:

(a) a main system interface unit connected between said main system and a plurality of base modules housing a plurality of peripheral-controllers, said main system interface unit including:

(a1) means to formulate an I/O task command and a Descriptor-Link Word to identify a particular data transfer task for a particular peripheral-controller, said task command and Descriptor-Link Word being communicated to a specific peripheral-controller;

(a2) means to determine the highest priority signal code from competing peripheral-controllers which are requesting access to main memory and to grant connecting access to main memory to the highest priority coded peripheral-controller;

(a3) means to connect or disconnect main memory to an addressed peripheral-controller;

(a4) means to asynchronously transfer data between main memory and an addressed peripheral-controller;

(a5) means to store addresses and address counts for data transfers occurring between main memory and a connected peripheral-controller, said main system interface unit operating independently of said main processor for data transfers with said main memory;

(a6) means to receive a result descriptor word from a peripheral controller, said result descriptor word representing the completion, incompletion or error-status of an I/O task command;

(b) a message level interface bus connecting each base module to said main system interface unit for providing a connected peripheral-controller in a base module with its own communication bus for message level data transfers with said main system;

(c) a base module for each remote station for supporting a plurality of peripheral-controllers at that station, said base module including:

(c1) Distribution Control means for selectively connecting an addressed peripheral-controller to said main system, for assigning local base priority signal codes to each peripheral-controller and for assigning overall global-system priority signal codes to each peripheral-controller;

(c2) common backplane connection means for connecting each peripheral-controller in a base module with common clock and common power supply and common maintenance-test means, and including address lines for selectively connecting an addressed peripheral-controller to said Distribution Control means;

(c3) interrupt signal means for requesting access to main memory from a peripheral-controller whose buffer memory is either full or empty and thus needs data transfer service from main memory;

(c4) a plurality of peripheral-controllers, each of which is dedicated via its own communication bus to a specific peripheral unit and wherein each of said peripheral-controllers includes:

(c4-1) processor logic means for execution of I/O task command received from said main system;

(c4-2) buffer memory storage means for storage of at least two full message length blocks of data, for storage of I/O task commands, Descriptor-Link identifier words and result-descriptor words;

(c4-3) means to formulate result-descriptor word signals to sense completion, incompletion or error of an I/O task, said result-descriptor word signals being subsequently transmitted to said main system for initiation of corrective action;

(c4-4) means to transfer message length blocks of data from the peripheral-controller to/from said main memory at the highest transfer speed of main memory while transfers of data are simultaneously occurring between other peripheral-controllers and their peripheral terminals;

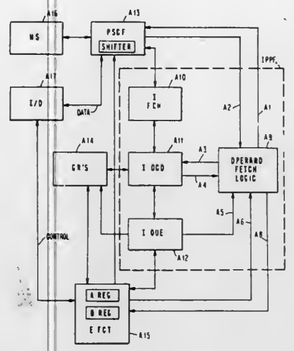
(c4-5) status count means providing digital signal counts to aid in controlling the sequential steps of communications between said peripheral-controller and to said main system system interface unit.

4,189,770

CACHE BYPASS CONTROL FOR OPERAND FETCHES

Patrick M. Gannon, Poughkeepsie, and John S. Liptay, Rhinebeck, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,097
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **6 Claims**



1. In processor storage controls for interfacing with an instruction unit which fetches and executes instructions, the storage control receiving a fetch request for a subline of a variable length operand from the instruction unit (IPPF), the storage controls initiating a cache line fetch from main storage when the request cannot be accessed in a cache and thereby is a cache miss fetch request, storage bus means connecting the cache to the main storage to transfer a line into the cache a subline at a time, a cache bypass bus connecting the main storage bus to the instruction unit, the cache miss fetch request causing the first subline of the line to be transferred to both the cache and the IPPF, the storage controls comprising:

means for sequentially generating fetch request addresses and sending them to main storage for sublines, beginning with the cache miss fetch request, each request having a higher address than the preceding request until after the request at the high-address storage boundary for the line which is followed by any subline requests from the low-address storage boundary of the line up to the cache miss fetch request,

first means for detecting when the first subline is being transferred from main storage, second means for detecting when the subline having the highest subline address in the line is being transferred from main storage,

bypass gate means for transferring sublines up to the highest address boundary of the line from main storage through the cache bypass bus to the instruction unit, the bypass gate means being enabled for each subline from the first subline detected by the first means through the subline detected by the second means,

operand subline buffer means in the instruction unit for accepting sublines received from the bypass gate means,

main storage synchronized timing means receiving each request for a subline in main storage and setting an indicator for the highest address subline in each line to detect its transfer from main storage,

whereby all sublines from the first subline through the highest address subline are sequentially sent to the instruction unit for immediate execution as operand data as a result of the operand subline buffer means acceptance of sublines transferred through the bypass gate means.

4,189,771

METHOD AND MEANS FOR THE DETECTION OF DEADLOCK AMONG WAITING TASKS IN A MULTIPROCESSING, MULTIPROGRAMMING CPU ENVIRONMENT

Paul R. Roever, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,163
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—300 **6 Claims**

1. A method for detecting deadlocks among N tasks in a multiprocessing, multiprogramming CPU environment in which any one task is constrained to wait upon, at most, one other task, the method comprising the steps of:

creating a vectored representation of task waiting relations including the steps of:

loading in a register a field of N+1 pointers, the pointers and their position order within said register defining wait relations among the tasks;

assigning to the j th register position the pointer value j;

reiteratively executing at least one selected CPU instruction operating upon the vectored representation including the steps of

translating the field of pointers with and upon itself including the steps of:

substituting the contents g of register position p for each register position r containing a pointer p;

continuing said substituting step for the iteration where r, p and g lie in the range greater than or equal to 0 and less than or equal to N;

testing the register for the occurrence of at least one pointer whose value is not equal to j;

upon the detection of at least one non-j pointer repeating the translating and testing steps until the set of non-j pointers would remain the same from one iteration to the next, such result being indicative of closure or deadlock and

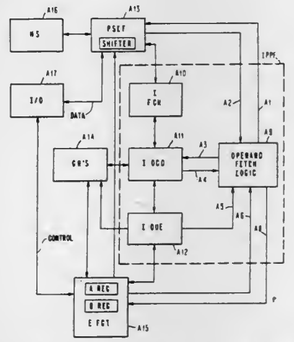
alerting at least one CPU of said closure or deadlock.

4,189,772

OPERAND ALIGNMENT CONTROLS FOR VFL INSTRUCTIONS

John S. Liptay, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,095
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **22 Claims**



1. Alignment controls for operands in a variable field length (VFL) instruction being decoded by an instruction decoder, comprising:

a floating set of operand address pairs (AOPs), each AOP including a subline request register and a subline buffer register, any AOP being assignable to any subline in an instruction being decoded,

means for dynamically selecting nonassigned AOPs in the

set and assigning an AOP for fetching each subline in an operand of the instruction being decoded, the operand requiring the fetching of one or more sublines from storage, the assignment of AOPs to sublines being done at the time each next subline in the operand is detected to be required,

the subline request register in a first assigned AOP for the operand receiving an operand address for the operand from the instruction decoder, the operand address providing the first subline address of the operand,

incrementing means for incrementing the operand address by a subline length to obtain a next subline address which is inserted into a next assigned AOP for fetching a next subline of the operand,

means for transferring each subline address from the incrementing means to storage as a fetch request, and

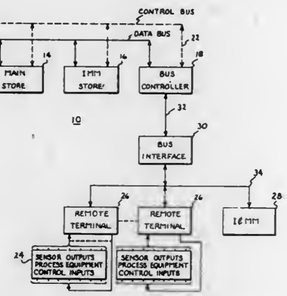
storage control means for controlling the fetching for each subline address and sending the fetched subline to the subline buffer register in the AOP containing the subline address of the fetch request.

4,189,773

ON-LINE MEMORY SPACE ALLOCATION

Michael F. O'Meara, Fos-sur-Mer, France, assignor to General Electric Company, Salem, Va.

Filed Jul. 3, 1974, Ser. No. 485,572
Int. Cl.[2] G06F *9/19*
U.S. Cl. 364—300 **11 Claims**



1. In an on-line data processing system for controlling equipment, a method, by means of an improved executive program, of changing at least a segment of an on-line application program and of optimizing memory space utilization by assuring contiguous positions of identifiable program segments comprised of instructions located in the memory after modification of a segment size while without interruption continuing the control of the equipment in accordance with the instructions in the modified segment comprising the steps:

(A) providing in the memory at least first, second and third portions,

(1) said first portion retaining said improved executive program governing the operation of the data processing system,

(2) said second portion having located therein a repetitively executable application program comprised of a plurality of individually identifiable segments disposed contiguously to one another, the instructions thereof being representative of logical states for controlling the equipment, and

(3) said third portion serving as a temporary store for a desired replacement segment which is to replace a segment in said second portion;

(B) inserting, under control of the executive program, a first branch instruction in the first memory instruction location of the segment to be replaced and a second branch instruction after the last instruction location of the replacement segment so that the application program is still repetitively executable by using the replacement segment while that segment is still in the third portion;

(C) determining, under control of the executive program, the amount of memory space that the replacement segment will occupy in the second portion;

(D) moving, under control of the executive program, all the application program segments in the memory following the segment to be replaced in said second portion in dependence upon the space requirements determined for said replacement segment; and

(E) writing, under control of the executive program, said replacement segment into the second portion of the memory in the space created by the moving of all the segments.

4,189,774

CHANGE CALCULATING APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,350
Claims priority, application Japan, Jun. 3, 1977, 52-65569
Int. Cl.[2] G06F *15/20*; G07G *1/00*
U.S. Cl. 364—405 **3 Claims**

$ 100 OF DOLLAR FOR PURCHASING AMOUNT		
AMOUNT OF RECEIVED MONEY (DOLLAR)	CHANGE CALCULATION	CHANGE (DOLLAR)
200	(100) − 00.01	99.99
150	(50) − 00.01	49.99
120	(20) − 00.01	19.99
110	(10) − 00.01	9.99
105	(5) − 0.01	4.99
102	(2) − 0.01	1.99
101	(1) − 0.01	0.99
100.50	(05) − 0.01	0.49
100.25	(025) − 0.01	0.24
100.10	(010) − 0.01	0.09
100.05	(005) − 0.01	0.04

1. A change calculation apparatus for calculating the difference between a sales total and an amount of money tendered by a purchaser, comprising:

a multi-digit memory device for storing numeral data corresponding to a sales total amount;

demonination keys provided for respective classes of money units for use in calculating the difference between said sales total amount and an amount of money tendered by a purchaser;

outputting means coupled to said denomination keys and responsive to the operation of at least one of the denomination keys to deliver denomination data corresponding to a respective class of money unit;

readout means responsive to the operation of said at least one denomination key for designating those predetermined ones of a plurality of digits of said memory device and for reading out their contents from said memory device; and

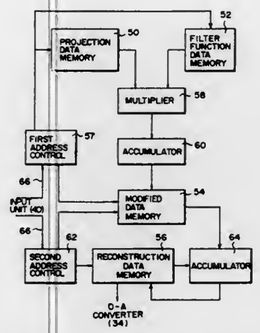
subtracting means coupled to said readout means and to said outputting means for subtracting from said denomination data delivered from said outputting means only those of the numeral data of said sales total amount stored in said predetermined digits of said memory device which are read out by said readout means, the result of the subtraction operation in said subtracting means corresponding to the calculated amount of change.

4,189,775

METHOD AND APPARATUS FOR SUBSECTION ANALYSIS USING COMPUTED TOMOGRAPHY

Tamon Inouye, Tokyo; Hiroyuki Mizutani, Kawasaki, and Toshio Uehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 874,064
Claims priority, application Japan, Jan. 31, 1977, 52-8702; Jan. 31, 1977, 52-8704
Int. Cl.[2] G01T *1/16*
U.S. Cl. 364—414 **6 Claims**



1. In a system for image reconstruction by computed tomography wherein projection data signals are generated by detecting radiation beams projected through an internal area to be examined, said beams being projected in the plane of said area and at a plurality of scan angles relative thereto, said projection data signals representing the detected intensity of said beams, a method comprising the steps of:

(a) storing said projection data signals;

(b) storing a set of data values representing a filtering function;

(c) reading from storage selected projection data signals generated by beams projected at a predetermined scan angle, said projection data signals being selected for readout under control of a designating signal defining a subsection area within said internal area to be examined such that only the projection data signals produced by beams passing through said subsection area and produced by beams passing through the regions immediately adjacent to and on either side of said subsection area are read out, said subsection area and said adjacent regions encompassing an area smaller than said internal area;

(d) processing said signals read out from storage with said filtering function data values to produce a set of modified projection data signals;

(e) storing said modified projection data signals;

(f) repeating steps (c), (d) and (e) to generate and store additional modified projection data signals for beams projected at a plurality of different scan angles; and

(b) accumulating in a memory pixel values representing the absorption coefficients for a plurality of points within said subsection area by reading from storage and back-projecting only those modified projection data signals corresponding to beams passing through said subsection area.

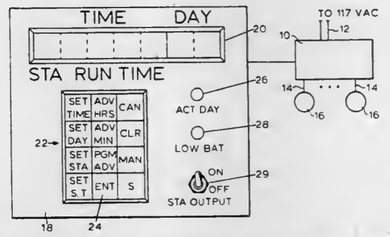
4,189,776

SIMPLIFIED IRRIGATION CONTROLLER

Thomas L. Kendall, Big Bear Lake, Calif., assignor to The Toro Company, Riverside, Calif.

Filed May 22, 1978, Ser. No. 907,911
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—420 **7 Claims**

1. In a solid state controller for an irrigation system having solid state logic and control means including means for storing irrigation information including real-time clock logic maintaining the current minute, hour and day of an irrigation sequence and having a data input and a control signal output for generating control signals identified with particular sprinkler stations as a function of the irrigation information including lists of operation durations and operation start times to be associated with each of a plurality of outputs and a days by outputs/status matrix of data values defining the desired operational status of each of the plurality of outputs on each of a plurality of sequential days, data input means connected to the data input for allowing an operator to input irrigation information and override signals into the solid state logic and control means, and, signal decoding and station power means having an input connected to the control signal output and a plurality of outputs to which individual sprinkler stations can be connected for receiving the sprinkler identified control signals and outputting a voltage at the output to which the sprinkler station identified with the control signal is connected whereby the



sprinkler is turned on in response to an associated control signal from the logic and control means, the improvement comprising:

(a) display means for displaying alpha-numeric data to an operator;

(b) the data input means consisting only of means for initiating system parameterization logic sequences and means for inputting operator decisions; and,

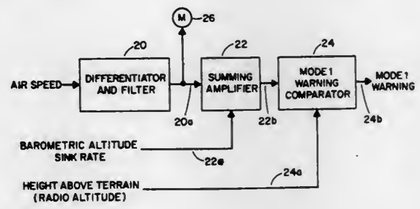
(c) the logic and control means including logic for causing the current real-time clock data and irrigation information to be selectively displayed to the operator on said display means, inputting operator decisions relative to said display data and information from said data input means, and updating the stored real-time clock data and irrigation information on the basis of said decisions whereby the operator is not required to input data but only affirm or reject data presented by the controller.

4,189,777

GROUND PROXIMITY WARNING SYSTEM WITH MEANS FOR ALTERING WARNING THRESHOLD IN ACCORDANCE WITH WIND SHEAR

Daryal Kuntman, S. Pompano Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 1, 1978, Ser. No. 901,537
Int. Cl.[2] G01C *5/00*
U.S. Cl. 364—433 **8 Claims**



1. A ground proximity warning system for aircraft for gener-

ating a warning signal when the aircraft is descending at an excess rate comprising:

a source of a rate signal proportional to the rate of change of the aircraft air speed;

a source of a sink signal proportional to the sink rate of said aircraft;

means for combining the above two signals to generate a composite signal;

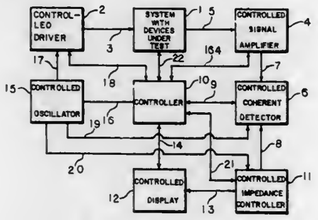
a source of an altitude signal proportional to the height of said aircraft above terrain; and, means comparing said altitude signal with said composite signal for generating said warning signal.

4,189,778

METHOD AND INSTRUMENTATION FOR THE MEASUREMENT OF PARAMETERS OF SYSTEM DEVICES

Uriel Vogel, P.O. Box 408, Huntington, N.Y. 11743

Filed Oct. 31, 1977, Ser. No. 846,634
Int. Cl.² G01R *31/22*
U.S. Cl. 364—482 **20 Claims**



1. Instrumentation for the measurement of parameters of a system device, when information about the values of said parameters is partially known, as stored characteristic functions and data, comprising

controlled oscillator means for generating controlled signals;

controlled driver means for amplifying said controlled signals of said controlled oscillator means for converting said signals to test signals for exciting said system device;

controlled signal amplifier means for amplifying responses of said device to said test signals;

controlled impedance controller means for generating output signals equivalent to impedances of said device, said controlled impedance controller means receiving reference signals from said controlled oscillator means;

controlled coherent detector means for detecting differences between said responses of said device to said test signals and said equivalent output signals of said controlled impedance controller means, said controlled coherent detector means receiving reference signals from said controlled oscillator means;

controller means for steering said test signals to said device, steering said response signals in said controlled signal amplifier means, steering said responses of said device and said equivalent outputs of said controlled impedance controller means to said controlled coherent detector means, steering said detected differences of said controlled coherent detector means to said controller means, processing and converting said differences in said controlled coherent detector means to control signals for controlling said controlled impedance controller means and said controlled oscillator means for making said output signals of said controlled impedance controller means equivalent to impedances of said device, processing said equivalent output signals of said controlled impedance controller means, generating additional signals, controlling said controlled oscillator means and, storing characteristic functions of said device; and

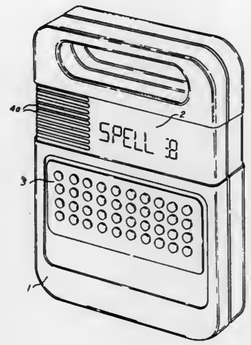
controlled display means for receiving and processing said processed equivalent output signals of said controlled impedance controller means, receiving and processing said equivalent output signals of said controlled impedance controller means, obtaining, displaying and transmitting values of parameters of said device.

4,189,779

PARAMETER INTERPOLATOR FOR SPEECH SYNTHESIS CIRCUIT

George L. Brantingham, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1978, Ser. No. 901,394
Int. Cl.² G01L *1/00*; G06F *15/34*
U.S. Cl. 364—718 **8 Claims**



1. A parameter interpolation for a speech synthesizer having an input means for receiving target values of speech parameters and a memory means for storing interpolated values of speech parameters, said parameter interpolator comprising:

(a) first means coupled to said input means and said memory means for calculating the difference between the target values of the parameters and values of the parameters stored in said memory means;

(b) second means coupled to said first means and said memory means for adding a portion of differences calculated by said first means to values parameters stored in said memory means;

(c) third means for determining the particular portions of the differences to be added by said second means according to the formula $1/2^N$ where N=0, 1, 2. . . N; and

(d) fourth means for inserting the output of said second means into said memory means.

4,189,780

ELECTRONIC COMPUTER WITH AUTOMATIC DECIMAL POINT SETTING MEANS

Mario Figini, Bosco Marengo, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 715,126, Aug. 17, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 919,953
Claims priority, application Italy, Aug. 25, 1975, 69127 A/75
Int. Cl.² G06F *7/38*
U.S. Cl. 364—744 **13 Claims**

1. An electronic computer having automatic decimal point setting means wherein a whole part and a decimal part of a numerical amount entered by the computer keyboard as a whole number can be automatically established, comprising:

a central processing means, having a memory, for processing data to calculate resulting data;

a numerical keyboard, comprising numerical keys, coupled to said memory for defining said numerical amount and causing the entry in said memory of data, representing said numerical amount, to be processed;

a decimal point key on said numerical keyboard for manually establishing a whole part and a decimal part of said numerical amount;

an input register in said memory having cells for storing said numerical amount to be processed;

an output register in said memory having cells for storing the resulting numerical amount representing said resulting data;

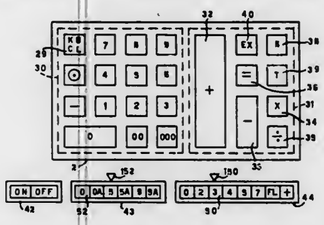
a printing unit coupled to said output register for printing the data contained in said output register;

a selector means for establishing a number of decimal positions of said resulting numerical amount;

said selector means comprising a settable element means selectively movable over a series of positions and movable to an additional position and a further position, each position of said series of positions corresponding to said number of decimal positions, for selecting a desired decimal position of said resulting numerical amount;

a decimal position register means in said central processing means for storing said desired decimal position,

said central processing means further comprising a first



addressing register for addressing cells of said output register according to the contents of said decimal position register means,

wherein said printing unit responsive to said first addressing register prints said resulting numerical amount stored in said output register with the desired decimal position;

an additional position means, coupled to said settable element means, for generating a positioning signal in response to movement of said settable element means to said additional position; and

an Add-Mode control means in said central processing means responsive to said positioning signal for causing said decimal position register means to store a predetermined fixed decimal position, said central processing means further comprising a second addressing register responsive to said decimal position register means for addressing cells of said input register according to said predetermined decimal position, whereby the whole part and the decimal part of said numerical amount entered by said numerical keyboard as a whole number is automatically established.

4,189,781

SEGMENTED STORAGE LOGGING AND CONTROLLING

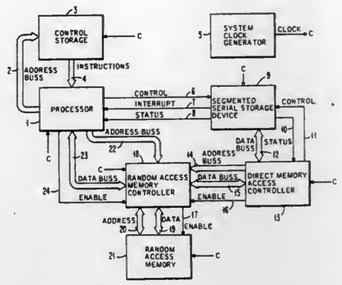
Gavin L. Douglas, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,379
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **9 Claims**

1. A method of storing machine logging data indicative of the content of all segments and portions of said segments of a storage media for text storage in a text processing system, comprising:

dedicating a plurality of defined portions of said segments for storage of said logging data on said dedicated portions;

storing initial text data on said media and the logging data indicative of the then content of said media on only one of said dedicated portions; and



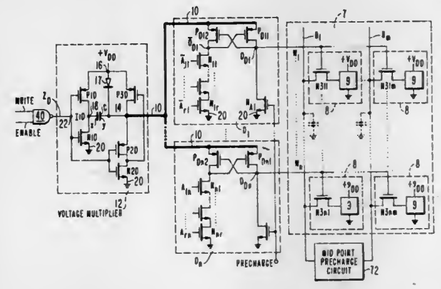
storing, at the termination of each storage of updated text data on said media, the most current logging data on only one of said dedicated portions.

4,189,782

MEMORY ORGANIZATION

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,530
Int. Cl.² G11C *11/40*
U.S. Cl. 365—190 **9 Claims**



1. In combination with a memory cell having an input-output (I/O) point and a single gating transistor whose conduction path is connected between said I/O point and a bit line, means for writing information into said cell and means for non-destructively reading the contents of the memory cell comprising:

first and second power terminals for the application therebetween of an operating potential;

a voltage multiplier circuit connected between said first and second power terminals having an output node at which is selectively produced either a read voltage which is approximately equal in amplitude to said operating potential or a write voltage which is substantially greater in amplitude and of same polarity as said read voltage; and

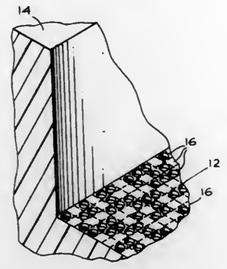
a selectively decoded level shift circuit connected between said output node and the control electrode of said gating transistor for, when selected, coupling the voltage at said output node to the control electrode of said gating transistor.

4,189,783

MASS STORAGE OF BOOKS

Ivor Brodie, and John Kelly, both of Palo Alto, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation of Ser. No. 772,026, Feb. 25, 1977, abandoned.
This application Sep. 8, 1978, Ser. No. 940,705
Int. Cl.[2] G11C *11/42*
U.S. Cl. 365—128 **15 Claims**



1. A mass information storage system comprising:

a disc having data recorded thereon as the presence or absence of pits, aligned in successive radial rows within the grooves of a spiral on the surface of said disc, the data stored in a row being in a single groove and at least some of the data including more than one pit and each groove having two spaced-apart opposite walls extending therefrom;

means for rotating said disc;

light generating means for generating a light beam having a size on the order of a pit, said means including means for deflecting said light beam to cause it to scan across each of said rows, as said disc is rotated, said light generating means including, cathode ray tube means for producing the light beam, hollow support means for supporting said cathode ray tube at a predetermined distance above said disc, said hollow support means having one end at which the face of said cathode ray tube is positioned, and an opposite end for engaging a groove of said spiral by being located between the two spaced-apart opposite walls extending from the groove and lens means supported in said hollow support means for reducing said light beam from said source to a size on the order of a pit;

means for detecting light reflected from locations in said rows where there are no pits as said light beam is scanned across the row, and for converting said detected light reflections into electrical signals; and

means for converting said electrical signals into a human language display.

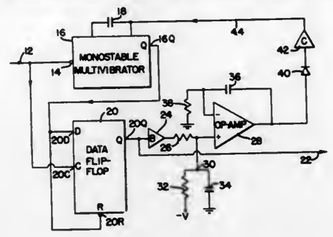
4,189,784

ADAPTIVE CIRCUIT FOR EXTRACTING TIMING INFORMATION FROM A REPETITIVE SERIES OF TIME COHERENT PULSES

Charles E. Mendenhall, Campbell, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,316
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—233 **5 Claims**

1. A circuit for generating an output pulse from a recurring pulse pattern having two adjacent pulses that occur at a first interval and one or more additional pulses that occur at a second interval that is longer than the first interval, the circuit comprising means for producing a controllably variable timing signal, said timing signal producing means having an input coupled to said pulse pattern and being constructed and arranged to initiate said timing pulse in response to the trailing edge of the pulses in the pulse pattern, means responsive to coincidence of said timing signal and the leading edge of a pulse in the pulse pattern for initiating said output pulse, means responsive to termination of said timing signal for terminating said output pulse, and feedback means coupling said output pulse to said timing signal producing means and including means for generating a feedback signal having a magnitude representative of the duration of said output pulse, said timing signal producing means being constructed and arranged to



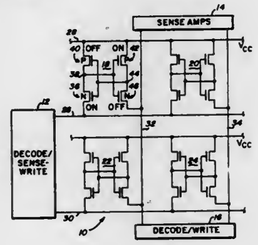
effect reduction of the duration of the timing signal by an amount corresponding to the magnitude of said feedback signal so as to maintain substantially constant the width of said timing pulses notwithstanding variations in the frequency of the pulses in said pulse pattern.

4,189,785

COMPLEMENTARY MOS MEMORY ARRAY INCLUDING COMPLEMENTARY MOS MEMORY CELLS THEREFOR

Adolph K. Rapp, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 26, 1978, Ser. No. 900,410
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—156 **20 Claims**



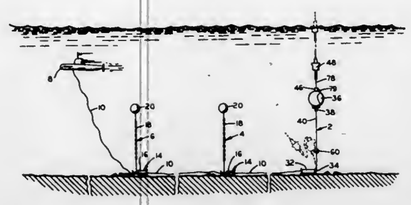
14. A complementary MOS memory array comprising, in combination, a plurality of complementary MOS memory cells, each one of said plurality of complementary MOS memory cells comprising two cross-coupled complementary pairs of series connected MOS devices, one source region of both of said two complementary pairs being connected to a common bias potential line, the other source region of one of said two complementary pairs being connected to a single row line, and the other source region of the other of said two complementary pairs being connected to a single column line, writing means connected to each one of said plurality of complementary MOS memory cells for selectively writing information into each one of said plurality of complementary MOS memory cells, and reading means connected to each one of said plurality of complementary MOS memory cells for reading the information stored in each one of said plurality of complementary MOS memory cells.

4,189,786

RADIO BUOY ASSEMBLY

Ronald E. Adler, 300 Chautauqua Blvd., Pacific Palisades, Calif. 90272

Filed Jun. 29, 1962, Ser. No. 206,528
Int. Cl.[2] H04B *1/59*; B63B *21/52*
U.S. Cl. 367—4 **6 Claims**



1. An apparatus comprising an intelligence capsule, a radio buoy, releasable means for retaining said buoy and said capsule attached together to be able to sink in sea water as a unit, pressure-responsive means for initiating release of said releasable means at a predetermined hydrostatic pressure, means for urging apart said buoy and capsule when said releasable means has been released;

said capsule including a free-flooded chamber; a frangible cap; said chamber being formed at least in part by said frangible cap; in said chamber, a subsurface float assembly comprising an inflatable float adapted to break and remove said cap upon inflation, a winch containing a line connected to said buoy, and a depth compensating dispenser for line connecting said capsule with said subsurface float assembly, said dispenser including means to restrain payment of line from said dispenser;

hydrostatic pressure responsive means, disabled from operation by said frangible cap, for activating said payment-restraining means, whereby said payment-restraining means is activated only upon removal of said frangible cap;

means responsive to a coded sonic signal for causing said winch to release said buoy to rise to the surface of water; and

means for causing said winch to retract said buoy to a predetermined depth below the water surface.

DESIGN PATENTS

GRANTED FEB. 19, 1980

ERRATA

For CLASS	See PATENT NO.
D06-113	254,236
D12-180	254,258

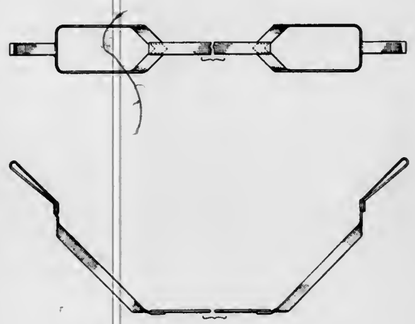
DESIGNS

FEBRUARY 19, 1980

254,216
SNOWMOBILE MUFF
Rosemary Caputo, Gateway Heights, Huntington, Mass. 01050
Filed Apr. 17, 1978, Ser. No. 897,520
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—362



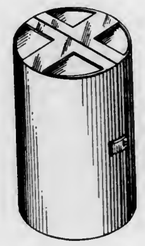
254,217
CARRYING HARNESS FOR A MATTRESS
James L. Corrigan, 4211 Menlo Ave., San Diego, Calif. 92115
Filed Jun. 20, 1977, Ser. No. 808,260
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—30

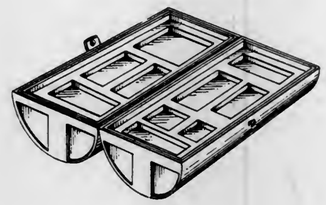


254,218
DART TRANSFER DEVICE
Lawrence A. Werth, 6070 Hubbell, Dearborn Heights, Mich. 48127
Filed Jan. 3, 1977, Ser. No. 756,012
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—26



254,219
CONTAINER FOR VETERINARY PRODUCTS OR SIMILAR ARTICLES
William G. Papciak, 4 Cambridge Way, East Windsor, N.J. 08520
Filed Mar. 13, 1978, Ser. No. 885,783
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—66

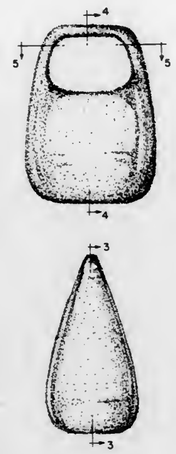




254,220
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Feb. 21, 1978, Ser. No. 879,709
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



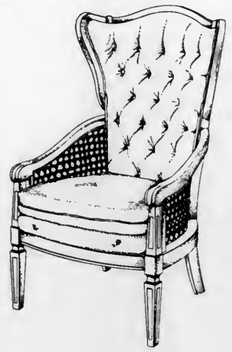
254,221
CARRYING CONTAINER
Gerald Beekenkamp, Etobicoke, Canada, assignor to Reliance Products Ltd., Winnipeg, Canada
Continuation-in-part of Ser. No. 660,011, Feb. 23, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,682
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—73



254,222
SKIN TREATMENT KIT
Fran MacGregor, New Britain, Conn., assignor to Clairol Incorporated
Filed Nov. 17, 1977, Ser. No. 852,388
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D4—20



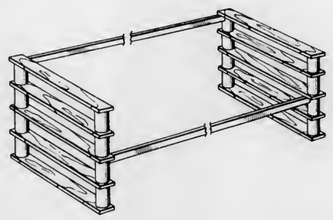
254,223
CHAIR
Mike T. Claman, Scarsdale, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Sep. 12, 1977, Ser. No. 832,513
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—68



254,224
COMBINED TOY AND TOOTHBRUSH HOLDER
Sophia Papas, 49 Mellow La., Jericho, N.Y. 11753
Filed Nov. 30, 1977, Ser. No. 855,832
Term of patent 14 years
Int. Cl. D7—*09*
U.S. Cl. D6—94



254,225
FURNITURE FRAME
Byron Botker, Los Angeles, Calif., assignor to Landes Manufacturing Co., Los Angeles, Calif.
Filed Sep. 9, 1977, Ser. No. 832,082
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



254,226
COMBINED ADVERTISING CARD AND DETACHABLE BEVERAGE COASTER
Henry C. Morse, 336 W. Wellington, Chicago, Ill. 60657
Filed Nov. 17, 1977, Ser. No. 852,339
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45



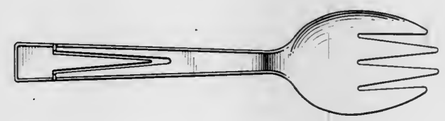
254,227
CONDIMENT SHAKER
Stuart A. Young, Meriden, Conn., assignor to International Silver Company
Filed Sep. 1, 1977, Ser. No. 829,827
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54



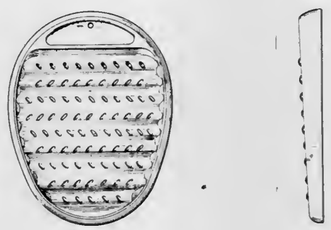
254,228
ARTICLE OF FLATWARE
Robert J. King, Wallingford, Conn., assignor to International Silver Company
Division of Ser. No. 838,930, Oct. 3, 1977. This application Apr. 23, 1979, Ser. No. 32,655
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



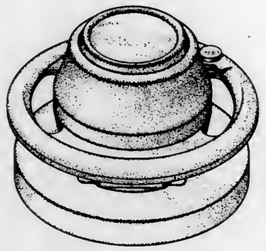
254,229
COMBINED FORK AND SEPARATABLE TOOTHPICK
Robert P. Julius, 345 E. 57th St., New York, N.Y. 10022
Filed Jun. 13, 1977, Ser. No. 806,296
Term of patent 7 years
Int. Cl. D7—*03*
U.S. Cl. D7—148



254,230
WASHBOARD
Millicent M. Sanger, 1461 S. Ocean Blvd., Apt. 126, Pompano Beach, Fla. 33060
Filed May 11, 1978, Ser. No. 905,103
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—201



254,231
AUTOMOBILE CLEANING AND WAXING TOOL
Robert E. Burglin, 517 S. Archer, Anaheim, Calif. 92804, and Sam S. Itaya, 420 Lakeview Rd., Pasadena, Calif. 91105
Filed Apr. 6, 1977, Ser. No. 785,195
Term of patent 14 years
Int. Cl. D8—*05;* D15—*05*
U.S. Cl. D8—62



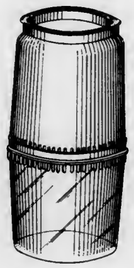
254,232
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 682,899, May 4, 1976, Pat. No. Des. 247,698. This application Aug. 31, 1977, Ser. No. 829,281
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



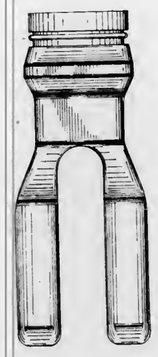
254,233
BOTTLE OR SIMILAR ARTICLE
John E. Dolan, Old Orchard St., Harrison, N.Y. 10528
Filed Oct. 14, 1977, Ser. No. 842,039
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—23



254,234
CONTAINER FOR LIQUIDS OR THE LIKE
Marianne C. Green, Midland, Mich., assignor to Koehring Company, Brookfield, Wis.
Division of Ser. No. 552,702, Feb. 24, 1975. This application Sep. 21, 1977, Ser. No. 835,418
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



254,235
BOTTLE
Philip F. Hartung, Dean Bldg., 655 Main St., East Greenwich, R.I. 02818
Filed Jul. 12, 1977, Ser. No. 814,965
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130

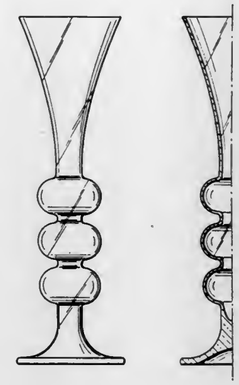


254,236
COMBINED HANGING SUPPORT AND FLOWER BASKETS THEREFOR
Joseph DeVito, 7 Ingrid Ct., Hauppage, N.Y. 11787, and Donald L. Tendrup, 32 Delmarie La., Neconset, N.Y. 11767
Filed May 1, 1978, Ser. No. 901,725
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—113

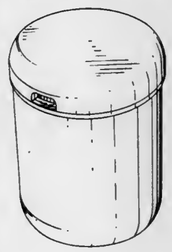


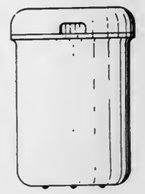


254,237
DRINKING GLASS
Nicholas P. Angelakos, Staten Island, N.Y., assignor to Lancaster Colony Corporation, New York, N.Y.
Filed Jan. 16, 1978, Ser. No. 869,553
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

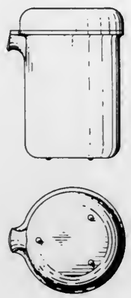


254,238
SUGAR BOWL
André Morin, 59 Pl. Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,498
Term of patent 14 years
Int. Cl. D7—*06, 01*
U.S. Cl. D7—17

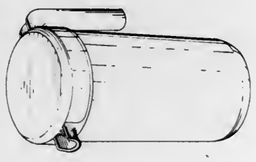


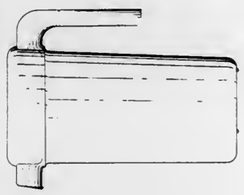


254,239
PITCHER
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,505
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—59

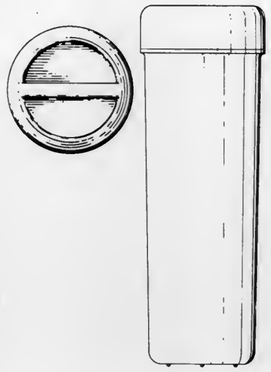


254,240
JUG
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,503
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—65





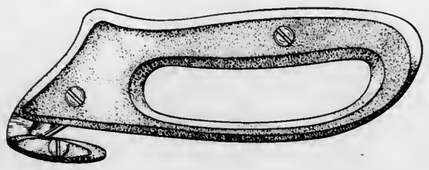
254,241
CANISTER OR SIMILAR ARTICLE
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,500
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



254,242
SPICE CONTAINER
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,507
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



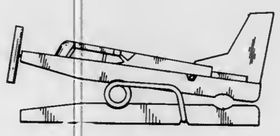
254,243
CUTTER FOR SHEET MATERIAL OR THE LIKE
John Florian, and Albert C. Verrell, both of Bakersfield, Calif., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 14, 1977, Ser. No. 842,184
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



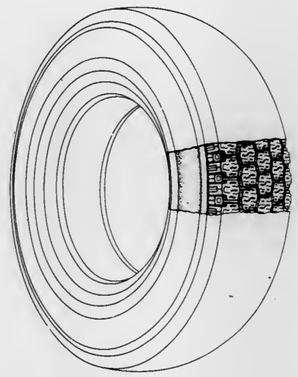
254,244
BOTTLE
D. Julian Diez Blanco, Somosierra, 29-2° Izq., Logrono, Spain
Filed May 17, 1977, Ser. No. 797,851
Claims priority, application Spain, Nov. 25, 1976, 88503
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28



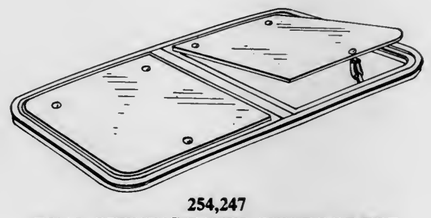
254,245
MINIATURE AIRPLANE CLIP
Charles S. Blinco, 7246 SE. 34th Ave., Portland, Oreg. 97202
Filed Feb. 1, 1978, Ser. No. 874,572
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—72



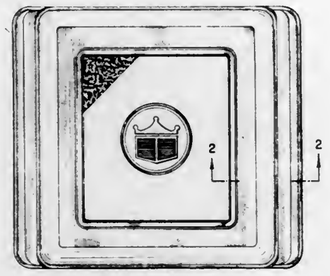
254,246
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 20, 1977, Ser. No. 862,765
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



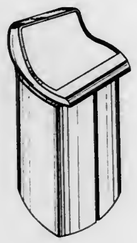
254,247
DUAL-OPENING PANEL SUN ROOF FOR AUTOMOBILES
Eugene B. Le Van, Whittier, and John Lehne, Hacienda Heights, both of Calif., assignors to Le Van Specialty Co. Inc., City of Industry, Calif.
Filed Jan. 23, 1978, Ser. No. 871,522
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



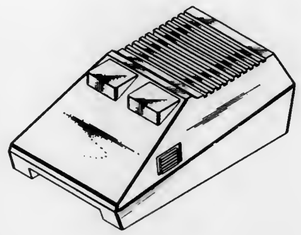
254,248
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Jan. 26, 1978, Ser. No. 872,480
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



254,249
CONTROL CONSOLE
Roy Biehl, Milwaukee, Wis., assignor to Gettys Manufacturing Company, Inc., Racine, Wis.
Filed Sep. 14, 1977, Ser. No. 833,395
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D13—12



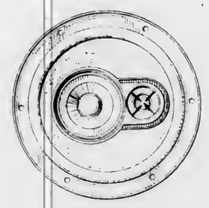
254,250
COMBINED PLAYER AND HOLDER FOR A SMALL RECORD
Bruce P. Carey, Saugus; Lloyd Y. Ishimaru, Agoura, and Moto Shimano, Los Angeles, all of Calif., assignors to Microsonics Corporation
Filed Mar. 9, 1977, Ser. No. 775,852
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14

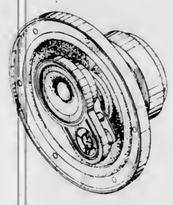


254,251
LOUDSPEAKER
Dennis C. Ward, 10 Old Steyne, Brighton BN1 1EJ, England
Filed Oct. 18, 1977, Ser. No. 843,648
Claims priority, application United Kingdom, Apr. 20, 1977, 979,735
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

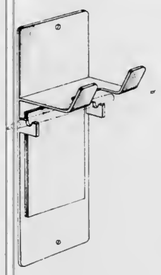


254,252
LOUDSPEAKER
Hideyuki Matsubara, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1978, Ser. No. 959,374
Claims priority, application Japan, May 10, 1978, 53-19177
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—30





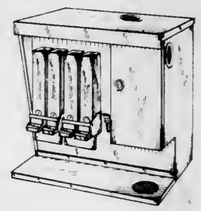
254,253
COMBINED WALL TELEPHONE SUPPORT, MEMORANDUM PAD AND PENCIL HOLDER
Ellis R. Haley, 385 Old Connecticut Path, Framingham, Mass. 01701
Filed Sep. 12, 1977, Ser. No. 832,807
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65

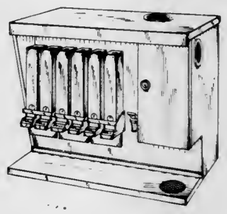


254,254
CONSOLE PROJECTION TELEVISION CABINET
Daniel Q. Boje, Seattle, Wash., assignor to Global Video Industries Ltd., Seattle, Wash.
Filed Jul. 26, 1976, Ser. No. 708,702
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79

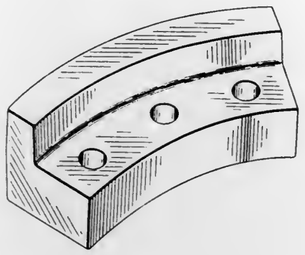


254,255
BEVERAGE DISPENSER
John G. Kiser, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Minn.
Filed Jan. 27, 1978, Ser. No. 872,840
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

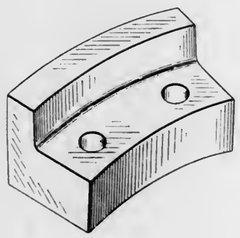




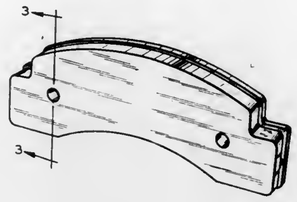
254,256
ROCK CRUSHER TABLE LINER
Stephen B. Ackers, Portland, Oreg., and Neil M. Rose, Vancouver, Wash., assignors to Canica Crushers, Ltd., Vancouver, Wash.
Filed Apr. 25, 1977, Ser. No. 790,750
Term of patent 14 years
Int. Cl. D15—*99;* D8—*99*
U.S. Cl. D15—123



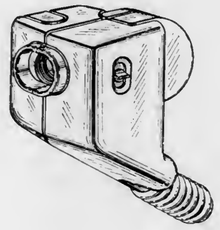
254,257
ROCK CRUSHER TABLE LINER
Stephen B. Ackers, Portland, Oreg., and Neil M. Rose, Vancouver, Wash., assignors to Canica Crushers, Ltd., Vancouver, Wash.
Filed Apr. 25, 1977, Ser. No. 790,768
Term of patent 14 years
Int. Cl. D15—*99;* D8—*99*
U.S. Cl. D15—123



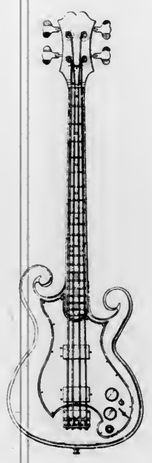
254,258
VEHICLE DISC BRAKE SHOE
Peter J. Soltis, Plymouth, and Peter H. Raves, Westland, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed Feb. 15, 1978, Ser. No. 878,055
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180

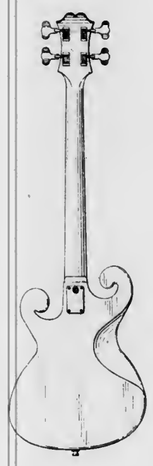


254,259
COMBINED MOTION PICTURE VIEWER AND FILM CARTRIDGE THEREFOR
Paul D. Miller, and Richard Penney, both of New York, N.Y., assignors to GAF Corporation, New York, N.Y.
Filed Jan. 30, 1978, Ser. No. 873,722
Term of patent 14 years
Int. Cl. D16—*01, 02*
U.S. Cl. D16—17



254,260
BASS GUITAR OR SIMILAR ARTICLE
Terry L. Green, Hammond, Ind., assignor to Norlin Industries, Inc., Lincolnwood, Ill.
Filed Nov. 14, 1977, Ser. No. 851,534
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

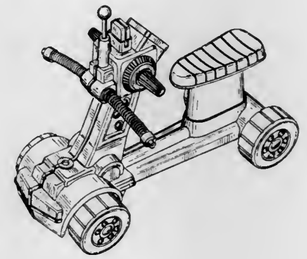




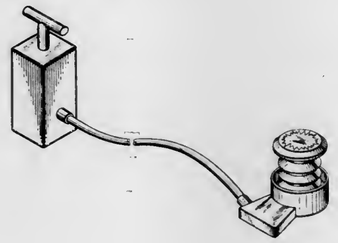
254,261
PANTS AND SKIRT FORM
Michael C. Wilkins, 114 Industrial Ave., Greensboro, N.C. 27406
Filed Jun. 1, 1977, Ser. No. 802,467
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—32



254,262
TOY VEHICLE
James R. Swearingen, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed May 9, 1977, Ser. No. 794,764
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76



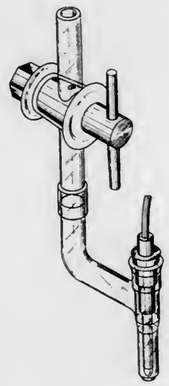
254,263
TOY DETONATOR
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,291
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—124



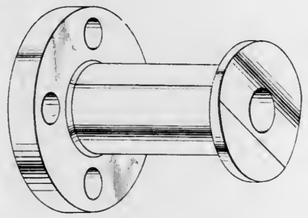
254,264
PUPPET
Athos Melotti, Via dello Spalto 3, Bologna, Italy
Filed Aug. 29, 1977, Ser. No. 828,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—152



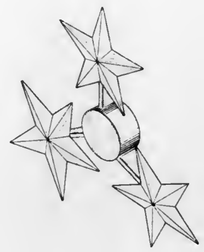
254,265
APPARATUS FOR PREVENTING BACTERIAL PASSAGE INTO STERILE FLUID SYSTEMS
Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014
Continuation-in-part of Ser. No. 791,586, Apr. 27, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,905
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



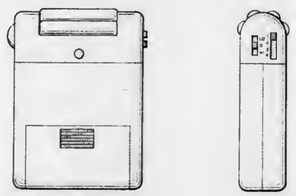
254,266
WELDING OUTLET
John P. Tableriou, Houston, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Sep. 1, 1977, Ser. No. 829,644
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



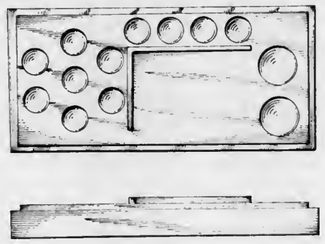
254,267
FAN BLADE
Betty J. Carpenter, 175 Linwood Ave., Buffalo, N.Y. 14209
Continuation-in-part of Ser. No. 753,924, Dec. 23, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 893,134
Term of patent 7 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



254,268
ELECTRICAL NEUROLOGICAL STIMULATOR
Irnee J. D'Haenens, Thousand Oaks, and Charles P. Ledergerber, Bel Air, both of Calif., assignors to Electromed Incorporated, Beverly Hills, Calif.
Filed Jul. 29, 1977, Ser. No. 821,047
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. 24—8



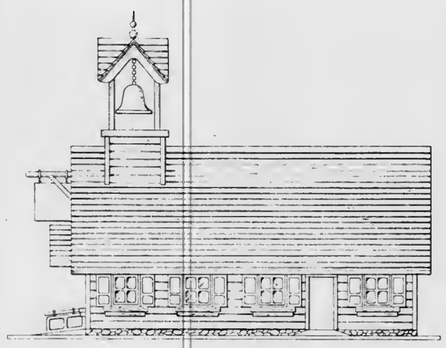
254,269
COMBINED MIXING AND STAINING DENTAL SLAB
Gayland G. Bird, 4810 SW. 6th St., Miami, Fla. 33134
Filed Sep. 18, 1978, Ser. No. 942,979
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



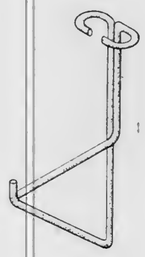
254,270
CATHETER DEFLECTOR ASSEMBLY FOR ENDOSCOPIC INSTRUMENTS AND THE LIKE
John S. Ziegler, Arlington Heights, Ill., assignor to American Hospital Supply Corporation
Filed Oct. 3, 1977, Ser. No. 838,997
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—23



254,271
RESTAURANT BUILDING
John P. Garneau, 2366 NE. 28th St., Lighthouse Point, Fla. 33064
Filed Dec. 12, 1977, Ser. No. 859,981
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



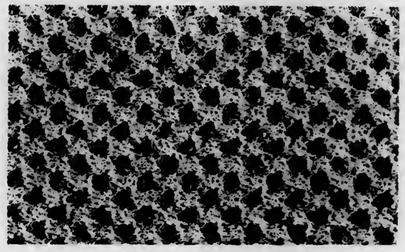
254,272
TREE CLIMBING STEP
Gerald T. Having, 2325 Hillview Rd. SE., Bessemer, Ala. 35020
Filed Dec. 8, 1977, Ser. No. 858,676
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—69



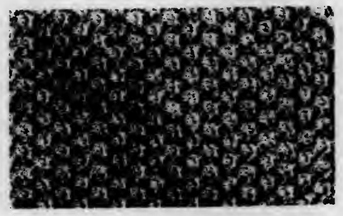
254,273
HAIR BAND
Inez B. Lawrence, 736 W. 228th St., Torrance, Calif. 90502
Filed Jan. 24, 1977, Ser. No. 761,706
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D28—41



254,274
DOUBLE KNIT FABRIC
William O. Avins, Cleveland, Tenn., assignor to American Research and Knitting, Inc.
Filed May 27, 1977, Ser. No. 801,235
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—2



254,275
DOUBLE KNIT FABRIC
William O. Avins, Cleveland, Tenn., assignor to American Research and Knitting, Inc.
Filed May 27, 1977, Ser. No. 801,236
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co. Inc.: *See—*
Greer, Bradley G., 4,188,964, Cl. 135-5.0AT.

A. H. C. Pharmacal, Inc.: *See—*
Fulton, James E., Jr., 4,189,501, Cl. 424-338.000.

A/S Bergens Mekaniske Verksteder: *See—*
Pedersen, Hakon S., 4,188,790, Cl. 60-483.000.

A/S Jac. Engelbredt: *See—*
Keller, Joergen, 4,188,736, Cl. 36-80.000.

Aaland, Kristian, to United States of America, Energy. Isolated trigger pulse generator. 4,189,650, Cl. 307-108.000.

AB Svenska Flaktfabriken: *See—*
Strindehag, Ove; and Wrangel, Erik, 4,189,330, Cl. 148-6.270.

Abbott, George A.; and Dudzik, Leonard J., to Jervis B. Webb Company. Self-locking connector for storage racks. 4,189,250, Cl. 403-190.000.

Abbott Laboratories: *See—*
Carney, Ronald E.; and McAlpine, James B., 4,189,569, Cl. 536-17.00R.

Abe, Tetsuya: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Abels, Theodor; and Gotz, Bernhard, to Linde Aktiengesellschaft. Fork-lift truck with internal-combustion engine. 4,189,020, Cl. 180-54.00A.

Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, to Linde Aktiengesellschaft. Hydraulic-actuated steering assembly for an industrial vehicle. 4,189,025, Cl. 180-159.000.

ACF Industries, Incorporated: *See—*
Krug, John A. K., Jr.; and Matthews, John W., 4,189,263, Cl. 406-137.000.

Acker Drill Company, Inc.: *See—*
Acker, III; William L.; and Acker, Warren T., 4,189,015, Cl. 175-330.000.

Acker, III; William L.; and Acker, Warren T., to Acker Drill Company, Inc. Drill bits for obtaining core samples. 4,189,015, Cl. 175-330.000.

Acker, Warren T.: *See—*
Acker, III; William L.; and Acker, Warren T., 4,189,015, Cl. 175-330.000.

Adam, Kenneth C., to RCA Corporation. Analog-to-digital circuit with adjustable sensitivity. 4,189,714, Cl. 340-347.0AD.

Adams, Christopher J.: *See—*
Brace, Roger; and Adams, Christopher J., 4,189,396, Cl. 252-99.000.

Adams, Donald C.: *See—*
Seliskar, James T.; and Adams, Donald C., 4,189,058, Cl. 220-218.000.

Adams, Ernest C., Jr.; and Layman, Kathleen M., to Miles Laboratories, Inc. Device and method for detecting myoglobin. 4,189,304, Cl. 23-230.00B.

Adams, Phillip Andrew: *See—*
Browning, Michael R.; and Mol, Volkert E., 4,189,210, Cl. 350-132.000.

Adams, Richard R., to Chromalloy American Corporation. Method for manufacturing waterproof boots. 4,188,680, Cl. 12-142.00E.

Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., to GTE Sylvania Incorporated. Roof drill bit. 4,189,013, Cl. 175-320.000.

Adler, Ronald E. Radio buoy assembly. 4,189,786, Cl. 367-4.000.

Advanced Instrument Development, Inc.: *See—*
Chaney, Edward L.; and Wiegman, Douglas C., 4,189,645, Cl. 250-394.000.

Aelion, Rene; and Ferezy, Edward, to Hydroplastics, Inc. Method for preparing hydrophilic polymers and polymer grafts including irradiation. 4,189,364, Cl. 204-159.220.

AGFA-Gevaert, A.G.: *See—*
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Agyagos, Ferenc I. Sheet assembly for use as a multipurpose tote bag. 4,188,988, Cl. 150-1.700.

Ahuja, Sudhir R., to Bell Telephone Laboratories, Incorporated. Accessing arrangement for interleaved modular memories. 4,189,767, Cl. 364-200.000.

Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., to Technical Research Affiliates, Inc. Detection of rheumatoid factor by antibody sensitized microbial particles. 4,189,466, Cl. 424-12.000.

Ainsworth, Ross N. Well pump service. 4,188,997, Cl. 166-77.000.

Air-Mo Hydraulics, Inc.: *See—*
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.

Air Resources, Inc.: *See—*
Thompson, Ralph B., 4,189,462, Cl. 423-573.00G.

Airwick Industries Inc.: *See—*
Hennart, Claude, 4,189,475, Cl. 424-200.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Nakao, Toshiyuki; and Kato, Kikuo, 4,188,838, Cl. 74-701.000.

Aizawa, Masanori: *See—*
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.

Akagi, Tetsuro: *See—*
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Transistor switch device. 4,189,651, Cl. 307-254.000.

Akesson, Bengt A., to Hallenius, Tore Jerker; and Sagefor, Karl Ivar. System for the storage of radioactive material. 4,189,254, Cl. 405-128.000.

Akubov, Gleb S.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Alberts Corporation: *See—*
Alberts, Melvin R., 4,188,855, Cl. 86-36.000.

Alberts, Melvin R., to Alberts Corporation. Method of and apparatus for automatically resizing and decapping fired cartridge cases. 4,188,855, Cl. 86-36.000.

Alexandrov, Nikolai N.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Alfa-Laval AB: *See—*
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Allen-Bradley Company: *See—*
Penrod, Orville R., 4,189,085, Cl. 228-173.00R.

Allen, Christopher S., to Imperial Chemical Industries Limited. Stabilization of 1,1,1-trichloroethane compositions against metal-induced decomposition with a polyalkylene glycol monoalkyl ether. 4,189,397, Cl. 252-171.000.

Allen, James H.; and Baker, William, III, to Smith International, Inc. Enhanced cross-flow with two jet drilling. 4,189,014, Cl. 175-339.000.

Allen, Richard C.; and Pierson, Darrell E., to Weyerhaeuser Company. Method for veneer redrying and handling. 4,188,730, Cl. 34-13.800.

Allied Chemical Corporation: *See—*
Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., 4,189,618, Cl. 174-35.0MS.
Patel, Gordhanbhai N., 4,189,399, Cl. 252-408.000.

Althoff, Dieter: *See—*
Scheuerpflug, Hans; and Althoff, Dieter, 4,189,021, Cl. 180-54.00C.

Alto Corporation: *See—*
Beckius, Herbert J., 4,189,047, Cl. 198-778.000.

Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, to Ciba-Geigy Corporation. Process for monoacylating water-soluble organic amino compounds. 4,189,576, Cl. 544-211.000.

Alza Corporation: *See—*
Higuchi, Takeru; and Hussain, Anwar A., 4,188,951, Cl. 128-260.000.

AM International, Inc.: *See—*
Bruning, Edwin C., 4,188,881, Cl. 101-141.000.
Szabo, Francis S., 4,189,216, Cl. 354-7.000.

Aman, Arcadio J. Debris separation and disposal system. 4,189,386, Cl. 210-235.000.

Amancharla, Amareswar, to Baker International Corporation. Expendable plug and packer assembly. 4,188,999, Cl. 166-133.000.

Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, to Taisho Pharmaceutical Co., Ltd. Anilionotropone derivatives. 4,189,607, Cl. 562-457.000.

Amax Inc.: *See—*
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.

Amazawa, Kiyoshi; and Mori, Masaharu, to Clarion Co., Ltd. Noise detecting circuit having noise-immune AGC. 4,189,679, Cl. 325-474.000.

Amemiya, Akira: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura,

Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

American Can Company: *See*—
Ticknor, William G., 4,189,519, Cl. 428-476.000.

American Cyanamid Company: *See*—
Hanifin, John W.; and Ridge, David N., 4,189,436, Cl. 549-72.000.
Hanifin, John W.; and Sloboda, Adolph E., 4,189,497, Cl. 424-275.000.
Martin, John H. E. J.; and Hertz, Martin R., 4,189,537, Cl. 435-75.000.
Weiss, Martin J.; and Siuta, Gerald J., 4,189,597, Cl. 560-118.000.

American Hoechst Corporation: *See*—
Hsieh, Shane H., 4,189,320, Cl. 430-145.000.

American Hospital Supply Corporation: *See*—
Fehlberg, David J., 4,188,942, Cl. 128-6.000.
Swinton, John A., 4,188,948, Cl. 128-214.00R.

American Hydrotherm Corporation: *See*—
Hinkle, Richard E., 4,188,995, Cl. 165-64.000.

American Safety Equipment Corporation: *See*—
Tanaka, Akira, 4,189,170, Cl. 280-802.000.

AMF Incorporated: *See*—
Guzzle, Timothy L.; and Sheeley, Eugene L., 4,189,144, Cl. 273-77.00R.

Amjadi, Ahmad. Automatic transmission. 4,188,831, Cl. 74-52.000.

Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, to Elfab Corporation. Method of fabricating an insulator for an electrical connector. 4,188,715, Cl. 29-629.000.

AMP Incorporated: *See*—
Yeager, Marvin L.; and Desso, Jerome A., 4,189,200, Cl. 339-75.0MP.

Analytical Radiation Corporation: *See*—
Wieder, Irwin; and Breedlove, Robert H., 4,189,687, Cl. 331-94.50D.

Anders, Gene A.: *See*—
Smith, B. Clark; and Anders, Gene A., 4,188,782, Cl. 60-733.000.

Andersen, Erik, to G. D. Searle & Co. Fluid collection receptacle. 4,188,989, Cl. 150-9.000.

Anderson, Arthur I., to Butler Manufacturing Company. Apparatus and method for handling dry bulk materials in a hopper-type container using air agitation. 4,189,262, Cl. 406-136.000.

Anderson, Greenwood & Co.: *See*—
Weise, Irvin B.; and Dane, Oscar, 4,188,973, Cl. 137-514.000.

Anderson, Marvin R. Apparatus and method for burnishing gears. 4,189,279, Cl. 414-750.000.

Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Phenoxybenzyl 2-[2-(2-hydroxy)indanyl]-3-methyl-butanoates. 4,189,598, Cl. 560-56.000.

Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid coupling. 4,188,785, Cl. 60-325.000.

Ando, Yumiko: *See*—
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Andre, Wolfram; and Muller, Hans, to International Standard Electric Corporation. Color-television picture tube with internal permanent magnets for convergence correction. 4,189,659, Cl. 313-412.000.

Andrews, Norwood H. Comminuting and classifying apparatus and process of the re-entrant circulating stream jet type. 4,189,102, Cl. 241-5.000.

Anischenko, Anatoly F.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Antoshkiw, William T., to Becton, Dickinson & Company. Sequential injection syringe. 4,188,949, Cl. 128-218.00M.

Antosik, Walter: *See*—
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.

Aoki, Keiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Digital control device for a fuel injection system of an internal combustion engine. 4,188,922, Cl. 123-32.0EA.

Aoyagi, Takaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Apellaniz, Ramon, to Waterlomat, Societe Anonyme. Peforating and sealing device for carbon dioxide capsules and suchlike. 4,189,068, Cl. 222-83.500.

Appenzeller, Valentin, to Kusters, Eduard. Sealing arrangement at a roll. 4,188,698, Cl. 29-116.0AD.

Arai, Katsuhiko: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Arai, Yutaka: *See*—
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.

Arenco-Decoufle: *See*—
Legardinier, Andre, 4,188,957, Cl. 131-96.000.
Verjux, Jean, 4,189,045, Cl. 198-457.000.

Argus Chemical Corporation: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,189,409, Cl. 260-23.0XA.

Arias, Armando; Scheiderer, Ronald L.; and Wiggenhorn, James T., to Motorola, Inc. Switching system utilizing flexible circuit with transmission line for matched impedance connections. 4,189,676, Cl. 325-125.000.

Armstrong, Currie; and Christophersen, Clarence E., to Armstrong, Currie. Coat hanger vending machine. 4,189,044, Cl. 194-2.000.

Arnold, Dan M., to Texaco Inc. Water injection profiling by nuclear logging. 4,189,638, Cl. 250-259.000.

Arnold, George P.: *See*—
Levinos, Nicholas J.; and Arnold, George P., 4,189,652, Cl. 307-428.000.

Arnold, Leonard R.; and Berry, Robert W., Jr., to Fansteel Inc. Positive chip control insert. 4,189,265, Cl. 407-114.000.

Arnold, Maurice C., to Ward Plant Spares (Henley) Limited. Attachment for mounting a pivotal and or shiftable load handling apparatus on a vehicle. 4,189,275, Cl. 414-640.000.

Aro-Sac Inc.: *See*—
Saccoccio, Nazareno J., 4,188,799, Cl. 63-14.00D.

Arrasmith, Fred V.; Bruns, Donald G.; and Killam, David G., to International Business Machines Corporation. Document stacking table lowering method, apparatus and controlling circuitry therefor. 4,189,133, Cl. 270-61.00F.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro, 4,189,221, Cl. 354-51.000.

Asai, Akiji: *See*—
Thies, Peter W.; and Asai, Akiji, 4,189,437, Cl. 260-340.300.

Asai, Mitsuko: *See*—
Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, 4,189,472, Cl. 424-117.000.

Asami, Shunichi: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, to Nippon Telegraph and Telephone Public Corporation. Semiconductor devices and method of manufacturing the same. 4,188,707, Cl. 29-571.000.

Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, to Canon Kabushiki Kaisha. Range detecting method and apparatus. 4,189,232, Cl. 356-1.000.

Asaoka, Hiroyasu: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Asman, Elof V. Method and device for improving the efficiency of heat generators. 4,188,917, Cl. 122-134.000.

Asmus, Kurt: *See*—
Gregor, Karl; and Asmus, Kurt, 4,189,272, Cl. 414-161.000.

Assinder, Andrew J.: *See*—
Margetts, Hugh G.; and Assinder, Andrew J., 4,189,191, Cl. 303-52.000.

Ast, Herbert H., to Kaiser Aerospace & Electronics Corporation. Conduit plug. 4,188,675, Cl. 4-295.000.

Atari, Inc.: *See*—
Stubben, David R.; and Koble, Dennis J., 4,189,145, Cl. 273-313.000.
Stubben, David R., 4,189,728, Cl. 340-725.000.

Athearn, Frank H.: *See*—
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., 4,189,156, Cl. 277-1.000.

Atkinson, John H., to Imperial Chemical Industries Limited. Acid oxidation process. 4,189,602, Cl. 568-801.000.

Atlantic Richfield Company: *See*—
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,189,599, Cl. 560-190.000.

Atwater, Jerrold B., to Lockheed Electronics Co., Inc. Motor actuating circuitry. 4,189,732, Cl. 343-5.00R.

Atwood Oceanics, Inc.: *See*—
Macan, John J.; and Magill, James M., 4,189,255, Cl. 405-211.000.

Augustyniak, Marian Z. Acromio-clavicular restoration brace. 4,188,944, Cl. 128-94.000.

Austin, George K., Jr. Multiple dental handpiece control system. 4,188,976, Cl. 137-637.100.

Automatic Switch Company: *See*—
Przywozny, Walter C.; and Moakler, William A., 4,189,649, Cl. 307-64.000.

Avco Corporation: *See*—
Wolf, Murray E.; and Suozzo, Vincent, 4,188,885, Cl. 102-221.000.

Avery International Corporation: *See*—
Takemoto, Shiro G.; and Morrison, Owen J., 4,189,419, Cl. 260-29.7NR.

Ayerst McKenna & Harrison Limited: *See*—
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,189,490, Cl. 424-269.000.

B. F. Goodrich Company, The: *See*—
Tucker, Harold A., 4,189,601, Cl. 560-24.000.

B & H Manufacturing Company, Inc.: *See*—
Dickey, Daniel M., 4,188,843, Cl. 83-304.000.

Babb, Burton A., to Babbco, Ltd. Method of making broad band dynamic loudspeaker. 4,188,711, Cl. 29-594.000.

Babbco, Ltd.: *See*—
Babb, Burton A., 4,188,711, Cl. 29-594.000.

Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Preparation of biotin. 4,189,586, Cl. 548-303.000.

Bai, Yasuo: *See*—
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Bair, Daniel L.: *See*—
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.

Bake, Willem J. H. Method of preparing and pouring concrete on a building site and a container and a vehicle for use with this method. 4,189,237, Cl. 366-2.000.

Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Patty broiler. 4,188,866, Cl. 99-339.000.

Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Energy conserver for broilers. 4,188,868, Cl. 99-386.000.

Baker, Edward D.; and Lang-Ree, Nils, to NPI Corporation. Staging cabinet and tray combination. 4,189,196, Cl. 312-236.000.

Baker, Edward D.; and Lang-Ree, Nils, to NPI Corporation. Hamburger bun storage device. 4,189,631, Cl. 219-388.000.

Baker International Corporation: *See*—
Amancharla, Amareswar, 4,188,999, Cl. 166-133.000.

Baker, Theodore C.; and Johnson, William E., to Owens-Illinois, Inc. MOS addressing circuits for display/memory panels. 4,189,729, Cl. 340-777.000.

Baker, Thomas G.: *See*—
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L., 4,189,593, Cl. 548-352.000.

Baker, William, III: *See*—
Allen, James H.; and Baker, William, III, 4,189,014, Cl. 175-339.000.

Balbes, Michael S.; and Moore, John M., to Microdyne Corporation. Television receiver threshold extension system by means of signal-to-noise control of bandwidth. 4,189,755, Cl. 358-904.000.

Baldacci, Lapo. Ice-cream making machine for household use. 4,189,241, Cl. 366-245.000.

Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., to Kerr-McGee Corporation. Process for the hydroconversion of coal. 4,189,372, Cl. 208-8.0LE.

Ballard, Gary W.; and Freliech, Robert A., to Carrier Corporation. Furnace having a normally closed blower relay. 4,189,091, Cl. 236-11.000.

Ballweber, Edward G.: *See*—
Phillips, Kenneth G.; and Ballweber, Edward G., 4,189,563, Cl. 528-493.000.

Barber-Colman Company: *See*—
Maxson, Dale E.; and Ober, David E., 4,189,092, Cl. 236-13.000.

Barbieri, Siegfried, to Durst AG Fabrik Fototechnischer Apparate. Illuminating system for photographic color enlargement or copying. 4,189,227, Cl. 355-35.000.

Barrett, Joy M.; Clark, David E.; and Hench, Larry L., to Board of Regents, State of Florida, University of Florida, The. Glass-ceramic dental restorations. 4,189,325, Cl. 106-35.000.

Barrow, Norman F.: *See*—
Kane, Milburn H.; and Barrow, Norman F., 4,189,246, Cl. 400-144.200.

Barthelemy, Pierre, to Roussel Uclaf. Cephalosporin derivatives and process. 4,189,574, Cl. 544-30.000.

Bartolini, Robert A.: *See*—
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.

BASF Aktiengesellschaft: *See*—
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
Halbritter, Klaus, 4,189,592, Cl. 548-342.000.
Hoch, Helmut; and Hiller, Heinrich, 4,189,582, Cl. 546-37.000.
Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, 4,189,322, Cl. 430-284.000.
Kempter, Fritz E.; and Schupp, Eberhard, 4,189,450, Cl. 525-455.000.
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, 4,189,557, Cl. 526-159.000.
Koenig, Karl-Heinz; and Reitel, Christian, 4,189,446, Cl. 260-544.00C.
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, 4,189,581, Cl. 544-324.000.
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

BASF Wyandotte Corporation: *See*—
Langdon, William K., 4,189,609, Cl. 568-601.000.

Bassani, Giovanni, to Dow Corning Corporation. Wire coating using a liquid polymer. 4,189,290, Cl. 425-113.000.

Battaglini, George T.: *See*—
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L., 4,189,593, Cl. 548-352.000.

Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., to International Business Machines Corporation. Cantilevered head support arm having increased resonance frequency. 4,189,759, Cl. 360-104.000.

Bauer, Werner R., to Robertshaw Controls Company. Reversing valve construction and valve member therefor and methods of making the same. 4,188,975, Cl. 137-625.660.

Baum, Gunter. Apparatus for cold sealing the gathered end of a plastic bag. 4,188,686, Cl. 24-30.50L.

Bausch & Lomb Incorporated: *See*—
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.

Bayer Aktiengesellschaft: *See*—
Dieterich, Dieter, 4,189,562, Cl. 528-75.000.
Eifler, Willi; and Ick, Juergen, 4,189,443, Cl. 260-453.0PH.
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.
Findeisen, Kurt, 4,189,580, Cl. 544-301.000.
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.
Komorowski, Klaus, 4,189,427, Cl. 260-156.000.
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Baynes, William R., to Turco Manufacturing Co. Grill for cooking. 4,188,937, Cl. 126-41.00R.

Beard, Hobert M., Jr.: *See*—
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Becht, Carl T.: *See*—
Smith, James E.; and Becht, Carl T., 4,189,080, Cl. 227-8.000.

Beckerman, Howard L., to Singer Company, The. Low bobbin thread detection system. 4,188,901, Cl. 112-278.000.

Beckius, Herbert J., to Alto Corporation. Endless conveyor. 4,189,047, Cl. 198-778.000.

Beckman Instruments, Inc.: *See*—
Louderback, Allan L., 4,189,401, Cl. 252-408.000.

Becton, Dickinson & Company: *See*—
Antoshkiw, William T., 4,188,949, Cl. 128-218.00M.

Beecham Group Limited: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,189,473, Cl. 424-124.000.

Beehive Machinery, Inc.: *See*—
dos Santos, Claudio, 4,189,104, Cl. 241-82.300.

Begin, Louis E.: *See*—
Dunbar, Joseph E.; and Begin, Louis E., 4,189,579, Cl. 544-276.000.

Beitzel, Stuart S., to Stuart Enterprises. Process of producing ozone in water. 4,189,363, Cl. 204-157.10R.

Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., to RCA Corporation. Record playback apparatus and information record therefor. 4,189,735, Cl. 346-135.100.

Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., to Takatori Machinery Mfg. Co., Ltd. System for combining stocking materials and gussets to form panty hose garments. 4,188,898, Cl. 112-262.100.

Bell Telephone Laboratories, Incorporated: *See*—
Ahuja, Sudhir R., 4,189,767, Cl. 364-200.000.
Copeland, John A., III, 4,189,739, Cl. 357-51.000.
Duttweiler, Donald L., 4,189,715, Cl. 340-347.0DD.
Flanagan, James L., 4,189,627, Cl. 179-180.000.
Frank, Amalie J., 4,189,711, Cl. 340-146.30H.
Grau, Thomas G., 4,189,199, Cl. 339-75.0MP.
Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., 4,189,208, Cl. 350-96.340.
Krambeck, Robert H., 4,189,716, Cl. 340-347.0DD.
Martschinke, Charles E., 4,188,840, Cl. 81-3.00R.

Bell, Willard F. Word forming bowling game. 4,189,154, Cl. 273-272.000.

Beloit Corporation: *See*—
Busker, Leroy H., 4,189,344, Cl. 162-117.000.

Bendall, Wilfrid H. Fuel economizing drive system for naval and merchant ships. 4,188,837, Cl. 74-665.00M.

Bendix Corporation, The: *See*—
Kuntman, Daryal, 4,189,777, Cl. 364-433.000.

Bendler, Hellmut; and Scheiderer, Gerrit, to Dynamit Nobel AG. Compressed-gas-actuated switching device. 4,188,856, Cl. 89-1.00B.

Bennett, Derek J., to Bunker Ramo Corporation. System for deploying a sensor array from transiting vessel. 4,189,703, Cl. 367-134.000.

Bennett, Robert A. Suction producing disposable pump and dispenser. 4,189,245, Cl. 401-126.000.

Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device to secure vanes to a rotor. 4,189,282, Cl. 416-221.000.

Berges, David A., to SmithKline Corporation. 7-Amino-3-(phosphonoalkyl and esterified phosphonoalkyl substituted tetrazolylthiomethyl)cephalosporins. 4,189,573, Cl. 544-21.000.

Berghahn, Walter G., to Bristol-Myers Company. Dispenser for dispensing limited amounts of materials. 4,189,066, Cl. 222-48.000.

Bernardi, Herbert: *See*—
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.

Berry, Robert W., Jr.: *See*—
Arnold, Leonard R.; and Berry, Robert W., Jr., 4,189,265, Cl. 407-114.000.

Beshers, Daniel N.: *See*—
Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., 4,188,830, Cl. 73-801.000.

Besson, Rene, to Ebauches S.A. Electro-mechanical calendar timepiece. 4,188,774, Cl. 58-4.00A.

Besson, Rene, to Ebauches S.A. Electro-mechanical calendar watch. 4,188,777, Cl. 58-58.000.

Best, David M. Casing scraper. 4,189,000, Cl. 166-173.000.

Beswick, David G. E.; and Wright, Stanley, to Kenneth E. Beswick Limited. Electric fuse-links and method of making them. 4,189,696, Cl. 337-232.000.

Bianchi, Valerio; and Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,188,920, Cl. 123-32.0EA.

Bianco, Romolo P. Expandable annular locking device for a shaft. 4,189,251, Cl. 403-261.000.

Bills, John E. Multipurpose double acting drum pedal. 4,188,853, Cl. 84-422.00R.

Binard, William J.: *See—*
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.

Binder, Volker: *See—*
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.

Bio-Response, Inc.: *See—*
Rose, Sam, 4,189,470, Cl. 424-85.000.

Biochefarm S.A.: *See—*
Tosi, Carlo; and Ferlenghi, Pierarturo, 4,189,499, Cl. 424-316.000.

Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., to Northrop Corporation. Cathode structure for a high power laser. 4,189,656, Cl. 313-37.000.

Birkelbach, Donald F., to Dow Chemical Company, The. High efficiency catalyst for polymerizing olefins. 4,189,553, Cl. 526-92.000.

Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., to National Research Development Corporation. High temperature secondary cells. 4,189,529, Cl. 429-103.000.

Bishop, Robert C.: *See—*
Shanbrom, Edward; and Bishop, Robert C., 4,189,425, Cl. 260-112.00B.

Bitner, Everett D. Time delay switch. 4,189,628, Cl. 200-33.00R.

Bittner, Emil: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Bjarsch, Otto, to Bosch-Siemens Hausgerate GmbH. Electric toaster. 4,188,865, Cl. 99-327.000.

Bjornson, Geir, to Phillips Petroleum Company. Hydrodealkylation process. 4,189,613, Cl. 568-805.000.

Black, Wesley F. In-line mud shearing apparatus. 4,189,243, Cl. 366-336.000.

Bland, Frederick H., to Minnesota Mining and Manufacturing Company. Cleansing pad and method of making the same. 4,189,395, Cl. 252-91.000.

Blewitt, Donald D., to Westinghouse Electric Corp. Current limiting fuse with improved low current clearing capability. 4,189,694, Cl. 337-158.000.

Bloom Engineering Company, INc.: *See—*
Twort, Thomas J., 4,189,301, Cl. 432-252.000.
Twort, Thomas J., 4,189,301, Cl. 432-252.000.

Blumberg, Baruch S.; and Millman, Irving, to Institute for Cancer Research. Hepatitis B testing reagent and method. 4,189,464, Cl. 424-1.000.

Board of Regents, State of Florida, University of Florida, The: *See—*
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.

BOC Limited: *See—*
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.

Bock, George F.; and Walsh, Bernard L., Jr., to Hughes Aircraft Company. Resonant linear frequency modulator. 4,189,690, Cl. 332-30.00V.

Bodor, Nicholas S.; and Zupan, Jack A., to Fisons Limited. Esters of cromoglycates. 4,189,571, Cl. 542-427.000.

Boeing Commercial Airplane Company: *See—*
Harper, Philip M.; and Johnson, Kirby W., 4,189,121, Cl. 244-214.000.
Wang, Timothy, 4,189,120, Cl. 244-214.000.

Boeing Company, The: *See—*
Peter-Contesse, Henri, 4,189,118, Cl. 244-182.000.
Peter-Contesse, Henri; and Stephan, Leonard P., 4,189,119, Cl. 244-182.000.

Bonazoli, Robert P.: *See—*
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.

Bonderman, Dean P.: *See—*
Proksch, Gary J.; and Bonderman, Dean P., 4,189,400, Cl. 252-408.000.

Bonnar, John H. Lock controlled power shut-off system. 4,189,692, Cl. 335-205.000.

Bonometti, Emil; and Seiler, Herbert, to Ciba-Geigy Corporation. Difluoro-s-triazinylamino-hydroxynaphthalene-sulfonic acid. 4,189,570, Cl. 544-211.000.

Booth, Robin G.; and Cooper, Anthony R., to Dynapol. Salt addition in ultrafiltration purification of solutions of polymeric colorants. 4,189,380, Cl. 210-23.00F.

Booth, Vernard S.; and Oswalt, Billy W., to Olinkraft, Inc. Assembled and folded blank for bulk container with partial bellows bottom. 4,189,086, Cl. 229-15.000.

Borg-Warner Corporation: *See—*
Fall, Don R.; and Lamarche, Paul E., 4,188,805, Cl. 64-27.00C.
Fall, Don R.; and Lamarche, Paul E., 4,188,806, Cl. 64-27.00C.

Borner, William G.: *See—*
Scarpellino, Anthony J., Jr; and Borner, William G., 4,189,358, Cl. 204-43.00N.

Borowski, Karl-Heinz, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Mining machine with cutter drums and sensing apparatus. 4,189,183, Cl. 299-1.000.

Bosch-Siemens Hausgerate GmbH: *See—*
Bjarsch, Otto, 4,188,865, Cl. 99-327.000.
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Boschetti, Egisto, to Societe Sebia. Process for obtaining gels of N-methylol-acrylamide copolymers and application of said gels for the stepped gradient separation of seric lipoproteins. 4,189,370, Cl. 204-299.00R.

Bourne, Percy V., to Calcimatic International, Limited. Direct cooler for calcining apparatus. 4,189,299, Cl. 432-78.000.

Bournicon, Claude; and Mansion, James, to Centre Technique des Industries Mecaniques. Method and machine for the manufacture of long concrete drills provided with helical splines over part of their length. 4,188,813, Cl. 72-299.000.

Bourns, Inc.: *See—*
Brown, Milton R., Jr., 4,188,829, Cl. 73-517.00R.

Bouvaist, Jean: *See—*
Dubost, Bruno; and Bouvaist, Jean, 4,189,334, Cl. 148-159.000.

Bowden, David N.: *See—*
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Boxer, Trevor C., to Lucas Industries Limited. Control circuits for electric traction motors for vehicles. 4,189,667, Cl. 318-338.000.

Boyajian, William M. Plant support. 4,188,891, Cl. 108-42.000.

Boyle, Carol J. Wind-and-sun shield. 4,188,991, Cl. 160-124.000.

Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, to Montedison S.p.A. Process for preparing esters from ethers or esters of lower homologous alcohols. 4,189,441, Cl. 260-410.90R.

Brace, Roger; and Adams, Christopher J., to Lever Brothers Company. Detergent compositions. 4,189,396, Cl. 252-99.000.

Brackett, Donald L.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Branlard, Paul; and Merle, Jean-Pierre, to Distugil. Process for preparing powdered rubber. 4,189,567, Cl. 528-485.000.

Brantingham, George L., to Texas Instruments Incorporated. Parameter interpolator for speech synthesis circuit. 4,189,779, Cl. 364-718.000.

Bratko, Rudolph S.; and Zwipf, Werner, to Slyman Manufacturing Corporation. Matrix mounting means for gas burners. 4,189,297, Cl. 431-328.000.

Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., to United States of America, Energy. Combination free electron and gaseous laser. 4,189,686, Cl. 331-94.5PE.

Brauer, Larry F.; and Eaton, Jefferson O., to United States of America, Navy. Pressure probe for safety-arming device. 4,188,886, Cl. 102-223.000.

Braunschweig, Orlen O., to Briggs & Stratton Corporation. Helical spring clutch. 4,189,040, Cl. 192-26.000.

Brdr. Schur International A/S: *See—*
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Breedlove, Robert H.: *See—*
Wieder, Irwin; and Breedlove, Robert H., 4,189,687, Cl. 331-94.50D.

Bregi, James F., to Ford Motor Company. Process for the desulphurization of molten cast iron and treating agent. 4,189,315, Cl. 75-251.000.

Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., to Allied Chemical Corporation. Electromagnetic shielding envelopes from wound glassy metal filaments. 4,189,618, Cl. 174-35.0MS.

Breuer, Hermann: *See—*
Truener, Uwe D.; and Breuer, Hermann, 4,189,482, Cl. 424-250.000.

Breunig, Anton: *See—*
Jeschke, Willi; Schilling, Paul; and Breunig, Anton, 4,188,882, Cl. 101-148.000.

Bridgestone Tire Company Limited: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Briggs & Stratton Corporation: *See—*
Braunschweig, Orlen O., 4,189,040, Cl. 192-26.000.
Santi, John D., 4,188,930, Cl. 123-148.00E.

Bright, Marvin L., Jr., to W. R. Grace & Co. Microwave sealing of thermoplastic material. 4,188,769, Cl. 53-434.000.

Brimm, Daniel J., to Chem-tronics, Inc. Metal forming methods. 4,188,811, Cl. 72-63.000.

Bristol-Myers Company: *See—*
Berghahn, Walter G., 4,189,066, Cl. 222-48.000.
Johnson, David L.; and Doyle, Terrence W., 4,189,568, Cl. 536-17.00A.

Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. Method for preparing 6-phenyl-triazolo or imidazolo-(1,3,4)-benzotriazepines and the novel intermediates used therewith. 4,189,588, Cl. 548-324.000.

Brodie, Ivor; and Kelly, John, to Stanford Research Institute. Mass storage of books. 4,189,783, Cl. 365-128.000.

Brodzina, Lieselotte: *See—*
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Bromell, Raymond J.; and Homanick, George, to National Advanced Drilling Machines, Inc. Hydraulic control apparatus. 4,188,787, Cl. 60-327.000.

Bronstert, Bernd: *See—*
Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, 4,189,322, Cl. 430-284.000.

Bronstert, Klaus: *See—*
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, 4,189,557, Cl. 526-159.000.

Brookhyser, Byron B., to Weyerhaeuser Company. Apparatus for indexing a rotary frame. 4,188,733, Cl. 34-236.000.

Brouwer, Frans. Pulley and tape motion linkage for platform weighing scale. 4,189,018, Cl. 177-256.000.

Brown, Alexander M.: *See—*
Earl, Norman M.; and Brown, Alexander M., 4,188,913, Cl. 119-51.00R.

Brown, Harry W.; and Heider, Erich E., to Eaton Corporation. Integrated wire termination system with reflow bonded retainer. 4,189,204, Cl. 339-275.00R.

Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., to Singer Company, The. Diaphragm pump for needle threading. 4,188,896, Cl. 112-225.000.

Brown, John S.: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,866, Cl. 99-339.000.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,868, Cl. 99-386.000.

Brown, Milton R., Jr., to Bourns, Inc. Flexure pivot accelerometer. 4,188,829, Cl. 73-517.00R.

Brown, Neil L.: *See—*
Lawson, Kenneth D.; and Brown, Neil L., 4,189,681, Cl. 330-109.000.

Browning, Michael R.; and Mol, Volkert E., to Adams, Phillip Andrew. Visual effect system. 4,189,210, Cl. 350-132.000.

Bruce, Howard D., to Laser-Grade (Ireland) Limited. Fluid regulating systems. 4,188,919, Cl. 123-32.0EA.

Bruce Plastics, Inc.: *See—*
Szabo, Bela G., 4,189,037, Cl. 190-58.00R.

Bruel & Kjaer Industri A/S: *See—*
Bruel, Per V., 4,189,655, Cl. 310-329.000.

Bruel, Per V., to Bruel & Kjaer Industri A/S. Lightweight piezoelectric accelerometer. 4,189,655, Cl. 310-329.000.

Brumbach, Joseph F.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,189,286, Cl. 417-477.000.

Brunel, Roger L.: *See—*
Hackman, Donald J.; and Brunel, Roger L., 4,189,268, Cl. 409-183.000.

Bruning, Edwin C., to AM International, Inc. Augmenting duplicator production. 4,188,881, Cl. 101-141.000.

Bruninga, Kenneth J., to L. R. Nelson Corporation. Spray head. 4,189,099, Cl. 239-200.000.

Bruns, Donald G.: *See—*
Arrasmith, Fred V.; Bruns, Donald G.; and Killam, David G., 4,189,133, Cl. 270-61.00F.

Brunsting, Albert: *See—*
Hogg, Walter R.; and Brunsting, Albert, 4,189,236, Cl. 356-317.000.

Brunswick Corporation: *See—*
Puryear, John W., 4,189,108, Cl. 242-84.20G.

Bryant, Emmett L., to United States of America, National Aeronautics and Space Administration. Noncontacting method for measuring angular deflection. 4,189,234, Cl. 356-152.000.

Bryll, Medard Z., to Gateway Industries, Inc.,. Method and apparatus for controlling access to a facility. 4,189,708, Cl. 340-64.000.

Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, to BASF Aktiengesellschaft. Manufacture of polymers in bead form from water-soluble, ethylenically unsaturated monomers. 4,189,559, Cl. 526-203.000.

Buhr, Gerhard, to Hoechst Aktiengesellschaft. Radiation-sensitive copying composition. 4,189,323, Cl. 430-281.000.

Bullard, Herbert L.: *See—*
Osborn, Robert A.; and Bullard, Herbert L., 4,189,547, Cl. 525-99.000.

Bunker Ramo Corporation: *See—*
Bennett, Derek J., 4,189,703, Cl. 367-134.000.

Burglin, Robert E.; and Itaya, Sam S. Automobile cleaning and waxing tool. 4,188,682, Cl. 15-97.00R.

Burk, Gerhard: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.

Burke, Edward F., Jr., to MFE Corporation. Limited-rotation motor with integral displacement transducer. 4,189,699, Cl. 335-229.000.

Burns, Richard D., to General Electric Company. Method for making stators for dynamoelectric machines. 4,188,712, Cl. 29-596.000.

Burrell, Raymond A.: *See—*
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., 4,189,483, Cl. 424-251.000.

Burroughs Corporation: *See—*
Cook, Darwen J.; and Millers, Donald A., II, 4,189,769, Cl. 364-200.000.
Romania, Samuel R., 4,189,201, Cl. 339-75.0MP.
Shintaku, Ken, 4,189,673, Cl. 324-133.000.
Spisz, Albert S., 4,189,078, Cl. 226-74.000.
Yuen, Raymond C., 4,189,671, Cl. 323-19.000.

Burroway, Gary L.; and Maximovich, Michael J., to Goodyear Tire & Rubber Company, The. Resin composition. 4,189,561, Cl. 526-317.000.

Burwall, Sten B. Structural connector. 4,189,247, Cl. 403-4.000.

Busker, Leroy H., to Beloit Corporation. Method of texturing untextured dry sanitary tissue web. 4,189,344, Cl. 162-117.000.

Butler Manufacturing Company: *See—*
Anderson, Arthur I., 4,189,262, Cl. 406-136.000.

Butler, Theodore G., to Mechtron International Corporation. Rotating drum dryer apparatus. 4,189,300, Cl. 432-118.000.

Butt, Frederick A.: *See—*
Haddad, George N.; and Butt, Frederick A., 4,189,452, Cl. 525-444.000.

Butterworth, Dennis: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,189,473, Cl. 424-124.000.

C.A. Pemberton & Co. Limited: *See—*
Kyle, Rhoden R., 4,188,771, Cl. 53-511.000.

Cadwell, Ronald G.: *See—*
Monigold, Larry E.; and Cadwell, Ronald G., 4,189,095, Cl. 236-92.00R.

Calcimatic International, Limited: *See—*
Bourne, Percy V., 4,189,299, Cl. 432-78.000.

Camisa, Raymond L.: *See—*
Sechi, Franco N.; and Camisa, Raymond L., 4,189,688, Cl. 331-117.0FE.

Campbell Soup Company: *See—*
Egee, Walter W.; and Weaver, George R., 4,188,819, Cl. 73-52.000.

Camsco, Inc.: *See—*
Higgins, Bobby L.; and Comer, Jerry, 4,189,337, Cl. 156-351.000.

Canada Wire and Cable Limited: *See—*
Roy, Clermont A., 4,189,331, Cl. 148-6.310.

Canadian Patents and Development Limited: *See—*
Dawson, Peter H., 4,189,640, Cl. 250-290.000.

Canon Kabushiki Kaisha: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.
Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, 4,189,214, Cl. 350-215.000.
Yamamichi, Masayoshi, 4,189,220, Cl. 354-43.000.

Carlock, John T., to Conoco, Inc. Polypyridinerhodiumcarbonyl and iridium carbonyl hydride and halide hydroformylation catalysts. 4,189,448, Cl. 260-604.0HF.

Carnall, Edward, Jr.: *See—*
Weiss, Armin K.; and Carnall, Edward, Jr., 4,189,406, Cl. 252-501.100.

Carney, Ronald E.; and McAlpine, James B., to Abbott Laboratories. Seldomycin factor 5 derivatives. 4,189,569, Cl. 536-17.00R.

Caro, Jasper: *See—*
Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.

Carrier Corporation: *See—*
Ballard, Gary W.; and Freliech, Robert A., 4,189,091, Cl. 236-11.000.
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., 4,189,156, Cl. 277-1.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Stack and nest container. 4,189,052, Cl. 206-507.000.

Carson Manufacturing Company, Inc.: *See—*
Carson, William H.; Smith, Gerald D.; and Owens, Frank R., 4,189,718, Cl. 340-384.00E.

Carson, William H.; Smith, Gerald D.; and Owens, Frank R., to Carson Manufacturing Company, Inc. Electronic siren. 4,189,718, Cl. 340-384.00E.

Carter, Heard L. Rotatable pop-up water delivery head for pool cleaning systems. 4,188,673, Cl. 4-172.170.

Cascardo, Adolph P.: *See—*
Lazich, Radovan P.; and Cascardo, Adolph P., 4,189,022, Cl. 180-268.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,189,774, Cl. 364-405.000.
Takeuchi, Eiichi, 4,189,717, Cl. 340-365.00E.

Caterpillar Tractor Co.: *See—*
Meisel, Thomas C., Jr., 4,189,010, Cl. 172-804.000.
Richardson, Warner G., 4,188,739, Cl. 37-126.0AE.
Roussin, Michael A., 4,189,158, Cl. 277-34.300.
Shaffer, Walter M., 4,189,276, Cl. 414-659.000.
Sindelar, Ernest C., 4,189,287, Cl. 417-490.000.
Smith, B. Clark; and Anders, Gene A., 4,188,782, Cl. 60-733.000.

Catmull, Edwin: *See—*
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., 4,189,743, Cl. 358-93.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Dubost, Bruno; and Bouvaist, Jean, 4,189,334, Cl. 148-159.000.

Celanese Corporation: *See—*
Levers, William E.; and Keith, Charles H., 4,189,511, Cl. 428-167.000.

Centre Technique des Industries Mecaniques: *See—*
Bournicon, Claude; and Mansion, James, 4,188,813, Cl. 72-299.000.

Cerberus AG: *See—*
Schubert, Wolfgang; and Durrer, Bernhard, 4,189,644, Cl. 250-381.000.

Cereal Enterprises, Inc.: *See—*
Giguere, James R., 4,189,503, Cl. 426-482.000.

Chabala, John: *See—*
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, 4,189,471, Cl. 424-88.000.
Champion International Corporation: *See—*
Tellman, Stephen J., 4,188,762, Cl. 52-541.000.
Chaney, Edward L.; and Wiegman, Douglas C., to Advanced Instrument Development, Inc. X-ray measuring system. 4,189,645, Cl. 250-394.000.
Charles H. Klieman, M.D.: *See—*
Klieman, Charles H.; and Densmore, Richard M., 4,188,953, Cl. 128-325.000.
Charles K. Kelley and Sons, Inc.: *See—*
Kelley, Charles K.; and Jones, William W., 4,189,261, Cl. 406-112.000.
Chem-tronics, Inc.: *See—*
Brimm, Daniel J., 4,188,811, Cl. 72-63.000.
Cheseldine, David M.: *See—*
Millard, Richard J.; and Cheseldine, David M., 4,188,706, Cl. 29-570.000.
Chevron Research Company: *See—*
Kurkov, Victor P., 4,189,608, Cl. 562-519.000.
Mitchell, David S., 4,189,376, Cl. 208-11.0LE.
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, to Hitachi, Ltd. Process for the preparation of magnetic recording medium. 4,189,508, Cl. 427-48.000.
Childress, Jon P. Tiller minder. 4,188,904, Cl. 114-172.000.
Childs, William V., to Phillips Petroleum Company. Preparation of alcohols by treating esters with alkali metal borohydride. 4,189,615, Cl. 568-842.000.
Chiron, Georges; and Giles, Maurice R., to Saint-Gobain Industries. Adjustment of the quantity of impregnating or coating material. 4,189,506, Cl. 427-8.000.
Chisso Corporation: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.
Chrablow, Marshall H., to Krossfield Inc. Compactor. 4,188,872, Cl. 100-53.000.
Christensen, Burton G.; Hannah, John; and Shih, David H., to Merck & Co., Inc. N-heterocyclic derivatives of thienamycin. 4,189,493, Cl. 424-273.00R.
Christophersen, Clarence E.: *See—*
Armstrong, Currie; and Christophersen, Clarence E., 4,189,044, Cl. 194-2.000.
Christou, Aristos: *See—*
Davey, John E.; and Christou, Aristos, 4,188,710, Cl. 29-580.000.
Chromalloy American Corporation: *See—*
Adams, Richard R., 4,188,680, Cl. 12-142.00E.
Chrysler Corporation: *See—*
Hall, John F., 4,188,784, Cl. 60-323.000.
Hurst, John W., 4,189,038, Cl. 192-21.000.
Chun, Kang R.: *See—*
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.
Ciba-Geigy Corporation: *See—*
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.
Bonometti, Emil; and Seiler, Herbert, 4,189,570, Cl. 544-211.000.
Holt, Brian; and Lee, Peter I., 4,189,587, Cl. 548-312.000.
Meyer, Hans R.; and Weber, Kurt, 4,189,589, Cl. 548-327.000.
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.
Portmann, Robert, 4,189,584, Cl. 546-289.000.
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,189,560, Cl. 526-259.000.
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.
Circle K Company: *See—*
Douglas, Edwin S., III, 4,188,862, Cl. 98-41.0SV.
Citizen Watch Company Limited: *See—*
Kashima, Yoshinobu, 4,188,775, Cl. 58-23.0AC.
CKD Praha, oborovy podnik: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Clarion Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,189,679, Cl. 325-474.000.
Clark, David E.: *See—*
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.
Clark, Jeffrey A.: *See—*
Mills, Douglas C.; and Clark, Jeffrey A., 4,189,134, Cl. 270-66.000.
Clark, Vernon R., to Phillips Petroleum Co. Isolated signal conditioner. 4,189,680, Cl. 330-59.000.
Clayton, William J., to Mobil Oil Corporation. Smokeless fire kindling device. 4,189,305, Cl. 44-41.000.
Clement, Henry L., Jr., to H. L. Clement Company. Method of sealing coke ovens. 4,189,457, Cl. 264-30.000.
Cochard, Pierre; and Guicherd, Christian, to Regie Nationale des Usines Renault. Internal combustion engine fuel feed. 4,188,923, Cl. 123-32.0ST.
Cohen, Amnon M., to Polak's Frutal Works, B.V. Process of the preparation of hydroxyfurenones. 4,189,439, Cl. 260-347.500.
Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. S-(+) 2,3,6-trimethyl-5-(2,2,4-trimethyl-1,3-dioxolane-4-ethyl)phenol. 4,189,612, Cl. 568-763.000.
Colautti, Franco, to Kinglor Metor S.p.A. Carbothermic process. 4,189,313, Cl. 75-37.000.
Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotic MM 13902. 4,189,473, Cl. 424-124.000.
Coleman, James P., to Monsanto Company. Preparation of 4,4-dioxy-substituted stilbenes. 4,189,610, Cl. 568-646.000.
Colgate-Palmolive Company: *See—*
Haver, Sanford A., 4,188,737, Cl. 36-131.000.
Collins, Joseph C., to Sterling Drug Inc. Aryl substituted diketones. 4,189,500, Cl. 424-331.000.
Collins, Robert C.; and Weber, Wallace E. Abrading tool. 4,188,696, Cl. 29-81.00J.
Colombo, Virginio, to Inventio AG. Door arrangement, especially for a residential structure. 4,188,753, Cl. 49-394.000.
Combette, Marc; and Noiray, Francois, to Societe de Prospection et d'Inventions Techniques SPIT. Return pawl for powder-actuated tool. 4,189,081, Cl. 227-10.000.
Comer, Jerry: *See—*
Higgins, Bobby L.; and Comer, Jerry, 4,189,337, Cl. 156-351.000.
Compagnie Generale des Etablissements Michelin: *See—*
Massoubre, Jean-Marie, 4,189,555, Cl. 526-179.000.
Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 4,189,524, Cl. 428-622.000.
Comstock, Lewis D.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.
Comstock & Wescott Inc.: *See—*
Rice, Richard E.; and Peterson, Charles W., 4,189,294, Cl. 431-7.000.
Conn, John L. Container with nozzle and/or drinking tube and closure means. 4,189,072, Cl. 222-519.000.
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., to Leeds & Northrup Company. Method for testing ion selective electrodes in continuous measuring systems. 4,189,367, Cl. 204-195.00G.
Conoco, Inc.: *See—*
Carlock, John T., 4,189,448, Cl. 260-604.0HF.
Consortium fur Elektrochemische Industrie GmbH: *See—*
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.
Constantino, Daniel G., to FIP, S. A. de C.V. Expanding gate valve. 4,189,127, Cl. 251-196.000.
Continental Group, Inc., The: *See—*
Klootwyk, Ronald I., 4,189,528, Cl. 429-70.000.
Control Devices, Inc.: *See—*
Flynn, M. Rutledge; and Schultz, Raymond P., 4,189,097, Cl. 237-8.00R.
Cook, Darwen J.; and Millers, Donald A., II, to Burroughs Corporation. Input-output subsystem for digital data processing system. 4,189,769, Cl. 364-200.000.
Cooper, Anthony R.: *See—*
Booth, Robin G.; and Cooper, Anthony R., 4,189,380, Cl. 210-23.00F.
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., to Purdue Research Foundation. Demodulator unit for spread spectrum apparatus utilized in a cellular mobile communication system. 4,189,677, Cl. 325-321.000.
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, to Dayco Corporation. Reinforced center bearing liner. 4,188,888, Cl. 105-199.00C.
Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 4,189,277, Cl. 414-664.000.
Copeland, John A., III, to Bell Telephone Laboratories, Incorporated. Semiconductor overload protection structure. 4,189,739, Cl. 357-51.000.
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., to Standard Oil Company (Indiana). Method for growing pseudomycelial yeasts and reducing bacterial contamination in a yeast fermentation process. 4,189,538, Cl. 435-247.000.
Corbin Gentry, Inc.: *See—*
Hanagan, Michael W., 4,188,697, Cl. 2/ 91.100.
Corghi Elettromeccanica S.p.A.: *See—*
Cuccolini, Maria, 4,188,828, Cl. 73-460.000.
Cornford, Neri E.: *See—*
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.
Costa, Armando, to Ing. C. Olivetti & Co., S.p.A. Sheet feeder for a writing system. 4,189,135, Cl. 271-4.000.
Coulter Electronics, Inc.: *See—*
Hogg, Walter R.; and Brunsting, Albert, 4,189,236, Cl. 356-317.000.
Courtney, Orley R. Wheel suspension system for a vehicle. 4,189,168, Cl. 280-284.000.
Cox, John M.: *See—*
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., 4,189,483, Cl. 424-251.000.
Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-5-thienylmethyl and furylmethyl-6-substituted and 6,7-disubstituted-benzofuran-2-carboxylic acid. 4,189,496, Cl. 424-275.000.
Cramaro, Nello. Tarpaulin cover system. 4,189,178, Cl. 296-105.000.
Cretzmeyer, John W.; and Espig, Hans R., to Gould Inc. Metal/oxygen cells and method for optimizing the active life properties thereof. 4,189,526, Cl. 429-13.000.

Cross, Michael A.: *See—*
Hurt, Fred S.; and Cross, Michael A., 4,189,233, Cl. 356-5.000.
Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. Marking systems containing 3-aryl-3-heterylphthalides and 3,3-bis(-heteryl)phthalides. 4,189,171, Cl. 282-27.500.
Crown Cork & Seal Company, Inc.: *See—*
Eissler, John C., 4,188,903, Cl. 113-120.0XY.
Crown Zellerbach Corporation: *See—*
Hartbauer, Ellsworth A.; and Weis, Rudolf R., 4,189,077, Cl. 225-14.000.
Csathy, Denis G.; and Hung, Wendell L. Y., to Deltak Corporation. Waste heat boiler for abstraction of heat energy from gaseous effluent containing corrosive chemical contaminants. 4,188,916, Cl. 122-7.00R.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Malerba, Oreste; and Neri, Antonio, 4,189,626, Cl. 179-84.00T.
Cuccolini, Maria, to Corghi Elettromeccanica S.p.A. Self-centering device for generally locking motor vehicle wheels on to balancing machine shafts. 4,188,828, Cl. 73-460.000.
Cuendet, Jean-Francois: *See—*
Shapiro, Daniel M.; and Cuendet, Jean-Francois, 4,189,491, Cl. 424-273.00R.
Culpepper, Will L., to Mead Corporation, The. Packaging machine. 4,188,766, Cl. 53-49.000.
Cummins, Kevin T., to Zardana Corporation N.V. Slipping clutch mechanism. 4,189,284, Cl. 417-313.000.
Cushion Cut, Inc.: *See—*
Reinhardt, Frederick N.; and Fouts, William A., 4,188,934, Cl. 125-4.000.
Cygnus X-5 Company Inc.: *See—*
Inman, Calvin R., 4,189,252, Cl. 405-33.000.
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., to Alfa-Laval AB. Multiple cyclone separator. 4,189,377, Cl. 209-211.000.
Daido Metal Company, Ltd.: *See—*
Mori, Sanae, 4,189,522, Cl. 428-557.000.
Mori, Sanae, 4,189,525, Cl. 428-643.000.
Daimler-Benz Aktiengesellschaft: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.
Dandl, Raphael A., to United States of America, Energy. Electron beam collector for a microwave power tube. 4,189,660, Cl. 315-5.380.
Dane, Oscar: *See—*
Weise, Irvin B.; and Dane, Oscar, 4,188,973, Cl. 137-514.000.
Danguillier, Wilhelm: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Darms, Roland: *See—*
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Data Products Corporation: *See—*
Harrison, Gregory F., 4,189,244, Cl. 400-55.000.
Daubach, Ewald: *See—*
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.
Davenport, Anthony T.: *See—*
Waid, George M.; and Davenport, Anthony T., 4,189,333, Cl. 148-36.000.
Davey, John E.; and Christou, Aristos, to United States of America, Navy. Ohmic contacts for group III-V n-type semiconductors using epitaxial germanium films. 4,188,710, Cl. 29-580.000.
Davies, David W. S. Ski carrier mount for vehicles. 4,189,074, Cl. 224-42.060.
Davies, Glyndwr J., to Glacier Metal Company Limited, The. Coated plain bearing and process of manufacture. 4,189,194, Cl. 308-35.000.
Davis, Robert E.: *See—*
Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., 4,189,372, Cl. 208-8.0LE.
Dawson, Peter H., to Canadian Patents and Development Limited. Quadrupole mass spectrometer. 4,189,640, Cl. 250-290.000.
Dawson, Robin. Pile guides. 4,189,256, Cl. 405-277.000.
Dayco Corporation: *See—*
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.
Henderson, Dewey D., 4,188,832, Cl. 74-233.000.
Dean, Lee W., III; and Peracchio, Aldo A., to United Technologies Corporation. Sound suppressor liners. 4,189,027, Cl. 181-286.000.
DeFilipps, Fred A., to Exxon Research & Engineering Co. Facsimile stylus assembly. 4,189,736, Cl. 346-139.00C.
De Graaf, Clare J., to Gordon Manufacturing Company. Low profile chair iron. 4,189,179, Cl. 297-305.000.
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., to Bausch & Lomb Incorporated. Polysiloxane shaped article for use in biomedical applications. 4,189,546, Cl. 528-26.000.
De Lorenzo, Bruce L., to Plasto-Matic Valves, Inc. Valve mechanism. 4,188,978, Cl. 137-859.000.
Deltak Corporation: *See—*
Csathy, Denis G.; and Hung, Wendell L. Y., 4,188,916, Cl. 122-7.00R.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Dispenser for rolls of flexible sheet material and cutter mechanism for use therein. 4,188,844, Cl. 83-337.000.
Denney, General C.; Lenz, John; and Williams, Joseph M., to McCall Pattern Company, The. Vacuum pickup device. 4,189,137, Cl. 271-103.000.
Denning, LeRoy M. Variable indexing pegs. 4,188,728, Cl. 33-184.500.
Densmore, Richard M.: *See—*
Klieman, Charles H.; and Densmore, Richard M., 4,188,953, Cl. 128-325.000.
Deprez, Thomas A., to Gleason Works, The. Clamping means for reducing deflections in machine tool. 4,189,267, Cl. 409-59.000.
Deraedt, Roger: *See—*
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.
DeRemer, Harold A., to General Electric Company. Door mechanism for appliances. 4,188,867, Cl. 99-385.000.
Descoins, Charles: *See—*
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, 4,189,614, Cl. 568-908.000.
Desso, Jerome A.: *See—*
Yeager, Marvin L.; and Desso, Jerome A., 4,189,200, Cl. 339-75.0MP.
Detweiler, Charles A., to Schmelzer Corporation. Vacuum motor for carburetors. 4,189,454, Cl. 261-39.00B.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.
de Villers, Bill. Sports equipment rack. 4,188,890, Cl. 108-30.000.
Devin, Charles: *See—*
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.
de Vries, Robert. Tennis racket. 4,189,142, Cl. 273-73.00D.
Dewey, Ronald A., to International Harvester Company. Boom prop. 4,189,278, Cl. 414-713.000.
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., to McKay International Engineers. Multi-directional crane truck. 4,188,887, Cl. 105-163.00R.
Dezseri, Eszter: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Diamond International Corporation: *See—*
O'Neill, Richard K.; and Wells, Roy T., 4,189,064, Cl. 222-321.000.
Diamond Power Specialty Corporation: *See—*
McKay, Donald E., 4,188,761, Cl. 52-474.000.
Dickey, Daniel M., to B & H Manufacturing Company, Inc. Rotary die cutting assembly for cutting labels. 4,188,843, Cl. 83-304.000.
Dieterich, Dieter, to Bayer Aktiengesellschaft. Polyhydroxy compounds containing urethane aryl sulfonic acid hydroxyalkyl ester groups. 4,189,562, Cl. 528-75.000.
Dingwall, Andrew G. F., to RCA Corporation. Memory organization. 4,189,782, Cl. 365-190.000.
Dinka, Stephen K., to United States of America, Agriculture. Serum cell growth promoting materials. 4,189,535, Cl. 435-2.000.
Director-General of Agency of Industrial Science and Technology: *See—*
Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, 4,189,373, Cl. 208-8.0LE.
Di Russo, Augustine P. Sausage cutting device. 4,189,132, Cl. 269-295.000.
Distugil: *See—*
Branlard, Paul; and Merle, Jean-Pierre, 4,189,567, Cl. 528-485.000.
Dittmann, Heiner: *See—*
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, 4,188,796, Cl. 62-121.000.
Dixon, William R., to Hoffmann-La Roche Inc. Immunoassay for zoxazolamine. 4,189,463, Cl. 424-1.000.
Dlugopolski, Joseph. Folding box with a drawer made from single blank. 4,189,087, Cl. 229-19.000.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Dr. Ing. Rudolf Hell GmbH: *See—*
Klopsch, Siegfried, 4,189,741, Cl. 358-76.000.
Klopsch, Siegfried, 4,189,742, Cl. 358-80.000.
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., to Mahaska Industries, Inc. Self cleaning animal floor assembly and method of fabricating same. 4,188,814, Cl. 72-324.000.
Doell, Raymond. Personal alarm system. 4,189,721, Cl. 340-539.000.
Dohm, Grant G. Windmill. 4,189,280, Cl. 415-2.000.
Doiron, Joseph G. Fly tyers bobbin. 4,189,111, Cl. 242-140.000.
Dollar, Dennis V.: *See—*
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Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., to International Harvester Company. Unitized face type seal. 4,189,159, Cl. 277-39.000.
Donaldson Company, Inc.: *See—*
Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, 4,189,724, Cl. 340-607.000.
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., to General Atomic Company. Fuel rod assembly to manifold attachment. 4,189,348, Cl. 176-79.000.
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., to Dow Chemical Company, The. Catalyst for making polyurethanes. 4,189,543, Cl. 521-128.000.
d'Orgelys, Henri Y. Fastener. 4,188,688, Cl. 24-211.00P.
dos Santos, Claudio, to Beehive Machinery, Inc. Deboning machine with bone expeller. 4,189,104, Cl. 241-82.300.

Doss, James D., to United States of America, Energy. Self-protecting transistor oscillator for treating animal tissues. 4,189,685, Cl. 331-62.000.

Dotson, Ronald L., to Olin Corporation. Method of purifying aqueous solutions of alkali metal hydroxides. 4,189,362, Cl. 204-149.000.

Douglas, Edwin S., III, to Circle K Company. Register assembly. 4,188,862, Cl. 98-41.0SV.

Douglas, Gavin L., to International Business Machines Corporation. Segmented storage logging and controlling. 4,189,781, Cl. 364-900.000.

Douwe Egberts Koninklijke Tabaksfabriek, Koffieliranderigen in Theehandel B.V.: *See—*
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,188,797, Cl. 62-123.000.

Dow Chemical Company, The: *See—*
Birkelbach, Donald F., 4,189,553, Cl. 526-92.000.
Britton, Thomas C.; and Trepanier, Donald L., 4,189,588, Cl. 548-324.000.
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.
Dunbar, Joseph E.; and Begin, Louis E., 4,189,579, Cl. 544-276.000.
Evans, John C.; and Wittbrodt, Edwin L., 4,189,335, Cl. 156-64.000.
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., 4,189,345, Cl. 162-168.00R.
Martin, Robert C., 4,189,002, Cl. 166-295.000.
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,189,510, Cl. 427-125.000.
Pews, R. Garth, 4,189,572, Cl. 544-11.000.
Schuster, Albert; and McCarthy, James R., 4,189,444, Cl. 260-453.0RW.
Seliskar, James T.; and Adams, Donald C., 4,189,058, Cl. 220-218.000.
Ward, Eldon L., 4,189,539, Cl. 521-25.000.

Dow Corning Corporation: *See—*
Bassani, Giovanni, 4,189,290, Cl. 425-113.000.

Dowiot, Lauren: *See—*
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.

Doyle, Terrence W.: *See—*
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Dragerwerk Aktiengesellschaft: *See—*
McBride, William S., 4,189,460, Cl. 422-165.000.
Pasternack, Adalbert, 4,188,947, Cl. 128-202.260.

Dressen, Heinz: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.

Dresser Industries, Inc.: *See—*
Greenlee, Donald R., 4,189,001, Cl. 166-216.000.
Upton, Thomas E., 4,188,998, Cl. 166-129.000.

Drinkuth, Gerald E. Automatic damper assembly. 4,189,090, Cl. 236-1.00G.

Drubin, Clifford A.: *See—*
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.

Drummond, Warren W., to PPG Industries, Inc. Creel. 4,189,110, Cl. 242-131.000.

Dryburgh, Peter M.; and Halstead, Raymond R., to National Research Development Corporation. Epitaxial crystalline aluminium nitride. 4,189,516, Cl. 428-409.000.

Dubin, Robert R., to Electric Power Research Institute, Inc. Na/S reactant container with protective resin coating. 4,189,531, Cl. 429-104.000.

Dubois, Philippe, to Nadella. Steering head set assembly. 4,189,167, Cl. 280-279.000.

Dubost, Bruno; and Bouvaist, Jean, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Process for thermal treatment of thin 7000 series aluminum alloys and products obtained. 4,189,334, Cl. 148-159.000.

Dudinyak, Ronald S., to Du Pont de Nemours, E. I., and Company. Process and composition for polymerizing and curing methyl methacrylate monomer-polymer syrups in the presence of metal salts of hemi-peresters of maleic acid. 4,189,451, Cl. 525-262.000.

Dudzik, Leonard J.: *See—*
Abbott, George A.; and Dudzik, Leonard J., 4,189,250, Cl. 403-190.000.

Duffy, Neil D., to Pico Electronics Limited. Remote control systems. 4,189,713, Cl. 340-168.00R.

Dunaeva, Tamara P.: *See—*
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Dunbar, Joseph E.; and Begin, Louis E., to Dow Chemical Company, The. Aminoalkylthiopurines. 4,189,579, Cl. 544-276.000.

Dunkl, Franz S.: *See—*
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,189,761, Cl. 361-433.000.

Du Pont de Nemours, E. I., and Company: *See—*
Dudinyak, Ronald S., 4,189,451, Cl. 525-262.000.
Fang, James C., 4,189,369, Cl. 204-296.000.
Gangal, Subhash V., 4,189,551, Cl. 526-74.000.
Gavin, John H., 4,188,704, Cl. 29-564.600.
Sam, Donnie J., 4,189,611, Cl. 525-472.000.
Sandy, Charles A., 4,189,306, Cl. 44-68.000.

Duquette, Lawrence G.: *See—*
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.

Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Amidinoformic and amidinosulphinic acids. 4,189,488, Cl. 424-263.000.

Durrer, Bernhard: *See—*
Schubert, Wolfgang; and Durrer, Bernhard, 4,189,644, Cl. 250-381.000.

Durst AG Fabrik Fototechnischer Apparate: *See—*
Barbieri, Siegfried, 4,189,227, Cl. 355-35.000.

Duttweiler, Donald L., to Bell Telephone Laboratories, Incorporated. μ-Law to floating point converter. 4,189,715, Cl. 340-347.0DD.

Duys, Nicolaas L. G.: *See—*
Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., 4,189,585, Cl. 546-349.000.

Dynamit Nobel AG: *See—*
Bendler, Hellmut; and Scheiderer, Gerrit, 4,188,856, Cl. 89-1.00B.

Dynamit Nobel Aktiengesellschaft: *See—*
Gauchel, Peter, 4,189,520, Cl. 428-520.000.

Dynapol: *See—*
Booth, Robin G.; and Cooper, Anthony R., 4,189,380, Cl. 210-23.00F.

E. R. Squibb & Sons, Inc.: *See—*
Truener, Uwe D.; and Breuer, Hermann, 4,189,482, Cl. 424-250.000.

E.S.G. Controls Limited: *See—*
Robinson, Anthony, 4,189,094, Cl. 236-46.00R.

Earl, Norman M.; and Brown, Alexander M. Bird feeders. 4,188,913, Cl. 119-51.00R.

Eastman Kodak Company: *See—*
Farrell, Robert J., 4,189,228, Cl. 355-41.000.
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.
Weiss, Armin K.; and Carnall, Edward, Jr., 4,189,406, Cl. 252-501.100.

Eaton Corporation: *See—*
Brown, Harry W.; and Heider, Erich E., 4,189,204, Cl. 339-275.00R.

Eaton, Jefferson O.: *See—*
Brauer, Larry F.; and Eaton, Jefferson O., 4,188,886, Cl. 102-223.000.

Ebauches Electroniques SA: *See—*
Fatton, Jean-Claude, 4,188,779, Cl. 58-153.000.

Ebauches S.A.: *See—*
Besson, Rene, 4,188,774, Cl. 58-4.00A.
Besson, Rene, 4,188,777, Cl. 58-58.000.
Scherrer, Igor, 4,188,776, Cl. 58-23.00R.

Eberle, Otto: *See—*
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.

Eberle, Robert, to Metabowerke GmbH & Co. Hammer drill. 4,189,011, Cl. 173-13.000.

Ebert, Edward A. Method of heating deformable articles on a support of verticle fibers. 4,189,630, Cl. 219-354.000.

Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, to Wacker-Chemie GmbH. Aqueous vinylchloride/vinyl acetate/ethylene copolymers and process. 4,189,415, Cl. 260-29.6WA.

Eddelbuttel & Schneider: *See—*
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.

Edixhoven, G. H., to Hunter Douglas International N.V. Method and apparatus for assembling slatted blinds. 4,188,693, Cl. 29-24.500.

Edward Shanbrom, Inc.: *See—*
Shanbrom, Edward; and Bishop, Robert C., 4,189,425, Cl. 260-112.00B.

Edwards, Arthur R.: *See—*
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Egee, Walter W.; and Weaver, George R., to Campbell Soup Company. Method and apparatus for sensing gas pressure in a container. 4,188,819, Cl. 73-52.000.

Ehrich, Ralph D.; and Emmert, Robert I., to Rockwell International Corporation. Navigation system. 4,189,116, Cl. 244-3.160.

Ehrlich, Stanley V., to Georgia-Pacific Corporation. Sheet transfer and stacking apparatus. 4,189,270, Cl. 414-45.000.

Eifler, Willi; and Ick, Juergen, to Bayer Aktiengesellschaft. Method for making a polyamine. 4,189,443, Cl. 260-453.0PH.

Eissler, John C., to Crown Cork & Seal Company, Inc. Closure-container combination and method for making the combination. 4,188,903, Cl. 113-120.0XY.

Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, to Chisso Corporation. Method of forming autogenously bonded non-woven fabric comprising bi-component fibers. 4,189,338, Cl. 156-167.000.

Elam, Edward U.: *See—*
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Electra Food Machinery, Inc.: *See—*
Jimenez, James A., 4,189,504, Cl. 426-508.000.

Electric Power Research Institute, Inc.: *See—*
Dubin, Robert R., 4,189,531, Cl. 429-104.000.

Mitoff, Stephan P., 4,189,530, Cl. 429-104.000.

Electro-Therm, Inc.: *See—*
Skinner, Charles A., 4,189,633, Cl. 219-458.000.

Eles, Janos: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Elfab Corporation: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.

Elias, Charles R., to Ex-Cell-O Corporation. Load measurement device. 4,188,821, Cl. 73-136.00R.

Elkerton, George D.: *See—*
Schmutzer, Joel; and Elkerton, George D., 4,189,663, Cl. 315-205.000.

Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, to Bayer Aktiengesellschaft. Process for the production of diisocyanatodiphenyl methane isomers with an adjusted content of chlorine compounds. 4,189,354, Cl. 203-81.000.

Eller, James D. Hydraulic turbine system. 4,188,788, Cl. 60-398.000.

Elliot, Myron A.; and Forbus, Robert H., to United States of America, Navy. Underwater generation of low frequency sound. 4,189,026, Cl. 181-118.000.

Ellis, Peter M.; and Selwood, Alan, to Imperial Chemical Industries Limited. Staple fibre webs. 4,189,512, Cl. 428-198.000.

Elsner, Emil: *See—*
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, 4,189,617, Cl. 13-18.00C.

Emmert, Robert I.: *See—*
Ehrich, Ralph D.; and Emmert, Robert I., 4,189,116, Cl. 244-3.160.

Endo, Takaya: *See—*
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.

Engel, Gary C. Oil reclamation device. 4,189,351, Cl. 196-115.000.

Engel, Gunter; and Wagner, Heribert, to Sandoz Ltd. Reducing free fatty acid of the blood and suppressing appetite. 4,189,494, Cl. 424-274.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.

Engelhard, William E., to Owego Heat Treat, Inc. Apparatus for protecting parts in heating and cooling processing cycles thereof. 4,189,129, Cl. 266-251.000.

Epina, August P.; Ganter, Robert J.; and Morehouse, James H., to Storage Technology Corporation. Isolation pocket for rack mounted tape drive. 4,189,113, Cl. 242-182.000.

Eprova Aktiengesellschaft: *See—*
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, 4,189,591, Cl. 548-342.000.

Equipment Company of America: *See—*
Thompson, Larry J., 4,189,128, Cl. 254-7.00R.

Erecta AG: *See—*
Ljungbo, Sven O. B., 4,188,756, Cl. 52-83.000.

Erie Technological Products, Inc.: *See—*
Marshall, Gilbert L., 4,189,760, Cl. 361-321.000.

Ermert, Ronald A. Engine air intake warning system. 4,189,707, Cl. 340-60.000.

Escher Wyss Limited: *See—*
Heuss, Valentin, 4,188,874, Cl. 100-170.000.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See—*
Herold, Wolf-Dietrich, 4,189,065, Cl. 222-46.000.
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.

Espig, Hans R.: *See—*
Cretzmeyer, John W.; and Espig, Hans R., 4,189,526, Cl. 429-13.000.

Ether, Theodore L., to Uniroyal, Inc. Extrusion head. 4,189,293, Cl. 425-376.00A.

Ethyl Corporation: *See—*
Jackson, James C., 4,188,705, Cl. 29-564.600.

Eutectic Corporation: *See—*
Patel, Mahesh S., 4,189,317, Cl. 75-252.000.

Evans, John C.; and Wittbrodt, Edwin L., to Dow Chemical Company, The. Method for determining distribution of a coating composition on a carpet structure. 4,189,335, Cl. 156-64.000.

Evdokimov, Svetozar V.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Ex-Cell-O Corporation: *See—*
Elias, Charles R., 4,188,821, Cl. 73-136.00R.
Fitzpatrick, Paul, 4,188,755, Cl. 51-206.00P.

Exxon Research & Engineering Co.: *See—*
DeFilipps, Fred A., 4,189,736, Cl. 346-139.00C.
Maa, Peter S.; and Vernon, Lonnie W., 4,189,371, Cl. 208-8.0LE.

Ezawa, Osamu: *See—*
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.

Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra. Aluminum can crushing device. 4,188,875, Cl. 100-218.000.

Facet Enterprises, Inc.: *See—*
Miller, Donald L., 4,189,042, Cl. 192-84.00C.

Faiveley S.A.: *See—*
Favrel, Michel, 4,188,889, Cl. 105-445.000.
Monot, Bernard, 4,188,752, Cl. 49-218.000.

Fales, Gene T.; and Dollar, Dennis V. Lamp packaging. 4,189,051, Cl. 206-326.000.

Fall, Don R.; and Lamarche, Paul E., to Borg-Warner Corporation. Torsional vibration damper. 4,188,805, Cl. 64-27.00C.

Fall, Don R.; and Lamarche, Paul E., to Borg-Warner Corporation. Torsional vibration damper assembly. 4,188,806, Cl. 64-27.00C.

Fang, James C., to Du Pont de Nemours, E. I., and Company. Diaphragm of hydrophilic fluoropolymers. 4,189,369, Cl. 204-296.000.

Fansteel Inc.: *See—*
Arnold, Leonard R.; and Berry, Robert W., Jr., 4,189,265, Cl. 407-114.000.
Kraemer, Rolf H., 4,189,264, Cl. 407-2.000.

Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Isoquinoline derivatives. 4,189,480, Cl. 424-246.000.

Faris, Bernard L. Apparatus for suspending a planter. 4,189,124, Cl. 248-318.000.

Farr, Glyn P. R., to Girling Limited. Hydraulically-operated disc brakes for vehicles. 4,189,032, Cl. 188-73.300.

Farrar, James G. Monitor for divers to avoid decompression. 4,188,825, Cl. 73-291.000.

Farrell, Robert J., to Eastman Kodak Company. Apparatus for detecting locators on a film strip. 4,189,228, Cl. 355-41.000.

Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., to Raytheon Company. Solid state diode amplifier. 4,189,683, Cl. 330-287.000.

Fatton, Jean-Claude, to Ebauches Electroniques SA. Electronic timepiece capable of simulating and displaying a game of chance. 4,188,779, Cl. 58-153.000.

Faustinos, Carlos Q. Fuel vaporizing apparatus for internal combustion engines. 4,188,928, Cl. 123-122.0AA.

Favara, Duccio; and Guzzi, Umberto, to Gruppo Lepetit S.p.A. 13-Azaprostaglandins. 4,189,606, Cl. 562-455.000.

Favrel, Michel, to Faiveley S.A. Retractable running-board, especially for a railway car door. 4,188,889, Cl. 105-445.000.

Fazio, Rodolfo: *See—*
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.

Fecske, Aurel J.: *See—*
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Federal Signal Corporation: *See—*
Gosswiller, Earl W., 4,189,709, Cl. 340-84.000.

Fehlberg, David J., to American Hospital Supply Corporation. Endoscope and urological instrument lock. 4,188,942, Cl. 128-6.000.

Feild, Alexander L., Jr., to United States of America, Energy. Nuclear fuel composition. 4,189,398, Cl. 252-301.10R.

Feldman, Paul L., to Research-Cottrell, Inc. High voltage wetted parallel plate collecting electrode arrangement for an electrostatic precipitator. 4,189,308, Cl. 55-13.000.

Feltham, Colin R.: *See—*
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.

Fenley, William F., Jr.: *See—*
Martin, Lincoln A.; and Fenley, William F., Jr., 4,189,704, Cl. 367-60.000.

Ferezy, Edward: *See—*
Aelion, Rene; and Ferezy, Edward, 4,189,364, Cl. 204-159.220.

Ferlenghi, Pierarturo: *See—*
Tosi, Carlo; and Ferlenghi, Pierarturo, 4,189,499, Cl. 424-316.000.

Ferro Corporation: *See—*
Heasley, James H., 4,189,209, Cl. 350-103.000.

Fibra-Sonics, Inc.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,189,286, Cl. 417-477.000.

Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., to Fried. Krupp Huttenwerke AG. Method of utilizing waste dust and waste sludge from blast furnaces and steel works. 4,189,314, Cl. 75-46.000.

Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic computer with automatic decimal point setting means. 4,189,780, Cl. 364-744.000.

Figov, Murray; and Whitlam, Iain E., to Vickers Limited. Blank for conversion into a perforated stencil by spark erosion. 4,188,880, Cl. 101-128.210.

Finan, Michael A.: *See—*
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.

Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of nitriles. 4,189,580, Cl. 544-301.000.

Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., to Sprague Electric Company. Non-aqueous electrolytic capacitor electrolyte. 4,189,761, Cl. 361-433.000.

Finley, Warren T. Method for bringing nutrient-rich water from the aphotic zone of the ocean to the photic zone. 4,189,379, Cl. 210-22.00D.

FIP, S. A. de C.V.: *See—*
Constantino, Daniel G., 4,189,127, Cl. 251-196.000.

Firestone Tire & Rubber Company, The: *See—*
Mitchell, George B.; and Oberster, Arthur E., 4,189,413, Cl. 260-29.20M.

Fischer, Hermann: *See—*
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.

Fischer, Kurt, to WIGO Gottlob Widmann & Sohne GmbH. Electric coffee or tea maker. 4,188,864, Cl. 99-307.000.

Fischer, Peter: *See—*
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.
Fish, Herbert L. Impact tool, handle assembly therefor, and method of attaching handle to head. 4,188,703, Cl. 29-460.000.
Fisher, Charles B.; and Fisher, Sidney T. Deep focus fiber optic lens. 4,189,207, Cl. 350-96.250.
Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,189,207, Cl. 350-96.250.
Fisons Limited: *See—*
Bodor, Nicholas S.; and Zupan, Jack A., 4,189,571, Cl. 542-427.000.
Fitzpatrick, Paul, to Ex-Cell-O Corporation. Expandable abrading tool and abrasive insert and washers thereof. 4,188,755, Cl. 51-206.00P.
Flanagan, James L., to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer filter assembly. 4,189,627, Cl. 179-180.000.
Fleischer, Helmut, to Robert Bosch GmbH. Automotive internal combustion engine servo control system, particularly for automatic speed control arrangement. 4,188,926, Cl. 123-102.000.
Florent, Jean; Lunel, Jean; and Mancy, Denise, to Rhone-Poulenc Industries. α,δ-Diaminoacid and its lactam. 4,189,349, Cl. 435-87.000.
Flores, Robert J., to Sherwin-Williams Company, The. Method of producing a greener shade Alkali Blue product and product produced thereby. 4,189,328, Cl. 106-288.00Q.
Flynn, M. Rutledge; and Schultz, Raymond P., to Control Devices, Inc. Device for controlling heat. 4,189,097, Cl. 237-8.00R.
Fontein, Freerk J.; and Jennekens, Hubertus F., to Stamicarbon, B.V. Gas treatment of liquid. 4,189,384, Cl. 210-60.000.
Forbus, Robert H.: *See—*
Elliot, Myron A.; and Forbus, Robert H., 4,189,026, Cl. 181-118.000.
Ford Motor Company: *See—*
Bregi, James F., 4,189,315, Cl. 75-251.000.
Forest Electric Company: *See—*
Schmutzer, Joel; and Elkerton, George D., 4,189,663, Cl. 315-205.000.
Forman, Everett W. Mirror-picture. 4,188,740, Cl. 40-152.100.
Formica, Vincent A.: *See—*
Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.
Foshee, James J., to NCR Corporation. Data communication system and bit-timing circuit. 4,189,622, Cl. 178-69.100.
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., to Dow Chemical Company, The. Fibrous compositions. 4,189,345, Cl. 162-168.00R.
Fouts, William A.: *See—*
Reinhardt, Frederick N.; and Fouts, William A., 4,188,934, Cl. 125-4.000.
Franch, Gino. Hydraulic machine. 4,188,786, Cl. 60-325.000.
Frank, Amalie J., to Bell Telephone Laboratories, Incorporated. Multilevel processing of image signals. 4,189,711, Cl. 340-146.30H.
Frank, Bertil G.: *See—*
Wetterlin, Leif Sune V.; and Frank, Bertil G., 4,188,986, Cl. 141-130.000.
Frankiewicz, Theodore C.: *See—*
Lueders, Robert E.; and Frankiewicz, Theodore C., 4,189,461, Cl. 423-27.000.
Frederiksen, Thomas M., to National Semiconductor Corporation. Integrated circuit package with optical input coupler. 4,188,708, Cl. 29-572.000.
Freliech, Robert A.: *See—*
Ballard, Gary W.; and Freliech, Robert A., 4,189,091, Cl. 236-11.000.
Frickel, Fritz-Frieder: *See—*
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Weis, Herbert, 4,189,106, Cl. 242-82.000.
Fried. Krupp Huttenwerke AG: *See—*
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.
Frohberger, Paul-Ernst: *See—*
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.
Frost, John L. Masonry building block and method for forming such a block. 4,188,760, Cl. 52-405.000.
Fuchs, Richard W. Window putty removal apparatus. 4,188,723, Cl. 30-276.000.
Fuchs, Werner: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Fujii, Etsuo: *See—*
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Fujikake, Kenji: *See—*
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,189,281, Cl. 415-213.00C.
Fujishiro, Takeshi; and Kita, Toru, to Nissan Motor Company, Limited. Method for detection of fluctuation in air/fuel ratio of air-fuel mixture fed to internal combustion engine. 4,189,355, Cl. 204-1.00T.
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Drive shaft of fan coupling assembly for motor vehicles. 4,188,800, Cl. 64-4.000.
Fujitsu Limited: *See—*
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.
Zasio, Gabriel, 4,189,230, Cl. 355-76.000.
Fujiwara, Hirohiko: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.
Fujiwhara, Mitsuto: *See—*
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.
Fujizaki, Masayoshi, deceased: *See—*
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Fujizaki, Yasugoro, Tomoo Fujizaki, successors: *See—*
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Fukke, Hajime: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Fulberth, Werner: *See—*
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.
Fulton, James E., Jr., to A. H. C. Pharmacal, Inc. Composition and method for the treatment of acne. 4,189,501, Cl. 424-338.000.
Funari, Anthony V., to Hughes Aircraft Company. Infrared tracking system. 4,189,747, Cl. 358-126.000.
Furusawa, Tomotaka: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Furuya, Miyuki: *See—*
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.
Furuya, Takashi: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
G.A.O.Gesellschaft fur Automation und Organisation mbH: *See—*
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.
G. D. Searle & Co.: *See—*
Andersen, Erik, 4,188,989, Cl. 150-9.000.
G & W Maschinen AG: *See—*
Sprecher, Andreas, 4,189,112, Cl. 242-159.000.
GAF Corporation: *See—*
Waxman, Burton H., 4,189,319, Cl. 430-380.000.
Gaillard, Hubert: *See—*
Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert, 4,189,292, Cl. 425-290.000.
Gaillard, Raymond. Article holder. 4,189,048, Cl. 206-37.000.
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., to Gulf & Western Manufacturing Company. Replacement torque rod assembly. 4,189,249, Cl. 403-27.000.
Gamblin, Rodger L., to Mead Corporation, The. Gray tone reproduction apparatus. 4,189,754, Cl. 358-296.000.
Gamso, Robert; and Gamso, Robert A. Space heater for use with fireplace. 4,188,939, Cl. 126-121.000.
Gamso, Robert A.: *See—*
Gamso, Robert; and Gamso, Robert A., 4,188,939, Cl. 126-121.000.
Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.
Gangal, Subhash V., to Du Pont de Nemours, E. I., and Company. Process for reducing adhesions during suspension polymerization. 4,189,551, Cl. 526-74.000.
Gannon, Patrick M.; and Liptay, John S., to International Business Machines Corporation. Cache bypass control for operand fetches. 4,189,770, Cl. 364-200.000.
Ganter, Robert J.: *See—*
Epina, August P.; Ganter, Robert J.; and Morehouse, James H., 4,189,113, Cl. 242-182.000.
Garrett, William R., to Smith International, Inc. Earth boring tool. 4,189,012, Cl. 175-312.000.
Garrison, Charles G., to Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.). Mechanism for leak testing of hermetically sealed vessels. 4,188,818, Cl. 73-40.700.
Garron, Stephen A.; and Odermann, Charles R., to Singer Company, The. Method of buttonhole formation. 4,188,900, Cl. 112-264.100.
Gateway Industries, Inc.,: *See—*
Bryll, Medard Z., 4,189,708, Cl. 340-64.000.
Gati, Sandor: *See—*
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.
Gattyan, Andor. Piston/cylinder type elements and compactors embodying those elements. 4,188,873, Cl. 100-98.00R.
Gauchel, Peter, to Dynamit Nobel Aktiengesellschaft. Shaped structural members having improved lightfastness and weatherproofness. 4,189,520, Cl. 428-520.000.
Gavin, John H., to Du Pont de Nemours, E. I., and Company. Hand tool and loader. 4,188,704, Cl. 29-564.600.
Gawron, Klaus: *See—*
Schroder, Johann; and Gawron, Klaus, 4,189,393, Cl. 252-70.000.
Schroder, Johann; and Gawron, Klaus, 4,189,394, Cl. 252-70.000.

Gazizov, Raif T.: *See—*
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., to Carrier Corporation. Seal system for a turbomachine employing working fluid in its liquid phase as the sealing fluid. 4,189,156, Cl. 277-1.000.
Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Borowski, Karl-Heinz, 4,189,183, Cl. 299-1.000.
Schupphaus, Herbert; and Oberste-Beulmann, Klaus, 4,189,188, Cl. 299-53.000.
Gebr. Spring, Metallwarenfabrik G.m.b.H.: *See—*
Hasenfratz, Rene, 4,188,938, Cl. 126-43.000.
Gebruder Lodige Maschinenbau GmbH: *See—*
Luke, Karlheinz, 4,189,242, Cl. 366-288.000.
General Atomic Company: *See—*
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.
General Dynamics Electronics Division: *See—*
Rope, Eugene L.; and Tricoles, Gus P., 4,189,731, Cl. 343-872.000.
General Electric Company: *See—*
Burns, Richard D., 4,188,712, Cl. 29-596.000.
DeRemer, Harold A., 4,188,867, Cl. 99-385.000.
Goossens, John C., 4,189,417, Cl. 260-29.6NR.
Haaf, William R., 4,189,411, Cl. 260-27.00R.
Johnson, Daniel; and Girard, Raymond T., 4,188,781, Cl. 60-39.28R.
Modic, Frank J., 4,189,545, Cl. 521-131.000.
O'Meara, Michael F., 4,189,773, Cl. 364-300.000.
Peterson, Marvin A., 4,189,518, Cl. 428-458.000.
Sugalski, Raymond K., 4,189,533, Cl. 429-223.000.
General Motors Corporation: *See—*
Krage, Mark K., 4,189,629, Cl. 219-10.55A.
General Tire & Rubber Company, The: *See—*
Shanoski, Henry; and Reichenbach, Donald F., 4,189,517, Cl. 428-423.700.
Geophysical Systems Corp.: *See—*
Martin, Lincoln A.; and Fenley, William F., Jr., 4,189,704, Cl. 367-60.000.
Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,188,844, Cl. 83-337.000.
Ehrlich, Stanley V., 4,189,270, Cl. 414-45.000.
Gerlivanov, Evgeny V.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.
Gernhardt, Paul: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Gesellschaft fur Hochtemperaturreaktor-Technik mbH: *See—*
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, 4,189,347, Cl. 176-58.0PB.
Getman, Harlan R., to Vroman Foods, Inc. Apparatus for producing frozen confections. 4,188,768, Cl. 53-282.000.
Getman, Harlan R., to Vroman Foods, Inc. Method and apparatus for producing and processing frozen confections. 4,189,289, Cl. 425-93.000.
Getrag Getriebe- und Zanhradfabrik GmbH: *See—*
Muller, Erich, 4,189,041, Cl. 192-53.00F.
Gewerkschaft Eisenhutte Westfalia: *See—*
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.
Gewerkschaft Schalker Eisenhutte: *See—*
Gregor, Karl; and Asmus, Kurt, 4,189,272, Cl. 414-161.000.
Gier, Josef: *See—*
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.
Giguere, James R., to Cereal Enterprises, Inc. Method of degerminating a kernel of grain by simultaneously compressing the edges of the kernel. 4,189,503, Cl. 426-482.000.
Giles, Maurice R.: *See—*
Chiron, Georges; and Giles, Maurice R., 4,189,506, Cl. 427-8.000.
Girard, Edmond, to Messier. Central heating plant. 4,189,096, Cl. 237-2.00B.
Girard, Raymond T.: *See—*
Johnson, Daniel; and Girard, Raymond T., 4,188,781, Cl. 60-39.28R.
Girling Limited: *See—*
Farr, Glyn P. R., 4,189,032, Cl. 188-73.300.
Margetts, Hugh G.; and Assinder, Andrew J., 4,189,191, Cl. 303-52.000.
Giudicelli, Don P. R. L.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.
Glacier Metal Company Limited, The: *See—*
Davies, Glyndwr J., 4,189,194, Cl. 308-35.000.
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., to Rockwell International Corporation. Epitaxial growth of M-type hexagonal ferrite films on spinel substrates and composite. 4,189,521, Cl. 428-539.000.
Glass, Neel W., to Les-Kare Inc. Composition horseshoe. 4,189,004, Cl. 168-4.000.
Gleason Works, The: *See—*
Deprez, Thomas A., 4,189,267, Cl. 409-59.000.
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, to Hoechst Aktiengesellschaft. Pharmaceutical compositions. 4,189,469, Cl. 424-80.000.
Gless, Richard D.: *See—*
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.
Glory Kogyo Kabushiki Kaisha: *See—*
Onoe, Katsuhiko; and Kosaka, Toshihisa, 4,188,962, Cl. 133-4.00R.
Glowacki, Pierre A.: *See—*
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti. System of busbars for aluminium-producing electrolyzers. 4,189,368, Cl. 204-243.00M.
Gode, Charles R. Prefabricated greenhouse structure. 4,188,764, Cl. 52-582.000.
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., to Sweda International, Inc. Document printing system. 4,189,217, Cl. 354-7.000.
Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Battery electrode with expander. 4,189,532, Cl. 429-215.000.
Goodrich, Robert S. Reciprocating pneumatic sanding and rubbing machine. 4,188,857, Cl. 91-352.000.
Goodyear Tire & Rubber Company, The: *See—*
Burroway, Gary L.; and Maximovich, Michael J., 4,189,561, Cl. 526-317.000.
Osborn, Robert A.; and Bullard, Herbert L., 4,189,547, Cl. 525-99.000.
Rye, Grover W.; and Marencak, Karol, 4,189,332, Cl. 148-6.310.
Goossens, John C., to General Electric Company. Process for the polymerization of alkenyl aromatic monomers in the presence of polyphenylene oxides. 4,189,417, Cl. 260-29.6NR.
Gordon Manufacturing Company: *See—*
De Graaf, Clare J., 4,189,179, Cl. 297-305.000.
Gosswiller, Earl W., to Federal Signal Corporation. Modular housing assembly for vehicle warning light system. 4,189,709, Cl. 340-84.000.
Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia: *See—*
Gusarov, Anatoly A.; and Shatalov, Lev N., 4,189,507, Cl. 427-47.000.
Gotz, Bernhard: *See—*
Abels, Theodor; and Gotz, Bernhard, 4,189,020, Cl. 180-54.00A.
Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, 4,189,025, Cl. 180-159.000.
Gould Inc.: *See—*
Cretzmeyer, John W.; and Espig, Hans R., 4,189,526, Cl. 429-13.000.
Reichman, Eli, 4,189,198, Cl. 339-13.000.
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, to Bosch-Siemens Hausgerate GmbH. Automatic washing machine for textiles having separate containers for washing substances, meters and common pre-mix channel for metered substances. 4,188,807, Cl. 68-17.00R.
Graham, David J.: *See—*
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.
Graham Magnetics, Inc.: *See—*
Johnson, Robert A., 4,189,514, Cl. 428-331.000.
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., to W. T. Rogers Co. Woven construction system. 4,188,983, Cl. 139-424.000.
Grams, Wolfgang: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Grant, William J.: *See—*
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.
Grantz, Helmut: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.
Grau, Thomas G., to Bell Telephone Laboratories, Incorporated. Electrical socket connector construction. 4,189,199, Cl. 339-75.0MP.
Graves, Donald J. Junk metal compressor. 4,188,876, Cl. 100-232.000.
Gravestock, Michael B.: *See—*
Johnson, William S.; and Gravestock, Michael B., 4,189,431, Cl. 260-239.55R.
Green, Ethan R.: *See—*
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.
Green, Harold F. Rotary drilling and extracting process. 4,189,184, Cl. 299-8.000.
Green, James H.: *See—*
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.
Green, Stanley E., to Hycel, Inc. Reagent systems, enzymatic assays and compositions therefor. 4,189,536, Cl. 435-12.000.
Greenfield, Mark S.: *See—*
Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.

Greenlee, Donald R., to Dresser Industries, Inc. Friction spring and slip retainer for a mechanical setting tubing anchor. 4,189,001, Cl. 166-216.000.

Greenspan, Donald J. Method and apparatus for separating serum or plasma from the formed elements of the blood. 4,189,385, Cl. 210-136.000.

Greenwood, David L.: *See—*
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Greer, Bradley G., to A & E Plastik Pak Co. Inc. Travel awning. 4,188,964, Cl. 135-5.0AT.

Gregor, Karl; and Asmus, Kurt, to Gewerkschaft Schalker Eisenhutte. Method of and apparatus for charging coal into a coke oven chamber. 4,189,272, Cl. 414-161.000.

Gregorio, Guglielmo: *See—*
Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, 4,189,441, Cl. 260-410.90R.

Greier, Josef: *See—*
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.

Gresko, Laurence S.: *See—*
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.

Griebel, Heinrich: *See—*
Wagner, Josef; and Griebel, Heinrich, 4,189,098, Cl. 239-127.000.

Griffith, James H.: *See—*
Shay, Greg D.; and Griffith, James H., 4,189,421, Cl. 260-38.000.

Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., to Klingepharma GmbH & Co. Novel derivatives of 1,3-diphenoxy-propane-2-on, process of their preparation and their use as medicaments. 4,189,594, Cl. 560-53.000.

Grillier, Jean-Claude: *See—*
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.

Grimm, Raymond L., to Muskegon Piston Ring Company. Bi-directional ring gap seal. 4,189,161, Cl. 277-221.000.

Grimmer, Franz, to Robert Bosch GmbH. Method and apparatus for defining duration of fuel injection control pulses. 4,188,921, Cl. 123-32.0EA.

Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., to Bell Telephone Laboratories, Incorporated. Zinc chloride optical fibers for transmission in the infrared. 4,189,208, Cl. 350-96.340.

Grogler, Gerhard: *See—*
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.

Grollier, Jean-Francois: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Grossi, Lucio. Automatic machine for the production of coffee from roasted coffee beans. 4,188,863, Cl. 99-286.000.

Grube, Helmuth: *See—*
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

Gruppo Lepetit S.p.A.: *See—*
Favara, Duccio; and Guzzi, Umberto, 4,189,606, Cl. 562-455.000.

Grybos, David P.: *See—*
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.

GTE Laboratories Incorporated: *See—*
Haugsjaa, Paul O.; and White, Edward F., 4,189,661, Cl. 315-39.000.

GTE Sylvania Incorporated: *See—*
Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.
Shaffer, John W., 4,189,298, Cl. 431-359.000.

Guicherd, Christian: *See—*
Cochard, Pierre; and Guicherd, Christian, 4,188,923, Cl. 123-32.0ST.

Guillaume, Emile A. H., to Zelacolor Systems Establishment. Enlarger. 4,189,229, Cl. 355-67.000.

Gulf Oil Corporation: *See—*
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.

Gulf & Western Manufacturing Company: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,189,249, Cl. 403-27.000.

Gulla, Michael; and Savas, Christy. Stabilized electroless plating solutions. 4,189,324, Cl. 106-1.220.

Gunn, Paul C.: *See—*
Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., 4,189,195, Cl. 312-209.000.

Gunther, William H., Jr.: *See—*
McPherson, John B.; and Gunther, William H., Jr., 4,189,341, Cl. 156-654.000.

Gurwara, Sweet K.: *See—*
Rich, Daniel H.; and Gurwara, Sweet K., 4,189,605, Cl. 562-438.000.

Gusarov, Anatoly A.; and Shatalov, Lev N., to Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia. Method for balancing rotors. 4,189,507, Cl. 427-47.000.

Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, to G.A.O.Gesellschaft fur Automation und Organisation mbH. Test device for dynamically measuring the degree of dirt accumulation on bank-notes. 4,189,235, Cl. 356-239.000.

Gutsche, Klaus: *See—*
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, 4,189,581, Cl. 544-324.000.

Guzzi, Umberto: *See—*
Favara, Duccio; and Guzzi, Umberto, 4,189,606, Cl. 562-455.000.

Guzzle, Timothy L.; and Sheeley, Eugene L., to AMF Incorporated. Golf club. 4,189,144, Cl. 273-77.00R.

H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M.; and Strauss, Edgar H., 4,189,089, Cl. 229-61.000.

H. L. Clement Company: *See—*
Clement, Henry L., Jr., 4,189,457, Cl. 264-30.000.

Haaf, William R., to General Electric Company. Modified polyphenylene ether compositions having lower melt viscosities. 4,189,411, Cl. 260-27.00R.

Hachisu, Mitsugu: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Hackman, Donald J.; and Brunel, Roger L., to United States of America, Navy. Diver-controlled underwater linear milling machine. 4,189,268, Cl. 409-183.000.

Haddad, George N.; and Butt, Frederick A., to Owens-Corning Fiberglas Corporation. Polyester resin composition. 4,189,452, Cl. 525-444.000.

Hagen, Helmut: *See—*
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.

Hahn, John E. Adjustable semi-flexible health shoe. 4,188,735, Cl. 36-11.500.

Hajos, Zoltan G.: *See—*
Parrish, Daid R.; and Hajos, Zoltan G., 4,189,447, Cl. 260-586.00F.

Hakon Myking Metall-Industri: *See—*
Myking, Reidar, 4,189,202, Cl. 339-101.000.

Halbritter, Klaus, to BASF Aktiengesellschaft. Preparation of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole dihydrochloride. 4,189,592, Cl. 548-342.000.

Haley, John S.: *See—*
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C..

Hall, James G.: *See—*
Massa, Donald P.; and Hall, James G., 4,189,719, Cl. 340-501.000.

Hall, John F., to Chrysler Corporation. Articulated exhaust system. 4,188,784, Cl. 60-323.000.

Hall, John O. Packframe-canteen. 4,189,075, Cl. 224-148.000.

Hallenius, Tore Jerker: *See—*
Akesson, Bengt A., 4,189,254, Cl. 405-128.000.

Haller, Helen D.: *See—*
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., 4,189,538, Cl. 435-247.000.

Halstead, Raymond R.: *See—*
Dryburgh, Peter M.; and Halstead, Raymond R., 4,189,516, Cl. 428-409.000.

Halter, Hartmut, to Reifenhauser KG. Apparatus for producing blown synthetic-resin foils and films. 4,189,288, Cl. 425-72.00R.

Hamada, Masa: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Hamaguchi, Takehiko: *See—*
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, 4,189,218, Cl. 354-25.000.

Hamilton, William J. Latch bolt accessory. 4,189,176, Cl. 292-346.000.

Hamm, Ronald E.: *See—*
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Hamma, Karlmann, to Zahnradfabrik Friedrichshafen AG. Hydraulic servocontroller for a hydrostatic transmission. 4,188,789, Cl. 60-444.000.

Hanagan, Michael W., to Corbin Gentry, Inc. Method of making motorcycle seat frame. 4,188,697, Cl. 29-91.100.

Hanazuka, Mitsuo: *See—*
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.

Hane, Naruaki: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Hanes Corporation: *See—*
King, James F., 4,189,259, Cl. 406-63.000.

Hanifin, John W.; and Ridge, David N., to American Cyanamid Company. β-oxo-3-thiophene propionitrile and β-amino-2-(3)-thiophene acrylonitriles. 4,189,436, Cl. 549-72.000.

Hanifin, John W.; and Sloboda, Adolph E., to American Cyanamid Company. Method of treating arthritic disease. 4,189,497, Cl. 424-275.000.

Hannah, John: *See—*
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.

Hannebaum, Manfred: *See—*
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.

Hanson, Gordon L.: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.

Hara, Kunio, to Nifco Inc. Thermal cut-off fuse. 4,189,697, Cl. 337-407.000.

Hara, Kunio, to Nifco Inc. Resettable thermal cut-off fuse. 4,189,698, Cl. 337-407.000.

Haren, Doyle V.: *See—*
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.

Harlander, Donald C.: *See—*
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,188,887, Cl. 105-163.00R.

Harner, Kermit I., to United Technologies Corporation. Wind turbine generator acceleration control. 4,189,648, Cl. 290-44.000.

Harper, Philip M.; and Johnson, Kirby W., to Boeing Commercial Airplane Company. Variable twist leading edge flap. 4,189,121, Cl. 244-214.000.

Harrell, John B.: *See—*
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.

Harriman, Russell H. Method and device for transmitting confidential information through the mail. 4,189,353, Cl. 283-6.000.

Harrington Manufacturing Company: *See—*
Jordan, Betram L.; and Mitchell, John D., 4,188,772, Cl. 56-10.200.

Harris, Frank W., to Valleylab, Inc. Multiple source electrosurgical generator. 4,188,927, Cl. 128-303.140.

Harrison, Gregory F., to Data Products Corporation. Platen gap adjuster. 4,189,244, Cl. 400-55.000.

Hartbauer, Ellsworth A.; and Weis, Rudolf R., to Crown Zellerbach Corporation. Sheet material dispensing device. 4,189,077, Cl. 225-14.000.

Hartco Company: *See—*
Pearson, Kenneth C., 4,189,523, Cl. 428-571.000.

Hartig, Juergen: *See—*
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

Harvey, Miden G.: *See—*
Harvey, Phillip D.; and Harvey, Miden G., 4,188,745, Cl. 46-32.000.

Harvey, Phillip D.; and Harvey, Miden G. Infant toy. 4,188,745, Cl. 46-32.000.

Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased (by Takahata, Kousaku, legal successor), to Nippon Kogaku K.K. Control system for flash photographing apparatus. 4,189,219, Cl. 354-33.000.

Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, to Aisin Seiki Kabushiki Kaisha; Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing cup. 4,189,160, Cl. 277-205.000.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Apparatus for piling veneer sheets. 4,189,271, Cl. 414-35.000.

Hasegawa, Koichi: *See—*
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.

Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, to Takeda Chemical Industries, Ltd. Antibiotic C-11924 F-1. 4,189,472, Cl. 424-117.000.

Hasenfratz, Rene, to Gebr. Spring, Metallwarenfabrik G.m.b.H. Burner device, especially for a brazier or the like. 4,188,938, Cl. 126-43.000.

Hashimoto, Takeshi: *See—*
Wakatsuki, Goroei; and Hashimoto, Takeshi, 4,188,834, Cl. 74-489.000.

Hashimoto, Tsutomu: *See—*
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.

Hatano, Kazunori: *See—*
Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, 4,189,472, Cl. 424-117.000.

Haugsjaa, Paul O.; and White, Edward F., to GTE Laboratories Incorporated. Electrodeless fluorescent light source. 4,189,661, Cl. 315-39.000.

Haus, Hans. Apparatus for the continuous exposure of sheet or strip copy material. 4,189,231, Cl. 355-100.000.

Haver, Sanford A., to Colgate-Palmolive Company. Sport shoes. 4,188,737, Cl. 36-131.000.

Hayashi, Kazushige: *See—*
Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.

Hayashi, Masaharu: *See—*
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Hayes, Thomas E., to Johnson Controls, Inc. Method and apparatus for controlling furnace. 4,189,296, Cl. 431-20.000.

Hazzard, Graham: *See—*
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.

Heasley, James H., to Ferro Corporation. Retroreflector of integrated light reflecting units of varying configurations. 4,189,209, Cl. 350-103.000.

Hector, Roy W.: *See—*
Swanson, Charles E.; and Hector, Roy W., 4,189,632, Cl. 219-413.000.

Hedinger, Alfred: *See—*
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, 4,189,591, Cl. 548-342.000.

Hegar, Gert: *See—*
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Jeschke, Willi; Schilling, Paul; and Breunig, Anton, 4,188,882, Cl. 101-148.000.

Heider, Erich E.: *See—*
Brown, Harry W.; and Heider, Erich E., 4,189,204, Cl. 339-275.00R.

Heiman, Frederic P., to Mars, Inc. Coin mechanism exact change indicator apparatus. 4,188,961, Cl. 133-2.000.

Heinz, David M.: *See—*
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.

Hemel, Johan H.: *See—*
Kroeze, Hendrik J.; and Hemel, Johan H., 4,188,861, Cl. 93-93.00C.

Hench, Larry L.: *See—*
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.

Henderson, Dewey D., to Dayco Corporation. Endless power transmission belt. 4,188,832, Cl. 74-233.000.

Henkel & Cie GmbH: *See—*
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.

Hennart, Claude, to Airwick Industries Inc. Insecticidal compositions exhibiting a synergistic effect. 4,189,475, Cl. 424-200.000.

Henrick, Clive A.: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,189,598, Cl. 560-56.000.

Herbert, Calvin J., to Western Electric Company, Inc. Method and apparatus for orienting and stripping an end portion of a bundle of wires. 4,188,702, Cl. 29-427.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See—*
Maykemper, Alfred; and Kahl, Hans-Jurgen, 4,189,258, Cl. 405-291.000.

Herold, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Metering dispenser for high-viscosity compositions. 4,189,065, Cl. 222-46.000.

Herr, John A.: *See—*
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.

Herrmann, Manfred: *See—*
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.

Hertz, Martin R.: *See—*
Martin, John H. E. J.; and Hertz, Martin R., 4,189,537, Cl. 435-75.000.

Herz, Kurt P. Garment container, carrier and hanger. 4,189,035, Cl. 190-43.000.

Hestermann, Klaus; and Vollmer, Hartfried, to Hoechst Aktiengesellschaft. Production of quaternary phosphonium hydroxides. 4,189,449, Cl. 260-606.50F.

Heuss, Valentin, to Escher Wyss Limited. Press with two pressure rollers. 4,188,874, Cl. 100-170.000.

Hewlett-Packard Company: *See—*
Scott, Peter M., 4,189,621, Cl. 178-67.000.

Heyer, Willy: *See—*
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.

Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., to Thermal Transfer Division of Kleinewefers. Heat recovery systems. 4,188,993, Cl. 165-8.000.

Hibi, Toshikatsu: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Hicks, William W.: *See—*
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., 4,189,356, Cl. 204-25.000.

Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, to Raytheon Company. Microwave power combiner. 4,189,684, Cl. 331-56.000.

Hieber, Allen L.: *See—*
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.

Higgins, Bobby L.; and Comer, Jerry, to Camsco, Inc. Real time labeler system. 4,189,337, Cl. 156-351.000.

Higuchi, Takeru; and Hussain, Anwar A., to Alza Corporation. Intrauterine system embracing selected copolymeric membranes for administering beneficial agent. 4,188,951, Cl. 128-260.000.

Hilgers, Manfred: *See—*
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Hill, David C., to Texas Instruments Incorporated. Resistor device and method of making. 4,189,509, Cl. 427-102.000.

Hill, David C., to Texas Instruments Incorporated. Resistor device. 4,189,700, Cl. 338-333.000.

Hiller, Heinrich: *See—*
Hoch, Helmut; and Hiller, Heinrich, 4,189,582, Cl. 546-37.000.

Hinkle, Richard E., to American Hydrotherm Corporation. Apparatus for the cyclic heating and cooling of processing equipment. 4,188,995, Cl. 165-64.000.

Hinode Electric Machine Co., Ltd.: *See—*
Hirahara, Shigeyoshi, 4,189,695, Cl. 337-204.000.

Hinshaw, Louis W. Cooling and heating apparatuses. 4,188,994, Cl. 165-61.000.

Hirahara, Shigeyoshi, to Hinode Electric Machine Co., Ltd. Current limiting fuse device employing cooling and insulating medium. 4,189,695, Cl. 337-204.000.

Hirai, Seiichi: *See—*
Otsuka, Nobuyuki; and Hirai, Seiichi, 4,188,803, Cl. 64-21.000.

Hiranuma, Hidetoshi: *See—*
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.

Hirata, Akira: *See—*
Uchida, Isamu; and Hirata, Akira, 4,189,139, Cl. 271-162.000.

Hirata, Hiromasa: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Hiratuka, Tomoyosi; and Saito, Akihiro, to Hitachi, Ltd. Rectifier assembly for rectifying output of alternator for internal combustion engine. 4,189,653, Cl. 310-68.00D.

Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, to Matsushita Electronics Corporation. Solid state image sensing device. 4,189,749, Cl. 358-167.000.

Hirschfeld, Richard L. Power control unit for automatic control of power consumption in a lighting load. 4,189,664, Cl. 315-297.000.

Hitachi, Ltd.: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Hiratuka, Tomoyosi; and Saito, Akihiro, 4,189,653, Cl. 310-68.00D.
Ishimoto, Masaki; and Kajiwara, Toshiyuki, 4,188,809, Cl. 72-17.000.
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, 4,189,641, Cl. 250-311.000.
Oyama, Tadao, 4,188,695, Cl. 29-25.190.
Suzuki, Yoshihisa, 4,189,115, Cl. 242-195.000.

Hitachi Metals, Ltd.: *See—*
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.

Hoch, Helmut; and Hiller, Heinrich, to BASF Aktiengesellschaft. Process for upgrading the color value of 3,4,9,10-tetracarboxylic acid N,N'-bis-methylimide. 4,189,582, Cl. 546-37.000.

Hocker, Van G. Combined milk flow sensing and vacuum shut-off device. 4,188,910, Cl. 119-14.080.

Hoechst Aktiengesellschaft: *See—*
Buhr, Gerhard, 4,189,323, Cl. 430-281.000.
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.
Hestermann, Klaus; and Vollmer, Hartfried, 4,189,449, Cl. 260-606.50F.
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.

Hoehn, Rudolph H., to Slater Electric, Inc. Screw mounting means. 4,188,854, Cl. 85-36.000.

Hoekstra, Irenus A. Desulfurization of flue gas. 4,189,309, Cl. 55-44.000.

Hoff, Stephen J., to Hoffco, Inc. Lawn trimmer chain saw attachment. 4,188,719, Cl. 30-122.000.

Hoffacker, Franz: *See—*
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Hoffco, Inc.: *See—*
Hoff, Stephen J., 4,188,719, Cl. 30-122.000.

Hoffman, William F.: *See—*
Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., 4,189,496, Cl. 424-275.000.

Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, to BASF Aktiengesellschaft. Photopolymerizable compositions for the production of printing plates and relief plates containing dianthronyl or bisanthrone compound. 4,189,322, Cl. 430-284.000.

Hoffmann, Herwig: *See—*
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.

Hoffmann, Irmgard: *See—*
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.

Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,189,586, Cl. 548-303.000.
Cohen, Noal; and Saucy, Gabriel, 4,189,612, Cl. 568-763.000.
Dixon, William R., 4,189,463, Cl. 424-1.000.
Li, Choh H., 4,189,426, Cl. 260-112.50R.
Parrish, Daid R.; and Hajos, Zoltan G., 4,189,447, Cl. 260-586.00F.
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.

Hoffmann, Nicole. Dial and cylinder knitting machine. 4,188,804, Cl. 66-24.000.

Hogg, Walter R.; and Brunsting, Albert, to Coulter Electronics, Inc. Ellipsoid-conic radiation collector and method. 4,189,236, Cl. 356-317.000.

Hohle, Hans-Werner: *See—*
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.

Hohn, Herbert: *See—*
Maier, Karl; and Hohn, Herbert, 4,189,269, Cl. 414-19.000.

Holden, Homer N.: *See—*
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.

Hollaender, Fritz; and Schneider, Klaus, to Phoeniz AG; and Eddelbuttel & Schneider. Annular shaped buoyancy element for transport hoses. 4,188,679, Cl. 9-8.00R.

Holt, Brian; and Lee, Peter I., to Ciba-Geigy Corporation. 1,3-Diaminomethyl-hydantoin additives for lubricating oils. 4,189,587, Cl. 548-312.000.

Holtschmidt, Ulrich: *See—*
Laqua, Arnold; and Holtschmidt, Ulrich, 4,189,311, Cl. 71-67.000.

Homanick, George: *See—*
Bromell, Raymond J.; and Homanick, George, 4,188,787, Cl. 60-327.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nakazawa, Yoshihiro, 4,189,762, Cl. 362-72.000.
Otsuka, Nobuyuki; and Hirai, Seiichi, 4,188,803, Cl. 64-21.000.
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Wakatsuki, Goroei; and Hashimoto, Takeshi, 4,188,834, Cl. 74-489.000.

Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, to Director-General of Agency of Industrial Science and Technology. Process for the production of ashless liquid fuels. 4,189,373, Cl. 208-8.0LE.

Honecker, Gunter: *See—*
Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, 4,189,025, Cl. 180-159.000.

Honeywell Inc.: *See—*
Lorenze, Robert V., Jr.; and White, William J., 4,188,709, Cl. 29-577.00R.
van der Zee, Jan H., 4,188,972, Cl. 137-489.000.

Hood, John D.: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,189,473, Cl. 424-124.000.

Hood, William R., to United States of America, National Aeronautics and Space Administration. Detection of the transitional layer between laminar and turbulent flow areas on a wing surface. 4,188,823, Cl. 73-147.000.

Hopkins, James R. Solar heating system. 4,188,941, Cl. 126-440.000.

Horiguchi, Shinju; and Sahashi, Joji, to Nippon Telegraph and Telephone Public Corporation. Racing circuit for controlling access of processor units to a common device. 4,189,766, Cl. 364-200.000.

Horng, Fu-Erh. Safety device for lamps of motor vehicle. 4,189,662, Cl. 315-136.000.

Horninger, Karlheinrich: *See—*
Schrader, Lothar; and Horninger, Karlheinrich, 4,189,737, Cl. 357-23.000.

Hotta, Shigeo, to Kabushiki Kaisha Sanetsu. Apparatus for removing oil mist. 4,189,310, Cl. 55-317.000.

Hsieh, Shane H., to American Hoechst Corporation. Light-sensitive o-quinone diazide compositions and photographic reproduction processes and structures. 4,189,320, Cl. 430-145.000.

Huchler, Otto H.: *See—*
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.

Hudson Oxygen Therapy Sales Company: *See—*
Rowland, Robert O., 4,189,725, Cl. 340-636.000.

Hugh, Melvin D.; and Moore, Chauncey H., to Ingersoll-Rand Company. Universal joint. 4,188,801, Cl. 64-7.000.

Hughes Aircraft Company: *See—*
Bock, George F.; and Walsh, Bernard L., Jr., 4,189,690, Cl. 332-30.00V.
Funari, Anthony V., 4,189,747, Cl. 358-126.000.

Hughes, Nathaniel. Stable vortex generating device. 4,189,101, Cl. 239-405.000.

Hughes, Ralph O.: *See—*
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,188,887, Cl. 105-163.00R.

Humphrey Instruments Inc.: *See—*
Humphrey, William E., 4,189,215, Cl. 351-7.000.

Humphrey, William E., to Humphrey Instruments Inc. Method and apparatus for the corneal positioning of a patient's eye. 4,189,215, Cl. 351-7.000.

Hung, Wendell L. Y.: *See—*
Csathy, Denis G.; and Hung, Wendell L. Y., 4,188,916, Cl. 122-7.00R.

Hunter Douglas International N.V.: *See—*
Edixhoven, G. H., 4,188,693, Cl. 29-24.500.

Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert. Extruding head for making reticulated seamless tubes. 4,189,292, Cl. 425-290.000.

Hureau, Jean-Claude: *See—*
Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert, 4,189,292, Cl. 425-290.000.

Hurst, John W., to Chrysler Corporation. Drive coupling and clutches. 4,189,038, Cl. 192-21.000.

Hurt, Fred S.; and Cross, Michael A., to Westinghouse Electric Corp. Passive optical range simulator device. 4,189,233, Cl. 356-5.000.

Huseby, Irvin C.; and Klug, Frederic J. Nonstoichiometric $MgAl_2O_3$ for casting advanced superalloy materials. 4,189,326, Cl. 106-62.000.

Hussain, Anwar A.: *See—*
Higuchi, Takeru; and Hussain, Anwar A., 4,188,951, Cl. 128-260.000.

Hutai, Hubert: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.

Hutflesz, Heather E., to Imperial Chemical Industries Limited. Method of forming pile products by tack-spinning and heat treatment therefore. 4,189,336, Cl. 156-72.000.

Hycel, Inc.: *See—*
Green, Stanley E., 4,189,536, Cl. 435-12.000.

Hydroplastics, Inc.: *See—*
Aelion, Rene; and Ferezy, Edward, 4,189,364, Cl. 204-159.220.

Hylton, Earl A. Electrical receptacle provided with an alarm system. 4,189,723, Cl. 340-568.000.

Ick, Juergen: *See—*
Eifler, Willi; and Ick, Juergen, 4,189,443, Cl. 260-453.0PH.

Iga, Akira, to Sony Corporation. Method and apparatus for detecting errors in a transmitted code. 4,189,710, Cl. 340-146.1AL.

Iizuka, Haruhiko, to Nissan Motor Company, Limited. Apparatus for controlling operation of inlet and exhaust valves and supply of fuel to selected cylinders of all of multi-cylinder I. C. engine. 4,188,933, Cl. 123-198.00F.

Iizuka, Yutaka, to Nippon Kogaku K.K. Zoom lens system. 4,189,213, Cl. 350-184.000.

Ikeda, Shigeru: *See—*
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.

Ikeya, Nobushige: *See—*
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.

Imai, Kin-ichi: *See—*
Matsuno, Toshimi; and Imai, Kin-ichi, 4,189,485, Cl. 424-253.000.

Imperial Chemical Industries Limited: *See—*
Allen, Christopher S., 4,189,397, Cl. 252-171.000.
Atkinson, John H., 4,189,602, Cl. 568-801.000.
Ellis, Peter M.; and Selwood, Alan, 4,189,512, Cl. 428-198.000.
Hutflesz, Heather E., 4,189,336, Cl. 156-72.000.
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., 4,189,483, Cl. 424-251.000.
Wakeford, David E., 4,189,422, Cl. 260-40.00R.

Infrared Industries, Inc.: *See—*
Vandehei, Peter T., 4,189,205, Cl. 350-1.700.

Ing. C. Olivetti & C., S.p.A.: *See—*
Figini, Mario, 4,189,780, Cl. 364-744.000.

Ing. C. Olivetti & Co., S.p.A.: *See—*
Costa, Armando, 4,189,135, Cl. 271-4.000.

Ingersoll-Rand Company: *See—*
Hugh, Melvin D.; and Moore, Chauncey H., 4,188,801, Cl. 64-7.000.

Inman, Calvin R., to Cygnus X-5 Company Inc. Undersea platform construction system. 4,189,252, Cl. 405-33.000.

Inouye, Shigeharu: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, to Tokyo Shibaura Electric Co., Ltd. Method and apparatus for subsection analysis using computed tomography. 4,189,775, Cl. 364-414.000.

Institut National de la Recherche Agronomique: *See—*
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, 4,189,614, Cl. 568-908.000.

Institute for Cancer Research: *See—*
Blumberg, Baruch S.; and Millman, Irving, 4,189,464, Cl. 424-1.000.

International Business Machines Corporation: *See—*
Arrasmith, Fred V.; Bruns, Donald G.; and Killam, David G., 4,189,133, Cl. 270-61.00F.
Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.
Douglas, Gavin L., 4,189,781, Cl. 364-900.000.
Gannon, Patrick M.; and Liptay, John S., 4,189,770, Cl. 364-200.000.
Justus, Dennis J.; and Smith, Gerald L., 4,189,642, Cl. 250-324.000.
Kane, Milburn H.; and Barrow, Norman F., 4,189,246, Cl. 400-144.200.
Liptay, John S.; and Rymarczyk, James W., 4,189,768, Cl. 364-200.000.
Liptay, John S., 4,189,772, Cl. 364-200.000.
Rhodes, Robert T., 4,188,694, Cl. 29-25.170.
Roever, Paul R., 4,189,771, Cl. 364-300.000.

International Harvester Company: *See—*
Dewey, Ronald A., 4,189,278, Cl. 414-713.000.
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,189,159, Cl. 277-39.000.

International Minerals & Chemical Corporation: *See—*
Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., 4,189,103, Cl. 241-20.000.

International Nickel Company, Inc., The: *See—*
Scarpellino, Anthony J., Jr; and Borner, William G., 4,189,358, Cl. 204-43.00N.

International Standard Electric Corporation: *See—*
Andre, Wolfram; and Muller, Hans, 4,189,659, Cl. 313-412.000.

Inventio AG: *See—*
Colombo, Virginio, 4,188,753, Cl. 49-394.000.

Ion, John C., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,188,835, Cl. 74-501.00R.

Ishida, Hiroshi: *See—*
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.

Ishida, Noboru: *See—*
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Ishihara, Heigo: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Ishikawa, Takashi: *See—*
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Ishimoto, Masaki; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Apparatus for detecting the shape of a strip. 4,188,809, Cl. 72-17.000.

Ishizuka, Masaaki: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Isola Fabrikker A/S: *See—*
Thiis-Evensen, Eyvind M., 4,188,763, Cl. 52-557.000.

Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. Common circuitry VIR control apparatus for color television receiver. 4,189,740, Cl. 358-21.00V.

Itaya, Sam S.: *See—*
Burglin, Robert E.; and Itaya, Sam S., 4,188,682, Cl. 15-97.00R.

Ito, Junichi: *See—*
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Itoh, Osamu: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Itoh, Takao: *See—*
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ITT Industries, Incorporated: *See—*
Luepertz, Hans-Henning, 4,189,190, Cl. 303-6.00C.

Iuchi, Keiko: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

J. P. Stevens & Co., Inc.: *See—*
Pike, Herbert J., 4,188,692, Cl. 28-271.000.

Jablonsky, Erich, to Zahnradfabrik Friedrichshafen AG. Auxiliary power steering for motor vehicles. 4,189,024, Cl. 180-133.000.

Jackson, James C., to Ethyl Corporation. Thermal barrier stitching apparatus. 4,188,705, Cl. 29-564.600.

Jackson, Norman C., to Standard Products Company, The. Dual durometer flange cover. 4,188,765, Cl. 52-716.000.

Jackson, Sylvester, to Waldes Kohinoor, Inc. Dispensing methods and apparatus for split retaining rings. 4,189,062, Cl. 221-188.000.

Jackson, Winston J., Jr.: *See—*
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.

Jacobson, Kjell G.: *See—*
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Jacobson, Sava. Telephone answering device having simplified mechanical controls. 4,189,623, Cl. 179-6.00R.

Jaffe, Wolfgang: *See—*
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.

Jalfre, Maurice: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

James, Henry J.; and Young, Carter R., to Otis Engineering Corporation. Method of completing wells in which the lower tubing is suspended from a tubing hanger below the wellhead and upper removable tubing extends between the wellhead and tubing hanger. 4,189,003, Cl. 166-315.000.

James, Robert G. Log splitting attachment. 4,188,987, Cl. 144-193.00R.

Janka, Raymond C.: *See—*
Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., 4,189,372, Cl. 208-8.0LE.

Janoe, Charles E.; and Spector, George. Portable tent/canopy for jeeps. 4,188,963, Cl. 135-1.00A.

Janssen, Wilhelm J. P.: *See—*
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.

Janu, George J.: *See—*
Trobaugh, Arnold G.; and Janu, George J., 4,188,968, Cl. 137-236.00R.

Japan Aircraft Mfg. Co., Ltd.: *See—*
Kato, Shigeru, 4,189,148, Cl. 273-350.000.

Jarnagin, William S. Operationally confined nuclear fusion system. 4,189,346, Cl. 176-5.000.

Jarva, Inc.: *See—*
Snyder, Larry L., 4,189,186, Cl. 299-31.000.

Jean, Larry, to Teledyne Electro-Mechanisms. Rigid termination for flexible printed circuits. 4,188,714, Cl. 29-628.000.

Jennekens, Hubertus F.: *See—*
Fontein, Freerk J.; and Jennekens, Hubertus F., 4,189,384, Cl. 210-60.000.

Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, to Brdr. Schur International A/S. Packing of the folding bag type. 4,189,050, Cl. 206-245.000.

Jerinic, George: *See—*
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.

Jervis B. Webb Company: *See—*
Abbott, George A.; and Dudzik, Leonard J., 4,189,250, Cl. 403-190.000.

Jeschke, Willi; Schilling, Paul; and Breunig, Anton, to Heidelberger Druckmaschinen Aktiengesellschaft. Dampening unit for offset printing machines. 4,188,882, Cl. 101-148.000.

Jezl, James L., to Standard Oil Company a corporation of Indiana. Method for converting polymer powder to pellets. 4,189,458, Cl. 264-143.000.
Jimenez, James A., to Electra Food Machinery, Inc. Method of cooking foods. 4,189,504, Cl. 426-508.000.
Jirkovsky, Ivo L.: *See—*
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,189,490, Cl. 424-269.000.
Jochum, Peter: *See—*
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.
Johannes Fuchs, Firma: *See—*
Scheuerpflug, Hans; and Althoff, Dieter, 4,189,021, Cl. 180-54.00C.
John, E. Roy. Method for the analysis, display and classification of multivariate indices of brain function—a functional electrophysiological brain scan. 4,188,956, Cl. 128-731.000.
Johne, Hans: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.
Johns-Manville Corporation: *See—*
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.
Johnson, Barry C.; and Pellechia, Vincent J., to Motorola, Inc. Low temperature and low cost assembly process for nonlinear resistors. 4,189,083, Cl. 228-123.000.
Johnson, Barry C.; and Pellechia, Vincent J., to Motorola, Inc. Low cost assembly processes for non-linear resistors and ceramic capacitors. 4,189,084, Cl. 228-123.000.
Johnson, Bernard L. Locking modular assembly. 4,189,123, Cl. 248-220.200.
Johnson Controls, Inc.: *See—*
Hayes, Thomas E., 4,189,296, Cl. 431-20.000.
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Trobaugh, Arnold G.; and Janu, George J., 4,188,968, Cl. 137-236.00R.
Johnson, Daniel; and Girard, Raymond T., to General Electric Company. Non-linear dual mode regulator circuit. 4,188,781, Cl. 60-39.28R.
Johnson, David L.; and Doyle, Terrence W., to Bristol-Myers Company. Antibiotic purification process. 4,189,568, Cl. 536-17.00A.
Johnson, Gary R.: *See—*
Kammerer, Archer W., Jr.; and Johnson, Gary R., 4,189,185, Cl. 299-13.000.
Johnson, Kirby W.: *See—*
Harper, Philip M.; and Johnson, Kirby W., 4,189,121, Cl. 244-214.000.
Johnson, Lee W., to Reell Precision Manufacturing Corporation. Method of indexing a spring clutch. 4,189,039, Cl. 192-26.000.
Johnson, Lewis T.: *See—*
Carroll, James C.; and Johnson, Lewis T., 4,189,052, Cl. 206-507.000.
Johnson, Matthey & Co., Limited: *See—*
Knapton, Arthur G.; and McGill, Ian R., 4,189,405, Cl. 252-462.000.
Johnson, Ralph E.; and Urciola, John A., to Singer Company, The. Needle bight control mechanism. 4,188,895, Cl. 112-158.00D.
Johnson, Robert A., to Graham Magnetics, Inc. Process of making high-temperature magnetic tape. 4,189,514, Cl. 428-331.000.
Johnson, William E.: *See—*
Baker, Theodore C.; and Johnson, William E., 4,189,729, Cl. 340-777.000.
Johnson, William S.; and Gravestock, Michael B., to Leland Stanford Junior University, The Board of Trustees of. Alkinyl terminating groups in biogenetic-like cyclizations to steroids. 4,189,431, Cl. 260-239.55R.
Jones, Graham R. S.; and Wyatt, Edwin E., to Masson Scott Thrissell Engineering Limited. Positioning apparatus. 4,188,846, Cl. 83-499.000.
Jones, Harry S.: *See—*
Weller, Royal; and Jones, Harry S., 4,188,905, Cl. 114-253.000.
Jones, William W.: *See—*
Kelley, Charles K.; and Jones, William W., 4,189,261, Cl. 406-112.000.
Jones, Wilson M. Method of making a shelf support post. 4,189,459, Cl. 264-255.000.
Jordan, Betram L.; and Mitchell, John D., to Harrington Manufacturing Company. Hydraulic speed control system for the pick-up reel of a peanut combine. 4,188,772, Cl. 56-10.200.
Jordan, Edgar R. Engine cylinder valve control mechanism and cylinder head and engine incorporating same. 4,188,925, Cl. 123-90.120.
Jordan, Henry W. Scaffold device. 4,189,029, Cl. 182-179.000.
Jossin, Alain: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, to Richter Gedeon Vegyeszeti Gyar Rt. N-formyl and N-desmethyl leurosine derivatives. 4,189,432, Cl. 260-244.400.
Joyce, John E. Method of generating liquid concentration gradients hydrostatically. 4,188,967, Cl. 137-1.000.
Judd, Robert L., to Whirlpool Corporation. Refuse disposal system. 4,188,879, Cl. 100-229.00A.
Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Mages, Bernhard, 4,188,685, Cl. 16-159.000.
Jung, Dietmar: *See—*
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
Jung, Johann: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Junginger, Erich: *See—*
Schnaibel, Eberhard; and Junginger, Erich, 4,189,093, Cl. 236-37.000.
Jurenko, Robert D.: *See—*
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., 4,189,367, Cl. 204-195.00G.
Justus, Dennis J.; and Smith, Gerald L., to International Business Machines Corporation. Method and apparatus for drum corona current measurement and alignment. 4,189,642, Cl. 250-324.000.
Kabara, Jon J., to Michigan State University. Antimicrobial compositions. 4,189,481, Cl. 424-248.540.
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, to Bayer Aktiengesellschaft. Combating pests with 2-carboxymethyl-3-carboxy-chromones and esters. 4,189,498, Cl. 424-283.000.
Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Matui, Yukito, 4,188,727, Cl. 33-147.00T.
Kabushiki Kaisha Morita Seisakusho: *See—*
Kataoka, Kenzo; and Nakayama, Shoji, 4,188,725, Cl. 433-129.000.
Kabushiki Kaisha Sanetsu: *See—*
Hotta, Shigeo, 4,189,310, Cl. 55-317.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,189,281, Cl. 415-213.00C.
Kabushiki Kiasha Komatsu Seisakusho: *See—*
Mizushima, Akira, 4,188,815, Cl. 72-446.000.
Kaetzel, Pierre, to Samibem, S.A. Mower-conditioner. 4,188,773, Cl. 56-192.000.
Kafunek, Pavel: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Kahan, William, to Singer Company, The. Bobbin thread run-out detectors. 4,188,902, Cl. 112-278.000.
Kahl, Hans-Jurgen: *See—*
Maykemper, Alfred; and Kahl, Hans-Jurgen, 4,189,258, Cl. 405-291.000.
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, to Matsushita Electric Industrial Co., Ltd. Process for analyzing charged particles. 4,189,639, Cl. 250-282.000.
Kaiser Aerospace & Electronics Corporation: *See—*
Ast, Herbert H., 4,188,675, Cl. 4-295.000.
Kaiser, Wilhelm: *See—*
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.
Kajiwara, Toshiyuki: *See—*
Ishimoto, Masaki; and Kajiwara, Toshiyuki, 4,188,809, Cl. 72-17.000.
Kakeya, Nobuharu; and Yoshimura, Yoshinobu, to Takeda Chemical Industries, Ltd. Cephalosporin esters. 4,189,479, Cl. 424-246.000.
Kakiyama, Hitoo: *See—*
Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, 4,189,373, Cl. 208-8.0LE.
Kali-Chemie Pharma GmbH: *See—*
Thies, Peter W.; and Asai, Akiji, 4,189,437, Cl. 260-340.300.
Kalso, Anne. Mini-support belt for garments. 4,188,672, Cl. 2-221.000.
Kaman Aerospace Corporation: *See—*
Kaman, Charles W., II, 4,188,850, Cl. 84-291.000.
Kaman, Charles W., II, to Kaman Aerospace Corporation. Foamed plastic guitar construction. 4,188,850, Cl. 84-291.000.
Kamimura, Shoji: *See—*
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, 4,189,641, Cl. 250-311.000.
Kammerer, Archer W., Jr.; and Johnson, Gary R., to Tri-State Oil Tool Industries, Inc. Method for producing chambered blast holes. 4,189,185, Cl. 299-13.000.
Kamo, Morris D.: *See—*
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.
Kane, Milburn H.; and Barrow, Norman F., to International Business Machines Corporation. Variable print-hammer control for on-the-fly-printing. 4,189,246, Cl. 400-144.200.
Kanegafuchi Chemical Industry Co., Ltd.: *See—*
Matsumura, Yoshitsugu, 4,188,894, Cl. 112-156.000.
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, to Rank Xerox Ltd. Paper feeder. 4,189,138, Cl. 271-109.000.
Kankura, Ralf; and Keck, Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Device for measuring the liquid level of an electrically conductive liquid. 4,188,826, Cl. 73-304.00R.
Kanno, Takao: *See—*
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.
Kanno, Takashi: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli,

Don P. R. L., to Synthelabo. 2-Methoxy-benzamide derivatives. 4,189,495, Cl. 424-274.000.
Karalius, Edward J. Pipe cleaner. 4,188,959, Cl. 131-245.000.
Karayannis, Nicholas M.; and Lee, Sam S., to Standard Oil Company (Indiana). Polymerization process. 4,189,556, Cl. 526-141.000.
Karcher, Karl-Friedrich; and Merkle, Otto, to Zahnradfabrik Friedrichshafen AG. Hydraulic steering limit control. 4,189,023, Cl. 180-132.000.
Karp, Erich. Fluid dispenser for a shower bath. 4,189,100, Cl. 239-310.000.
Kashima, Yoshinobu, to Citizen Watch Company Limited. Frequency adjustment means for electric timepiece. 4,188,775, Cl. 58-23.0AC.
Kashio, Toshio, to Casio Computer Co., Ltd. Change calculating apparatus. 4,189,774, Cl. 364-405.000.
Kasper, Rudolf: *See—*
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, 4,189,617, Cl. 13-18.00C.
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Axial flow fan having auxiliary blades. 4,189,281, Cl. 415-213.00C.
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, to Hitachi, Ltd. Electron microscope. 4,189,641, Cl. 250-311.000.
Katakabe, Noboru: *See—*
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.
Kataoka, Kenzo; and Nakayama, Shoji, to Kabushiki Kaisha Morita Seisakusho. Dental hand-piece with an air turbine. 4,188,725, Cl. 433-129.000.
Kato, Keigo: *See—*
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.
Kato, Kikuo: *See—*
Nakao, Toshiyuki; and Kato, Kikuo, 4,188,838, Cl. 74-701.000.
Kato, Shigeru, to Japan Aircraft Mfg. Co., Ltd. Towed target ship with submerged hull. 4,189,148, Cl. 273-350.000.
Kato, Tetuo, to Tokico Ltd. Hydraulic damper. 4,189,034, Cl. 188-318.000.
Kato, Yoshiki: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Katsiaficas, Mary D. Recreational structure including flexible tubular member. 4,189,149, Cl. 272-113.000.
Katsumori, Teiji, to Tokico Ltd. Shock absorber. 4,189,033, Cl. 188-269.000.
Katsura, Hiromitsu: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.
Kawaguchi, Kiyokazu: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Kawamura, Tateo: *See—*
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Kawanami, Takao: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, to Matsushita Electric Industrial Co., Ltd. Method of making a commutator for small-sized electric motor. 4,188,713, Cl. 29-597.000.
Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical shutter circuit. 4,189,221, Cl. 354-51.000.
Kawasaki Steel Corporation: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.
Kawata, Shunichi: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.
Keck, Jurgen: *See—*
Kankura, Ralf; and Keck, Jurgen, 4,188,826, Cl. 73-304.00R.
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., to Engelhard Minerals & Chemicals Corporation. Catalyst and process of its preparation. 4,189,404, Cl. 252-462.000.
Keith, Charles H.: *See—*
Levers, William E.; and Keith, Charles H., 4,189,511, Cl. 428-167.000.
Keldmann, Erik: *See—*
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.
Keller, Joergen, to A/S Jac. Engelbredt. Footwear with specially formed insole. 4,188,736, Cl. 36-80.000.
Kelley, Charles K.; and Jones, William W., to Charles K. Kelley and Sons, Inc. Single line pneumatic tube system. 4,189,261, Cl. 406-112.000.
Kellner, Bela: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Kellow, Raymond E., Sr.: *See—*
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Kelly, John: *See—*
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Kemenater, Christof: *See—*
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Kempter, Fritz E.; and Schupp, Eberhard, to BASF Aktiengesellschaft. Surface-coating binders and their use for cathodic electrocoating. 4,189,450, Cl. 525-455.000.
Kendall Company, The: *See—*
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.
Kendall, Thomas L., to Toro Company, The. Simplified irrigation controller. 4,189,776, Cl. 364-420.000.
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Kenneth E. Beswick Limited: *See—*
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Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
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Kerr-McGee Corporation: *See—*
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Riggs, Olen L., Jr., 4,189,357, Cl. 204-29.000.
Kesling, Haven S., Jr.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of dimethyl adipate by the hydrogenation of dimethyl hex-3-endioate. 4,189,599, Cl. 560-190.000.
Khan, Aman U., to Whirlpool Corporation. Drive mechanism for a compactor. 4,188,877, Cl. 100-290.000.
Kiefer, Gerhard; and Kurt, Pierre, to Von Roll AG. Method and apparatus for removal of fly ash from a waste incinerator with liquid slag discharge. 4,188,892, Cl. 110-238.000.
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, to Kowa Chemical Industry Ltd. Coating compositions for architectural use. 4,189,414, Cl. 260-29.40R.
Kil, Ilya G.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.
Killam, David G.: *See—*
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Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, to GTE Sylvania Incorporated. Method of making sealed beam lamp. 4,189,657, Cl. 313-113.000.
Kimura, Masaharu: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, to Nippon Oil Co., Ltd. Electrical insulating oil compositions. 4,189,391, Cl. 252-63.000.
Kinefuchi, Yoshio: *See—*
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King, James F., to Hanes Corporation. Article handling and advancing. 4,189,259, Cl. 406-63.000.
King, James P. Lubricant compositions based on zirconium polymers. 4,189,387, Cl. 252-32.70E.
Kinglor Metor S.p.A.: *See—*
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Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., to Gulf Oil Corporation. Coal liquefaction process employing internal heat transfer. 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., to Gulf Oil Corporation. Coal liquefaction process utilizing selective heat addition. 4,189,375, Cl. 208-8.0LE.
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, to List, Hans. Internal combustion engine ventilation. 4,188,924, Cl. 123-41.650.
Kishimoto, Akira: *See—*
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Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, to BASF Aktiengesellschaft. Manufacture of homopolymers and copolymers of alpha-monoolefins. 4,189,557, Cl. 526-159.000.

Klapperich, Heinz-Josef: *See—*
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Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, to Bayer Aktiengesellschaft. Process for the production of foam moldings having an impervious outer skin using semi-prepolymer prepared from isocyanates such as isophorone diisocyanate. 4,189,542, Cl. 521-124.000.
Klein, Harold R. Ventilated seat cushion construction. 4,189,180, Cl. 297-453.000.
Kleuser, Dieter: *See—*
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Klieman, Charles H.; and Densmore, Richard M., to Charles H. Klieman, M.D. Hemostatic clip. 4,188,953, Cl. 128-325.000.
Klingepharma GmbH & Co.: *See—*
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Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, to AGFA-Gevaert, A.G. Apparatus for winding a reel of film. 4,189,105, Cl. 242-56.00R.
Klootwyk, Ronald I., to Continental Group, Inc., The. Power module assembly. 4,189,528, Cl. 429-70.000.
Klopfenstein, Fred H. Cube puzzle. 4,189,151, Cl. 273-156.000.
Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for improved color judgement in a color monitor for electrical color correction. 4,189,741, Cl. 358-76.000.
Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for indicating overcorrections, in electrical color correction apparatus. 4,189,742, Cl. 358-80.000.
Klosa, Josef. Use of pyridine aldehydes for the prevention and treatment of acne vulgaris. 4,189,487, Cl. 424-263.000.
Klose, Karl W., to Cooper Tire and Rubber Company. Supporting and handling device for use with a tire processing machine. 4,189,277, Cl. 414-664.000.
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Knapton, Arthur G.; and McGill, Ian R., to Johnson, Matthey & Co., Limited. Intermetallic catalysts. 4,189,405, Cl. 252-462.000.
Knox, Leonard S. Vehicle control for multiple speeds. 4,189,706, Cl. 340-53.000.
Kobayashi, Kazutsugu: *See—*
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Kock, Hendrikus G., to U.S. Philips Corporation. Semiconductor device comprising projecting contact layers. 4,189,342, Cl. 156-656.000.
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, to Meiji Seika Kaisha, Ltd. 5-Alkoxy-picolinic acid calcium salts and anti-hypertensive composition containing 5-alkoxy-picolinic acid calcium salts and anti-hypertensive composition thereof. 4,189,489, Cl. 424-266.000.
Koenig, Karl-Heinz; and Reitel, Christian, to BASF Aktiengesellschaft. Manufacture of α-haloethylcarbamyl halides. 4,189,446, Cl. 260-544.00C.
Kohlmann, Friedrich-Wilhelm: *See—*
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Kohno, Shoji: *See—*
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Kojima, Shuichi: *See—*
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Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, to Konishiroku Photo Industry Co., Ltd. Process for forming magenta dye images. 4,189,321, Cl. 430-381.000.
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Komorowski, Klaus, to Bayer Aktiengesellschaft. Azo dyestuffs from benzene diazo component fused to an aliphatic ring and containing two cyano substituents ortho to the azo group. 4,189,427, Cl. 260-156.000.
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Koslow, George. Rotary drill bit for hand-held power drills. 4,189,266, Cl. 408-224.000.
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., to Robertshaw Controls Company. Digital controller. 4,189,765, Cl. 364-120.000.
Kowa Chemical Industry Ltd.: *See—*
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Krage, Mark K., to General Motors Corporation. Apparatus and method for microwave heating in a kiln. 4,189,629, Cl. 219-10.55A.
Krambeck, Robert H., to Bell Telephone Laboratories, Incorporated. Circuit for determining the number of ones in a binary signal. 4,189,716, Cl. 340-347.0DD.
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Kranz, Ray E.; Harrell, John B.; and Solano, William E., to Salem Furnace Co. Weight ratio mixing of volatile containing carbonaceous materials with materials to be treated by the volatiles evolved therefrom. 4,189,312, Cl. 75-34.000.
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Krauss, Siegfried; and Maurer, Gerhard, to Zahnradfabrik Friedrichshafen AG. Ship transmission. 4,188,833, Cl. 74-417.000.
Kroeze, Hendrik J.; and Hemel, Johan H., to Koppers Company, Inc. Apparatus for the continuous stacking of paperboard blanks. 4,188,861, Cl. 93-93.00C.
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Kuo, John T.: *See—*
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Kurkov, Victor P., to Chevron Research Company. Carboxylic acid preparation. 4,189,608, Cl. 562-519.000.
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, to Nippon Zoki Pharmaceutical Co., Ltd. Dextrin hydroxycarboxylato polyiron (III) olated complex and process for the manufacture thereof. 4,189,474, Cl. 424-180.000.
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Kyle, Rhoden R., to C.A. Pemberton & Co. Limited. Meat packaging machine. 4,188,771, Cl. 53-511.000.
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Kysor Industrial Corporation: *See—*
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Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., to Johnson Controls, Inc. Fluid system circuit board. 4,188,977, Cl. 137-833.000.
LaBove, Larry D.; and Mitchell, Robert F., III. Slide rule for hyperalimentation dosage computations. 4,189,634, Cl. 235-70.00A.
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., to Amax Inc. Waste water treatment. 4,189,381, Cl. 210-28.000.
Lage, Lyle W., to Lage Products, Inc. Watering device for small pigs and the like. 4,188,914, Cl. 119-71.000.
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Fall, Don R.; and Lamarche, Paul E., 4,188,806, Cl. 64-27.00C.
Lambert, Robert L., Jr., to Minnesota Mining and Manufacturing Company. Hydrolyzable silyl-substituted dyestuffs for transfer printing. 4,189,429, Cl. 260-207.500.
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Baker, Edward D.; and Lang-Ree, Nils, 4,189,631, Cl. 219-388.000.
Langdon, William K., to BASF Wyandotte Corporation. Multi-block coupled polyoxyalkylene copolymer surfactants. 4,189,609, Cl. 568-601.000.
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Langen, Marinus J. M.; and Strauss, Edgar H., to H. J. Langen & Sons Ltd. Bag having sides seamed by complementary bands of cohesive material. 4,189,089, Cl. 229-61.000.
Langieri, Michael, to Louis Marx & Co., Inc. Pinball game with longitudinally moving flipper controls. 4,189,150, Cl. 273-121.00A.
Laqua, Arnold; and Holtschmidt, Ulrich, to Th. Goldschmidt AG. 1,3-Di-N-decyl-2-methyl-imidazolium chloride or bromide and microbiocidal preparation containing this compound. 4,189,311, Cl. 71-67.000.
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Laurito, James J., to Neville Chemical Company. Production of synthetic resins and their uses in printing ink compositions. 4,189,410, Cl. 260-23.70C.
Lawson, Kenneth D.; and Brown, Neil L., to Neil Brown Instruments Systems, Inc. Bandpass filter having low passband phase shift. 4,189,681, Cl. 330-109.000.
Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., to International Minerals & Chemical Corporation. Method of beneficiating phosphate ores. 4,189,103, Cl. 241-20.000.
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Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.
Lehrach, Franz: *See—*
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.
Leland Stanford Junior University, The Board of Trustees of: *See—*
Johnson, William S.; and Gravestock, Michael B., 4,189,431, Cl. 260-239.55R.
Lemelson, Jerome H. Switch and lock activating system and method. 4,189,712, Cl. 340-149.00A.
Lenz, John: *See—*
Denney, General C.; Lenz, John; and Williams, Joseph M., 4,189,137, Cl. 271-103.000.
Leonard, Charles F.; and Leonard, Claude H. Mud-flap supporting assembly. 4,189,165, Cl. 280-154.50R.
Leonard, Claude H.: *See—*
Leonard, Charles F.; and Leonard, Claude H., 4,189,165, Cl. 280-154.50R.
Lerner, Julius O. Swimming pool intrusion alarm system. 4,189,722, Cl. 367-93.000.
Les-Kare Inc.: *See—*
Glass, Neel W., 4,189,004, Cl. 168-4.000.
Leslie, Frank B.; and Kiss, Alexander S. Web ladder. 4,189,030, Cl. 182-196.000.
Lett, Russell M.: *See—*
Palmer, Oakley B.; and Lett, Russell M., 4,188,966, Cl. 135-67.000.
Lever Brothers Company: *See—*
Brace, Roger; and Adams, Christopher J., 4,189,396, Cl. 252-99.000.
Levers, William E.; and Keith, Charles H., to Celanese Corporation. Filter. 4,189,511, Cl. 428-167.000.
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., to Massachusetts Institute of Technology. Cell culture microcarriers. 4,189,534, Cl. 435-2.000.
Levinos, Nicholas J.; and Arnold, George P., to United States of America, Energy. Beam splitter coupled CDSE optical parametric oscillator. 4,189,652, Cl. 307-428.000.
Levinson, Sidney H.; and Mendelson, Wilford L., to SmithKline Corporation. 3-(o-Hydroxyphenyl)-5-formylhydrazino-Δ^2-pyrazolines. 4,189,578, Cl. 544-239.000.
Levy, Lawrence L. Key. 4,188,741, Cl. 40-330.000.
Lewis, John C., Jr., to Tucel Industries, Inc. Apparatus for forming tufted angular brush construction. 4,189,189, Cl. 300-7.000.
Lewis, Lawrence R.: *See—*
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.
Lexitron Corporation: *See—*
Vaughn, Louis E., Jr., 4,189,727, Cl. 340-711.000.
Li, Choh H., to Hoffmann-La Roche, Inc. Recombinant hormonal compositions and method. 4,189,426, Cl. 260-112.50R.
Lichon, James F. Dental impression gun. 4,188,724, Cl. 433-90.000.

Liebert, Timothy C., to Phillips Petroleum Company. Maximum utilization of energy in isoparaffin recycle in alkylation. 4,189,616, Cl. 585-701.000.

Lienert, Hans-Jurgen: *See—*
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.

Liet, Cornelis H.: *See—*
Liet, Fredericus; and Liet, Cornelis H., 4,188,759, Cl. 52-245.000.

Liet, Fredericus; and Liet, Cornelis H., to Trioliet-Mullos Silo Nederland B.V. Sheet for constructing the wall of a substantially cylindrical silo; as well as substantially cylindrical silo. 4,188,759, Cl. 52-245.000.

Light, Walter J. Tuning system for timpani. 4,188,852, Cl. 84-411.00A.

Limare, Armand; and Plancqueel, Guy, to Societe Metallurgique le Nickel-SLN. Process for the electrodeposition of ferro-nickel alloys. 4,189,359, Cl. 204-43.00T.

Lindauer Dornier Gesellschaft mbH.: *See—*
Muller, Kurt, 4,188,980, Cl. 139-1.00R.

Linde Aktiengesellschaft: *See—*
Abels, Theodor; and Gotz, Bernhard, 4,189,020, Cl. 180-54.00A.
Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, 4,189,025, Cl. 180-159.000.
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, 4,188,796, Cl. 62-121.000.

Lindsey, Ben. Self-propelled vehicle. 4,189,166, Cl. 280-234.000.

Lipani, Anthony F., to Xerox Corporation. Particle dispenser with a magnetically driven agitator. 4,188,907, Cl. 118-657.000.

Liptay, John S.; and Rymarczyk, James W., to International Business Machines Corporation. Operand fetch control improvement. 4,189,768, Cl. 364-200.000.

Liptay, John S., to International Business Machines Corporation. Operand alignment controls for VFL instructions. 4,189,772, Cl. 364-200.000.

Liptay, John S.: *See—*
Gannon, Patrick M.; and Liptay, John S., 4,189,770, Cl. 364-200.000.

List, Hans: *See—*
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.
Moser, Werner; and Mantsch, Peter, 4,188,820, Cl. 73-116.000.

Little, Jim E. Ground support pads for mobile structures. 4,189,125, Cl. 248-346.000.

Liu, Jack F.; and Liu, Susan L. Product holder. 4,189,054, Cl. 206-634.000.

Liu, Susan L.: *See—*
Liu, Jack F.; and Liu, Susan L., 4,189,054, Cl. 206-634.000.

Ljungbo, Sven O. B., to Erecta AG. Heat-insulated plastic hall. 4,188,756, Cl. 52-83.000.

Lockheed Electronics Co., Inc.: *See—*
Atwater, Jerrold B., 4,189,732, Cl. 343-5.00R.

Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., to Johns-Manville Corporation. Method for providing sections of wrapping material having a strip of adhesive tape attached to an end portion thereof. 4,189,339, Cl. 156-263.000.

Lohr, Raymond J. Control cable. 4,188,750, Cl. 46-253.000.

Longhi, Eligio. Apparatus and process for recovering scraps of thermoplastic material, even of heterogeneous shapes, by gradual melting and compression through one or more orifices. 4,189,291, Cl. 425-215.000.

L'Oreal: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Lorenz, Joachim: *See—*
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Lorenze, Robert V., Jr.; and White, William J., to Honeywell Inc. Double sided hybrid mosaic focal plane. 4,188,709, Cl. 29-577.00R.

Loschilov, Vladimir I.; Zasypkin, Vadim V.; and Petrov, Vladimir I. Surgical instrument for ultrasonic separation of biological tissue. 4,188,952, Cl. 128-305.000.

Loser, Roland: *See—*
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.

Lothmann, Joseph, to United States Steel Corporation. Spring element for use in sliding gate valve. 4,189,073, Cl. 222-600.000.

Lott, Thomas M. Repeater for smoke and similar alarms. 4,189,720, Cl. 340-539.000.

Lotton, Wilson H.; and Sears, Delbert R., to Mayden, Gladys. Reserve fuel tank system. 4,188,969, Cl. 137-264.000.

Lotz, Robert W.: *See—*
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.

Louderback, Allan L., to Beckman Instruments, Inc. Method of storing a biological reference control standard and biological reference control standard obtained thereby. 4,189,401, Cl. 252-408.000.

Louis Marx & Co., Inc.: *See—*
Langieri, Michael, 4,189,150, Cl. 273-121.00A.

Lowrance Electronics, Inc.: *See—*
Maloy, Rex M., 4,189,702, Cl. 367-109.000.

Lubsen, Timothy A.; and Maag, Gustav A., to Procter & Gamble Company, The. Separation of fatty acid esters. 4,189,442, Cl. 260-428.500.

Lucas Industries Limited: *See—*
Boxer, Trevor C., 4,189,667, Cl. 318-338.000.

Ludwig, Joseph B. Hinge pin remover. 4,188,701, Cl. 29-275.000.

Lueders, Robert E.; and Frankiewicz, Theodore C., to Kennecott Copper Corporation. Metal leaching from concentrates using nitrogen dioxide in acids. 4,189,461, Cl. 423-27.000.

Luepertz, Hans-Henning, to ITT Industries, Incorporated. Brake system for motorcycles. 4,189,190, Cl. 303-6.00C.

Luke, Karlheinz, to Gebruder Lodige Maschinenbau GmbH. Mixer with a mixing mechanism revolving in a cylindrical or partly cylindrical mixing container. 4,189,242, Cl. 366-288.000.

Lunel, Jean: *See—*
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.

Lupfer, Dale E.: *See—*
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.

Lvov, Vladimir M.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Lyall, Rodney. Baby-milk powder dispenser. 4,188,984, Cl. 141-12.000.

Lykes Pasco Packing Company, Dispenser Division: *See—*
Nottke, James E.; and Ruebel, Jack K., 4,189,067, Cl. 222-57.000.

Maa, Peter S.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Multiple-stage hydrogen-donor coal liquefaction process. 4,189,371, Cl. 208-8.0LE.

Maag, Gustav A.: *See—*
Lubsen, Timothy A.; and Maag, Gustav A., 4,189,442, Cl. 260-428.500.

Macan, John J.; and Magill, James M., to Atwood Oceanics, Inc. Sea-floor shoring cellar and method of installing same. 4,189,255, Cl. 405-211.000.

Macosko, Christopher W.; and Lee, Ly J., to University of Minnesota, The Regents of the. Reaction injection molding machine. 4,189,070, Cl. 222-134.000.

Maeda, Hiroshi: *See—*
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,188,685, Cl. 16-159.000.

Magill, James M.: *See—*
Macan, John J.; and Magill, James M., 4,189,255, Cl. 405-211.000.

Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A. End face shaft seal. 4,189,157, Cl. 277-3.000.

Mahan, James D.: *See—*
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

Mahan, Ronnie L.: *See—*
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

Mahaska Industries, Inc.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Maidment, Peter E.; and Thouin, Marcel. Apparatus for controllably injecting contaminant material into a liquid flow system. 4,188,970, Cl. 137-268.000.

Maier, Karl; and Hohn, Herbert, to L. Schuler GmbH. Workpiece transport device. 4,189,269, Cl. 414-19.000.

Mairson, Theodore, to Sanders Associates, Inc. Apparatus and method for performing inertial measurements using translational acceleration transducers and for calibrating translational acceleration transducers. 4,188,816, Cl. 73-1.00D.

Maitani, Yoshihisa, to Olympus Optical Co., Ltd. Camera with sliding case. 4,189,222, Cl. 354-126.000.

Maja-Maschinenfabrik Hermann Schill GmbH: *See—*
Schill, Hermann, 4,188,870, Cl. 99-589.000.

Majewski, Elmer J. Knock-down portable shopping rack. 4,189,056, Cl. 211-195.000.

Malashin, Mikhail M.: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Malerba, Oreste; and Neri, Antonio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Electronic tone ringer for telephone sets. 4,189,626, Cl. 179-84.00T.

Malm, Robert, to Northrop Corporation. Adaptive electronically steerable phased array. 4,189,733, Cl. 343-100.0SA.

Maloy, Rex M., to Lowrance Electronics, Inc. Commutator and fiber brush rotating disc. 4,189,702, Cl. 367-109.000.

Mancy, Denise: *See—*
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.

Mandet, Gerard M. F.: *See—*
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.

Manoury, Philippe M. J.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Mansfield, Henry T. Apparatus aid. 4,188,717, Cl. 30-90.000.

Mansion, James: *See—*
Bournicon, Claude; and Mansion, James, 4,188,813, Cl. 72-299.000.

Mantsch, Peter: *See—*
Moser, Werner; and Mantsch, Peter, 4,188,820, Cl. 73-116.000.

Marcus, Stanley: *See—*
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Mardirosian, Louis C. Contact lens saving devices. 4,188,674, Cl. 4-292.000.

Marencak, Karol: *See—*
Rye, Grover W.; and Marencak, Karol, 4,189,332, Cl. 148-6.310.

Margetts, Hugh G.; and Assinder, Andrew J., to Girling Limited. Control valve assemblies for hydraulic braking systems. 4,189,191, Cl. 303-52.000.

Marion, Charles P., to Texaco Development Corporation. Production of clean HCN-free synthesis gas. 4,189,307, Cl. 48-197.00R.

Mark, Abraham S.: *See—*
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.

Mars, Inc.: *See—*
Heiman, Frederic P., 4,188,961, Cl. 133-2.000.

Marshall, David R.; and Morie, Ronal C. Halogen-containing plastic refuse treatment. 4,189,329, Cl. 134-5.000.

Marshall, Gilbert L., to Erie Technological Products, Inc. Monolithic capacitor with non-noble metal electrodes and method of making the same. 4,189,760, Cl. 361-321.000.

Martin, John H. E. J.; and Hertz, Martin R., to American Cyanamid Company. Process of producing antibiotic BL580Δ with *Streptomyces hygroscopicus*. 4,189,537, Cl. 435-75.000.

Martin, Lincoln A.; and Fenley, William F., Jr., to Geophysical Systems Corp. Method and apparatus for determination of optimum velocity in processing seismic signals from low energy sources. 4,189,704, Cl. 367-60.000.

Martin, Robert C., to Dow Chemical Company, The. Method for rigless zone abandonment using internally catalyzed resin system. 4,189,002, Cl. 166-295.000.

Martschinke, Charles E., to Bell Telephone Laboratories, Incorporated. Conductor cable untwisting tool. 4,188,840, Cl. 81-3.00R.

Martynets, Nikolai S.: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Maruzen Oil Co., Ltd.: *See—*
Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, 4,189,603, Cl. 562-417.000.

Marwede, Gunter: *See—*
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Maryland Cup Corporation: *See—*
Rubenstein, Irving H., 4,189,502, Cl. 426-249.000.
West, John B., 4,189,071, Cl. 222-189.000.

Maschinenfabrik Meyer & Burger AG: *See—*
Stauffer, Alfred, 4,188,936, Cl. 125-16.00R.

Masclet, Jean; and Turiot, Andre, to Messier-Hispano-Bugatti. Retractable fuselage mounted undercarriage. 4,189,117, Cl. 244-102.00R.

Masclet, Jean, to Messier-Hispano. Apparatus for adjusting the application of brakes to the wheels of various types of vehicles. 4,189,192, Cl. 303-105.000.

Mason & Porter, Limited: *See—*
Porter, Frederick C., 4,189,008, Cl. 172-253.000.

Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., to United States of America, Army. Apparatus for examining structures using stimulated acoustic emission. 4,188,830, Cl. 73-801.000.

Massa, Donald P.; and Hall, James G., to Stoneleigh Trust, The. Intrusion alarm systems. 4,189,719, Cl. 340-501.000.

Massachusetts Institute of Technology: *See—*
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.

Masson Scott Thrissell Engineering Limited: *See—*
Jones, Graham R. S.; and Wyatt, Edwin E., 4,188,846, Cl. 83-499.000.

Massoubre, Jean-Marie, to Compagnie Generale des Etablissements Michelin. Continuous solution polymerization process. 4,189,555, Cl. 526-179.000.

Masunaga, Midori: *See—*
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Mathbirk Limited: *See—*
Matthews, Denis, 4,188,899, Cl. 112-262.100.

Matherly, Foster. Wood or coal burning stove having a top with a pivotable lid for top loading of wood or coal into the stove. 4,188,940, Cl. 126-217.000.

Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, to Canon Kabushiki Kaisha. Fourier transform lens system. 4,189,214, Cl. 350-215.000.

Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, to Teijin Limited. Process and apparatus for crimping filament yarn. 4,188,691, Cl. 28-255.000.

Matsumoto, Tadao: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Matsumoto, Yoshio: *See—*
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.

Matsumura, Yoshitsugu, to Kanegafuchi Chemical Industry Co., Ltd., a part interest. Hair rooting apparatus with its hooked needle moving also transversely. 4,188,894, Cl. 112-156.000.

Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, to Sumitomo Chemical Company, Limited. Polyester resin composition. 4,189,549, Cl. 525-439.000.

Matsuno, Toshimi; and Imai, Kin-ichi, to Takeda Chemical Industries, Ltd. Purine derivatives. 4,189,485, Cl. 424-253.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, 4,189,639, Cl. 250-282.000.
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.

Matsushita Electric Industrial Co., Ltd: *See—*
Ushio, Fusao; and Okuno, Noboru, 4,189,745, Cl. 358-128.500.

Matsushita Electronics Corporation: *See—*
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Matsuura, Hirohide: *See—*
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.

Matsuyama Petrochemicals Inc.: *See—*
Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, 4,189,603, Cl. 562-417.000.

Mattel, Inc.: *See—*
Rich, Hubert A.; and May, Herbert, 4,188,748, Cl. 46-202.000.

Mattern, Alfred, to Siemens Aktiengesellschaft. Digital time division multiplex telecommunication network. 4,189,624, Cl. 179-15.0AL.

Matthews, Denis, to Mathbirk Limited. Sewing machines and method for joining pieces of fabric. 4,188,899, Cl. 112-262.100.

Matthews, John W.: *See—*
Krug, John A. K., Jr.; and Matthews, John W., 4,189,263, Cl. 406-137.000.

Matthews Machine Co., Inc.: *See—*
Rester, Joe D., 4,189,173, Cl. 292-86.000.

Matthiesen, Ralph F. Ice dispenser. 4,189,063, Cl. 222-1.000.

Matui, Yukito, to Kabushiki Kaisha Mitutoyo Seisakusho. Constant pressure slide calipers for inside-outside measurements. 4,188,727, Cl. 33-147.00T.

Maul, Rudolf: *See—*
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Maurer, Gerhard: *See—*
Krauss, Siegfried; and Maurer, Gerhard, 4,188,833, Cl. 74-417.000.

Maximovich, Michael J.: *See—*
Burroway, Gary L.; and Maximovich, Michael J., 4,189,561, Cl. 526-317.000.

Maxson, Dale E.; and Ober, David E., to Barber-Colman Company. Damper control for preventing spread of fire and smoke through an induction mixing box. 4,189,092, Cl. 236-13.000.

May, Herbert: *See—*
Rich, Hubert A.; and May, Herbert, 4,188,748, Cl. 46-202.000.

Mayden, Gladys: *See—*
Lotton, Wilson H.; and Sears, Delbert R., 4,188,969, Cl. 137-264.000.

Maykemper, Alfred; and Kahl, Hans-Jurgen, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Walking mine-roof support. 4,189,258, Cl. 405-291.000.

Maytag Company, The: *See—*
Quayle, Lawrence L., 4,188,732, Cl. 34-54.000.

McAlpine, James B.: *See—*
Carney, Ronald E.; and McAlpine, James B., 4,189,569, Cl. 536-17.00R.

McBride, William S., to Dragerwerk Aktiengesellschaft. Chemical oxygen generator and process of making a generator. 4,189,460, Cl. 422-165.000.

McCabe, James E. Paper spring method and product. 4,189,131, Cl. 267-165.000.

McCall Pattern Company, The: *See—*
Denney, General C.; Lenz, John; and Williams, Joseph M., 4,189,137, Cl. 271-103.000.

McCarthy, Edward P., to Youngstown Sheet and Tube Company. Coating adherence prospensity testing of metal substrates. 4,188,824, Cl. 73-150.00A.

McCarthy, James R.: *See—*
Schuster, Albert; and McCarthy, James R., 4,189,444, Cl. 260-453.0RW.

McClintock, Walter 0.: *See—*
Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., 4,189,103, Cl. 241-20.000.

McCoubrey, George A., to United States of America, Navy. Rotor hub for a helicopter. 4,189,283, Cl. 416-20.00A.

McDonough, Robert J., to Raytheon Company. Microwave terminating structure. 4,189,691, Cl. 333-22.00R.

McGill, Ian R.: *See—*
Knapton, Arthur G.; and McGill, Ian R., 4,189,405, Cl. 252-462.000.

McGraw, Philip W.: *See—*
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.

McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., to Dow Chemical Company, The. Replacement plating procedure for silver on nickel. 4,189,510, Cl. 427-125.000.

McKay, Donald E., to Diamond Power Specialty Corporation. Spacer-sealer strip for reflective insulation assemblies. 4,188,761, Cl. 52-474.000.

McKay International Engineers: *See—*
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,188,887, Cl. 105-163.00R.

McLoughlin, John. Fire truck control means. 4,189,005, Cl. 169-24.000.
McPherson, John B.; and Gunther, William H., Jr., to Thor Dahl, Inc. Envelope opening mechanism. 4,189,341, Cl. 156-654.000.
McTiernan, James: *See—*
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.
McWhorter, Daniel M.: *See—*
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.
Mead Corporation, The: *See—*
Culpepper, Will L., 4,188,766, Cl. 53-49.000.
Gamblin, Rodger L., 4,189,754, Cl. 358-296.000.
Mechtron International Corporation: *See—*
Butler, Theodore G., 4,189,300, Cl. 432-118.000.
Meiji Seika Kaisha, Ltd.: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.
Meinan Machinery Works, Inc.: *See—*
Hasegawa, Katsuji, 4,189,271, Cl. 414-35.000.
Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Power angling bulldozer assembly. 4,189,010, Cl. 172-804.000.
Mendelson, Wilford L.: *See—*
Levinson, Sidney H.; and Mendelson, Wilford L., 4,189,578, Cl. 544-239.000.
Mendenhall, Charles E., to Sperry Rand Corporation. Adaptive circuit for extracting timing information from a repetitive series of time coherent pulses. 4,189,784, Cl. 365-233.000.
Mendenhall, Robert L. Recycled asphalt-aggregate process and apparatus. 4,189,238, Cl. 366-7.000.
Merck & Co., Inc.: *See—*
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.
Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., 4,189,496, Cl. 424-275.000.
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, 4,189,471, Cl. 424-88.000.
Merk, Wolfgang: *See—*
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.
Merkle, Otto: *See—*
Karcher, Karl-Friedrich; and Merkle, Otto, 4,189,023, Cl. 180-132.000.
Merle, Jean-Pierre: *See—*
Branlard, Paul; and Merle, Jean-Pierre, 4,189,567, Cl. 528-485.000.
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., to Whittaker Corporation. Method for plating copper on steel rods. 4,189,356, Cl. 204-25.000.
Messier: *See—*
Girard, Edmond, 4,189,096, Cl. 237-2.00B.
Messier-Hispano: *See—*
Masclet, Jean, 4,189,192, Cl. 303-105.000.
Messier-Hispano-Bugatti: *See—*
Masclet, Jean; and Turiot, Andre, 4,189,117, Cl. 244-102.00R.
Metabowerke GmbH & Co.: *See—*
Eberle, Robert, 4,189,011, Cl. 173-13.000.
Mettler Instrumente AG: *See—*
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.
Meuser, Klaus, to Volkswagenwerk Aktiengesellschaft. Seat belt fastening device. 4,189,169, Cl. 280-802.000.
Meyborg, Holger: *See—*
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.
Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Phenylbenzimidazolyl-furanes. 4,189,589, Cl. 548-327.000.
MFE Corporation: *See—*
Burke, Edward F., Jr., 4,189,699, Cl. 335-229.000.
Michigan State University: *See—*
Kabara, Jon J., 4,189,481, Cl. 424-248.540.
Microdyne Corporation: *See—*
Balbes, Michael S.; and Moore, John M., 4,189,755, Cl. 358-904.000.
Miles Laboratories, Inc.: *See—*
Adams, Ernest C., Jr.; and Layman, Kathleen M., 4,189,304, Cl. 23-230.00B.
Miles, Peter; Richardson, Norman; and Finan, Michael A., to Ciba-Geigy Corporation. Novel compositions of matter for use in the treatment of aqueous systems. 4,189,383, Cl. 210-58.000.
Millard, Richard J.; and Cheseldine, David M., to Sprague Electric Company. Method for making a plurality of solid electrolyte capacitors and capacitors made thereby. 4,188,706, Cl. 29-570.000.
Miller, Donald L., to Facet Enterprises, Inc. Constant torque friction clutch. 4,189,042, Cl. 192-84.00C.
Miller, Ivan O., to Shafco Industries, Inc. Locking mechanism. 4,188,860, Cl. 92-15.000.
Miller, John W., to United States of America, Air Force. Circular connector. 4,189,203, Cl. 339-184.00M.
Miller, Marlin L.: *See—*
Tachmindji, Alexander J.; Miller, Marlin L.; and Morgan, William B., 4,188,906, Cl. 115-34.00R.
Miller, Richard L.: *See—*
Rosa, Frank; and Miller, Richard L., 4,189,726, Cl. 340-689.000.
Miller, Robert A., to United States of America, Army. Novel microscope slide smoker. 4,188,908, Cl. 118-715.000.
Miller, Samuel A., to United States of America, Navy. Wide angle gimbal system. 4,189,122, Cl. 248-176.000.
Millers, Donald A., II: *See—*
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Millington, Michael J., to Parsons Controls Limited. Stopper components for use in fishing trawls. 4,188,687, Cl. 24-114.500.
Millman, Irving: *See—*
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Mills, Douglas C.; and Clark, Jeffrey A., to Saxmayer Corporation. Method for multi-folding a newspaper or the like. 4,189,134, Cl. 270-66.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. Process for preparing a methylenebis(2-hydroxy-4-alkoxybenzophenone) and acyloxymethyl 2-OH 4-alkoxy benzophenones. 4,189,409, Cl. 260-23.0XA.
Minakuchi, Hiroshi: *See—*
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.
Minami, Setsuo: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Bland, Frederick H., 4,189,395, Cl. 252-91.000.
Lambert, Robert L., Jr., 4,189,429, Cl. 260-207.500.
Trotman, Gladstone, III, 4,189,060, Cl. 220-260.000.
Minore Pty. Ltd.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,189,378, Cl. 209-459.000.
Mirzoian, Genrikh S.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.
Mitchell, David S., to Chevron Research Company. Solvent extraction process. 4,189,376, Cl. 208-11.0LE.
Mitchell, George B.; and Oberster, Arthur E., to Firestone Tire & Rubber Company, The. Phosphazene rubber latices. 4,189,413, Cl. 260-29.20M.
Mitchell, John D.: *See—*
Jordan, Betram L.; and Mitchell, John D., 4,188,772, Cl. 56-10.200.
Mitchell, Robert F., III: *See—*
LaBove, Larry D.; and Mitchell, Robert F., III, 4,189,634, Cl. 235-70.00A.
Mitoff, Stephan P., to Electric Power Research Institute, Inc. Sodium insert container for a sodium-sulfur cell and method. 4,189,530, Cl. 429-104.000.
Mitsubishi Chemical Industries, Ltd.: *See—*
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,189,651, Cl. 307-254.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Mitsubishi Rayon Company, Limited: *See—*
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See—*
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
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Mitsuya, Munehisa: *See—*
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Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, to Takenaka Komuten Co., Ltd. Apparatus treating sludge deposits. 4,189,239, Cl. 366-169.000.
Miyakawa, Yoshitaka: *See—*
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Miyamoto, Ryoichi: *See—*
Sakashita, Takeshi; and Miyamoto, Ryoichi, 4,189,548, Cl. 525-109.000.
Miyatake, Kanzi. Manual vise for articles of varying shapes. 4,188,842, Cl. 81-103.000.
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, to Mitsubishi Yuka Pharmaceutical Co., Ltd. Antihypertensive quinazoline derivatives. 4,189,484, Cl. 424-251.000.
Mizushima, Akira, to Kabushiki Kiasha Komatsu Seisakusho. Die changing apparatus for a bending brake. 4,188,815, Cl. 72-446.000.
Mizutani, Hiroyuki: *See—*
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.
Mizutani, Norio; and Nakamura, Soichi, to Nippon Kogaku K.K. Wide angle zoom lens system. 4,189,212, Cl. 350-184.000.
Moakler, William A.: *See—*
Przywozny, Walter C.; and Moakler, William A., 4,189,649, Cl. 307-64.000.
Mobil Oil Corporation: *See—*
Clayton, William J., 4,189,305, Cl. 44-41.000.

Modic, Frank J., to General Electric Company. Silicone foam composition which has burn resistant properties. 4,189,545, Cl. 521-131.000.
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, to Printing Developments, Inc. Electronic screening with galvanometer recorders. 4.189,752, Cl. 358-298.000.
Moeller, Rolf: *See—*
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Mol, Volkert E.: *See—*
Browning, Michael R.; and Mol, Volkert E., 4,189,210, Cl. 350-132.000.
Monigold, Larry E.; and Cadwell, Ronald G., to Kysor Industrial Corporation. Combination valve. 4,189,095, Cl. 236-92.00R.
Monot, Bernard, to Faiveley S.A. Oblique-displacement sliding door. 4,188,752, Cl. 49-218.000.
Monsanto Company: *See—*
Coleman, James P., 4,189,610, Cl. 568-646.000.
Williams, Charles R., 4,189,416, Cl. 260-29.6TA.
Montedison S.p.A.: *See—*
Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, 4,189,441, Cl. 260-410.90R.
Mooney, John J.: *See—*
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.
Moore, Chauncey H.: *See—*
Hugh, Melvin D.; and Moore, Chauncey H., 4,188,801, Cl. 64-7.000.
Moore, John M.: *See—*
Balbes, Michael S.; and Moore, John M., 4,189,755, Cl. 358-904.000.
Moore, William H.: *See—*
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.
Moorer, Donald K. Convertible baby vehicle. 4,189,164, Cl. 280-87.050.
Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., to Mosler Safe Company, The. Dispatch and receive terminal for a pneumatic carrier system. 4,189,260, Cl. 406-76.000.
Mordau, Manfred: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.
Morehouse, James H.: *See—*
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Morgan, William B.: *See—*
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Mori, Masaharu: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,189,679, Cl. 325-474.000.
Mori, Sanae, to Daido Metal Company, Ltd. Multi-layer sliding material and method for manufacturing the same. 4,189,522, Cl. 428-557.000.
Mori, Sanae, to Daido Metal Company, Ltd. Bearing metal for large engines. 4,189,525, Cl. 428-643.000.
Mori, Yasuki: *See—*
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Fibers filter rods and other nonwoven articles made from poly(1,2-propylene terephthalate) copolyesters of terephthalic acid, 1,2-propylene glycol and ethylene glycol. 4,188,960, Cl. 131-267.000.
Morie, Ronal C.: *See—*
Marshall, David R.; and Morie, Ronal C., 4,189,329, Cl. 134-5.000.
Morille, Alfred, to Paco Rabanne Parfums S.A. Device for packaging liquid such as perfume. 4,189,057, Cl. 220-23.400.
Morio, Minoru; Kubota, Yukio; and Okada, Hidehiko. Apparatus for controlling the scanning path of a rotary transducer. 4,189,758, Cl. 360-77.000.
Morisawa, Kunio: *See—*
Kubo, Seitoku; and Morisawa, Kunio, 4,188,839, Cl. 74-869.000.
Morishita, Hirosada: *See—*
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.
Moriyama, Yasuhiro: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.
Morman, John W. Body mounted umbrella. 4,188,965, Cl. 135-5.00C.
Morrison, Owen J.: *See—*
Takemoto, Shiro G.; and Morrison, Owen J., 4,189,419, Cl. 260-29.7NR.
Moser, Werner; and Mantsch, Peter, to List, Hans. Device for measuring rotational angles of a rotating shaft. 4,188,820, Cl. 73-116.000.
Mosher, Arthur J., to Societe d'Assistance Technique pour Produits Nestle S.A. Pork-like flavorant and process for preparing same. 4,189,505, Cl. 426-533.000.
Mosler Safe Company, The: *See—*
Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., 4,189,260, Cl. 406-76.000.
Motorola, Inc.: *See—*
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Johnson, Barry C.; and Pellechia, Vincent J., 4,189,083, Cl. 228-123.000.
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,084, Cl. 228-123.000.
Mourier, Georges, to Thomson-CSF. Electrical machine operating as a generator or as an amplifier. 4,189,654, Cl. 310-72.000.
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, to Eprova Aktiengesellschaft. Method of preparing 4-methyl-5-hydroxymethyl-imidazole. 4,189,591, Cl. 548-342.000.
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Polymerization of tetrahydrofuran. 4,189,566, Cl. 528-408.000.
Mukoh, Akio: *See—*
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.
Mulder, Jan, to U.S. Philips Corporation. Piston-centering system for a hot gas machine. 4,188,791, Cl. 60-520.000.
Muller, Erich, to Getrag Getriebe- und Zanhradfabrik GmbH. Synchronized change-speed gear unit. 4,189,041, Cl. 192-53.00F.
Muller-Frank, Ulrich: *See—*
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, 4,189,347, Cl. 176-58.0PB.
Muller, Hans: *See—*
Andre, Wolfram; and Muller, Hans, 4,189,659, Cl. 313-412.000.
Muller, Kurt, to Lindauer Dornier Gesellschaft mbH. Lubricating means for reciprocating filling-yarn inserters. 4,188,980, Cl. 139-1.00R.
Muller, Richard B. Repair part and method for repairing transmission detent cable. 4,188,836, Cl. 74-501.00R.
Muller, Roland: *See—*
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.
Murdock, Arthur W. Directional antenna shield for a slotted opening. 4,189,730, Cl. 343-841.000.
Murozono, Izumi: *See—*
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.
Murry, Edward J.; and Brumbach, Joseph F., to Fibra-Sonics, Inc. Peristaltic pump. 4,189,286, Cl. 417-477.000.
Muskegon Piston Ring Company: *See—*
Grimm, Raymond L., 4,189,161, Cl. 277-221.000.
Myking, Reidar, to Hakon Myking Metall-Industri. Rubber sleeve devices. 4,189,202, Cl. 339-101.000.
Naamloze Vennootschap A. Claeys-Flandria: *See—*
Ramon, Noel A., 4,189,295, Cl. 431-12.000.
Nadella: *See—*
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Nagano, Kazuo: *See—*
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Nagashiro, Waichi: *See—*
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Nagumo, Fumio, to Sony Corporation. Solid state television camera with defect compensation to reduce noise. 4,189,751, Cl. 358-213.000.
Najer, Henry: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.
Nakajima, Kunio: *See—*
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, 4,189,218, Cl. 354-25.000.
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, to Taiheiyo Engineering Inc. Sheltering apparatus for use in long wall mining. 4,189,257, Cl. 405-291.600.
Nakamura, Kaoru: *See—*
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Nakamura, Masaru; and Itoh, Takao, to Tokyo Shibaura Electric Co., Ltd. Apparatus for stripping the coatings of optical fibers. 4,188,841, Cl. 81-9.510.
Nakamura, Masayoshi: *See—*
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Nakamura, Norihiko: *See—*
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Nakamura, Soichi: *See—*
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Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, to Nitto Denki Kogyo Kabushiki Kaisha; and Osaka Gasu Kabushiki Kaisha. Protective cover for a thermoresponsive tube. 4,188,979, Cl. 138-109.000.
Nakamura, Tsutomu: *See—*
Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.
Nakanishi, Kazuyoshi: *See—*
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.
Nakano, Hiromitsu: *See—*
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Nakao, Toshiyuki; and Kato, Kikuo, to Aisin Seiki Kabushiki Kaisha. Control apparatus of a transfer mechanism. 4,188,838, Cl. 74-701.000.

Nakatani, Hirokuni: *See—*
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Nakayama, Shoji: *See—*
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Nakazawa, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Headlight for motorized two-wheeled vehicle. 4,189,762, Cl. 362-72.000.

Nakhle, George D.: *See—*
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Nalco Chemical Company: *See—*
Phillips, Kenneth G.; and Ballweber, Edward G., 4,189,563, Cl. 528-493.000.

Naletov, Anatoly S.: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

National Advanced Drilling Machines, Inc.: *See—*
Bromell, Raymond J.; and Homanick, George, 4,188,787, Cl. 60-327.000.

National Petro Chemicals Corporation: *See—*
Rekers, Louis J.; and Speca, Anthony N., 4,189,402, Cl. 252-428.000.

National Research Development Corporation: *See—*
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.
Dryburgh, Peter M.; and Halstead, Raymond R., 4,189,516, Cl. 428-409.000.

National Semiconductor Corporation: *See—*
Frederiksen, Thomas M., 4,188,708, Cl. 29-572.000.
Rapp, Adolph K., 4,189,785, Cl. 365-156.000.

Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash": *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

NCR Corporation: *See—*
Foshee, James J., 4,189,622, Cl. 178-69.100.

Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, to Roussel Uclaf. Novel Δ^4-pregnenes. 4,189,477, Cl. 424-243.000.

Neil Brown Instruments Systems, Inc.: *See—*
Lawson, Kenneth D.; and Brown, Neil L., 4,189,681, Cl. 330-109.000.

Nemeth, Laszlo: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Neri, Antonio: *See—*
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Nettleton, Raymond W.: *See—*
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.

Neu, David L.: *See—*
Soderstrom, Edward C.; and Neu, David L., 4,189,273, Cl. 414-285.000.

Neville Chemical Company: *See—*
Laurito, James J., 4,189,410, Cl. 260-23.70C.
Yaggi, Cyril J., Jr., 4,189,407, Cl. 260-18.00R.
Yaggi, Cyril J., Jr., 4,189,408, Cl. 260-18.00R.

New York Institute of Technology: *See—*
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., 4,189,743, Cl. 358-93.000.
Stern, Garland, 4,189,744, Cl. 358-93.000.

Newkirk, Raymond K. Method of fusion welding of thermoplastic components. 4,189,340, Cl. 156-306.000.

Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., to Eastman Kodak Company. Radiation curable compositions containing 5-halo-6-halomethyluracil derivatives as photoinitiators. 4,189,366, Cl. 204-159.230.

Ngai, Mun-Hay. Record player. 4,189,155, Cl. 274-1.00A.

Nicol, Jack C. Exact cup measuring tea kettle with spiral spring. 4,189,016, Cl. 177-149.000.

Nielsen, Erik W.: *See—*
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Nifco Inc.: *See—*
Hara, Kunio, 4,189,697, Cl. 337-407.000.
Hara, Kunio, 4,189,698, Cl. 337-407.000.

Nihon Takushu Noyaku Seizo K.K.: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.

Niida, Taro: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Nijhof, Engbert B. G.: *See—*
van Loon, Johannes C. F.; and Nijhof, Engbert B. G., 4,189,669, Cl. 318-811.000.

Nikiforov, Vladimir P.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Ninomiya, Ichiro, to Sony Corporation. Apparatus for generating bi-phase coded characters. 4,189,756, Cl. 360-14.000.

Nippon Kogaku K.K.: *See—*
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.
Iizuka, Yutaka, 4,189,213, Cl. 350-184.000.
Mizutani, Norio; and Nakamura, Soichi, 4,189,212, Cl. 350-184.000.

Nippon Oil Co., Ltd.: *See—*
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Nippon Steel Corporation: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, 4,188,707, Cl. 29-571.000.
Horiguchi, Shinju; and Sahashi, Joji, 4,189,766, Cl. 364-200.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.

Nishihara, Akira: *See—*
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Nishikawa, Masaji, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,189,225, Cl. 355-8.000.

Nishizawa, Rinzo: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Nissan Chemical Industries, Ltd.: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Nissan Motor Company, Limited: *See—*
Fujishiro, Takeshi; and Kita, Toru, 4,189,355, Cl. 204-1.00T.
Iizuka, Haruhiko, 4,188,933, Cl. 123-198.00F.
Suekane, Junnosuke; and Kojima, Shuichi, 4,188,981, Cl. 139-370.200.

Nitto Denki Kogyo Kabushiki Kaisha: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Niwa, Yukichi: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.

Noble, David; and Noble, Donald. Water-filled chair. 4,189,181, Cl. 297-455.000.

Noble, Donald: *See—*
Noble, David; and Noble, Donald, 4,189,181, Cl. 297-455.000.

Noel Penny Turbines Limited: *See—*
Penny, Robert N., 4,188,780, Cl. 60-39.28R.

Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, to Hitachi Metals, Ltd. One-component magnetic developer powder for developing electrostatic latent image and method of making same. 4,189,390, Cl. 430-111.000.

Nohzuka, Hiromichi. Fixture for an elongated flexible member. 4,189,055, Cl. 211-119.120.

Noiray, Francois: *See—*
Combette, Marc; and Noiray, Francois, 4,189,081, Cl. 227-10.000.

Nomoto, Tadao: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Nippon Steel Corporation. Installation for production of continuously cold rolled sheet metal or strip. 4,188,812, Cl. 72-227.000.

Northern Telecom Limited: *See—*
Parsons, Robert R.; and Wei, John S. S., 4,189,753, Cl. 358-294.000.

Northrop Corporation: *See—*
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.
Malm, Robert, 4,189,733, Cl. 343-100.0SA.
Reis, James J., 4,189,748, Cl. 358-133.000.

Norwood, Richard E.: *See—*
Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.

Nothdurft, Carl. Fishing lure. 4,188,743, Cl. 43-42.150.

Nottke, James E.; and Ruebel, Jack K., to Lykes Pasco Packing Company, Dispenser Division. Electronic control for dispenser system. 4,189,067, Cl. 222-57.000.

Novak, Petr: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.

Nowlin, Oscar D., to Phillips Petroleum Company. Magnesium reducing agent prepared in absence of complexing diluent milled with organoaluminum. 4,189,554, Cl. 526-125.000.

Nozu, Toshiro: *See—*
Tada, Hiroshi; and Nozu, Toshiro, 4,188,681, Cl. 14-16.100.

NPI Corporation: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,866, Cl. 99-339.000.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,868, Cl. 99-386.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,196, Cl. 312-236.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,631, Cl. 219-388.000.

Ober, David E.: *See—*
Maxson, Dale E.; and Ober, David E., 4,189,092, Cl. 236-13.000.

Oberste-Beulmann, Klaus: *See—*
Schupphaus, Herbert; and Oberste-Beulmann, Klaus, 4,189,188, Cl. 299-53.000.

Oberster, Arthur E.: *See—*
Mitchell, George B.; and Oberster, Arthur E., 4,189,413, Cl. 260-29.20M.

Obitz, Daniel C. L.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Odermann, Charles R.: *See—*
Garron, Stephen A.; and Odermann, Charles R., 4,188,900, Cl. 112-264.100.

Ogawa, Kinya: *See—*
Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, 4,189,552, Cl. 526-84.000.

Ogawa, Satoshi: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Ogino, Shigeo: *See—*
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Ogura, Katsuyuki: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, to Bridgestone Tire Company Limited. Method for producing heat resistant and flame resistant polyisocyanurate foams using little or no organosilicone surfactant. 4,189,541, Cl. 521-110.000.

Ohba, Michio: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, to BASF Aktiengesellschaft. 4-Hydroxy-1,2-benzisothiazoles and their manufacture. 4,189,433, Cl. 548-207.000.

Ohta, Kanzo: *See—*
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.

Ohta, Tatsuo: *See—*
Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, 4,189,724, Cl. 340-607.000.

Ohtsubo, Yoshiaki: *See—*
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Ohtsuki, Yoshiharu: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Oiles Industry Co., Ltd.: *See—*
Tada, Hiroshi; and Nozu, Toshiro, 4,188,681, Cl. 14-16.100.

Oka, Takashi: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.

Okada, Hidehiko: *See—*
Morio, Minoru; Kubota, Yukio; and Okada, Hidehiko, 4,189,758, Cl. 360-77.000.

Okano, Takeo: *See—*
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Okuda, Shinya: *See—*
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Okuno, Noboru: *See—*
Ushio, Fusao; and Okuno, Noboru, 4,189,745, Cl. 358-128.500.

Okuyama, Toru: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Olin Corporation: *See—*
Dotson, Ronald L., 4,189,362, Cl. 204-149.000.

Olinkraft, Inc.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,189,086, Cl. 229-15.000.

Oliver, Louise I. Toy wheel and driving rod. 4,188,749, Cl. 46-220.000.

Olympus Optical Co., Ltd.: *See—*
Maitani, Yoshihisa, 4,189,222, Cl. 354-126.000.
Nishikawa, Masaji, 4,189,225, Cl. 355-8.000.
Satoh, Ken, 4,189,636, Cl. 235-92.0MP.

O'Meara, Michael F., to General Electric Company. On-line memory space allocation. 4,189,773, Cl. 364-300.000.

Omron Tateisi Electronics Co.: *See—*
Sakamoto, Tamaki; and Kinefuchi, Yoshio, 4,188,955, Cl. 128-680.000.

O'Neill, Richard K.; and Wells, Roy T., to Diamond International Corporation. Pumps sprayer. 4,189,064, Cl. 222-321.000.

Onishi, Masaru: *See—*
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.

Onoe, Katsuhiko; and Kosaka, Toshihisa, to Glory Kogyo Kabushiki Kaisha. Money dispensation control device. 4,188,962, Cl. 133-4.00R.

Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, to Donaldson Company, Inc. Electric restriction indicator with a contactless switch device for indicating a restriction in filter elements. 4,189,724, Cl. 340-607.000.

Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, to BASF Aktiengesellschaft. Surface-active phenolic derivatives. 4,189,445, Cl. 260-458.00C.

Orogil: *See—*
Soula, Gerard, 4,189,389, Cl. 252-47.500.

Orova, Josef: *See—*
Podrapsky, Jiri; and Orova, Josef, 4,188,929, Cl. 123-148.00E.

Osaka Gasu Kabushiki Kaisha: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Osborn, Robert A.; and Bullard, Herbert L., to Goodyear Tire & Rubber Company, The. Hydrocarbon-derived resins of piperylene and methyl branched tertiary olefin hydrocarbons blended with other hydrocarbon resins. 4,189,547, Cl. 525-99.000.

Osborne, Edward L.: *See—*
Rappolt, James F.; and Osborne, Edward L., 4,189,088, Cl. 229-31.00R.

Osterman, Evan J. Structure for servicing a plurality of motor vehicles simultaneously. 4,188,985, Cl. 141-98.000.

Ostmann, Walther: *See—*
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Oswalt, Billy W.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,189,086, Cl. 229-15.000.

Ota, Mitsuharu: *See—*
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Otis Engineering Corporation: *See—*
James, Henry J.; and Young, Carter R., 4,189,003, Cl. 166-315.000.

Otsuka, Nobuyuki; and Hirai, Seiichi, to Honda Giken Kogyo Kabushiki Kaisha. Constant velocity universal joint. 4,188,803, Cl. 64-21.000.

Otteson, N. Stuart, to United States of America, Navy. Fluid cutout valve. 4,188,971, Cl. 137-460.000.

Otto, Eberhard: *See—*
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Oulman, Stanley R. Rod holder having fish activated hook setting mechanism. 4,188,742, Cl. 43-15.000.

Ovation Instruments, Inc.: *See—*
Rickard, James H., 4,188,849, Cl. 84-1.150.

Overton, Lyle S. Variable speed drum concentrating machine. 4,189,343, Cl. 159-11.00R.

Owada, Mitsutoshi: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.

Owego Heat Treat, Inc.: *See—*
Engelhard, William E., 4,189,129, Cl. 266-251.000.

Owens-Corning Fiberglas Corporation: *See—*
Haddad, George N.; and Butt, Frederick A., 4,189,452, Cl. 525-444.000.

Owens, Frank R.: *See—*
Carson, William H.; Smith, Gerald D.; and Owens, Frank R., 4,189,718, Cl. 340-384.00E.

Owens-Illinois, Inc.: *See—*
Baker, Theodore C.; and Johnson, William E., 4,189,729, Cl. 340-777.000.

Oyama, Tadao, to Hitachi, Ltd. Panel processing apparatus. 4,188,695, Cl. 29-25.190.

Oyama, Tomio: *See—*
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Pacifici, James G.: *See—*
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Paco Rabanne Parfums S.A.: *See—*
Morille, Alfred, 4,189,057, Cl. 220-23.400.

Palladino, Gaetano. 2-Bromo-6β-fluoro-3-keto-$\Delta^{1,4}$-steroids of the pregnane series. 4,189,440, Cl. 260-397.450.

Palmer, Lewis H., III: *See—*
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.

Palmer, Oakley B.; and Lett, Russell M. Walking support device. 4,188,966, Cl. 135-67.000.

Parkos, Gregory T.: *See—*
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., 4,189,356, Cl. 204-25.000.

Parrish, Daid R.; and Hajos, Zoltan G., to Hoffmann-La Roche Inc. Substituted-hydroxytetrahydroindanones. 4,189,447, Cl. 260-586.00F.

Parsons Controls Limited: *See—*
Millington, Michael J., 4,188,687, Cl. 24-114.500.

Parsons, Robert R.; and Wei, John S. S., to Northern Telecom Limited. Document scanning head. 4,189,753, Cl. 358-294.000.

Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Breathing device having a coolant chamber. 4,188,947, Cl. 128-202.260.

Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., to Kendall Company, The. Catheter with improved balloon assembly. 4,188,954, Cl. 128-349.00B.

Patel, Gordhanbhai N., to Allied Chemical Corporation. Co-crystallized acetylenic compounds. 4,189,399, Cl. 252-408.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,189,317, Cl. 75-252.000.

Patentverwertungs-und Finanzierungsgesellschaft Serania AG: *See*—
Schmid, August, 4,189,147, Cl. 273-406.000.
Patrin, Raymond A. Tie binder. 4,188,689, Cl. 24-221.00R.
Pauliukonis, Richard S. Metering pump. 4,189,285, Cl. 417-403.000.
Pavely, Frederick G.: *See*—
Revett, Raymond H.; and Pavely, Frederick G., 4,189,007, Cl. 172-224.000.
Paxton, Lee C. Door strike. 4,189,175, Cl. 292-340.000.
Payne, Leslie E., to R.J. Reynolds Tobacco Company. Method and apparatus for perforating an assembled filter used on a smoking product. 4,188,847, Cl. 83-868.000.
Pearce, Leonard J.: *See*—
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.
Pearson, Gary L.: *See*—
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.
Pearson, Kenneth C., to Hartco Company. Sheet metal fastener assembly and method of forming the same. 4,189,523, Cl. 428-571.000.
Pedersen, Hakon S., to A/S Bergens Mekaniske Verksteder. Hydraulic system for operation of a winch. 4,188,790, Cl. 60-483.000.
Pedlow, J. Watson. Fire protective mastic and fire stop. 4,189,619, Cl. 174-48.000.
Pekor, Charles B. Process and apparatus for maintaining a desired depth of a waterway. 4,189,253, Cl. 405-74.000.
Pelavin, Joseph Y., to Lark Luggage Corporation. Garment bag with constrained hangers. 4,189,036, Cl. 190-43.000.
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, to CKD Praha, oborovy podnik. Liquid cooler for semiconductor power elements. 4,188,996, Cl. 165-80.00C.
Pellechia, Vincent J.: *See*—
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,083, Cl. 228-123.000.
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,084, Cl. 228-123.000.
Pennec, Jean C., to Regie Nationale des Usines Renault. Apparatus for articulation of movable panels. 4,188,684, Cl. 16-128.100.
Penneck, Richard J.; and Senior, John M. Tracking resistant HV insulation material containing fluorine-substituted component to inhibit erosion. 4,189,392, Cl. 252-63.200.
Penny, Robert N., to Noel Penny Turbines Limited. Centrifugally controlled fuel system. 4,188,780, Cl. 60-39.28R.
Penrod, Orville R., to Allen-Bradley Company. Method of assembling a microcircuit with face-mounted leads. 4,189,085, Cl. 228-173.00R.
Peracchio, Aldo A.: *See*—
Dean, Lee W., III; and Peracchio, Aldo A., 4,189,027, Cl. 181-286.000.
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., to Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia. Iron modifier and method of using same. 4,189,316, Cl. 75-252.000.
Perrin, Duane O. Pipe coupling. 4,189,172, Cl. 285-12.000.
Peschel, Stanley G. Variable transformer method and apparatus for preventing short-circuit current flow. 4,189,672, Cl. 323-43.50R.
Peter-Contesse, Henri, to Boeing Company, The. Shear detection and compensation circuit for aircraft throttle control system. 4,189,118, Cl. 244-182.000.
Peter-Contesse, Henri; and Stephan, Leonard P., to Boeing Company, The. Turbulence compensated throttle control system. 4,189,119, Cl. 244-182.000.
Peterson, Charles W.: *See*—
Rice, Richard E.; and Peterson, Charles W., 4,189,294, Cl. 431-7.000.
Peterson, Edwin E. Scribing protractor. 4,188,729, Cl. 33-332.000.
Peterson, Marvin A., to General Electric Company. Cured polymeric coating material, coated substrate, and process of forming. 4,189,518, Cl. 428-458.000.
Peterson, Wesley R.: *See*—
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.
Petrick, Jean L.: *See*—
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., 4,188,983, Cl. 139-424.000.
Petrov, Vladimir I.: *See*—
Loschilov, Vladimir I.; Zasypkin, Vadim V.; and Petrov, Vladimir I., 4,188,952, Cl. 128-305.000.
Pews, R. Garth, to Dow Chemical Company, The. Preparation of 1H-Benzo (2,1,3)thiadiazine-3,4-dihydro-2,2-dioxides. 4,189,572, Cl. 544-11.000.
Pfeifer, Bernd: *See*—
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.
Pfeifer, Josef: *See*—
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,189,560, Cl. 526-259.000.
Pfizer Inc.: *See*—
Sciavolino, Frank C., 4,189,590, Cl. 548-336.000.
Philipp, Adolf H.; and Jirkovsky, Ivo L., to Ayerst McKenna & Harrison Limited. 2-Substituted-3-methyl-γ-pyrone tricyclic derivatives. 4,189,490, Cl. 424-269.000.
Phillips, Kenneth G.; and Ballweber, Edward G., to Nalco Chemical Company. Dry Mannich quaternary ammonia salt polymers. 4,189,563, Cl. 528-493.000.
Phillips Petroleum Company: *See*—
Bjornson, Geir, 4,189,613, Cl. 568-805.000.
Carroll, James C.; and Johnson, Lewis T., 4,189,052, Cl. 206-507.000.
Childs, William V., 4,189,615, Cl. 568-842.000.
Clark, Vernon R., 4,189,680, Cl. 330-59.000.
Liebert, Timothy C., 4,189,616, Cl. 585-701.000.
Nowlin, Oscar D., 4,189,554, Cl. 526-125.000.
Phillips, Robert F.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,189,510, Cl. 427-125.000.
Phoeniz AG: *See*—
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.
Pickelman, Dale M.: *See*—
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., 4,189,345, Cl. 162-168.00R.
Pico Electronics Limited: *See*—
Duffy, Neil D., 4,189,713, Cl. 340-168.00R.
Pierdet, Andre: *See*—
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.
Piereder, Ludwig, to Piereder Machinery Ltd-Machinerie L. Iereder Ltee. Apparatus for portioning and encasing meat products. 4,188,767, Cl. 53-122.000.
Piereder Machinery Ltd-Machinerie L. Iereder Ltee: *See*—
Piereder, Ludwig, 4,188,767, Cl. 53-122.000.
Pierson, Darrell E.: *See*—
Allen, Richard C.; and Pierson, Darrell E., 4,188,730, Cl. 34-13.800.
Pike, Herbert J., to J. P. Stevens & Co., Inc. Air jet for yarn entanglement. 4,188,692, Cl. 28-271.000.
Pitts, Robert W., Jr., to Texaco Inc. Well logging system. 4,189,705, Cl. 250-262.000.
Plancqueel, Guy: *See*—
Limare, Armand; and Plancqueel, Guy, 4,189,359, Cl. 204-43.00T.
Plasto-Matic Valves, Inc.: *See*—
De Lorenzo, Bruce L., 4,188,978, Cl. 137-859.000.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Polycyclic nitrogen-containing compounds. 4,189,434, Cl. 548-257.000.
Ploszaj, Leon C.: *See*—
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Plunkett, Larry D., to Signode Corporation. Bumper deterioration warning system for fastener driving tools. 4,188,858, Cl. 91-392.000.
Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. Internal combustion engine magneto-type ignition system with electronically controlled spark advance. 4,188,929, Cl. 123-148.00E.
Pohl, Siegfried: *See*—
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Polak's Frutal Works, B.V.: *See*—
Cohen, Amnon M., 4,189,439, Cl. 260-347.500.
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, to Merck & Co., Inc. Immunologic glycolipid adjuvants. 4,189,471, Cl. 424-88.000.
Ponsinet, Gerard: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Popova, Emilia N.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.
Porter, Frederick C., to Mason & Porter, Limited. Agricultural machine with detachable and separately usable propelling structure. 4,189,008, Cl. 172-253.000.
Portmann, Robert, to Ciba-Geigy Corporation. Process for the production of 2-bromo-3-cyano-4,6-diaminopyridine. 4,189,584, Cl. 546-289.000.
Pottenger, Rique L.: *See*—
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.
Pozgay, Jerome H.: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.
PPG Industries, Inc.: *See*—
Drummond, Warren W., 4,189,110, Cl. 242-131.000.
Price-Pfister Brass Mfg. Co.: *See*—
Tolnai, Julius L.; and Tarnay, Matthew G., 4,188,676, Cl. 4-295.000.
Printing Developments, Inc.: *See*—
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.
Procter & Gamble Company, The: *See*—
Lubsen, Timothy A.; and Maag, Gustav A., 4,189,442, Cl. 260-428.500.
Proksch, Gary J.; and Bonderman, Dean P. Compound useful in cholesterol assay procedures. 4,189,400, Cl. 252-408.000.
Przywozny, Walter C.; and Moakler, William A., to Automatic Switch Company. Control panel for automatic transfer switch. 4,189,649, Cl. 307-64.000.
Purdue Research Foundation: *See*—
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.
Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.

Puryear, John W., to Brunswick Corporation. Bail retaining washer for fishing reel. 4,189,108, Cl. 242-84.20G.
Quayle, Lawrence L., to Maytag Company, The. Dishwasher airflow drying system. 4,188,732, Cl. 34-54.000.
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, to Stanley-Mabo S.A. Coilable rule with automatic recoil. 4,189,107, Cl. 242-84.800.
Quintell, Debra: *See*—
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.
R.J. Reynolds Tobacco Company: *See*—
Payne, Leslie E., 4,188,847, Cl. 83-868.000.
R.R. Donnelley & Sons Company: *See*—
Swanson, Kermit E., 4,189,140, Cl. 271-212.000.
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, to Linde Aktiengesellschaft. Method of and apparatus for the cooling (quenching) of cracking gases. 4,188,796, Cl. 62-121.000.
Raber, John C. Golf link. 4,189,152, Cl. 273-176.0AB.
Rafaely, Gilad. Enclosure device for encouraging the laying of eggs by domestic fowls particularly turkeys. 4,188,911, Cl. 119-48.000.
Raganato, Carlo; and Voituron, Georges, to Solvay & Cie. Process for the manufacture of discontinuous fibrils. 4,189,455, Cl. 264-12.000.
Raizon, Bernard M.: *See*—
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.
Ramon, Noel A., to Naamloze Vennootschap A. Claeys-Flandria. Control for heating apparatus. 4,189,295, Cl. 431-12.000.
Ramun, John R.: *See*—
Ramun, Michael; and Ramun, John R., 4,188,721, Cl. 30-134.000.
Ramun, Michael; and Ramun, John R. Attachment for a back hoe. 4,188,721, Cl. 30-134.000.
Rank Xerox Ltd.: *See*—
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.
Ransomes Sims & Jefferies Limited: *See*—
Revett, Raymond H.; and Pavely, Frederick G., 4,189,007, Cl. 172-224.000.
Rapistan Incorporated: *See*—
Soderstrom, Edward C.; and Neu, David L., 4,189,273, Cl. 414-285.000.
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., to United States of America, Health, Education and Welfare. Synthesis of 4A-aryl-decahydroisoquinolines. 4,189,583, Cl. 546-141.000.
Rapp, Adolph K., to National Semiconductor Corporation. Complementary MOS memory array including complementary MOS memory cells therefor. 4,189,785, Cl. 365-156.000.
Rappolt, James F.; and Osborne, Edward L., to Westvaco Corporation. Container with interlocking corners. 4,189,088, Cl. 229-31.00R.
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., to Air-Mo Hydraulics, Inc. Hydraulic chuck. 4,189,162, Cl. 279-4.000.
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, to Gewerkschaft Eisenhutte Westfalia. Mineral mining planer having pivoted floor cutter carrier. 4,189,187, Cl. 299-34.000.
Rausing, Anders R. Method for forming containers with foamed corners. 4,189,456, Cl. 264-25.000.
Rauskolb, Fred W. Method and apparatus for eliminating wet streaks in fibrous sheets or webs by infra-red radiation. 4,188,731, Cl. 34-41.000.
Rawolle, Keith C. Nursery equipment. 4,188,678, Cl. 5-105.000.
Rayburn, Robert L.: *See*—
Watson, Robert L.; and Rayburn, Robert L., 4,188,946, Cl. 128-204.220.
Raytheon Company: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.
McDonough, Robert J., 4,189,691, Cl. 333-22.00R.
RCA Corporation: *See*—
Adam, Kenneth C., 4,189,714, Cl. 340-347.0AD.
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.
Dingwall, Andrew G. F., 4,189,782, Cl. 365-190.000.
Sechi, Franco N., 4,189,682, Cl. 330-252.000.
Sechi, Franco N.; and Camisa, Raymond L., 4,189,688, Cl. 331-117.0FE.
Valachovic, John, 4,189,746, Cl. 358-128.500.
Reell Precision Manufacturing Corporation: *See*—
Johnson, Lee W., 4,189,039, Cl. 192-26.000.
Regie Nationale des Usines Renault: *See*—
Cochard, Pierre; and Guicherd, Christian, 4,188,923, Cl. 123-32.0ST.
Pennec, Jean C., 4,188,684, Cl. 16-128.100.
Reichel, Pavel: *See*—
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Reichenbach, Donald F.: *See*—
Shanoski, Henry; and Reichenbach, Donald F., 4,189,517, Cl. 428-423.700.
Reichman, Eli, to Gould Inc. Conduit ground wire coupling. 4,189,198, Cl. 339-13.000.
Reifenhauser KG: *See*—
Halter, Hartmut, 4,189,288, Cl. 425-72.00R.
Reilly, Norman B.: *See*—
United States of America, National Aeronautics and Space Administration; Reilly, Norman B.; and Smith, Joel G., 4,189,675, Cl. 325-4.000.
Reinhard, Cheyenne A. Folding fire escape ladder. 4,189,028, Cl. 182-160.000.
Reinhard, Russell R.: *See*—
Yaffe, Roberta; and Reinhard, Russell R., 4,189,388, Cl. 252-46.700.
Reinhardt, Frederick N.; and Fouts, William A., to Cushion Cut, Inc. Step safety groover apparatus. 4,188,934, Cl. 125-4.000.
Reis, James J., to Northrop Corporation. Video bandwidth reduction system using a two-dimensional transformation, and an adaptive filter with error correction. 4,189,748, Cl. 358-133.000.
Reisdorf, Daniel: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Reitel, Christian: *See*—
Koenig, Karl-Heinz; and Reitel, Christian, 4,189,446, Cl. 260-544.00C.
Rekers, Louis J.; and Speca, Anthony N., to National Petro Chemicals Corporation. Supported catalyst for olefin polymerization. 4,189,402, Cl. 252-428.000.
Relle, Zsuzsa: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Republic Steel Corporation: *See*—
Waid, George M.; and Davenport, Anthony T., 4,189,333, Cl. 148-36.000.
Resco Products, Inc.: *See*—
Winchester, George L., Jr., 4,189,327, Cl. 106-60.000.
Research-Cottrell, Inc.: *See*—
Feldman, Paul L., 4,189,308, Cl. 55-13.000.
Rester, Joe D., to Matthews Machine Co., Inc. Latch for a fire screen folding door assembly. 4,189,173, Cl. 292-86.000.
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, to Gesellschaft fur Hochtemperaturreaktor-Technik mbH. Base for vessel subject to high temperature, especially for a pebble bed reactor vessel. 4,189,347, Cl. 176-58.0PB.
Revett, Raymond H.; and Pavely, Frederick G., to Ransomes Sims & Jefferies Limited. Reversible ploughs. 4,189,007, Cl. 172-224.000.
Rhodes, Robert T., to International Business Machines Corporation. Corona grid wire assembly and mounting. 4,188,694, Cl. 29-25.170.
Rhoe, Stanley A. Step tapered back rest cushion. 4,189,182, Cl. 297-460.000.
Rhone-Poulenc Industries: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.
Rice, Richard E.; and Peterson, Charles W., to Comstock & Wescott Inc. Flameless combustion burner and method of operation. 4,189,294, Cl. 431-7.000.
Rich, Cy. Educational toy. 4,188,734, Cl. 35-35.00H.
Rich, Daniel H.; and Gurwara, Sweet K., to Wisconsin Alumni Research Foundation. 3-Nitro-4-bromomethyl benzoic acid. 4,189,605, Cl. 562-438.000.
Rich, Hubert A.; and May, Herbert, to Mattel, Inc. Toy vehicle and housing set. 4,188,748, Cl. 46-202.000.
Richards, David J.: *See*—
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.
Richardson-Merrell Inc.: *See*—
Sjoerdsma, Albert, 4,189,492, Cl. 424-273.00R.
Richardson, Norman: *See*—
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.
Richardson, Thomas E.: *See*—
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.
Richardson, Warner G., to Caterpillar Tractor Co. Magnetic switch adjusting system. 4,188,739, Cl. 37-126.0AE.
Richter Gedeon Vegyeszeti Gyar Rt: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Rickard, James H., to Ovation Instruments, Inc. Pickup for stringed musical instrument. 4,188,849, Cl. 84-1.150.
Ricoh Company, Ltd.: *See*—
Sakai, Katsuo, 4,189,224, Cl. 355-4.000.
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Ridge, David N.: *See*—
Hanifin, John W.; and Ridge, David N., 4,189,436, Cl. 549-72.000.
Ridgway, John A., Jr.: *See*—
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Rieber, Norbert: *See*—
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Riggs, Olen L., Jr., to Kerr-McGee Corporation. Method of treating a substrate material to form an electrode. 4,189,357, Cl. 204-29.000.
Robbins, Urban G., Jr. Internal combustion engine having inducted charge control means driven by engine through variable speed hydraulic transmission. 4,188,918, Cl. 123-25.00R.

Robeco Chemicals, Inc.: *See—*
Rosenthal, Maurice L., 4,189,465, Cl. 424-10.000.
Robert Bosch GmbH: *See—*
Bianchi, Valerio; and Latsch, Reinhard, 4,188,920, Cl. 123-32.0EA.
Fleischer, Helmut, 4,188,926, Cl. 123-102.000.
Grimmer, Franz, 4,188,921, Cl. 123-32.0EA.
Podrapsky, Jiri; and Orova, Josef, 4,188,929, Cl. 123-148.00E.
Schnaibel, Eberhard; and Junginger, Erich, 4,189,093, Cl. 236-37.000.
Roberts, Patrick S., to Thomas International Corporation. Digital tone and chord generators. 4,188,848, Cl. 84-1.010.
Roberts, Sidney N.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,189,378, Cl. 209-459.000.
Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,188,975, Cl. 137-625.660.
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.
Robinette, James A., to Strong-Robinette Bag Company, Inc. Automatic bag tube feeder. 4,189,136, Cl. 271-12.000.
Robinson, Anthony, to E.S.G. Controls Limited. Control of heating and ventilation systems. 4,189,094, Cl. 236-46.00R.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Mounting plate for hinges or the like. 4,188,685, Cl. 16-159.000.
Rockwell International Corporation: *See—*
Ehrich, Ralph D.; and Emmert, Robert I., 4,189,116, Cl. 244-3.160.
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.
Sheller, Daniel R., 4,189,635, Cl. 235-92.0EC.
Rockwood, Stephen D.: *See—*
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.
Rodriguez, Claude: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.
Roessler, Peter: *See—*
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.
Roever, Paul R., to International Business Machines Corporation. Method and means for the detection of deadlock among waiting tasks in a multiprocessing, multiprogramming CPU environment. 4,189,771, Cl. 364-300.000.
Roger, Harry. Bypass valve assembly and system. 4,188,974, Cl. 137-557.000.
Rogers, Howard H.: *See—*
Stadnick, Steven J.; and Rogers, Howard H., 4,189,527, Cl. 429-26.000.
Romania, Samuel R., to Burroughs Corporation. Latch assembly for clamping electronic components. 4,189,201, Cl. 339-75.0MP.
Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., to Shell Oil Company. Catalyst for cyclodimerization of isoprene. 4,189,403, Cl. 252-431.00P.
Rooney, Kenneth R. Mask for exercising facial muscles. 4,189,141, Cl. 272-95.000.
Rope, Eugene L.; and Tricoles, Gus P., to General Dynamics Electronics Division. Radome with tilted dielectric strips. 4,189,731, Cl. 343-872.000.
Rosa, Frank; and Miller, Richard L. Automatic orientation circuit indicator device for portable power tools and the like. 4,189,726, Cl. 340-689.000.
Rose, Sam, to Bio-Response, Inc. Method for the continuous removal of a specific antibody from the lymph fluid in animals and humans. 4,189,470, Cl. 424-85.000.
Rosenthal, Maurice L., to Robeco Chemicals, Inc. Method for inhibiting nitrosamine formation. 4,189,465, Cl. 424-10.000.
Rosidium Pty. Ltd.: *See—*
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Ross, Josef A. Bowling ball carrier insert. 4,188,990, Cl. 150-52.00A.
Ross, Sidney D.: *See—*
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Roth, Martin; Darms, Roland; and Pfeifer, Josef, to Ciba-Geigy Corporation. Crosslinkable polymers of unsaturated imides. 4,189,560, Cl. 526-259.000.
Rothacker, Dietrich: *See—*
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Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.
Roussin, Michael A., to Caterpillar Tractor Co. Gas loaded face seal. 4,189,158, Cl. 277-34.300.
Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Battery powered condition sensing and display apparatus with low battery indication. 4,189,725, Cl. 340-636.000.
Roy, Clermont A., to Canada Wire and Cable Limited. Oxidation resistant barrier coated copper based substrate and method for producing the same. 4,189,331, Cl. 148-6.310.
Rubenstein, Irving H., to Maryland Cup Corporation. Marshmallow variegate for frozen confections and frozen confections containing same. 4,189,502, Cl. 426-249.000.
Rudolh, Otfried: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.
Ruebel, Jack K.: *See—*
Nottke, James E.; and Ruebel, Jack K., 4,189,067, Cl. 222-57.000.
Ryabov, Valentin I.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.
Rye, Grover W.; and Marencak, Karol, to Goodyear Tire & Rubber Company, The. Vapor treatment of metal tire cord. 4,189,332, Cl. 148-6.310.
Rymarczyk, James W.: *See—*
Liptay, John S.; and Rymarczyk, James W., 4,189,768, Cl. 364-200.000.
Rymer, Richard. Method of constructing an attrition mill grate. 4,188,700, Cl. 29-163.50R.
Saarbergwerke A.G.: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Saccoccio, Nazareno J., to Aro-Sac Inc. Ear clip. 4,188,799, Cl. 63-14.00D.
Sadel, Hans. Method and apparatus for measuring television sound and picture. 4,189,750, Cl. 358-192.000.
Sagami Chemical Research Center: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.
Sagefor, Karl Ivar: *See—*
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Saito, Akihiro: *See—*
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Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Takushu Noyaku Seizo K.K. Combating pests with O,S-dialkyl-O-haloalkyl-phosphorothiolates. 4,189,476, Cl. 424-224.000.
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, to Konishiroku Photo Industry Co., Ltd. Apparatus for detecting focal point. 4,189,218, Cl. 354-25.000.
Saito, Teruo: *See—*
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Sakai, Katsuo, to Ricoh Company, Ltd. Two color electrostatic copying machine. 4,189,224, Cl. 355-4.000.
Sakai, Tetsushi: *See—*
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Sakamoto, Shuji; and Wada, Shuichi, to Sanyo Electric Co., Ltd. Combination VHF-UHF tuner for use in a television receiver. 4,189,678, Cl. 325-459.000.
Sakamoto, Tamaki; and Kinefuchi, Yoshio, to Omron Tateisi Electronics Co. Blood pressure measuring process and apparatus. 4,188,955, Cl. 128-680.000.
Sakashita, Takeshi; and Miyamoto, Ryoichi, to Mitsui Petrochemical Industries, Ltd. Epoxy resin composition. 4,189,548, Cl. 525-109.000.
Sakata, Ryozo: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Nissan Chemical Industries, Ltd.; and Sagami Chemical Research Center. [N-benzyl-o-(2,6-dichloroanilino)phenyl]acetic acid derivatives. 4,189,595, Cl. 560-47.000.
Sakurai, Wataru: *See—*
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, 4,189,639, Cl. 250-282.000.
Salem Furnace Co.: *See—*
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.
Sam, Donnie J., to Du Pont de Nemours, E. I., and Company. Orthonitrophenylethylene glycols. 4,189,611, Cl. 525-472.000.
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, to Institut National de la Recherche Agronomique. Process for the stereo specific preparation of sexual pheromones. 4,189,614, Cl. 568-908.000.
Samel, Ulf-Rainer: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Samibem, S.A.: *See—*
Kaetzel, Pierre, 4,188,773, Cl. 56-192.000.
Samurin, Norman A.: *See—*
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., 4,189,156, Cl. 277-1.000.
Sanada, Seiji: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,189,740, Cl. 358-21.00V.
Sanda, Shogo: *See—*
Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, 4,188,932, Cl. 123-191.00S.

Sanders Associates, Inc.: *See—*
Mairson, Theodore, 4,188,816, Cl. 73-1.00D.
Sandoz Ltd.: *See—*
Engel, Gunter; and Wagner, Heribert, 4,189,494, Cl. 424-274.000.
Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Hexacoordinated transition metal compounds and fuel compositions containing them. 4,189,306, Cl. 44-68.000.
Santi, John D., to Briggs & Stratton Corporation. Breakerless flywheel magneto ignition system. 4,188,930, Cl. 123-148.00E.
Sanyo Electric Co., Ltd.: *See—*
Sakamoto, Shuji; and Wada, Shuichi, 4,189,678, Cl. 325-459.000.
Saruwatari, Minoru. Magnetic seed treating device. 4,188,751, Cl. 47-1.300.
Sasajima, Michitada: *See—*
Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, 4,189,607, Cl. 562-457.000.
Sato, Akimune: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.
Sato, Makoto: *See—*
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Satoh, Ken, to Olympus Optical Co., Ltd. Tape recorder provided with a count display for counting and displaying a number of reel rotations. 4,189,636, Cl. 235-92.0MP.
Satoh, Takao: *See—*
Seita, Toru; Satoh, Takao; and Shimizu, Akihiko, 4,189,361, Cl. 204-98.000.
Satti, John A., to United States of America, Energy. Superconducting magnet. 4,189,693, Cl. 335-216.000.
Saucy, Gabriel: *See—*
Cohen, Noal; and Saucy, Gabriel, 4,189,612, Cl. 568-763.000.
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, to Consortium fur Elektrochemische Industrie GmbH. 1-(3-Pyridyl)-2,2,2-trihaloethyl compounds. 4,189,486, Cl. 424-263.000.
Savas, Christy: *See—*
Gulla, Michael; and Savas, Christy, 4,189,324, Cl. 106-1.220.
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, to Shikoku Chemicals Corporation. Imidazole-isocyanuric acid adducts. 4,189,577, Cl. 544-222.000.
Sawada, Jiro: *See—*
Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, 4,189,607, Cl. 562-457.000.
Sawada, Katsumi: *See—*
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.
Sawazaki, Hajime, to Tokyo Shibaura Electric Co., Ltd. Semiconductor integrated circuit device. 4,189,738, Cl. 357-40.000.
Saxmayer Corporation: *See—*
Mills, Douglas C.; and Clark, Jeffrey A., 4,189,134, Cl. 270-66.000.
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purification device. 4,188,783, Cl. 60-277.000.
Sbrana, Glauco: *See—*
Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, 4,189,441, Cl. 260-410.90R.
Scandella, Louis: *See—*
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.
Scarpellino, Anthony J., Jr; and Borner, William G., to International Nickel Company, Inc., The. Electrodeposition of ruthenium-iridium alloy. 4,189,358, Cl. 204-43.00N.
Schaefer, Donald W.: *See—*
Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.
Schaible, Wolfgang. Method and apparatus for regulating a steam turbine installation. 4,188,792, Cl. 60-660.000.
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, to BASF Aktiengesellschaft. 2-Acylamino-4-amino-5-(3,4,5-trimethoxybenzyl)-pyrimidines. 4,189,581, Cl. 544-324.000.
Scheiderer, Gerrit: *See—*
Bendler, Hellmut; and Scheiderer, Gerrit, 4,188,856, Cl. 89-1.00B.
Scheiderer, Ronald L.: *See—*
Arias, Armando; Scheiderer, Ronald L.; and Wiggenhorn, James T., 4,189,676, Cl. 325-125.000.
Schenck, Hans-Uwe: *See—*
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
Scheppele, Lyle W., to Toledo Stamping & Manufacturing Company. Mixer for animal feed. 4,189,240, Cl. 366-186.000.
Scherr, George H.: *See—*
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.
Scherrer, Igor, to Ebauches S.A. Electronic watch. 4,188,776, Cl. 58-23.00R.
Scheuerpflug, Hans; and Althoff, Dieter, to Johannes Fuchs, Firma. High-speed mobile working machine. 4,189,021, Cl. 180-54.00C.
Schick, Rupert: *See—*
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Schill, Hermann, to Maja-Maschinenfabrik Hermann Schill GmbH. Skinning machine for bacon or the like. 4,188,870, Cl. 99-589.000.
Schilling, Paul: *See—*
Jeschke, Willi; Schilling, Paul; and Breunig, Anton, 4,188,882, Cl. 101-148.000.
Schleinkofer, Rudolf, to Siemens Aktiengesellschaft. Rotating anode X-ray tube. 4,189,658, Cl. 313-330.000.
Schleis, William: *See—*
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.
Schmelzer Corporation: *See—*
Detweiler, Charles A., 4,189,454, Cl. 261-39.00B.
Schmid, August, to Patentverwertungs-und Finanzierungsgesellschaft Serania AG. Rifle target moving apparatus. 4,189,147, Cl. 273-406.000.
Schmid, Bruce K.: *See—*
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.
Schmidt, Paul J.: *See—*
Crounse, Nathan N.; and Schmidt, Paul J., 4,189,171, Cl. 282-27.500.
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, to Hoechst Aktiengesellschaft. Medicinal composition and its use as antidepressive agent. 4,189,478, Cl. 424-244.000.
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Photopolymerizable compositions based on acrylic or methacrylic acid esters containing organic phosphites. 4,189,365, Cl. 204-159.230.
Schmutzer, Joel; and Elkerton, George D., to Forest Electric Company. Direct current ballasting and starting circuitry for gaseous discharge lamps. 4,189,663, Cl. 315-205.000.
Schnaibel, Eberhard; and Junginger, Erich, to Robert Bosch GmbH. Apparatus for regulating the temperature of a compartment or space. 4,189,093, Cl. 236-37.000.
Schneider, Klaus: *See—*
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, to United States of America, Navy. Method and apparatus of testing a model. 4,188,822, Cl. 73-147.000.
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Rotary printing machine. 4,188,883, Cl. 101-183.000.
Schott, Alfred: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.
Schrader, Lothar; and Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Field effect transistor having an extremely short channel length. 4,189,737, Cl. 357-23.000.
Schreck, Robert C.: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.
Schroder, Johann; and Gawron, Klaus, to U.S. Philips Corporation. Heat storage material comprising lithium chlorate-trihydrate and a nucleating agent. 4,189,393, Cl. 252-70.000.
Schroder, Johann; and Gawron, Klaus, to U.S. Philips Corporation. Heat storage material comprising calcium chloride-hexahydrate and a nucleating agent. 4,189,394, Cl. 252-70.000.
Schubert, Wolfgang; and Durrer, Bernhard, to Cerberus AG. Smoke detector ionization chamber. 4,189,644, Cl. 250-381.000.
Schultz, Bruce R.: *See—*
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Schultz, Raymond P.: *See—*
Flynn, M. Rutledge; and Schultz, Raymond P., 4,189,097, Cl. 237-8.00R.
Schulz, Horst: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.
Schumacher, Arnold, to Sulzer Brothers Limited. Crankshaft bearing. 4,189,193, Cl. 308-23.000.
Schupp, Eberhard: *See—*
Kempter, Fritz E.; and Schupp, Eberhard, 4,189,450, Cl. 525-455.000.
Schupphaus, Herbert; and Oberste-Beulmann, Klaus, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Drum cutter mining machine. 4,189,188, Cl. 299-53.000.
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., to New York Institute of Technology. Apparatus and method for automatic coloration and/or shading of images. 4,189,743, Cl. 358-93.000.
Schuster, Albert; and McCarthy, James R., to Dow Chemical Company, The. Process for the preparation of N,N'-disubstituted 2-naphthaleneethanimidamide and intermediates used therein. 4,189,444, Cl. 260-453.0RW.
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, to Korf-Stahl AG. Liquid-cooled electrode for electric arc furnaces. 4,189,617, Cl. 13-18.00C.
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler; and Henkel & Cie GmbH. Antistatic agents for thermoplastic synthetic resins. 4,189,550, Cl. 525-6.000.
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, to TMC Corporation. Anti-crossover device for skis. 4,189,163, Cl. 280-11.37E.
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer supported at the end wall of a self-supporting motor vehicle body. 4,189,177, Cl. 296-188.000.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives—C_8 modifications. 4,189,590, Cl. 548-336.000.

Scientific Glassware Ltd.: *See—*
Young, James, 4,188,699, Cl. 29-157.10R.

Scott, Peter M., to Hewlett-Packard Company. CMI-encoder. 4,189,621, Cl. 178-67.000.

Sears, Delbert R.: *See—*
Lotton, Wilson H.; and Sears, Delbert R., 4,188,969, Cl. 137-264.000.

Sears, Stephan B.: *See—*
Kyser, Edmond L.; and Sears, Stephan B., 4,189,734, Cl. 346-1.100.

Sebag, Henri: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Sechi, Franco N., to RCA Corporation. Microwave FET power circuit. 4,189,682, Cl. 330-252.000.

Sechi, Franco N.; and Camisa, Raymond L., to RCA Corporation. Microwave FET power oscillator. 4,189,688, Cl. 331-117.0FE.

Segerljung, Bo V. Brake device for rotatable and spring loaded rods, foil or cloth material being attachable to said rods. 4,188,992, Cl. 160-296.000.

Seibert, Harry L.: *See—*
Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.

Seiler, Herbert: *See—*
Bonometti, Emil; and Seiler, Herbert, 4,189,570, Cl. 544-211.000.

Seita, Toru; Satoh, Takao; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Electrolysis of sodium chloride. 4,189,361, Cl. 204-98.000.

Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for producing cation exchange membrane by impregnating a diene monomer having carboxylic acid groups into a fluorinated membrane having cation exchange groups and polymerizing. 4,189,540, Cl. 521-27.000.

Sekiya, Tetsuo: *See—*
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.

Sekizawa, Yasuharu: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Seliskar, James T.; and Adams, Donald C., to Dow Chemical Company, The. Floating thermally insulating tank covers. 4,189,058, Cl. 220-218.000.

Sellers, Gregory J.: *See—*
Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., 4,189,618, Cl. 174-35.0MS.

Selwood, Alan: *See—*
Ellis, Peter M.; and Selwood, Alan, 4,189,512, Cl. 428-198.000.

Senco Products, Inc.: *See—*
Smith, James E.; and Becht, Carl T., 4,189,080, Cl. 227-8.000.

Senior, John M.: *See—*
Penneck, Richard J.; and Senior, John M., 4,189,392, Cl. 252-63.200.

Sewell, Walter D.: *See—*
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG: *See—*
Zeidler, Gerhard; and Ziegler, Gunther, 4,188,802, Cl. 64-12.000.

Shafco Industries, Inc.: *See—*
Miller, Ivan O., 4,188,860, Cl. 92-15.000.

Shaffer, Earl W., Jr.: *See—*
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., 4,189,367, Cl. 204-195.00G.

Shaffer, Ernest M. Two-wheeled cycle bumper carrier for motor vehicles. 4,189,274, Cl. 414-462.000.

Shaffer, John W., to GTE Sylvania Incorporated. Multilamp photoflash unit having conductive adhesive connection. 4,189,298, Cl. 431-359.000.

Shaffer, Walter M., to Caterpillar Tractor Co. Side loading ultra-narrow aisle lift truck. 4,189,276, Cl. 414-659.000.

Shahbender, Rabah: *See—*
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.

Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma I. 4,189,425, Cl. 260-112.00B.

Shanoski, Henry; and Reichenbach, Donald F., to General Tire & Rubber Company, The. Low-shrink in-mold coating. 4,189,517, Cl. 428-423.700.

Shapiro, Daniel M.; and Cuendet, Jean-Francois. Tetrahydrocannabinol in a method of treating glaucoma. 4,189,491, Cl. 424-273.00R.

Shatalov, Lev N.: *See—*
Gusarov, Anatoly A.; and Shatalov, Lev N., 4,189,507, Cl. 427-47.000.

Shaw Aero Devices, Inc.: *See—*
Shaw, James R., 4,189,059, Cl. 220-246.000.

Shaw, James R., to Shaw Aero Devices, Inc. Sealing mechanism for aircraft fuel tank cap. 4,189,059, Cl. 220-246.000.

Shay, Greg D.; and Griffith, James H., to Sherwin-Williams Company, The. Crosslinking agent for powder coatings. 4,189,421, Cl. 260-38.000.

Sheeley, Eugene L.: *See—*
Guzzle, Timothy L.; and Sheeley, Eugene L., 4,189,144, Cl. 273-77.00R.

Shell Oil Company: *See—*
Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,189,403, Cl. 252-431.00P.

Sheller, Daniel R., to Rockwell International Corporation. Self-test circuit apparatus. 4,189,635, Cl. 235-92.0EC.

Shen, Tsung-Ying: *See—*
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, 4,189,471, Cl. 424-88.000.

Shephard, Kenneth P., to Upjohn Company, The. Expoxide process. 4,189,430, Cl. 260-239.55R.

Shephard, Margaret C.: *See—*
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., 4,189,483, Cl. 424-251.000.

Sherwin-Williams Company, The: *See—*
Flores, Robert J., 4,189,328, Cl. 106-288.00Q.
Shay, Greg D.; and Griffith, James H., 4,189,421, Cl. 260-38.000.

Sherwood Medical Industries Inc.: *See—*
Zine, Anthony R., Jr., 4,189,382, Cl. 210-46.000.

Shibata, Toshihiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,189,409, Cl. 260-23.0XA.

Shibata, Uichi: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, to Matsuyama Petrochemicals Inc.; and Maruzen Oil Co., Ltd. Process for producing high-quality terephthalic acid suitable for use in direct polymerization. 4,189,603, Cl. 562-417.000.

Shih, David H.: *See—*
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.

Shikoku Chemicals Corporation: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

Shimai, Hideo, to Yoshida Kogyo K.K. Apparatus for gapping a slide fastener chain. 4,188,716, Cl. 29-770.000.

Shimano Industrial Company, Limited: *See—*
Takamatsu, Masatoshi, 4,189,424, Cl. 260-42.150.

Shimazaki, Fumio. Device of detecting cloth feeding amount in sewing machines. 4,188,893, Cl. 112-121.110.

Shimizu, Akihiko: *See—*
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Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, 4,189,552, Cl. 526-84.000.

Shinohara, Minoru: *See—*
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Shintaku, Ken, to Burroughs Corporation. Pen-shaped precision multi-level current mode logic test probe. 4,189,673, Cl. 324-133.000.

Shoji, Shigeo: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.

Siemens Aktiengesellschaft: *See—*
Mattern, Alfred, 4,189,624, Cl. 179-15.0AL.
Schleinkofer, Rudolf, 4,189,658, Cl. 313-330.000.
Schrader, Lothar; and Horninger, Karlheinrich, 4,189,737, Cl. 357-23.000.

Sieveking, Hans U.: *See—*
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.

Signode Corporation: *See—*
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Silonics, Inc.: *See—*
Kyser, Edmond L.; and Sears, Stephan B., 4,189,734, Cl. 346-1.100.

Silver, Edward S., to Silver Knit Industries, Inc. Unitary hanger display package. 4,189,049, Cl. 206-216.000.

Silver Knit Industries, Inc.: *See—*
Silver, Edward S., 4,189,049, Cl. 206-216.000.

Silverberg, Morton, to Xerox Corporation. Steering and supporting system for a photoconductive belt. 4,189,223, Cl. 355-3.0BE.

Simonov, Vadim D.: *See—*
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D. Halogenated spiro compounds. 4,189,575, Cl. 544-70.000.

Sindelar, Ernest C., to Caterpillar Tractor Co. Back-up ring for cup seal. 4,189,287, Cl. 417-490.000.

Singer Company, The: *See—*
Beckerman, Howard L., 4,188,901, Cl. 112-278.000.
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.
Garron, Stephen A.; and Odermann, Charles R., 4,188,900, Cl. 112-264.100.
Johnson, Ralph E.; and Urciola, John A., 4,188,895, Cl. 112-158.00D.
Kahan, William, 4,188,902, Cl. 112-278.000.

Siuta, Gerald J.: *See—*
Weiss, Martin J.; and Siuta, Gerald J., 4,189,597, Cl. 560-118.000.

Sizemore, Walter R.: *See—*
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Sjoerdsma, Albert, to Richardson-Merrell Inc. Antihypertensive compositions of 2-[1-(2,6-dichlorophenoxy)ethyl]-4,5-dihydro-1H-imidazole and N-(2-chloroethyl)-N-(1-methyl-2-phenoxy-ethyl)benzenemethanamine. 4,189,492, Cl. 424-273.00R.

Sjostrand, Gunnar. Method of producing a dismountable, reinforced plaster mold or plaster cast and means therefor. 4,188,943, Cl. 128-91.00A.

Skala, Stephen F. Freezer with rapid defrosting. 4,188,794, Cl. 62-82.000.

Skinner, Charles A., to Electro-Therm, Inc. Flexing device for holding a surface electric heating element in a raised position. 4,189,633, Cl. 219-458.000.

Skopil, Arthur, to VDO Adolf Schindling AG. Bi-metallic indicator. 4,188,827, Cl. 73-363.500.

Skradski, Frank L.: *See—*
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L., 4,189,593, Cl. 548-352.000.

Slater Electric, Inc.: *See—*
Hoehn, Rudolph H., 4,188,854, Cl. 85-36.000.

Slepnev, Gennady M.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Sloan, Cephas H.: *See—*
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.

Sloboda, Adolph E.: *See—*
Hanifin, John W.; and Sloboda, Adolph E., 4,189,497, Cl. 424-275.000.

Slyman Manufacturing Corporation: *See—*
Bratko, Rudolph S.; and Zwipf, Werner, 4,189,297, Cl. 431-328.000.

Smallegan, Jon M.: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,189,249, Cl. 403-27.000.

Smalley, Benjamin M. Animal feeding apparatus. 4,188,912, Cl. 119-51.00R.

Smida, George R.: *See—*
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.

Smith, Alvy R.: *See—*
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., 4,189,743, Cl. 358-93.000.

Smith, B. Clark; and Anders, Gene A., to Caterpillar Tractor Co. Fuel vaporizing combustor tube. 4,188,782, Cl. 60-733.000.

Smith, Gerald D.: *See—*
Carson, William H.; Smith, Gerald D.; and Owens, Frank R., 4,189,718, Cl. 340-384.00E.

Smith, Gerald L.: *See—*
Justus, Dennis J.; and Smith, Gerald L., 4,189,642, Cl. 250-324.000.

Smith International, Inc.: *See—*
Allen, James H.; and Baker, William, III, 4,189,014, Cl. 175-339.000.
Garrett, William R., 4,189,012, Cl. 175-312.000.

Smith, James E.; and Becht, Carl T., to Senco Products, Inc. Impact device. 4,189,080, Cl. 227-8.000.

Smith, Joel G.: *See—*
United States of America, National Aeronautics and Space Administration; Reilly, Norman B.; and Smith, Joel G., 4,189,675, Cl. 325-4.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.

Smith, Raymond E., Jr. Telescoping aerial lift. 4,188,757, Cl. 52-111.000.

SmithKline Corporation: *See—*
Berges, David A., 4,189,573, Cl. 544-21.000.
Levinson, Sidney H.; and Mendelson, Wilford L., 4,189,578, Cl. 544-239.000.

Smorodinov, Alexandr N.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368. Cl. 204-243.00M.

Snow, Robert E.: *See—*
Lawver, James E.; Snow, Robert E.; and McClintock, Walter O., 4,189,103, Cl. 241-20.000.

Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., to Imperial Chemical Industries Limited. Pesticidal compounds, compositions and processes. 4,189,483, Cl. 424-251.000.

Snyder, Donald W. Current controlled inverter. 4,189,764, Cl. 363-21.000.

Snyder, Harold J., Jr.: *See—*
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.

Snyder, Larry L., to Jarva, Inc. Tunneling machine. 4,189,186, Cl. 299-31.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Mosher, Arthur J., 4,189,505, Cl. 426-533.000.

Societe de Prospection et d'Inventions Techniques SPIT: *See—*
Combette, Marc; and Noiray, Francois, 4,189,081, Cl. 227-10.000.

Societe Metallurgique le Nickel-SLN: *See—*
Limare, Armand; and Plancqueel, Guy, 4,189,359, Cl. 204-43.00T.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.

Societe Sebia: *See—*
Boschetti, Egisto, 4,189,370, Cl. 204-299.00R.

Soderstrom, Edward C.; and Neu, David L., to Rapistan Incorporated. Modular warehouse conveyor system. 4,189,273, Cl. 414-285.000.

Solano, William E.: *See—*
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.

Solomon, Sydney H. Glazier's point driver. 4,189,082, Cl. 227-109.000.

Solvay & Cie.: *See—*
Raganato, Carlo; and Voituron, Georges, 4,189,455, Cl. 264-12.000.

Somers, M. John: *See—*
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.

Sony Corporation: *See—*
Iga, Akira, 4,189,710, Cl. 340-146.1AL.
Isono, Katsuo; and Sanada, Seiji, 4,189,740, Cl. 358-21.00V.
Nagumo, Fumio, 4,189,751, Cl. 358-213.000.
Ninomiya, Ichiro, 4,189,756, Cl. 360-14.000.
Tanahashi, Makoto, 4,189,670, Cl. 323-9.000.

Sorensen, Calvin P.: *See—*
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.

Sorensen, Leif: *See—*
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Soula, Gerard, to Orogil. Novel alkenyl succinimides and process for their preparation. 4,189,389, Cl. 252-47.500.

Speca, Anthony N.: *See—*
Rekers, Louis J.; and Speca, Anthony N., 4,189,402, Cl. 252-428.000.

Spector, George: *See—*
Janoe, Charles E.; and Spector, George, 4,188,963, Cl. 135-1.00A.

Sperry Rand Corporation: *See—*
Mendenhall, Charles E., 4,189,784, Cl. 365-233.000.

Spisz, Albert S., to Burroughs Corporation. Paper tractor locking apparatus. 4,189,078, Cl. 226-74.000.

Spivak, Marvin J. Introduction and acclimation device for marine aquariums. 4,188,909, Cl. 119-5.000.

Spoor, Herbert: *See—*
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.

Sprague Electric Company: *See—*
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,189,761, Cl. 361-433.000.
Millard, Richard J.; and Cheseldine, David M., 4,188,706, Cl. 29-570.000.

Spray Tech Corporation: *See—*
Wagner, Josef; and Griebel, Heinrich, 4,189,098, Cl. 239-127.000.

Sprecher, Andreas, to G & W Maschinen AG. Formation of balls of knitting yarn. 4,189,112, Cl. 242-159.000.

Stache, Helmut: *See—*
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Stadnick, Steven J.; and Rogers, Howard H., to United States of America, Air Force. Spherical heat pipe metal-hydrogen cell. 4,189,527, Cl. 429-26.000.

Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, to Hoffmann-La Roche Inc. Bulk unit of use informational medicinal dispensing system. 4,189,053, Cl. 206-570.000.

Stahnecker, Erhard: *See—*
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.

Staiger, Gerhard: *See—*
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, 4,189,557, Cl. 526-159.000.

Stamicarbon, B.V.: *See—*
Fontein, Freerk J.; and Jennekens, Hubertus F., 4,189,384, Cl. 210-60.000.
Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., 4,189,585, Cl. 546-349.000.

Stammberger, Willi: *See—*
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.

Standard Oil Company a corporation of Indiana: *See—*
Jezl, James L., 4,189,458, Cl. 264-143.000.

Standard Oil Company (Indiana): *See—*
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., 4,189,538, Cl. 435-247.000.
Karayannis, Nicholas M.; and Lee, Sam S., 4,189,556, Cl. 526-141.000.
Steigelmann, Edward F., 4,188,817, Cl. 73-40.700.

Standard Products Company, The: *See—*
Jackson, Norman C., 4,188,765, Cl. 52-716.000.

Stanford Research Institute: *See—*
Brodie, Ivor; and Kelly, John, 4,189,783, Cl. 365-128.000.

Stange, William F. Cable termination device. 4,189,620, Cl. 174-79.000.

Stanke, Walter, to Krupp-Koppers, GmbH. Coke oven door. 4,189,352, Cl. 202-248.000.

Stanley-Mabo S.A.: *See—*
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.

Stauffer, Alfred, to Maschinenfabrik Meyer & Burger AG. Method for increasing the cutting performance of reciprocating slurry saws and a reciprocating slurry saw for carrying out this method. 4,188,936, Cl. 125-16.00R.

Stearns, Frederick S.: *See—*
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.

Steigelmann, Edward F., to Standard Oil Company (Indiana). Method for detecting membrane leakage. 4,188,817, Cl. 73-40.700.

Stein, William E.: *See—*
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.

Steinbuchel, Gunter H.: *See—*
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Steinhagen, Horst G., to Twin Disc, Incorporated. Automatic self-adjusting plate type clutch. 4,189,043, Cl. 192-111.00A.

Stendel, Wilhelm: *See—*
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.

Stephan, Leonard P.: *See—*
Peter-Contesse, Henri; and Stephan, Leonard P., 4,189,119, Cl. 244-182.000.

Sterling Drug Inc.: *See—*
Collins, Joseph C., 4,189,500, Cl. 424-331.000.
Crounse, Nathan N.; and Schmidt, Paul J., 4,189,171, Cl. 282-27.500.

Stern, Garland, to New York Institute of Technology. Apparatus for generating signals representing operator-selected portions of a scene. 4,189,744, Cl. 358-93.000.

Stocker, Rudolf: *See—*
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.

Stoneleigh Trust, The: *See—*
Massa, Donald P.; and Hall, James G., 4,189,719, Cl. 340-501.000.

Stoody, William R. Squeeze tube sack for aerosol type containers. 4,189,069, Cl. 222-83.500.

Storage Technology Corporation: *See—*
Epina, August P.; Ganter, Robert J.; and Morehouse, James H., 4,189,113, Cl. 242-182.000.

Stork, Karl: *See—*
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.

Straley, James M.: *See—*
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.

Strandberg, Terry W. Method and apparatus for processing dual frequency digital information signals. 4,189,625, Cl. 179-15.0BY.

Strasberg, Murray: *See—*
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.

Strauss, Edgar H.: *See—*
Langen, Marinus J. M.; and Strauss, Edgar H., 4,189,089, Cl. 229-61.000.

Strindehag, Ove; and Wrangel, Erik, to AB Svenska Flaktfabriken. Method for making humidity and heat exchanger apparatus. 4,189,330, Cl. 148-6.270.

Stritzl, Karl: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Strizhov, Gennady S.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, to Mettler Instrumente AG. Weighing apparatus including digitalization error correcting means. 4,189,017, Cl. 177-212.000.

Strobele, Rudolf: *See—*
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Strong-Robinette Bag Company, Inc.: *See—*
Robinette, James A., 4,189,136, Cl. 271-12.000.

Stuart Enterprises: *See—*
Beitzel, Stuart S., 4,189,363, Cl. 204-157.10R.

Stubben, David R.; and Koble, Dennis J., to Atari, Inc. Apparatus for continuous rotation simulation of video images. 4,189,145, Cl. 273-313.000.

Stubben, David R., to Atari, Inc. Apparatus for generating a plurality of moving objects on a video display screen utilizing associative memory. 4,189,728, Cl. 340-725.000.

Stukenberg, Karl-Heinz. Strip cutter. 4,188,845, Cl. 83-356.100.

Su, Kai C.: *See—*
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.

Suekane, Junnosuke; and Kojima, Shuichi, to Nissan Motor Company, Limited. Weft yarn sensor. 4,188,981, Cl. 139-370.200.

Sugalski, Raymond K., to General Electric Company. Stippled substrate for pressed battery plates. 4,189,533, Cl. 429-223.000.

Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, to Mitsubishi Chemical Industries, Ltd. Polyolefin resin composition and method for making polyolefin film. 4,189,420, Cl. 260-31.600.

Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, to Mitsubishi Gas Chemical Company, Inc. Process for polymerizing trioxane. 4,189,565, Cl. 528-232.000.

Sugiura, Yasuyuki: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Sully, George R., to Truth Incorporated. Snap-on-handle structure. 4,189,248, Cl. 403-11.000.

Sulzer Brothers Limited: *See—*
Schumacher, Arnold, 4,189,193, Cl. 308-23.000.

Sumitomo Chemical Company, Limited: *See—*
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Sunbeam Corporation: *See—*
Swanson, Charles E.; and Hector, Roy W., 4,189,632, Cl. 219-413.000.

Sunohara, Yoshio: *See—*
Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, 4,188,707, Cl. 29-571.000.

Suozzo, Vincent: *See—*
Wolf, Murray E.; and Suozzo, Vincent, 4,188,885, Cl. 102-221.000.

Superior Products Company, Inc.: *See—*
Klabunde, Edwin C., 4,189,412, Cl. 260-28.5AS.

Suss, Beate: *See—*
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.

Suzuki, Akira: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Suzuki, Ken-ichi: *See—*
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.

Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased (by Fujizaki, Yasugoro, Tomoo Fujizaki, successors), to Mitsubishi Rayon Company, Limited. Nonwoven fabric and manufacturing method thereof. 4,188,690, Cl. 28-103.000.

Suzuki, Shigeru; and Yasuda, Yuji, to Ricoh Company Ltd. Document illumination apparatus. 4,189,763, Cl. 362-241.000.

Suzuki, Shigeru: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Suzuki, Toshihiro: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

Suzuki, Yoshihisa, to Hitachi, Ltd. Auto-loading magnetic tape. 4,189,115, Cl. 242-195.000.

Suzumori, Takeo: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Svoboda, Josef: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Swann, Charles. Base for movable wall parts. 4,188,758, Cl. 52-241.000.

Swanson, Charles E.; and Hector, Roy W., to Sunbeam Corporation. Toaster oven. 4,189,632, Cl. 219-413.000.

Swanson, Kermit E., to R.R. Donnelley & Sons Company. Sheet stacking apparatus. 4,189,140, Cl. 271-212.000.

Sweda International, Inc.: *See—*
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Swett, Robert W.: *See—*
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Swingley, Harold E., Jr.: *See—*
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., 4,188,983, Cl. 139-424.000.

Swinton, John A., to American Hospital Supply Corporation. Filter device. 4,188,948, Cl. 128-214.00R.

Sylvester, Gerd: *See—*
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Synthelabo: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Szabo, Bela G., to Bruce Plastics, Inc. Mountings for duplex handles for attache cases and the like. 4,189,037, Cl. 190-58.00R.

Szabo, Francis S., to AM International, Inc. Optical system for photographic composing apparatus. 4,189,216, Cl. 354-7.000.

Szasz, Kalman: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Tabur, Marcel J. Machine for packaging various articles. 4,188,770, Cl. 53-509.000.

Tachmindji, Alexander J.; Miller, Marlin L.; and Morgan, William B. Supercavitating propeller with air ventilation. 4,188,906, Cl. 115-34.00R.

Tada, Hiroshi; and Nozu, Toshiro, to Oiles Industry Co., Ltd. Support structure. 4,188,681, Cl. 14-16.100.

Taiheiyo Engineering Inc.: *See—*
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Taisho Pharmaceutical Co., Ltd.: *See—*
Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, 4,189,607, Cl. 562-457.000.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Automatic locking safety belt retractor. 4,189,109, Cl. 242-107.40A.

Takahashi, Hisashi: *See—*
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Takahashi, Ken: *See—*
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Takahashi, Kenji: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Takahata, Kouichi, deceased: *See—*
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Takahata, Kousaku, legal successor: *See—*
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Device for detecting angular acceleration of wheels. 4,189,637, Cl. 250-231.00R.

Takamatsu, Masatoshi, to Shimano Industrial Company, Limited. Friction material for brakes of bicycles or the like. 4,189,424, Cl. 260-42.150.

Takamura, Tooru: *See—*
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Takata Kojyo Co., Ltd.: *See—*
Takada, Juichiro, 4,189,109, Cl. 242-107.40A.

Takatori Machinery Mfg. Co., Ltd.: *See—*
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Takatori Machinery Works, Ltd.: *See—*
Takatori, Osho, 4,188,897, Cl. 112-262.200.

Takatori, Osho, to Takatori Machinery Works, Ltd. Seaming method for gored panty-hose. 4,188,897, Cl. 112-262.200.

Takeda Chemical Industries, Ltd.: *See—*
Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, 4,189,472, Cl. 424-117.000.
Kakeya, Nobuharu; and Yoshimura, Yoshinobu, 4,189,479, Cl. 424-246.000.
Matsuno, Toshimi; and Imai, Kin-ichi, 4,189,485, Cl. 424-253.000.

Takeda, Mutsuhiko: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Takemoto, Shiro G.; and Morrison, Owen J., to Avery International Corporation. Pressure-sensitive adhesives based on carboxylated SBR emulsion. 4,189,419, Cl. 260-29.7NR.

Takenaka Komuten Co., Ltd.: *See—*
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.

Takeuchi, Eiichi, to Casio Computer Co., Ltd. Synchronous control apparatus in multi-circuit system. 4,189,717, Cl. 340-365.00E.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Takita, Tomohisa: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Tanahashi, Makoto, to Sony Corporation. Power circuit for different stabilized DC voltages. 4,189,670, Cl. 323-9.000.

Tanaka, Akira, to American Safety Equipment Corporation. Three-point passive safety belt system. 4,189,170, Cl. 280-802.000.

Tanaka, Katsumasa: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Tanaka, Keiji: *See—*
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Tanaka, Masao: *See—*
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Tanaka, Tuneo: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Taniguchi, Yoshiko: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Tarnay, Matthew G.: *See—*
Tolnai, Julius L.; and Tarnay, Matthew G., 4,188,676, Cl. 4-295.000.

Taylor, Forrest C.: *See—*
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,189,159, Cl. 277-39.000.

Taylor, William H., to Kollmorgen Corporation. Wide angle telecentric projection lens assembly. 4,189,211, Cl. 350-175.0TS.

Teachout, Donald O. Band and clip method. 4,188,871, Cl. 100-2.000.

Technical Research Affiliates, Inc.: *See—*
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.

Teijin Limited: *See—*
Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.

Teledyne Electro-Mechanisms: *See—*
Jean, Larry, 4,188,714, Cl. 29-628.000.

Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.): *See—*
Garrison, Charles G., 4,188,818, Cl. 73-40.700.

Teleflex Incorporated: *See—*
Ion, John C., 4,188,835, Cl. 74-501.00R.

Tellman, Stephen J., to Champion International Corporation. Triple lap hardboard siding. 4,188,762, Cl. 52-541.000.

Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, to Fujitsu Limited. Optical switching device. 4,189,206, Cl. 350-96.200.

Terakawa, Yukio: *See—*
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Terry, Lynn E. Hydrogen-hydride absorption systems and methods for refrigeration and heat pump cycles. 4,188,795, Cl. 62-102.000.

Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, to Matsushita Electric Industrial Co., Ltd. Speed control system for small size D-C electric motor. 4,189,666, Cl. 318-334.000.

Texaco Development Corporation: *See—*
Marion, Charles P., 4,189,307, Cl. 48-197.00R.
Waddill, Harold G., 4,189,564, Cl. 528-94.000.

Texaco Inc.: *See—*
Arnold, Dan M., 4,189,638, Cl. 250-259.000.
Pitts, Robert W., Jr., 4,189,705, Cl. 250-262.000.
Yaffe, Roberta; and Reinhard, Russell R., 4,189,388, Cl. 252-46.700.

Texas Instruments Incorporated: *See—*
Brantingham, George L., 4,189,779, Cl. 364-718.000.
Hill, David C., 4,189,509, Cl. 427-102.000.
Hill, David C., 4,189,700, Cl. 338-333.000.

Th. Goldschmidt AG: *See—*
Laqua, Arnold; and Holtschmidt, Ulrich, 4,189,311, Cl. 71-67.000.

Thermal Transfer Division of Kleinewefers: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.

Thies, Peter W.; and Asai, Akiji, to Kali-Chemie Pharma GmbH. Pharmaceutically active 2,9-dioxatricyclo[4,3,1,$0^{3,7}$]decanes. 4,189,437, Cl. 260-340.300.

Thiis-Evensen, Eyvind M., to Isola Fabrikker A/S. Roofing shingle. 4,188,763, Cl. 52-557.000.

Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., to Douwe Egberts Koninklijke Tabaksfabriek, Koffielranderigen in Theehandel B.V. Counter current crystallizer. 4,188,797, Cl. 62-123.000.

Thilly, William G.: *See—*
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.

Thomas International Corporation: *See—*
Roberts, Patrick S., 4,188,848, Cl. 84-1.010.

Thompson, Edward J., to Upjohn Company, The. Polyisocyanurate polymers prepared using carbamate modifier. 4,189,544, Cl. 521-128.000.

Thompson, Joe G. Rim shield. 4,189,126, Cl. 249-205.000.

Thompson, Larry J., to Equipment Company of America. Manual lifter and mover assembly. 4,189,128, Cl. 254-7.00R.

Thompson, Ralph B., to Air Resources, Inc. Catalytic removal of hydrogen sulfide from gases. 4,189,462, Cl. 423-573.00G.

Thomson-CSF: *See—*
Mourier, Georges, 4,189,654, Cl. 310-72.000.

Thor Dahl, Inc.: *See—*
McPherson, John B.; and Gunther, William H., Jr., 4,189,341, Cl. 156-654.000.

Thorsen, Walter J., to United States of America, Agriculture. Method of shrinkproofing animal fibers with ozone. 4,189,303, Cl. 8-115.700.

Thouin, Marcel: *See—*
Maidment, Peter E.; and Thouin, Marcel, 4,188,970, Cl. 137-268.000.

Ticknor, William G., to American Can Company. Heat sealable resin blends. 4,189,519, Cl. 428-476.000.

Timan, Dirk A.: *See—*
Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., 4,189,618, Cl. 174-35.0MS.

Timex Corporation: *See—*
Wuthrich, Paul, 4,188,778, Cl. 58-88.00R.

Tinyakov, Viktor G.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

TMC Corporation: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Tochtrop, Charles. Multiple hook apparatus for cake fish-bait. 4,188,744, Cl. 43-44.820.

Tokico Ltd.: *See—*
Kato, Tetuo, 4,189,034, Cl. 188-318.000.
Katsumori, Teiji, 4,189,033, Cl. 188-269.000.

Tokyo Rokuon Kogyo Kabushiki Kaisha: *See—*
Uehara, Zenshiro, 4,189,079, Cl. 226-188.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.
Nakamura, Masaru; and Itoh, Takao, 4,188,841, Cl. 81-9.510.
Sawazaki, Hajime, 4,189,738, Cl. 357-40.000.

Toland, James, to World Carpets, Inc. Continuous process and apparatus for randomly coloring pile fabric. 4,189,302, Cl. 8-1.0XA.

Toledo Stamping & Manufacturing Company: *See—*
Scheppele, Lyle W., 4,189,240, Cl. 366-186.000.

Tolnai, Julius L.; and Tarnay, Matthew G., to Price-Pfister Brass Mfg. Co. Push-push drain closure assembly. 4,188,676, Cl. 4-295.000.

Tomioka, Susumu: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Toro Company, The: *See—*
Kendall, Thomas L., 4,189,776, Cl. 364-420.000.

Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, to United States of America, Navy. Hydroacoustic detection system. 4,189,701, Cl. 367-2.000.

Tosi, Carlo; and Ferlenghi, Pierarturo, to Biochefarm S.A. Lysine 4-allyloxy-3-chlorophenylacetate and method of its preparation. 4,189,499, Cl. 424-316.000.

Toyo Calorizing Ind. Co., Ltd.: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Toyo Seikan Kaisha Limited: *See—*
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Seita, Toru; Satoh, Takao; and Shimizu, Akihiko, 4,189,361, Cl. 204-98.000.
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Toyoda, Hiroaki: *See—*
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.
Aoki, Keiji, 4,188,922, Cl. 123-32.0EA.
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, 4,188,932, Cl. 123-191.00S.
Kubo, Seitoku; and Morisawa, Kunio, 4,188,839, Cl. 74-869.000.

Trepanier, Donald L.: *See—*
Britton, Thomas C.; and Trepanier, Donald L., 4,189,588, Cl. 548-324.000.

Tri-State Oil Tool Industries, Inc.: *See—*
Kammerer, Archer W., Jr.; and Johnson, Gary R., 4,189,185, Cl. 299-13.000.

Tricoles, Gus P.: *See—*
Rope, Eugene L.; and Tricoles, Gus P., 4,189,731, Cl. 343-872.000.

Trioliet-Mullos Silo Nederland B.V.: *See—*
Liet, Fredericus; and Liet, Cornelis H., 4,188,759, Cl. 52-245.000.

Triplett, Gregory L., to Wulfsberg Electronics, Inc. Automatic leveling stabilized VHF-FM frequency synthesizer. 4,189,689, Cl. 332-18.000.

Triplus Sjukvardsprodukter AB: *See—*
Wenander, Bjorn, 4,188,945, Cl. 128-132.00D.

Trobaugh, Arnold G.; and Janu, George J., to Johnson Controls, Inc. Flow system with pressure level responsive air admission control. 4,188,968, Cl. 137-236.00R.

Trotman, Gladstone, III, to Minnesota Mining and Manufacturing Company. Retention means for container closure assembly. 4,189,060, Cl. 220-260.000.

Trudeau, William H.: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,189,249, Cl. 403-27.000.

Truener, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Penicillins having an imino substituted piperazindioncarbonylamino acyl sidechain. 4,189,482, Cl. 424-250.000.

Truth Incorporated: *See—*
Sully, George R., 4,189,248, Cl. 403-11.000.

TRW Inc.: *See—*
Lathlaen, Richard A., 4,189,674, Cl. 324-208.000.

Tsubata, Noritaka: *See—*
Yoshida, Hiroshi; and Tsubata, Noritaka, 4,188,982, Cl. 139-384.00B.

Tsuboi, Shinichi: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.

Tsuchihashi, Genichi: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Tsuda, Shin: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.

Tsunoda, Teruo: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Tsuruoka, Takashi: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Tsybukov, Igor K.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Tubesing, William W. Roller handle for saw. 4,188,935, Cl. 125-13.00R.

Tucel Industries, Inc.: *See—*
Lewis, John C., Jr., 4,189,189, Cl. 300-7.000.

Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,189,601, Cl. 560-24.000.

Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Turco Manufacturing Co.: *See—*
Baynes, William R., 4,188,937, Cl. 126-41.00R.

Turiot, Andre: *See—*
Masclet, Jean; and Turiot, Andre, 4,189,117, Cl. 244-102.00R.

Turney, Frank: *See—*
Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., 4,189,195, Cl. 312-209.000.

Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., to Turney, Virginia R.; and Turney, Frank. Bathroom cabinet. 4,189,195, Cl. 312-209.000.

Twin Disc, Incorporated: *See—*
Steinhagen, Horst G., 4,189,043, Cl. 192-111.00A.

Twort, Thomas J., to Bloom Engineering Company, Inc., GB2; and Bloom Engineering Company, INc. Reinforced insulating members. 4,189,301, Cl. 432-252.000.

Uchida, Isamu; and Hirata, Akira, to Laurel Bank Machine Co., Ltd. Note counting apparatus. 4,189,139, Cl. 271-162.000.

Ueda, Katutoshi: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Uehara, Toshio: *See—*
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.

Uehara, Zenshiro, to Tokyo Rokuon Kogyo Kabushiki Kaisha. Controllable drive for tape recorder. 4,189,079, Cl. 226-188.000.

Uemura, Yukikazu: *See—*
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.

Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, to Toyo Seikan Kaisha Limited. Can end sealing rubber composition containing a styrene-butadiene rubbery copolymer, a tackifier and a filler. 4,189,418, Cl. 260-29.70R.

Ueno, Tomihisa: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Ulrich, Klaus-H.: *See—*
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.

Umemura, Toshikazu: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Physiologically active substance esterastin. 4,189,438, Cl. 260-343.900.

Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Bestatin. 4,189,604, Cl. 562-437.000.

Uniroyal, Inc.: *See—*
Ether, Theodore L., 4,189,293, Cl. 425-376.00A.

United States of America
Agriculture: *See—*
Dinka, Stephen K., 4,189,535, Cl. 435-2.000.
Thorsen, Walter J., 4,189,303, Cl. 8-115.700.
Air Force: *See—*
Miller, John W., 4,189,203, Cl. 339-184.00M.
Stadnick, Steven J.; and Rogers, Howard H., 4,189,527, Cl. 429-26.000.
Army: *See—*

Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., 4,188,830, Cl. 73-801.000.
Miller, Robert A., 4,188,908, Cl. 118-715.000.

Energy: *See—*
Aaland, Kristian, 4,189,650, Cl. 307-108.000.
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.
Dandl, Raphael A., 4,189,660, Cl. 315-5.380.
Doss, James D., 4,189,685, Cl. 331-62.000.
Feild, Alexander L., Jr., 4,189,398, Cl. 252-301.10R.
Levinos, Nicholas J.; and Arnold, George P., 4,189,652, Cl. 307-428.000.
Satti, John A., 4,189,693, Cl. 335-216.000.
Wittig, J. Michael, 4,189,647, Cl. 290-42.000.

Health, Education and Welfare: *See—*
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Reilly, Norman B.; and Smith, Joel G. Satellite personal communications system. 4,189,675, Cl. 325-4.000.

National Aeronautics and Space Administration: *See—*
Bryant, Emmett L., 4,189,234, Cl. 356-152.000.
Hood, William R., 4,188,823, Cl. 73-147.000.

Navy: *See—*
Brauer, Larry F.; and Eaton, Jefferson O., 4,188,886, Cl. 102-223.000.
Davey, John E.; and Christou, Aristos, 4,188,710, Cl. 29-580.000.
Elliot, Myron A.; and Forbus, Robert H., 4,189,026, Cl. 181-118.000.
Hackman, Donald J.; and Brunel, Roger L., 4,189,268, Cl. 409-183.000.
McCoubrey, George A., 4,189,283, Cl. 416-20.00A.
Miller, Samuel A., 4,189,122, Cl. 248-176.000.
Otteson, N. Stuart, 4,188,971, Cl. 137-460.000.
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.
Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.
Weller, Royal; and Jones, Harry S., 4,188,905, Cl. 114-253.000.
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.

U.S. Philips Corporation: *See—*
Kock, Hendrikus G., 4,189,342, Cl. 156-656.000.
Mulder, Jan, 4,188,791, Cl. 60-520.000.
Schroder, Johann; and Gawron, Klaus, 4,189,393, Cl. 252-70.000.
Schroder, Johann; and Gawron, Klaus, 4,189,394, Cl. 252-70.000.
van der Meulen, Andries, 4,189,665, Cl. 315-360.000.
van Loon, Johannes C. F.; and Nijhof, Engbert B. G., 4,189,669, Cl. 318-811.000.

United States Steel Corporation: *See—*
Lothmann, Joseph, 4,189,073, Cl. 222-600.000.

United Technologies Corporation: *See—*
Dean, Lee W., III; and Peracchio, Aldo A., 4,189,027, Cl. 181-286.000.
Harner, Kermit I., 4,189,648, Cl. 290-44.000.

University of Minnesota, The Regents of the: *See—*
Macosko, Christopher W.; and Lee, Ly J., 4,189,070, Cl. 222-134.000.

Upjohn Company, The: *See—*
Shephard, Kenneth P., 4,189,430, Cl. 260-239.55R.
Thompson, Edward J., 4,189,544, Cl. 521-128.000.
VanRheenen, Verlan H., 4,189,596, Cl. 560-105.000.

Upton, Thomas E., to Dresser Industries, Inc. Well packer bypass valve seal assembly. 4,188,998, Cl. 166-129.000.

Urciola, John A.: *See—*
Johnson, Ralph E.; and Urciola, John A., 4,188,895, Cl. 112-158.00D.

Ushio, Fusao; and Okuno, Noboru, to Matsushita Electric Industrial Co., Ltd. Defect detecting apparatus. 4,189,745, Cl. 358-128.500.

Uskokovic, Milan R.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,189,586, Cl. 548-303.000.

Valachovic, John, to RCA Corporation. Method and apparatus for determining focus conditions. 4,189,746, Cl. 358-128.500.

Valdez, Albert H. Bicycle lock. 4,188,808, Cl. 70-233.000.

Valleylab, Inc.: *See—*
Harris, Frank W., 4,188,927, Cl. 128-303.140.

Van Den Bergh Engineering Limited: *See—*
Komen, Cornelis, 4,188,869, Cl. 99-584.000.

Van Auken, John A.; and Van Auken, Lorraine A. Tennis scorekeeper. 4,189,143, Cl. 273-73.00R.

Van Auken, Lorraine A.: *See—*
Van Auken, John A.; and Van Auken, Lorraine A., 4,189,143, Cl. 273-73.00R.

Van Bergen, Johannes A. W. P. Ear clip with friction-retained gripping portions. 4,188,798, Cl. 63-14.00C.

van Buren, Martin F.: *See—*
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.

Vandehei, Peter T., to Infrared Industries, Inc. Coated copper reflector. 4,189,205, Cl. 350-1.700.

Vanderleeden, Johannes C. Process and apparatus for reacting laser radiation with a reactive medium. 4,189,646, Cl. 250-423.00P.

van der Lely, Cornelis. Soil cultivating implements. 4,189,006, Cl. 172-68.000.

van der Malen, Bernardus G. M.: *See—*
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,188,797, Cl. 62-123.000.

van der Meulen, Andries, to U.S. Philips Corporation. Irradiation apparatus. 4,189,665, Cl. 315-360.000.

van der Zee, Jan H., to Honeywell Inc. Gas valve assembly. 4,188,972, Cl. 137-489.000.

van Leeuwen, Petrus W. N. M.: *See—*
Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,189,403, Cl. 252-431.00P.

Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, to L'Oreal. Crosslinked polyamino-polyamide in hair conditioning compositions. 4,189,468, Cl. 424-70.000.

van Loon, Johannes C. F.; and Nijhof, Engbert B. G., to U.S. Philips Corporation. Circuit arrangement for generating a pulse-width modulated signal. 4,189,669, Cl. 318-811.000.

Van Parys, Remi E. Closing device for sliding doors and windows. 4,189,174, Cl. 292-98.000.

VanRheenen, Verlan H., to Upjohn Company, The. Preparing 2-arylalkanoic acid derivatives. 4,189,596, Cl. 560-105.000.

Van Riper, Gary G.: *See—*
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.

van Uitert, LeGrand G.: *See—*
Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., 4,189,208, Cl. 350-96.340.

VanWagenen, Norman L.; and Lamph, A. Norman. Fluid drive mechanisms and methods. 4,188,859, Cl. 91-499.000.

Varta Batterie Aktiengesellschaft: *See—*
Golz, Hans-Joachim, 4,189,532, Cl. 429-215.000.

Vaughn, Louis E., Jr., to Lexitron Corporation. Display advance system for a word processor. 4,189,727, Cl. 340-711.000.

Vayda, Michael M., Jr. Single-stop shopping method. 4,189,031, Cl. 186-1.00C.

VDO Adolf Schindling AG: *See—*
Skopil, Arthur, 4,188,827, Cl. 73-363.500.

VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.

Veca, Anthony R.: *See—*
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.

Venere, Lawrence A.: *See—*
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,189,159, Cl. 277-39.000.

Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., to Stamicarbon, B.V. Process for the preparation of pyridine and 2,6-lutidine. 4,189,585, Cl. 546-349.000.

Verjux, Jean, to Arenco-Decoufle. Device for transferring rod-like objects. 4,189,045, Cl. 198-457.000.

Vernon, Lonnie W.: *See—*
Maa, Peter S.; and Vernon, Lonnie W., 4,189,371, Cl. 208-8.0LE.

Vickers Limited: *See—*
Figov, Murray; and Whitlam, Iain E., 4,188,880, Cl. 101-128.210.

Voege, Herbert: *See—*
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.

Vogel, Ludwig: *See—*
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

Vogel, Uriel. Method and instrumentation for the measurement of parameters of system devices. 4,189,778, Cl. 364-482.000.

Vogel, Victor J.: *See—*
Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., 4,189,260, Cl. 406-76.000.

Vohl, Paul-Eugene. Endless screw propeller unit for a snow thrower. 4,188,738, Cl. 37-43.00E.

Voituron, Georges: *See—*
Raganato, Carlo; and Voituron, Georges, 4,189,455, Cl. 264-12.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Meuser, Klaus, 4,189,169, Cl. 280-802.000.

Vollmer, Hartfried: *See—*
Hestermann, Klaus; and Vollmer, Hartfried, 4,189,449, Cl. 260-606.50F.

Von Roll AG: *See—*
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von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Polyurethanes having ectoparasiticidal activity. 4,189,467, Cl. 424-14.000.

Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, to BASF Aktiengesellschaft. Particulate expandable styrene polymers having short minimum molding times. 4,189,515, Cl. 428-407.000.

Vredenburg, Edric W., Sr. Tree girdling device. 4,188,718, Cl. 30-121.000.

Vroman Foods, Inc.: *See—*
Getman, Harlan R., 4,188,768, Cl. 53-282.000.
Getman, Harlan R., 4,189,289, Cl. 425-93.000.

Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

W. R. Grace & Co.: *See—*
Bright, Marvin L., Jr., 4,188,769, Cl. 53-434.000.

W. T. Rogers Co.: *See*—
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., 4,188,983, Cl. 139-424.000.
Wacker-Chemie GmbH: *See*—
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.
Wada, Shuichi: *See*—
Sakamoto, Shuji; and Wada, Shuichi, 4,189,678, Cl. 325-459.000.
Waddill, Harold G., to Texaco Development Corporation. Non-crystallizing epoxy resin accelerator. 4,189,564, Cl. 528-94.000.
Wagner, Heribert: *See*—
Engel, Gunter; and Wagner, Heribert, 4,189,494, Cl. 424-274.000.
Wagner, Josef; and Griebel, Heinrich, to Spray Tech Corporation. Household spray apparatus. 4,189,098, Cl. 239-127.000.
Wagner, Josef: *See*—
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.
Waid, George M.; and Davenport, Anthony T., to Republic Steel Corporation. Welded alloy casing. 4,189,333, Cl. 148-36.000.
Wakatsuki, Goroei; and Hashimoto, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Operating device. 4,188,834, Cl. 74-489.000.
Wakeford, David E., to Imperial Chemical Industries Limited. Polyester composition. 4,189,422, Cl. 260-40.00R.
Waldes Kohinoor, Inc.: *See*—
Jackson, Sylvester, 4,189,062, Cl. 221-188.000.
Walker, George O., Jr. Portable desk. 4,189,197, Cl. 312-258.000.
Walsh, Bernard L., Jr.: *See*—
Bock, George F.; and Walsh, Bernard L., Jr., 4,189,690, Cl. 332-30.00V.
Wang, Daniel I. C.: *See*—
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.
Wang, Timothy, to Boeing Commercial Airplane Company. Variable camber leading edge flap. 4,189,120, Cl. 244-214.000.
Ward, Charles W., deceased; and by Ward, Hilda, administratrix. Conveyor belt cleaning apparatus. 4,189,046, Cl. 198-499.000.
Ward, Eldon L., to Dow Chemical Company, The. Reaction product of an epoxide and a polyalkylenepolyamine in bead form and a method for preparing same. 4,189,539, Cl. 521-25.000.
Ward, Hilda, administratrix: *See*—
Ward, Charles W., deceased; and Ward, Hilda, administratrix, 4,189,046, Cl. 198-499.000.
Ward, John V.: *See*—
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.
Ward Plant Spares (Henley) Limited: *See*—
Arnold, Maurice C., 4,189,275, Cl. 414-640.000.
Wardlaw, Stephen C. Disposable syringe. 4,188,950, Cl. 128-218.00F.
Warner, Harold D. Group ring target. 4,189,146, Cl. 273-408.000.
Warren, Ray A.: *See*—
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, to Kawasaki Steel Corporation; and Toyo Calorizing Ind. Co., Ltd. Blast-furnace tuyere. 4,189,130, Cl. 266-270.000.
Watanabe, Sakuji: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.
Waterhouse, Richard E. Automotive self-starting device. 4,188,931, Cl. 123-179.00B.
Waterlomat, Societe Anonyme: *See*—
Apellaniz, Ramon, 4,189,068, Cl. 222-83.500.
Watson, Richard W.; Grant, William J.; and Graham, David J., to BOC Limited. Condensation of vapor of organic liquids. 4,188,793, Cl. 62-51.000.
Watson, Robert L.; and Rayburn, Robert L. Controllable partial rebreathing anesthesia circuit and respiratory assist device. 4,188,946, Cl. 128-204.220.
Waxman, Burton H., to GAF Corporation. Arginine or salt thereof as a development accelerator of color development of color photographic materials. 4,189,319, Cl. 430-380.000.
Weaver, George R.: *See*—
Egee, Walter W.; and Weaver, George R., 4,188,819, Cl. 73-52.000.
Weaver, Harry R.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.
Weaver, Max A.; Straley, James M.; and Moore, William H., to Eastman Kodak Company. Thiazolylazo and benzothiazolylazo compounds from cyclohexylaminoacylanilides. 4,189,428, Cl. 260-158.000.
Weber, Kurt: *See*—
Meyer, Hans R.; and Weber, Kurt, 4,189,589, Cl. 548-327.000.
Weber, Wallace E.: *See*—
Collins, Robert C.; and Weber, Wallace E., 4,188,696, Cl. 29-81.00J.
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L. Process for making imidazolines. 4,189,593, Cl. 548-352.000.
Wei, John S. S.: *See*—
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Weinstein, Larry J.: *See*—
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.
Weis, Herbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Delivery arm for a laying reel of a wire or rod mill. 4,189,106, Cl. 242-82.000.
Weis, Rudolf R.: *See*—
Hartbauer, Ellsworth A.; and Weis, Rudolf R., 4,189,077, Cl. 225-14.000.
Weise, Irvin B.; and Dane, Oscar, to Anderson, Greenwood & Co. Check valve. 4,188,973, Cl. 137-514.000.
Weiss, Armin K.; and Carnall, Edward, Jr., to Eastman Kodak Company. Method for hot-pressing photoconductors. 4,189,406, Cl. 252-501.100.
Weiss, Martin J.; and Siuta, Gerald J., to American Cyanamid Company. 11-(2-Hydroxyethylthio)prostenoic acid E series derivatives. 4,189,597, Cl. 560-118.000.
Weissgerber, Rudolf: *See*—
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Weissmuller, Adam: *See*—
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Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, to BASF Aktiengesellschaft. Manufacture of glycol acetate. 4,189,600, Cl. 560-246.000.
Welch, Rafael J. Wheel mounted earth moving scraper with pivot in center of pivot axle. 4,189,009, Cl. 172-384.000.
Weller, Dwight D.: *See*—
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.
Weller, Royal; and Jones, Harry S., to United States of America, Navy. Mine sweeping means. 4,188,905, Cl. 114-253.000.
Wells, Roy T.: *See*—
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Wemyss, William A. Level-determining device. 4,188,726, Cl. 33-126.600.
Wenander, Bjorn, to Triplus Sjukvardsprodukter AB. Surgical cloth. 4,188,945, Cl. 128-132.00D.
Wessling, Ritchie A.: *See*—
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., 4,189,345, Cl. 162-168.00R.
West, John B., to Maryland Cup Corporation. Soup Dispenser. 4,189,071, Cl. 222-189.000.
Western Electric Company, Inc.: *See*—
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Westinghouse-Bellambie (Proprietary) Limited: *See*—
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.
Westinghouse Electric Corp.: *See*—
Blewitt, Donald D., 4,189,694, Cl. 337-158.000.
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Westvaco Corporation: *See*—
Rappolt, James F.; and Osborne, Edward L., 4,189,088, Cl. 229-31.00R.
Wetterlin, Leif Sune V.; and Frank, Bertil G. Microsampler. 4,188,986, Cl. 141-130.000.
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Allen, Richard C.; and Pierson, Darrell E., 4,188,730, Cl. 34-13.800.
Brookhyser, Byron B., 4,188,733, Cl. 34-236.000.
Kuhnau, Bruce L., 4,188,878, Cl. 100-212.000.
Whirlpool Corporation: *See*—
Judd, Robert L., 4,188,879, Cl. 100-229.00A.
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White, Edward F.: *See*—
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White, William D.; Green, James H.; and Cornford, Neri E., to United States of America, Navy. Water reactive underwater warhead. 4,188,884, Cl. 102-54.000.
White, William J.: *See*—
Lorenze, Robert V., Jr.; and White, William J., 4,188,709, Cl. 29-577.00R.
Whitford, Leon. Smoking pipe. 4,188,958, Cl. 131-194.000.
Whitlam, Iain E.: *See*—
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Whittaker Corporation: *See*—
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Wieder, Irwin; and Breedlove, Robert H., to Analytical Radiation Corporation. Compact laser construction. 4,189,687, Cl. 331-94.50D.
Wiegman, Douglas C.: *See*—
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Wieloch, Francis J., to Xerox Corporation. Treatment of paper for improved electrostatographic fusing. 4,189,643, Cl. 250-326.000.
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Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.
Wiggenhorn, James T.: *See*—
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Wildforster, Heinrich: *See*—
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., to Westinghouse-Bellambie (Proprietary) Limited. D.C. motor snubbing. 4,189,668, Cl. 318-379.000.
Williams, Brown F.: *See*—
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.
Williams, Charles R., to Monsanto Company. Composition containing an aqueous solution of a mixed salt of an interpolymer of styrene/-maleic anhydride/vinyl acetate. 4,189,416, Cl. 260-29.6TA.
Williams, Joseph M.: *See*—
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Winchester, George L., Jr., to Resco Products, Inc. Semi-cordierite and method of making the same. 4,189,327, Cl. 106-60.000.
Winterholler, Daniel: *See*—
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.
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Wittbrodt, Edwin L.: *See*—
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Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, to Bayer Aktiengesellschaft. Process for the production of butadiene-propylene copolymers. 4,189,558, Cl. 526-169.200.
Witte, Wayne H.: *See*—
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Wittig, J. Michael, to United States of America, Energy. Open cycle ocean thermal energy conversion system. 4,189,647, Cl. 290-42.000.
Wolf, Eric N. Strap latching device. 4,188,851, Cl. 84-327.000.
Wolf, Murray E.; and Suozzo, Vincent, to Avco Corporation. Fail-safe mechanical code convertor, munition arming device using same, and method of transmitting coded mechanical inputs. 4,188,885, Cl. 102-221.000.
Wolf, Tobin. Responsive doll. 4,188,746, Cl. 46-44.000.
Woltersdorf, Otto W., Jr.: *See*—
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Wong, Jason S.: *See*—
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Woods, Craig P.: *See*—
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Woods, Jack L.; and Woods, Craig P. Process for continuous anodizing of aluminum. 4,189,360, Cl. 204-58.000.
World Carpets, Inc.: *See*—
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Wright, Douglas C.; and Roberts, Sidney N., to Minore Pty. Ltd.; and Rosidium Pty. Ltd. Spiral separators. 4,189,378, Cl. 209-459.000.
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Triplett, Gregory L., 4,189,689, Cl. 332-18.000.
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Wyatt, Edwin E.: *See*—
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Xerox Corporation: *See*—
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Silverberg, Morton, 4,189,223, Cl. 355-3.0BE.
Wieloch, Francis J., 4,189,643, Cl. 250-326.000.
Yaffe, Roberta; and Reinhard, Russell R., to Texaco Inc. Synthetic aircraft turbine oil. 4,189,388, Cl. 252-46.700.
Yaggi, Cyril J., Jr., to Neville Chemical Company. Chlorinated hydrocarbons and polysulfide rubber sealant compositions incorporating same. 4,189,407, Cl. 260-18.00R.
Yaggi, Cyril J., Jr., to Neville Chemical Company. Chlorinated hydrocarbons and improved rubber sealant compositions incorporating same. 4,189,408, Cl. 260-18.00R.
Yagi, Michio: *See*—
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Yamada, Katsuhito: *See*—
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Yamada, Masatoshi: *See*—
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Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrophotographic apparatus for developing an electrostatic latent image on a slide film. 4,189,226, Cl. 355-10.000.
Yamaguchi, Shih: *See*—
Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, 4,189,214, Cl. 350-215.000.
Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Diaphragm closing device for a camera with an electromagnetic control system. 4,189,220, Cl. 354-43.000.
Yamamoto, Koichi. Portable cutter. 4,188,754, Cl. 51-37.000.
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Yamazaki, Masami: *See*—
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Yamazaki, Takao: *See*—
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Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, to Sumitomo Chemical Company, Limited. Process for purifying urokinase. 4,189,350, Cl. 435-215.000.
Yasuda, Eiichi: *See*—
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Yeager, Marvin L.; and Desso, Jerome A., to AMP Incorporated. Sequentially actuated zero insertion force printed circuit board connector. 4,189,200, Cl. 339-75.0MP.
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Yoshida, Hiroshi; and Tsubata, Noritaka, to Yoshida Kogyo K.K. Woven fastener stringer. 4,188,982, Cl. 139-384.00B.
Yoshida, Isao: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Masako: *See*—
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Young, Carter R.: *See*—
James, Henry J.; and Young, Carter R., 4,189,003, Cl. 166-315.000.
Young, James, to Scientific Glassware Ltd. Methods of making sealing members. 4,188,699, Cl. 29-157.10R.
Young, John O. Cutting tool for removing a nut securely fastened to a bolt. 4,188,722, Cl. 30-168.000.
Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.
Youngstown Sheet and Tube Company: *See*—
McCarthy, Edward P., 4,188,824, Cl. 73-150.00A.
Yu, Sheu-Jin. Fixed bottle cover device of compressed air thermos bottle. 4,189,061, Cl. 220-326.000.
Yuen, Raymond C., to Burroughs Corporation. Voltage regulator and regulator buffer. 4,189,671, Cl. 323-19.000.
Yukawa, Yoshiki. Fast rewinding device for cassette tapes. 4,189,114, Cl. 242-186.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Hamma, Karlmann, 4,188,789, Cl. 60-444.000.
Jablonsky, Erich, 4,189,024, Cl. 180-133.000.
Karcher, Karl-Friedrich; and Merkle, Otto, 4,189,023, Cl. 180-132.000.
Krauss, Siegfried; and Maurer, Gerhard, 4,188,833, Cl. 74-417.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.
Zardana Corporation N.V.: *See*—
Cummins, Kevin T., 4,189,284, Cl. 417-313.000.

Zasio, Gabriel, to Fujitsu Limited. Wafer holder with spring-loaded wafer-holding means. 4,189,230, Cl. 355-76.000.
Zasypkin, Vadim V.: *See—*
Loschilov, Vladimir I.; Zasypkin, Vadim V.; and Petrov, Vladimir I., 4,188,952, Cl. 128-305.000.
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Zech, Leonard E. Propulsion support unit. 4,189,019, Cl. 180-182.000.
Zehner, Lee R.: *See—*
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,189,599, Cl. 560-190.000.
Zeidler, Gerhard; and Ziegler, Gunther, to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG. Elastic shaft plate for shaft couplings. 4,188,802, Cl. 64-12.000.
Zelacolor Systems Establishment: *See—*
Guillaume, Emile A. H., 4,189,229, Cl. 355-67.000.
Ziegler, Gunther: *See—*
Zeidler, Gerhard; and Ziegler, Gunther, 4,188,802, Cl. 64-12.000.
Zine, Anthony R., Jr., to Sherwood Medical Industries Inc. Blood coagulation and separation. 4,189,382, Cl. 210-46.000.
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, to Ciba-Geigy Corporation. Processes for the production of sulphur-containing esters of phosphoric acid and phosphorous acid. 4,189,453, Cl. 260-976.000.
Zoecon Corporation: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,189,598, Cl. 560-56.000.
Zollinger, Werner. Board game. 4,189,153, Cl. 273-256.000.
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash". Flux for use in centrifugal casting of bimetallic pipes. 4,189,318, Cl. 75-257.000.
Zschocke, Rainer H.: *See—*
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.
Zufich, Anthony C. Backpack and frame apparatus. 4,189,076, Cl. 224-211.000.
Zumbrunn, Werner: *See—*
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.
Zuna, Jaroslav: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Zundel, Weldon P.: *See—*
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.
Zupan, Jack A.: *See—*
Bodor, Nicholas S.; and Zupan, Jack A., 4,189,571, Cl. 542-427.000.
Zur, Henry C. Lounger bed and adjustable body supporting assembly. 4,188,677, Cl. 5-66.000.
Zwipf, Werner: *See—*
Bratko, Rudolph S.; and Zwipf, Werner, 4,189,297, Cl. 431-328.000.
Zysman, Alexandre: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. 8,8-Disubstituted-6-methylergolines and related compounds. Re. 30,218, Cl. 546-67.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Method of preparing 8,8-disubstituted-6-methylergolines and related compounds. Re. 30,219, Cl. 546-69.000.
Bell Telephone Laboratories, Incorporated: *See—*
O'Neill, John F., Re. 30,220, Cl. 179-99.00H.
Bhavsar, Guy M. Tunnel-type commerical-duty washing machine. Re. 30,214, Cl. 68-27.000.
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Copolymer of polyimide oligomers and terephthalonitrile N,N-dioxide and their methods of preparation. Re. 30,217, Cl. 525-426.000.
Eli Lilly and Company: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,218, Cl. 546-67.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,219, Cl. 546-69.000.
Fairmount Chemical Company, Inc.: *See—*
Kish, Calman J., Re. 30,216, Cl. 71-78.000.
Forest Mechanical Products Corp.: *See—*
Kuenzig, Ernest O.; and Pennino, Frank L., Re. 30,215, Cl. 425-525.000.
Hughes Aircraft Company: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.
Kish, Calman J., to Fairmount Chemical Company, Inc. Tobacco sucker control agent and method. Re. 30,216, Cl. 71-78.000.
Kornfeld, Edmund C.: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,218, Cl. 546-67.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,219, Cl. 546-69.000.
Kuenzig, Ernest O.; and Pennino, Frank L., to Forest Mechanical Products Corp. Sealing and shearing member in a plastic resin blow molding machine. Re. 30,215, Cl. 425-525.000.
Landis, Abraham L.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.
Miller, Leroy J.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.
O'Neill, John F., to Bell Telephone Laboratories, Incorporated. Station loop control arrangement for telephone switching system. Re. 30,220, Cl. 179-99.00H.
Pennino, Frank L.: *See—*
Kuenzig, Ernest O.; and Pennino, Frank L., Re. 30,215, Cl. 425-525.000.

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Armstrong Nurseries, Inc.: *See—*
McGredy, Samuel, IV, 4,503, Cl. 17.000.
McGredy, Samuel, IV, to Armstrong Nurseries, Inc. Rose plant. 4,503, 2-19-80, Cl. 17.000.
Welker, Richard P. Dieffenbachia plant. 4,504, 2-19-80, Cl. 88.000.

LIST OF DESIGN PATENTEES

Ackers, Stephen B.; and Rose, Neil M., to Canica Crushers, Ltd. Rock crusher table liner. 254,256, 2-19-80, Cl. D15-123.000.
Ackers, Stephen B.; and Rose, Neil M., to Canica Crushers, Ltd. Rock crusher table liner. 254,257, 2-19-80, Cl. D15-123.000.
Airway Industries, Inc.: *See—*
Davis, Michael, 254,220, Cl. D3-71.000.
American Hospital Supply Corporation: *See—*
Ziegler, John S., 254,270, Cl. D24-23.000.
American Research and Knitting, Inc.: *See—*
Avins, William O., 254,274, Cl. D47-2.000.
Avins, William O., 254,275, Cl. D47-2.000.
Angelakos, Nicholas P., to Lancaster Colony Corporation. Drinking glass. 254,237, 2-19-80, Cl. D7-13.000.
Appel, Mel. Toy detonator. 254,263, 2-19-80, Cl. D21-124.000.
Avins, William O., to American Research and Knitting, Inc. Double knit fabric. 254,274, 2-19-80, Cl. D47-2.000.
Avins, William O., to American Research and Knitting, Inc. Double knit fabric. 254,275, 2-19-80, Cl. D47-2.000.
Beekenkamp, Gerald, to Reliance Products Ltd. Carrying container. 254,221, 2-19-80, Cl. D3-73.000.
Biehl, Roy, to Gettys Manufacturing Company, Inc. Control console. 254,249, 2-19-80, Cl. D13-12.000.
Bird, Gayland G. Combined mixing and staining dental slab. 254,269, 2-19-80, Cl. D24-10.000.
Blinco, Charles S. Miniature airplane clip. 254,245, 2-19-80, Cl. D11-72.000.
Boje, Daniel Q., to Global Video Industries Ltd. Console projection television cabinet. 254,254, 2-19-80, Cl. D14-79.000.
Botker, Byron, to Landes Manufacturing Co. Furniture frame. 254,225, 2-19-80, Cl. D6-191.000.
Burglin, Robert E.; and Itaya, Sam S. Automobile cleaning and waxing tool. 254,231, 2-19-80, Cl. D8-62.000.
Canica Crushers, Ltd.: *See—*
Ackers, Stephen B.; and Rose, Neil M., 254,256, Cl. D15-123.000.
Ackers, Stephen B.; and Rose, Neil M., 254,257, Cl. D15-123.000.
Caputo, Rosemary. Snowmobile muff. 254,216, 2-19-80, Cl. D2-362.000.
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, to Microsonics Corporation. Combined player and holder for a small record. 254,250, 2-19-80, Cl. D14-14.000.
Carpenter, Betty J. Fan blade. 254,267, 2-19-80, Cl. D23-165.000.
Clairol Incorporated: *See—*
MacGregor, Fran, 254,222, Cl. D4-20.000.
Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Chair. 254,223, 2-19-80, Cl. D6-68.000.
Compagnie Generale des Etablissements Michelin: *See—*
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Corrigan, James L. Carrying harness for a mattress. 254,217, 2-19-80, Cl. D3-30.000.
CPG Products Corp.: *See—*
Swearingen, James R., 254,262, Cl. D21-76.000.
Davis, Michael, to Airway Industries, Inc. Luggage case. 254,220, 2-19-80, Cl. D3-71.000.
DeVito, Joseph; and Tendrup, Donald L. Combined hanging support and flower baskets therefor. 254,236, 2-19-80, Cl. D6-113.000.
D'Haenens, Irnee J.; and Ledergerber, Charles P., to Electromed Incorporated. Electrical neurological stimulator. 254,268, 2-19-80, Cl. 24-8.000.
Diez Blanco, D. Julian. Bottle. 254,244, 2-19-80, Cl. D9-28.000.
Dolan, John E. Bottle or similar article. 254,233, 2-19-80, Cl. D9-23.000.
Electromed Incorporated: *See—*
D'Haenens, Irnee J.; and Ledergerber, Charles P., 254,268, Cl. 24-8.000.
Florian, John; and Verrell, Albert C., to Mobil Oil Corporation. Cutter for sheet material or the like. 254,243, 2-19-80, Cl. D8-98.000.
Fountain Industries, Inc.: *See—*
Kiser, John G., 254,255, Cl. D15-116.000.
GAF Corporation: *See—*
Miller, Paul D.; and Penney, Richard, 254,259, Cl. D16-17.000.

Garneau, John P. Restaurant building. 254,271, 2-19-80, Cl. D25-22.000.
Gettys Manufacturing Company, Inc.: *See—*
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Global Video Industries Ltd.: *See—*
Boje, Daniel Q., 254,254, Cl. D14-79.000.
Green, Marianne C., to Koehring Company. Container for liquids or the like. 254,234, 2-19-80, Cl. D9-125.000.
Green, Terry L., to Norlin Industries, Inc. Bass guitar or similar article. 254,260, 2-19-80, Cl. D17-14.000.
Haley, Ellis R. Combined wall telephone support, memorandum pad and pencil holder. 254,253, 2-19-80, Cl. D14-65.000.
Hartung, Philip F. Bottle. 254,235, 2-19-80, Cl. D9-130.000.
Having, Gerald T. Tree climbing step. 254,272, 2-19-80, Cl. D25-69.000.
International Silver Company: *See—*
King, Robert J., 254,228, Cl. D7-137.000.
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Julius, Robert P. Combined fork and separatable toothpick. 254,229, 2-19-80, Cl. D7-148.000.
Kabushiki Kaisha Izumi Seisakusho: *See—*
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Karamian, Narbik A. Apparatus for preventing bacterial passage into sterile fluid systems. 254,265, 2-19-80, Cl. D23-3.000.
Kelsey-Hayes Company: *See—*
Soltis, Peter J.; and Raves, Peter H., 254,258, Cl. D12-180.000.
King, Robert J., to International Silver Company. Article of flatware. 254,228, 2-19-80, Cl. D7-137.000.
Kiser, John G., to Fountain Industries, Inc. Beverage dispenser. 254,255, 2-19-80, Cl. D15-116.000.
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Lancaster Colony Corporation: *See—*
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Lawrence, Inez B. Hair band. 254,273, 2-19-80, Cl. D28-41.000.
Le Van Specialty Co. Inc.: *See—*
Le Van, Eugene B.; and Lehne, John, 254,247, Cl. D12-156.000.
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Le Van, Eugene B.; and Lehne, John, to Le Van Specialty Co. Inc. Dual-opening panel sun roof for automobiles. 254,247, 2-19-80, Cl. D12-156.000.
Lewittes Furniture Enterprises, Inc.: *See—*
Claman, Mike T., 254,223, Cl. D6-68.000.
MacGregor, Fran, to Clairol Incorporated. Skin treatment kit. 254,222, 2-19-80, Cl. D4-20.000.
Matsubara, Hideyuki, to Pioneer Kabushiki Kaisha. Loudspeaker. 254,252, 2-19-80, Cl. D14-30.000.
Melotti, Athos. Puppet. 254,264, 2-19-80, Cl. D21-152.000.
Microsonics Corporation: *See—*
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 254,250, Cl. D14-14.000.
Miller, Paul D.; and Penney, Richard, to GAF Corporation. Combined motion picture viewer and film cartridge therefor. 254,259, 2-19-80, Cl. D16-17.000.
Mobil Oil Corporation: *See—*
Florian, John; and Verrell, Albert C., 254,243, Cl. D8-98.000.
Morin, Andre. Sugar bowl. 254,238, 2-19-80, Cl. D7-17.000.
Morin, Andre. Pitcher. 254,239, 2-19-80, Cl. D7-59.000.
Morin, Andre. Jug. 254,240, 2-19-80, Cl. D7-65.000.
Morin, Andre. Canister or similar article. 254,241, 2-19-80, Cl. D7-79.000.
Morin, Andre. Spice container. 254,242, 2-19-80, Cl. D7-79.000.
Morse, Henry C. Combined advertising card and detachable beverage coaster. 254,226, 2-19-80, Cl. D7-45.000.
Norlin Industries, Inc.: *See—*
Green, Terry L., 254,260, Cl. D17-14.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 254,232, 2-19-80, Cl. D8-397.000.
Papas, Sophia. Combined toy and toothbrush holder. 254,224, 2-19-80, Cl. D6-94.000.
Papciak, William G. Container for veterinary products or similar articles. 254,219, 2-19-80, Cl. D3-66.000.
Penney, Richard: *See—*
Miller, Paul D.; and Penney, Richard, 254,259, Cl. D16-17.000.
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Pioneer Kabushiki Kaisha: *See—*
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Reliance Products Ltd.: *See—*
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Ackers, Stephen B.; and Rose, Neil M., 254,256, Cl. D15-123.000.
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Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 254,250, Cl. D14-14.000.
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Swearingen, James R., to CPG Products Corp. Toy vehicle. 254,262, 2-19-80, Cl. D21-76.000.
Tableriou, John P., to WFI International, Inc. Welding outlet. 254,266, 2-19-80, Cl. D23-40.000.
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Ward, Dennis C. Loudspeaker. 254,251, 2-19-80, Cl. D14-30.000.
Werth, Lawrence A. Dart transfer device. 254,218, 2-19-80, Cl. D3-26.000.
WFI International, Inc.: *See—*
Tableriou, John P., 254,266, Cl. D23-40.000.
Wilkins, Michael C. Pants and skirt form. 254,261, 2-19-80, Cl. D20-32.000.
Wooters, Dwight N., to Rubbermaid Specialty Products Inc. Auto mat. 254,248, 2-19-80, Cl. D12-203.000.
Young, Stuart A., to International Silver Company. Condiment shaker. 254,227, 2-19-80, Cl. D7-54.000.
Ziegler, John S., to American Hospital Supply Corporation. Catheter deflector assembly for endoscopic instruments and the like. 254,270, 2-19-80, Cl. D24-23.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 19, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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3 R 4,188,840
9.51 4,188,841
103 4,188,842

CLASS 83

304 4,188,843
337 4,188,844
356.1 4,188,845
499 4,188,846
868 4,188,847

CLASS 84

1.01 4,188,848
1.15 4,188,849
291 4,188,850
327 4,188,851
411 A 4,188,852
422 R 4,188,853

CLASS 85

36 4,188,854

CLASS 86

4,188,855

CLASS 89

1 B 4,188,856

CLASS 91

352 4,188,857
392 4,188,858
499 4,188,859

CLASS 92

15 4,188,860

CLASS 93

93 C 4,188,861

CLASS 98

41 SV 4,188,862

CLASS 99

286 4,188,863
307 4,188,864
327 4,188,865
339 4,188,866
385 4,188,867
386 4,188,868
584 4,188,869
589 4,188,870

CLASS 100

2 4,188,871
53 4,188,872
98 R 4,188,873
170 4,188,874
212 4,188,878
218 4,188,875
229 A 4,188,879
232 4,188,876
290 4,188,877

CLASS 101

128.21 4,188,880
141 4,188,881
148 4,188,882
183 4,188,883

CLASS 102

54 4,188,884
221 4,188,885
223 4,188,886

CLASS 105

163 R 4,188,887
199 C 4,188,888
445 4,188,889

CLASS 106

1.22 4,189,324
35 4,189,325
60 4,189,327
62 4,189,326
288 Q 4,189,328

CLASS 108

30 4,188,890
42 4,188,891

CLASS 110

238 4,188,892

CLASS 112

121.11 4,188,893
156 4,188,894
158 D 4,188,895
225 4,188,896
262.1 4,188,898
4,188,899
262.2 4,188,897
264.1 4,188,900
278 4,188,901
4,188,902

CLASS 113

120 XY 4,188,903

CLASS 114

172 4,188,904
253 4,188,905

CLASS 115

34 R 4,188,906

CLASS 118

657 4,188,907
715 4,188,908

CLASS 119

5 4,188,909
14.08 4,188,910
48 4,188,911
51 R 4,188,912
4,188,913
71 4,188,914

CLASS 122

6 A 4,188,915
7R 4,188,916
134 4,188,917

CLASS 123

25 R 4,188,918
32 EA 4,188,919
4,188,920
4,188,921
4,188,922
32 ST 4,188,923
41.65 4,188,924
90.12 4,188,925
102 4,188,926
122 AA 4,188,928
148 E 4,188,929
4,188,930
179 B 4,188,931
191 S 4,188,932
198 F 4,188,933

CLASS 125

4 4,188,934
13 R 4,188,935
16 R 4,188,936

CLASS 126

41 R 4,188,937
43 4,188,938
121 4,188,939
217 4,188,940
440 4,188,941

CLASS 128

6 4,188,942
91 A 4,188,943
94 4,188,944
132 D 4,188,945
202.26 4,188,947
204.22 4,188,946
214 R 4,188,948
218 F 4,188,950
218 M 4,188,949
260 4,188,951
303.14 4,188,927
305 4,188,952
325 4,188,953
349 B 4,188,954
680 4,188,955
731 4,188,956

CLASS 131

96 4,188,957
194 4,188,958
245 4,188,959
267 4,188,960

CLASS 133

2 4,188,961
4 R 4,188,962

CLASS 134

5 4,189,329

CLASS 135

1 A 4,188,963
5 AT 4,188,964
5 C 4,188,965
67 4,188,966

CLASS 137

1 4,188,967
236 R 4,188,968
264 4,188,969
268 4,188,970
460 4,188,971
489 4,188,972
514 4,188,973
557 4,188,974
625.66 4,188,975
637.1 4,188,976
833 4,188,977
859 4,188,978

CLASS 138

109 4,188,979

CLASS 139

1 R 4,188,980
370.2 4,188,981
384 B 4,188,982
424 4,188,983

CLASS 141

12 4,188,984
98 4,188,985
130 4,188,986

CLASS 144

193 R 4,188,987

CLASS 148

6.27 4,189,330
6.31 4,189,331
4,189,332
36 4,189,333
159 4,189,334

CLASS 150

1.7 4,188,988
9 4,188,989
52 A 4,188,990

CLASS 156

64 4,189,335
72 4,189,336
167 4,189,338
263 4,189,339
306 4,189,340
351 4,189,337
654 4,189,341
656 4,189,342

CLASS 159

11 R 4,189,343

CLASS 160

124 4,188,991
296 4,188,992

CLASS 162

117 4,189,344
168 R 4,189,345

CLASS 165

8 4,188,993
61 4,188,994
64 4,188,995
80C 4,188,996

CLASS 166

77 4,188,997
129 4,188,998
133 4,188,999
173 4,189,000
216 4,189,001
295 4,189,002
315 4,189,003

CLASS 168

4 4,189,004

CLASS 169

24 4,189,005

CLASS 172

68 4,189,006
224 4,189,007
253 4,189,008
384 4,189,009
804 4,189,010

CLASS 173

13 4,189,011

CLASS 174

35 MS 4,189,618
48 4,189,619
79 4,189,620

CLASS 175

312 4,189,012
320 4,189,013
330 4,189,015
339 4,189,014

CLASS 176

5 4,189,346
58 PB 4,189,347
79 4,189,348

CLASS 177

149 4,189,016
212 4,189,017
256 4,189,018

CLASS 178

67 4,189,621
69.1 4,189,622

CLASS 179

6 R 4,189,623
15 AL 4,189,624
15 BY 4,189,625
84 T 4,189,626
99 H Re.30,220
180 4,189,627

CLASS 180

54 A 4,189,020
54 C 4,189,021
132 4,189,023
133 4,189,024
159 4,189,025
182 4,189,019
268 4,189,022

CLASS 181

118 4,189,026
286 4,189,027

CLASS 182

160 4,189,028
179 4,189,029
196 4,189,030

CLASS 186

1 C 4,189,031

CLASS 188

73.3 4,189,032
269 4,189,033
318 4,189,034

CLASS 190

43 4,189,035
4,189,036
58 R 4,189,037

CLASS 192

21 4,189,038
26 4,189,039
4,189,040
53 F 4,189,041
84 C 4,189,042
111 A 4,189,043

CLASS 194

2 4,189,044

CLASS 196

115 4,189,351

CLASS 198

457 4,189,045
499 4,189,046
778 4,189,047

CLASS 200

33 R 4,189,628

CLASS 202

248 4,189,352

CLASS 203

81 4,189,354

CLASS 204

1 T 4,189,355
25 4,189,356
29 4,189,357
43 N 4,189,358
43 T 4,189,359
58 4,189,360
98 4,189,361
149 4,189,362
157.1 R 4,189,363
159.22 4,189,364
159.23 4,189,365
4,189,366
195 G 4,189,367
243 M 4,189,368
296 4,189,369
299 R 4,189,370

CLASS 206

37 4,189,048
216 4,189,049
245 4,189,050
326 4,189,051
507 4,189,052
570 4,189,053
634 4,189,054

CLASS 208

8 LE 4,189,371
4,189,372
4,189,373
4,189,374
4,189,375
11 LE 4,189,376

CLASS 209

211 4,189,377
459 4,189,378

CLASS 210

22 D 4,189,379
23 F 4,189,380
28 4,189,381
46 4,189,382
58 4,189,383
60 4,189,384
136 4,189,385
235 4,189,386

CLASS 211

119.12 4,189,055
195 4,189,056

CLASS 219

10.55 A 4,189,629
354 4,189,630
388 4,189,631
413 4,189,632
458 4,189,633

CLASS 220

23.4 4,189,057
218 4,189,058
246 4,189,059
260 4,189,060
326 4,189,061

CLASS 221

188 4,189,062

CLASS 222

1 4,189,063
46 4,189,065
48 4,189,066
57 4,189,067
83.5 4,189,068
4,189,069
134 4,189,070
189 4,189,071
321 4,189,064
519 4,189,072
600 4,189,073

CLASS 224

42.06 4,189,074
148 4,189,075
211 4,189,076

CLASS 225

14 4,189,077

CLASS 226

74 4,189,078
188 4,189,079

CLASS 227

8 4,189,080
10 4,189,081
109 4,189,082

CLASS 228

123 4,189,083
4,189,084
173 R 4,189,085

CLASS 229

15 4,189,086
19 4,189,087
31 R 4,189,088
61 4,189,089

CLASS 235

70 A 4,189,634
92 EC 4,189,635
92 MP 4,189,636

CLASS 236

1 G 4,189,090
11 4,189,091
13 4,189,092
37 4,189,093
46 R 4,189,094
92 R 4,189,095

CLASS 237

2 B 4,189,096
8 R 4,189,097

CLASS 239

127 4,189,098
200 4,189,099
310 4,189,100
405 4,189,101

CLASS 241

5 4,189,102
20 4,189,103
82.3 4,189,104

CLASS 242

56 R 4,189,105
82 4,189,106
84.2 G 4,189,108
84.8 4,189,107
107.4 A 4,189,109
131 4,189,110
140 4,189,111
159 4,189,112
182 4,189,113
186 4,189,114
195 4,189,115

CLASS 244

3.16 4,189,116
102 R 4,189,117
182 4,189,118
4,189,119
214 4,189,120
4,189,121

CLASS 248

176 4,189,122
220.2 4,189,123
318 4,189,124
346 4,189,125

CLASS 249

205 4,189,126

CLASS 250

231 R 4,189,637
259 4,189,638
262 4,189,705
282 4,189,639
290 4,189,640
311 4,189,641
324 4,189,642
326 4,189,643
381 4,189,644
394 4,189,645
423 P 4,189,646

CLASS 251

196 4,189,127

CLASS 252

32.7 E 4,189,387
46.7 4,189,388
47.5 4,189,389
63 4,189,391
63.2 4,189,392
70 4,189,393
4,189,394
91 4,189,395
99 4,189,396
171 4,189,397
301.1 R 4,189,398
408 4,189,399
4,189,400
4,189,401
428 4,189,402
431 P 4,189,403
462 4,189,404
4,189,405
501.1 4,189,406

CLASS 254

7 R 4,189,128

CLASS 260

18 R 4,189,407
4,189,408
23 XA 4,189,409
23.7 C 4,189,410
27 R 4,189,411
28.5 AS 4,189,412
29.2 M 4,189,413
29.4 R 4,189,414
29.6 NR 4,189,417
29.6 TA 4,189,416
29.6 WA 4,189,415
29.7 NR 4,189,419
29.7 R 4,189,418
31.6 4,189,420
38 4,189,421
40 R 4,189,422
42 4,189,423
42.15 4,189,424
112 B 4,189,425
112.5 R 4,189,426
156 4,189,427
158 4,189,428
207.5 4,189,429
239.55 R 4,189,430
4,189,431
244.4 4,189,432
340.3 4,189,437
343.9 4,189,438
347.5 4,189,439
397.45 4,189,440
410.9 R 4,189,441
428.5 4,189,442
453 PH 4,189,443
453 RW 4,189,444
458 C 4,189,445
544 C 4,189,446
586 F 4,189,447
604 HF 4,189,448
606.5 F 4,189,449
976 4,189,453

CLASS 261

39 B 4,189,454

CLASS 264

12 4,189,455
25 4,189,456
30 4,189,457
143 4,189,458
255 4,189,459

CLASS 266

251 4,189,129
270 4,189,130

CLASS 267

165 4,189,131

CLASS 269

295 4,189,132

CLASS 270

61 F 4,189,133
66 4,189,134

CLASS 271

4 4,189,135
12 4,189,136
103 4,189,137
109 4,189,138
162 4,189,139
212 4,189,140

CLASS 272

95 4,189,141
113 4,189,149

CLASS 273

73 D 4,189,142
73 R 4,189,143
77 R 4,189,144
121 A 4,189,150
156 4,189,151
176 AB 4,189,152
256 4,189,153
272 4,189,154
313 4,189,145
350 4,189,148
406 4,189,147
408 4,189,146

CLASS 274

1 A 4,189,155

CLASS 277

1 4,189,156
3 4,189,157
34.3 4,189,158
39 4,189,159
205 4,189,160
221 4,189,161

CLASS 279

4 4,189,162

CLASS 280

11.37 E 4,189,163
87.05 4,189,164
154.5 R 4,189,165
234 4,189,166
279 4,189,167
284 4,189,168
802 4,189,169
4,189,170

CLASS 282

27.5 4,189,171

CLASS 283

6 4,189,353

CLASS 285

12 4,189,172

CLASS 290

42 4,189,647
44 4,189,648

CLASS 292

86 4,189,173
98 4,189,174
340 4,189,175
346 4,189,176

CLASS 296

105 4,189,178
188 4,189,177

CLASS 297

305 4,189,179
453 4,189,180
455 4,189,181
460 4,189,182

CLASS 299

1 4,189,183
8 4,189,184
13 4,189,185
31 4,189,186
34 4,189,187
53 4,189,188

CLASS 300

7 4,189,189

CLASS 303

6 C 4,189,190
52 4,189,191
105 4,189,192

CLASS 307

64 4,189,649
108 4,189,650
254 4,189,651
428 4,189,652

CLASS 308

23 4,189,193
35 4,189,194

CLASS 310

68 D 4,189,653
72 4,189,654
329 4,189,655

CLASS 312

209 4,189,195
236 4,189,196
258 4,189,197

CLASS 313

37 4,189,656
113 4,189,657
330 4,189,658
412 4,189,659

CLASS 315

5.38 4,189,660
39 4,189,661
136 4,189,662
205 4,189,663
297 4,189,664
360 4,189,665

CLASS 318

334 4,189,666
338 4,189,667
379 4,189,668
811 4,189,669

CLASS 323

9 4,189,670
19 4,189,671
43.5 R 4,189,672

CLASS 324

133 4,189,673
208 4,189,674

CLASS 325

4 4,189,675
125 4,189,676
321 4,189,677
459 4,189,678
474 4,189,679

CLASS 330

59 4,189,680
109 4,189,681
252 4,189,682
287 4,189,683

CLASS 331

56 4,189,684
62 4,189,685
94.5 D 4,189,687
94.5 PE 4,189,686
117 FE 4,189,688

CLASS 332

18 4,189,689
30 V 4,189,690

CLASS 333

22 R 4,189,691

CLASS 335

205 4,189,692
216 4,189,693
229 4,189,699

CLASS 337

158 4,189,694
204 4,189,695
232 4,189,696
407 4,189,697
4,189,698

CLASS 338

333 4,189,700

CLASS 339

13 4,189,198
75 MP 4,189,199
4,189,200
4,189,201
101 4,189,202
184 M 4,189,203
275 R 4,189,204

CLASS 340

53 4,189,706
60 4,189,707
64 4,189,708
84 4,189,709
146.1 AL 4,189,710
146.3 H 4,189,711
149 A 4,189,712
168 R 4,189,713
347 AD 4,189,714
347 DD 4,189,715
4,189,716
365 E 4,189,717
384 E 4,189,718
501 4,189,719
539 4,189,720
4,189,721
568 4,189,723
607 4,189,724
636 4,189,725
689 4,189,726
711 4,189,727
725 4,189,728
777 4,189,729

CLASS 343

5 R 4,189,732
100 SA 4,189,733
841 4,189,730
872 4,189,731

CLASS 346

1.1 4,189,734
135.1 4,189,735
139 C 4,189,736

CLASS 350

1.7 4,189,205
96.20 4,189,206
96.25 4,189,207
96.34 4,189,208
103 4,189,209
132 4,189,210
175 TS 4,189,211
184 4,189,212
4,189,213
215 4,189,214

CLASS 351

7 4,189,215

CLASS 354

4,189,216
4,189,217
25 4,189,218
33 4,189,219
43 4,189,220
51 4,189,221
126 4,189,222

CLASS 355

3 BE 4,189,223
4 4,189,224
8 4,189,225
10 4,189,226
35 4,189,227
41 4,189,228
67 4,189,229
76 4,189,230
100 4,189,231

CLASS 356

1 4,189,232
5 4,189,233
152 4,189,234
239 4,189,235
317 4,189,236

CLASS 357

23 4,189,737
40 4,189,738
51 4,189,739

CLASS 358

21 V 4,189,740
76 4,189,741
80 4,189,742
93 4,189,743

4,189,744
126 4,189,747
128.5 4,189,745
4,189,746
133 4,189,748
167 4,189,749
192 4,189,750
213 4,189,751
294 4,189,753
296 4,189,754
298 4,189,752
904 4,189,755

CLASS 360

14 4,189,756
51 4,189,757
77 4,189,758
104 4,189,759

CLASS 361

321 4,189,760
433 4,189,761

CLASS 362

72 4,189,762
241 4,189,763

CLASS 363

21 4,189,764

CLASS 364

120 4,189,765
200 4,189,766
4,189,767
4,189,768
4,189,769
4,189,770
4,189,772
300 4,189,771
4,189,773
405 4,189,774
414 4,189,775
420 4,189,776
433 4,189,777
482 4,189,778
713 4,189,779
744 4,189,780
900 4,189,781

CLASS 365

128 4,189,783
156 4,189,785
190 4,189,782
233 4,189,784

CLASS 366

2 4,189,237
7 4,189,238
169 4,189,239
186 4,189,240
245 4,189,241
288 4,189,242
336 4,189,243

CLASS 367

2 4,189,701
4 4,189,786
60 4,189,704
93 4,189,722
109 4,189,702
134 4,189,703

CLASS 400

55 4,189,244
144.2 4,189,246

CLASS 401

126 4,189,245

CLASS 403

4 4,189,247
11 4,189,248
27 4,189,249
190 4,189,250
261 4,189,251

CLASS 405

33 4,189,252
74 4,189,253
128 4,189,254
211 4,189,255
277 4,189,256
291 4,189,257
4,189,258

CLASS 406

63 4,189,259
76 4,189,260
112 4,189,261
136 4,189,262
137 4,189,263

CLASS 407

2 4,189,264
114 4,189,265

CLASS 408

224 4,189,266

CLASS 409

59 4,189,267
183 4,189,268

CLASS 414

19 4,189,269
35 4,189,271
45 4,189,270
161 4,189,272
285 4,189,273
462 4,189,274
640 4,189,275
659 4,189,276
664 4,189,277
713 4,189,278
750 4,189,279

CLASS 415

2 4,189,280
213 C 4,189,281

CLASS 416

20 A 4,189,283
221 4,189,282

CLASS 417

313 4,189,284
403 4,189,285
477 4,189,286
490 4,189,287

CLASS 422

165 4,189,460

CLASS 423

27 4,189,461
573 G 4,189,462

CLASS 424

1 4,189,463
4,189,464
10 4,189,465
12 4,189,466
14 4,189,467
70 4,189,468
80 4,189,469
85 4,189,470
88 4,189,471
117 4,189,472
124 4,189,473
180 4,189,474
200 4,189,475
224 4,189,476
243 4,189,477
244 4,189,478
246 4,189,479
4,189,480
248.54 4,189,481
250 4,189,482
251 4,189,483
4,189,484
253 4,189,485
263 4,189,486
4,189,487
4,189,488
266 4,189,489
269 4,189,490
273 R 4,189,491
4,189,492
4,189,493
274 4,189,494
4,189,495
275 4,189,496
4,189,497
283 4,189,498
316 4,189,499
331 4,189,500
338 4,189,501

CLASS 425

72 R 4,189,288
93 4,189,289
113 4,189,290
215 4,189,291
290 4,189,292
376 A 4,189,293
525 Re.30,215

CLASS 426

249 4,189,502
482 4,189,503
508 4,189,504
533 4,189,505

CLASS 427

8 4,189,506
47 4,189,507
48 4,189,508
102 4,189,509
125 4,189,510

CLASS 428

167 4,189,511
198 4,189,512
331 4,189,514
407 4,189,515
409 4,189,516
423.7 4,189,517
458 4,189,518
476 4,189,519
520 4,189,520
539 4,189,521
557 4,189,522
571 4,189,523
622 4,189,524
643 4,189,525

CLASS 429

13 4,189,526
26 4,189,527
70 4,189,528
103 4,189,529
104 4,189,530
4,189,531
215 4,189,532
223 4,189,533

CLASS 430

111 4,189,390
145 4,189,320
281 4,189,323
284 4,189,322
380 4,189,319
381 4,189,321

CLASS 431

7 4,189,294
12 4,189,295
20 4,189,296
328 4,189,297
359 4,189,298

CLASS 432

78 4,189,299
118 4,189,300
252 4,189,301

CLASS 433

90 4,188,724
129 4,188,725

CLASS 435

2 4,189,534
4,189,535
12 4,189,536
75 4,189,537
87 4,189,349
215 4,189,350
247 4,189,538

CLASS 521

25 4,189,539
27 4,189,540
110 4,189,541
124 4,189,542
128 4,189,543
4,189,544
131 4,189,545

CLASS 525

6 4,189,550
99 4,189,547
109 4,189,548
262 4,189,451
426 Re.30,217
439 4,189,549
444 4,189,452
455 4,189,450
472 4,189,611

CLASS 526

74 4,189,551
84 4,189,552
92 4,189,553
125 4,189,554
141 4,189,556
159 4,189,557
169.2 4,189,558
179 4,189,555
203 4,189,559
259 4,189,560
317 4,189,561

CLASS 528

26 4,189,546
75 4,189,562
94 4,189,564
232 4,189,565
408 4,189,566
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For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

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SIDNEY A. DIAMOND,
Jan. 28, 1980. *Commissioner of Patents and Trademarks.*

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Classification Definitions in Microfiche

The Patent and Trademark Office announcea the availability of *Classification Definitions* in microfiche form, offered for sale on a subscription basis through the Superintendent of Documents, U.S. Government Printing Office.

A subscription consists of an initial set of microfiche containing all of the definitions and subsequent quarterly issues of microfiche providing any newly published definitions or any changes in existing definitions. The term of a subscription will depend upon the number of quarterly update microfiche issued, but is expected to extend for two years.

Each of the definitions is published in its entirety on one or two microfiche, including all addenda. The microfiche are sheets of diazo type film of 105mm by 148mm (4'' x 6''), which contain up to 98 pages of information at a reduction ratio of 24:1. The present full set consists of 323 definitions on 359 microfiche, containing definitions for over 100,000 subclasses.

For the convenience of the user, changes resulting from addenda will be hand-entered into the text where feasible: all other changes will be indicated by reference in the text to addendum page number. Where a class definition is modified in any way through an addendum or republication, the entire microfiche(s) for that definition will be replaced in the next issuing update.

Paper copies of individual class definitions will continue to be available from U.S. Patent and Trademark Office, Office of Documentation Planning, Support and Control, Special Processing Section, Room 7D30, CP2, Washington, D.C. 20231 [telephone (703) 557-9361]. Prices vary according to the size of each document.

The *Classification Definitions* in microfiche may be purchased only from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price for domestic orders (United States and possessions only) is $170. All other orders are priced at $212.50. Payment may be made by check or money order, by charge to your Superintendent of Documents deposit account or by charge to your Master Charge or Visa card. Orders may also be made by telephone at any GPO bookstore or by calling the Washington order desk (from 8:00 A.M.-4:30 P.M. eastern time, weekdays except holidays) at (202) 783-3238.

Jan. 16, 1980 ALFRED C. MARMOR,
Administrator for Documentation.

Establishment and Membership of Performance Review Board

This notice announces the establishment, by the Commissioner of the Patent and Trademark Office (PTO), as Appointing Authority for the Senior Executive Service at PTO, of the Performance Review Board (PRB) and the appointment of its members.

The purpose of the PRB is to review (1) initial appraisals and ratings prepared by supervisors of senior executives, (2) the responses of senior executives, (3) the written review of initial ratings by higher level management when made, as well as providing written reports on senior executive appraisals and ratings to the Commissioner. The PRB may also make recommendations to the Commissioner on matters that will ensure the fair and equitable treatment of senior executives and instill, in the minds of all concerned, confidence regarding the integrity, competence, and impartiality of the PRB. The PRB will perform its review functions for all PTO members of the Senior Executive Service.

The names, titles, and terms of service of the PRB members who have been appointed are set forth below:

Lutrelle F. Parker, *Chairman,* Deputy Commissioner, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

Rene D. Tegtmeyer, *Member,* Assistant Commissioner of Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

Richard J. Shakman, *Member,* Assistant Commissioner for Administration, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

James O. Thomas, Jr., *Member,* Director, Patent Examining Group 140, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—3 years.

Herbert C. Wamsley, *Member,* Executive Assistant to the Commissioner, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—3 years.

William Feldman, *Member,* Deputy Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—2 years.

Jere W. Sears, *Member,* Deputy Solicitor, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—2 years.

Richard P. Bartlett, Jr., (*Outside*) *Member,* Director of Administrative and Information Systems, National Bureau of Standards, Washington, D.C. 20234. Term—1 year.

The Personnel Officer, Aaron W. Deitch, shall serve as Executive Secretary to the PRB. Anyone desiring further information about the PRB or its membership should contact the Personnel Officer, Office of Personnel, U.S. Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-2662.

RENE D. TEGTMEYER,
Dated: Jan. 31, 1980. *Acting Commissioner of Patents and Trademarks.*

Conference on Patents at Purdue University

The Patent and Trademark Office, in conjunction with the Greater Lafayette Chamber of Commerce, the Indiana State Chamber of Commerce, the Indianapolis Center for Advanced Research, Inc., and the International Trade Administration of the Department of Commerce, is sponsoring a conference on patents to be held at Purdue University on March 14, 1980. The conference, "What You Need to Know About Patents," will begin with a luncheon highlighted by an address by Senator Birch Bayh. The program will be moderated by the Commissioner of Patents and Trademarks, Sidney A. Diamond. Other speakers will include Donald W. Banner, former Commissioner of Patents and Trademarks, Dr. Robert Henderson, President, Indianapolis Center for Advanced Research, Inc. and Lyman H. Wolfla, II, President. Lyman H. Wolfla, Inc., Indianapolis, Indiana. This conference will be of value not only to patent attorneys and patent agents, but also to inventors, engineers, researchers, small businessmen, and anyone else interested in learning more about patents.

Registration for this conference will be at 11:30 a.m., March 14, 1980, West Faculty Lounge, Purdue Memorial Union, Purdue University. For more information, or for advance registration, write or call Becky Jane Smith, 126 Stewart Center, Purdue University, West Lafayette, Indiana 47907, telephone (317) 749-2533, or Mr. Mel Sherar, International Trade Administration, Department of Commerce, 46 E. Ohio Street, Indianapolis, Indiana 46204, telephone (317) 269-6214.

LUTRELLE F. PARKER,
Dated: Feb. 5, 1980. *Acting Commissioner of Patents and Trademarks.*

Availability of Consolidated Listing

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," which appeared in the OFFICIAL GAZETTE of January 1, 1980, is available, as a separate publication, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Please include the following information when ordering. Stock. No. 003-004-00567-0, cost $4.50.

RICHARD J. SHAKMAN,
Dated: Feb. 5, 1980. *Assistant Commissioner for Administration.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,062,367, Re. S.N. 096,610, Filed Nov. 21, 1979, Cl. 131/134, TIERED CONTAINER WITH FLOW DISTRIBUTION SYSTEM, Robert C. Johnson, Owner of Record: *Reynolds Leasing Corporation, Jacksonville, Fla.,* Attorney or Agent: Grover M. Myers, et al., Ex. Gp.: 335

4,064,254, Re. S.N. 098,008, Filed Nov. 28, 1979, Cl. 424/267, SUBSTITUTED PIPERIDINES THERAPEUTIC PROCESS AND COMPOSITIONS, Stanley J. Dykstra, et al., Owner of Record: *Mead Johnson & Co., Evansville, Ind.,* Attorney or Agent: Robert E. Carnahan, et al., Ex. Gp.: 125

4,143,187, Re. S.N. 097,234, Filed Nov. 26, 1979, Cl. 427/358, PROCESS FOR COATING SHEET SUBSTRATES WITH THERMOPLASTIC POLYMER, James Frank Pilgrim, et al., Owner of Record: *Du Pont of Canada Limited, Montreal, Canada,* Attorney or Agent: Ivan G. Szanto, Ex. Gp.: 162

PATENT NOTICES

Certificates of Correction for the Week of Feb. 26, 1980

Plt. 4,465	4,098,740	4,129,725	4,164,379
Re. 29,829	4,098,815	4,129,726	4,166,534
Re. 29,891	4,098,898	4,130,580	4,166,770
Re. 29,948	4,098,989	4,132,153	4,168,104
Re. 29,964	4,099,658	4,132,741	4,168,346
Re. 30,014	4,101,513	4,133,012	4,168,924
D. 246,311	4,104,889	4,133,325	4,168,929
3,531,542	4,105,566	4,134,022	4,169,186
3,902,668	4,105,622	4,136,879	4,169,463
3,922,319	4,107,203	4,137,825	4,169,827
3,926,839	4,107,887	4,139,490	4,170,167
3,946,358	4,112,014	4,139,720	4,170,189
3,957,739	4,112,015	4,140,180	4,170,305
3,984,347	4,113,664	4,140,527	4,170,663
3,989,908	4,114,042	4,142,968	4,170,917
3,993,570	4,116,927	4,143,059	4,171,213
3,996,194	4,120,350	4,143,172	4,171,237
3,996,264	4,122,460	4,143,760	4,171,389
4,034,990	4,123,424	4,144,935	4,171,647
4,035,198	4,123,766	4,145,442	4,171,667
4,046,923	4,124,356	4,147,670	4,172,250
4,053,058	4,124,382	4,148,211	4,172,857
4,054,420	4,124,483	4,148,342	4,172,922
4,056,487	4,124,872	4,148,949	4,173,079
4,057,820	4,125,951	4,148,968	4,173,155
4,061,625	4,126,605	4,150,028	4,173,556
4,070,061	4,126,640	4,150,531	4,174,210
4,072,435	4,127,045	4,154,676	4,174,406
4,072,653	4,127,066	4,154,702	4,174,439
4,073,873	4,127,168	4,155,095	4,174,482
4,082,435	4,127,301	4,155,123	4,174,702
4,083,630	4,127,679	4,156,578	4,174,984
4,085,270	4,127,720	4,158,331	4,175,088
4,086,257	4,128,070	4,158,347	4,175,149
4,088,685	4,128,086	4,159,273	4,175,150
4,091,300	4,128,127	4,160,213	4,175,486
4,094,903	4,128,269	4,162,820	4,175,663
4,095,464	4,128,397	4,162,932	4,177,010
4,097,845	4,128,425	4,162,941	4,177,639
4,097,873	4,129,559	4,163,697	4,180,465
4,098,319			

Dedication

4,141,929.—*Reginald B. Stoops,* Gainesville, Fla., and *John M. Maxel,* St. Charles, Ill. UNIDIRECTIONAL SHEET MOLDING COMPOSITION AND PROCESS OF PREPARING SAME. Patent dated Feb. 27, 1979. Dedication filed Dec. 5, 1979, by the assignee, Armco, Inc.

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,481,783.—*Hans-Jurgen Von Der Linde, Wolfenbuttel,* and *Wilhelm Haberich,* Braunschweig, Germany. MOLASSES PURIFICATION. Patent dated Dec. 2, 1969. Disclaimed filed Dec. 13, 1979, by the assignee, Braunschweigische Maschinenbauanstalt.

Hereby enters this disclaimer to claim 1 of said patent.

3,723,474.—*Eugene G. Teach,* El Cerrito, and *Duane R. Arneklev,* Sunnyvale, Calif. META-THIOCARBAMYL PHENYLENE AMIDES AND UREAS AND THEIR UTILITY AS HERBICIDES. Patent dated Mar. 27, 1973. Disclaimer filed Jan. 10, 1980, by the assignee, Stauffer Chemical Company.

Hereby enters this disclaimer to claims 14 to 30, inclusive of said patent.

4,161,407.—*Gerald Allan Campbell,* Webster, N.Y. CROSS-LINKABLE POLYMERS HAVING VINYLSULFONYL GROUPS OR STYRYLSULFONYL GROUPS AND THEIR USE AS HARDENERS FOR GELATIN. Patent dated July 17, 1979. Disclaimer filed Dec. 20, 1979, by the assignee, Eastman Kodak Company.

Hereby enters this disclaimer to all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va., 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division
Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 6–004,625. Chemiluminescent Method and Apparatus for the Detection of Ozone. Filed Jan. 19, 1979.

Patent application 6–019,193. Microwave Oscillator for Microwave Integrated Circuits Applications. Filed Mar. 9, 1979.

Patent application 6–019,688. Resonant Subcavity Differential Spectrophone. Filed Mar. 12, 1979.

Patent application 6–019,791. Keeper for Load Carrying Equipment. Filed Mar. 12, 1979.

Patent application 6–028,934. Wideband Antenna With Frequency Dependent Ferrite Core Inductor. Filed Apr. 11, 1979.

Patent application 6–029,182. Multiple Access, Time-Division Multiplex, Satellite Communications System. Filed Apr. 12, 1979.

Patent application 6–030,966. Piezoelectric Polymer Heat Exchanger. Filed Apr. 17, 1979.

Patent application 6–033,911. Permanent Magnet Materials. Filed Apr. 27, 1979.

Patent application 6–033,939. Magnetic Alloys. Filed Apr. 27, 1979.

Patent application 6–033,940. Method of Treating a Permanent Magnet Alloy. Filed Apr. 27, 1979.

Patent application 6–036,199. Double Button Spurious Signals Prevention Circuit. Filed May 4, 1979.

Patent application 6–037,256. Tube With Bonded Cathode and Electrode Structure and Getter. Filed May 9, 1979.

Patent application 6–037,257. Bonded Cathode and Electrode Structure With Layered Insulation and Method of Manufacture. Filed May 9, 1979.

Patent application 6–040,366. Method of Making a Quartz Resonator. Filed May 18, 1979.

Patent application 6–040,376. Method and Apparatus for Manufacturing Masked Motion Picture Film for Simulated Target Practice. Filed May 18, 1979.

Patent application 6–042,654. Fast Warm-Up Oven Controlled Oscillator. Filed May 25, 1979.

Patent application 883,552. Re-Entrant Insulator Design for Geiger-Mueller Tube of the Like. Filed Mar. 6, 1978.

Patent application 958,595. Connector for Splicing Optical Fibers. Filed Nov. 7, 1978.

Patent application 959,264. Method of Extending the Storage Life in the Frozen State of Precooked Foods. Filed No. 9, 1978.

Patent application 959,265. Dental Liquid Entrees and Method of Making. Filed Nov. 9, 1978.

Patent application 970,017. Interference Cancelling System. Filed Dec. 18, 1978.

Patent application 970,608. Self-Adaptive Mobile Subscriber Access System Employing Time Division Multiple Accessing. Filed Dec. 18, 1978.

Patent application 972,199. Variable Resistance Attenuator. Filed Dec. 22, 1978.

Patent application 972,532. Automatic Channel Selection. Filed Dec. 22, 1978.

Patent application 973,402. Electronic Intruder Detection System. Filed Dec. 26, 1978.

Patent application 973,642. Radar Antenna. Filed Dec. 26, 1978.

Patent 4,118,211. Method of Maintaining the Strength of Optical Fibers. Filed June 22, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,857. Flipped Method for Characterization of Epitaxial Layers. Filed Jan. 12, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,119,462. Color Photographic Developer Composition. Filed May 24, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,120,547. Dissecting Tray. Filed Nov. 23, 1976. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,701. Reactant for Steel. Filed Aug. 25, 1966. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,666. Fuel (Flammable Liquid) Tank Fire Extinguisher. Filed Apr. 11, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,124,066. Radiator Shutter for Arctic Vehicles. Filed Jan. 3, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,124,280. Acoustic-Optic Technique for Processing Many Signals Simultaneously. Filed June 7, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,125,376. Method for Detecting Water Pollutants. Filed Apr. 22, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,126,039. Projectile Strain Damage Indicating Device. Filed May 26, 1977. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,126,730. Anionically Polymerized Copolymers of Methyl Alpha-N-Alkylacrylate and Methyl Methacrylate and Method of Making Same. Filed Apr. 3, 1978. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,129,459. Method for Diminishing the Strength and Ductility of Steel Utilizing a Lithium-Indium-Amalgam Containing a Small Amount of Vanadium Pentoxide. Filed Aug. 25, 1966. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,129,893. Thermoelectric Generator Overload Protective Device Using Hysterisis Control. Filed May 31, 1977. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,132,271. Fragment Prevention Screen for Explodable Fire Suppressant Panels. Filed July 11, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,134,100. Fluidic Mud Pulse Data Transmission Apparatus. Filed Nov. 30, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,134,367. Electronic Fuel Injection Control. Filed May 26, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,681. Method of Determining Relative Orientation of Physical Systems. Filed Aug. 5, 1976. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,159. Apparatus for Suppressing a Strong Electrical Signal. Filed June 24, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,137,651. Moving Target Practice Firing Simulator. Filed May 19, 1978. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,137,761. Tilting Table Initial Tack Test Apparatus for Adhesive Bonds. Filed Oct. 11, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,196. Fiber Interferometer Rotary Motion Sensor. Filed July 6, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,512. Process for Chemical Vapor Deposition of a Homogeneous Alloy of Refractory Metals. Filed Oct. 17, 1977. Patented Feb. 5, 1979. Not available NTIS.

Patent 4,138,684. Loaded Microstrip Antenna With Integral Transformer. Filed May 12, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,139,908. Photovoltaic-Ferroelectric Data Recorder. Filed Aug. 15, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,140,062. Differential Integrator. Filed Feb. 16, 1955. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,710. Recovery of o-Chlorobenzilidene Malononitrile From Finely Divided Mixtures Thereof With Colloidal Silica. Filed Aug. 1, 1978. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,917. East Risetime Soiral Pulse Generator. Filed July 20, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,141,801. Fuel Cell Anode Electrode, Method of Making the Fuel Cell Anode Electrode, and Fuel Cell Containing the Fuel Cell Anode Electrode. Filed Dec. 15, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,190. Microstrip Feed With Reduced Aperture Blockage. Filed Sept. 29, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,859. Chemiluminescent Process and Detector for Monitoring Atmospheric Contaminants. Filed June 23, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,143,971. Reconnaissance/Surveillance System Utilizing Color Signature of Target. Filed Aug. 22, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,144,591. Memory Transistor. Filed Apr. 5, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,146,394. Filter Pack Correction Method in Color Photography. Filed Mar. 4, 1975. Patented Mar. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administration Service Division Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent 4,167,250. Sequential Velocity Disk Refiner. Filed Apr. 19, 1978. Patented Sept. 11, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel For Patents.
Room A 2–3018
Washington, D.C. 20545

Patent 4,099,852. Lens Positioner With Five Degrees of Freedom. Filed Oct. 5, 1976. Patented July 11, 1978. Not available NTIS.

Patent 4,102,739. Method of Shielding a Liquid-Metal-Cooled Reactor. Filed Sept. 30, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,148. Dynamic Pulse Difference Circuit. Filed Nov. 24, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,165. Neutron Responsive Self-Powered Radiation Detector. Filed Mar. 23, 1977. Patented July 25, 1978. Not available NTIS.

Patent 4,103,555. Pressure Sensor for High-Temperature Liquids. Filed June 6, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,105,470. Dye-Sensitized Schottky Barrier Solar Cells. Filed June 1, 1977. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,107,519. Optical Control System for High-Voltage Terminals. Filed Apr. 13, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,109,612. Electroless Plating Apparatus for Discrete Microsized Particles. Filed Sept. 16, 1975. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,049. Sun Meter. Filed Mar. 8, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,517. Electrochemical Cell Design. Filed Jan. 11, 1978. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,111,747. Packed Rod Neutron Shield for Fast Nuclear Reactors. Filed June 8, 1976. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,113,562. Apparatus for Controlling Coolant Level in a Liquid-Metal-Cooled Nuclear Reactor. Filed Apr. 20, 1977. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,113,564. Core Disruptive Accident Margin Seal. Filed Aug. 13, 1976. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,115,193. Nuclear Reactor Pressure Vessel Support System. Filed Aug. 17, 1976. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,116,764. Apparatus for Controlling Nuclear Core Debris. Filed Feb. 11, 1976. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,116,766. Ultrasonic Dip Seal Maintenance System. Filed Aug. 31, 1976. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,118,249. Modular Assembly of a Photovoltaic Solar Energy Receiver. Filed Aug. 30, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,275. Variable Flow Control for a Nuclear Reactor Control Rod. Filed Dec. 12, 1974. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,278. Nuclear Reactor Insulation and Preheat System. Filed Sept. 27, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,127,443. Compact Power Reactor. Filed May 4, 1960. Patented Nov. 28, 1978. Not available NTIS.

Patent 4,130,107. Solar Concentrator With Restricted Exit Angles. Filed Nov. 10, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,133,854. Method for Producing Small Hollow Spheres. Filed June 16, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,134,960. Method for Dissolving Plutonium Oxide With HI and Separating Plutonium. Filed June 1, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,973. Core Disruptive Accident Margin Seal. Filed Mar. 10, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,282. Directional Detector of Gamma Rays. Filed Nov. 29, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,140,576. Apparatus for Neutralization of Accelerated Ions. Filed Sept. 22, 1976. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,142,088. Method of Mounting a Fuel Pallet in a Laser-Excited Fusion Reactor. Filed Jan. 27, 1976. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,300. Lanthanum Nickel Aluminum Alloy. Filed July 18, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,143,316. Hydrogen Consentration Meter Utilizing a Diffusion Tube Composed of 2¼ Cr–1 Mo Steel and a Sleeve of Nickel. Filed Sept. 7, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,144,059. Ductile Long Range Ordered Alloys With High Critical Ordering Temperature and Wrought Articles Fabricated Therefrom. Filed Mar. 14, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,144,454. Tape Transport Mechanism. Filed Jan. 27. 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,146,449. Purification of Silane Via Laser-Induced Chemistry. Filed Dec. 28, 1977. Patented Mar. 27, 1979. Not available NTIS.

U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St. SW.
Washington, D.C. 20460

Patent application 6–015,314. Two Stage Catalytic Combustion Process and Apparatus. Filed Feb. 26, 1979.

Patent application 799,948. Catalytic Combustion Process and Apparatus. Filed May 24, 1977.

Patent application 893,575. Catalytic Combustion Process and System. Filed Apr. 5, 1978.

Patent application 911,549. Conversion of Sulfur-Containing Fuel to Sulfur-Free Gases. Filed June 1, 1978.

Patent application 920,944. Remote Controlled Air Sampler. Filed June 30, 1978.

Patent 4,035,170. Granular Filter. Filed Jan. 8, 1976. Patented July 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–040,921. Detection of Non-A, Non-B Hepatitis Associated Antigen. Filed May 21, 1979.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent 4,159,641. Vibrating Wire Stress Meter. Filed Sept. 3. 1974. Patented July 3, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–053,569. Containerless High Temperature Calorimeter Apparatus. Filed June 29, 1979.

Patent application 6–043,941. Copper Doped Polycrystalline Silicon. Filed May 30, 1979.

Patent application 6–043,944. Superplastically Formed Diffusion Bonded Metallic Structure. Filed May 30, 1979.

Patent application 6–044,428. Method for Anisotropically Etching a Silicon Wafer Having a Reinforced Peripheral Portion. Filed June 1, 1979.

Patent application 6–044,429. General Logic Structure for Custom LSI Circuits. Filed June 1, 1979.

Patent application 6–044,431. Improved Power Factor Control System for AC Induction Motors. Filed June 1, 1979.

Patent application 6–044,432. Multifunctional Transducer. Filed June 1, 1979.

Patent application 712,270. Apparatus and Method of Inserting a Microelectrode in Body Tissue or the Like Using Vibration Means. Filed Sept. 6, 1976.

Patent application 837,513. Schottky Barrier Cell and Method of Fabricating It. Filed Sept. 29, 1977.

Patent application 899,828. A High-Speed Data Link for Moderate Distances and Noisy Environments. Filed Apr. 25, 1978.

Patent 4,148,031. Phase Conjugation Method and Apparatus for an Active Retrodirective Antenna Array. Filed Mar. 16. 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,149,233. Circuit for Automatic Load Sharing in Parallel Converter Modules. Filed Sept. 15, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,278. Compact Artificial Hand. Filed Sept. 27. 1977. Patented Apr. 17. 1979. Not available NTIS.

Patent 4,149,423. High-Temperature Microphone System. Filed Apr. 28, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,521. Solar Energy Collection System. Filed Jan. 25, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,665. Bonding Machine for Forming a Solar Array Strip. Filed Nov. 4. 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,938. Electrochemical Detection Device. Filed Nov. 30, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,425. Module Failure Isolation Circuit for Paralleled Inverters. Filed Feb. 9, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,151,086. Fluid Sample Collection and Distribution System. Filed Apr. 4, 1978. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,612. Spacesuit Mobility Knee Joints. Filed Mar. 3, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,153,476. Double-Sided Solar Cell Package. Filed Mar. 29, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,154,084. Coal-Shale Interface Detection. Filed Nov. 3, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,154,912. In Situ Self Cross-Linking of Polyvinyl Alcohol Battery Separators. Filed Apr. 19, 1978. Patented May 15, 1979. Not available NTIS.

OFFICE OF NAVAL RESEARCH
Field Support Group,
Room 221, Arlington, Va. 22217

Patent 4,031,488. Multiple Polarization Switch. Filed Apr. 5. 1976, patented June 21, 1977. Not available NTIS.

Patent 4,132,681. Fluorinated Polyether Network Polymers. Filed Oct. 29, 1976, patented Jan. 2, 1979. Not available NTIS.

Patent 4,142,212. Two-Dimensional Surface Acoustic Wave Image Scanning. Filed Aug. 5, 1977, patented Feb. 27, 1979. Not available NTIS.

Patent 4,146,332. Spectrometer with Electronic Readout. Filed Apr. 19, 1977, patented Mar. 27, 1979. Not available NTIS.

Patent 4,150,340. High-Power Microwaves from a Non-Isochronous Reflecting Electron System (NIRES). Filed Mar. 22, 1978, patented Apr. 17, 1979. Not available NTIS.

Patent 4,152,492. Water Cooled Bipolar Battery Apparatus. Filed July 31, 1978, patented May 1, 1979. Not available NTIS.

Patent 4,152,772. Apparatus for Performing a Discrete Cosine Transform of an Input Signal. Filed Dec. 20, 1976, patented May 1, 1979. Not available NTIS.

Patent 4,154,532. High Precision Optical Alignment System. Filed April 20, 1978, patented May 15, 1979. Not available NTIS.

Patent 4,154,631. Equilibrium Growth Technique for Preparing PbS sub x Se sub (1–x) Epilayers. Filed May 27, 1977. patented May 15, 1979. Not available NTIS.

Patent 4,154,658. Purification of 1,1-Dimethyl Hydrazine (UDMH) Containing Formaldehyde Dimethyl Hydrazone. Filed July 3, 1978, patented May 15, 1979. Not available NTIS.

Patent 4,155,065. Optic Scattering Acoustic Transducer. Filed Sept. 12, 1977, patented May 15, 1979. Not available NTIS.

Patent 4,158,684. Method of Making Ceramic Prosthetic Implant Suitable for a Knee Joint. Filed Dec. 13, 1976, patented June 19, 1979. Not available NTIS.

Errata

All reference to Patent No. 4,184,469 to Charles W. Haldeman, et al of Massachusetts for TRANSPARENT INTERNAL COMBUSTION ENGINE appearing in the Official Gazette of Jan. 22, 1980 should be deleted since no patent was granted.

All reference to Patent No. 4,185,312 to James Bjordahl of California for TRANSDUCER POSITIONING APPARATUS appearing in the Official Gazette of Jan. 22, 1980 should be deleted since no patent was granted.

All reference to Patent No. 4,186,231 to Mark R. Weitzman of Ohio for DECORATIVE ACOUSTICAL PANEL FOR CEILINGS AND WALLS appearing in the Official Gazette of Jan. 29, 1980 should be deleted since no patent was granted.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking: Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-22-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

OFFICIAL GAZETTE NOTICE

EXTENSION OF TIME FOR FILING NOTICES OF OPPOSITION
TO MARKS PUBLISHED IN THE
OFFICIAL GAZETTES DATED
FEBRUARY 5, 1980, FEBRUARY 12, 1980, and FEBRUARY 19, 1980

Because of printing difficulties, the Official Gazettes dated February 5, 1980, February 12, 1980, and February 19, 1980 will not be issued on those dates. In addition, the Official Gazette dated February 19, 1980 will be issued before the Official Gazette dated February 12, 1980.

The schedule for issue of these Official Gazettes is as follows:

Official Gazette Dated	Will Be Issued On or About
February 5, 1980	February 26, 1980
February 19, 1980	February 26, 1980
February 12, 1980	February 28, 1980

Because of the delays in mailing these Official Gazettes, additional time will be permitted for filing Notices of Opposition to marks published in these issues. The due dates for Notices of Opposition are as follows:

Date of Official Gazette	Final Date for Filing Timely Notice of Opposition
February 5, 1980	March 27, 1980
February 19, 1980	March 27, 1980
February 12, 1980	March 31, 1980

February 15, 1980
Date

Patricia W. Davis
Acting Assistant Commissioner
for Trademarks

REISSUES

FEBRUARY 26, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

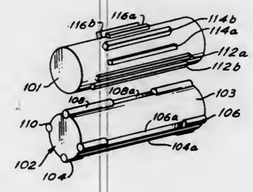
Re. 30,221
DOUGH SHEET SPREADER

Isabel L. Moreno, Oceanside, Calif., assignor to Edward F. Ruiz, San Dimas, Calif.

Original No. 3,748,079, dated Jul. 24, 1973, Ser. No. 66,734, Aug. 25, 1970. Application for reissue Nov. 17, 1977, Ser. No. 852,363

Int. Cl.[2] A21C *3/04*; B28B *21/52*

U.S. Cl. 425—190 **3 Claims**



3. An extrusion die for viscous material fed thereinto under pressure comprising: an adjustable cooperatng roller pair, the first roller of which contains a plurality of bars of differing dimensions on the outer periphery thereof, said bars each having an indentation in the mediate portion thereof, and the second roller of which contains a plurality of bars on the outer periphery thereof, said first and second roller bars being so dimensioned that at least one second roller bar fixedly and partially nests into the indentation of a corresponding first roller bar in sealing relationship to form a die through which viscous material under pressure may be extruded.

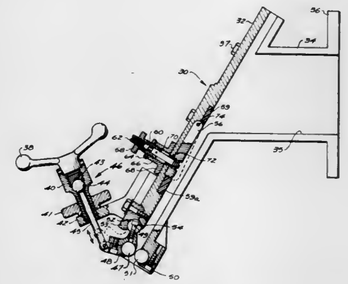
Re. 30,222
DOUGH SHEET SPREADER

Edward F. Ruiz, 959 W. Covina Blvd., San Dimas, Calif. 91773, and Isabel L. Moreno, Oceanside, Calif., assignors to Edward F. Ruiz, San Dimas, Calif.

Original No. 3,748,079, dated Jul. 24, 1973, Ser. No. 66,734, Aug. 25, 1970. Application for reissue Nov. 17, 1977, Ser. No. 852,364

Int. Cl.[2] A21C *3/04*

U.S. Cl. 425—190 **2 Claims**



1. A sheet spreader for viscous material comprising: an enclosed vessel having an inlet and an egress connected by an interior passageway for the movement of viscous materials therethrough, said passageway being so dimensioned as to diverge generally outwardly in a first plane and to converge generally inwardly in a plane normal to said first plane as the passageway progresses from said inlet toward said egress, said vessel egress comprising an extrusion die means, means for mounting said vessel so that the longitudinal axis of said passageway distends downwardly at about 60° from the horizontal, and in addition, means associated with said vessel for removing entrained gases from said viscous material being extruded prior to extrusion through said die means, said degassing means extending into said passageway between said inlet and said egress and comprising a plate extending in a biased, touching relationship to the material moving through said passageway and adapted to move in a direction substantially normal to the flow of material through the passageway in accordance with the variations in the material density, whereby variable movement of said plate against said material will drive out the gases entrained therein.

PLANT PATENTS

GRANTED FEBRUARY 26, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,505

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 27, 1978, Ser. No. 963,851
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Tempo and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark lavender pink ray floret color, with minimal color oxidation; diameter across face of capitulum ranging from 110 to 130 mm. at maturity; uniform eight week flowering response; tall plant height; and semi-spreading branching pattern.

4,506

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 27, 1978, Ser. No. 963,852
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Pot O'Gold and particularly characterized as to uniqueness by the combined characteristics of incurved capitulum form, reflexing at full maturity; decorative capitulum type; bronzy yellow ray floret color; diameter across face of capitulum ranging from 100 to 125 mm. at maturity; uniform 8 week flowering response; short plant height; and semi-upright branching pattern.

PATENTS

GRANTED FEB. 26, 1980

ERRATA

For CLASS	See PATENT NO.
433–225	4,189,834
433–214	4,189,835
433–127	4,189,836
433–057	4,189,837
433–167	4,189,838
433–004	4,189,839
128–742	4,190,033
139–435	4,190,067
126–419	4,190,199
410–037	4,190,262
408–188	4,190,388
422–063	4,190,420
430–066	4,190,445
430–214	4,190,447
430–539	4,190,449
435–172	4,190,495
435–007	4,190,496
264–046.4	4,190,572
548–236	4,190,584
585–361	4,190,610
585–361	4,190,611
585–378	4,190,612
525–215	4,190,613
525–106	4,190,614

PATENTS

GRANTED FEBRUARY 26, 1980

GENERAL AND MECHANICAL

4,189,787

HIGHLY STRETCHABLE GLOVE AND FORM FOR MAKING SAME

Benjamin Stansbury, Beverly Hills, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 31, 1977, Ser. No. 846,911
Int. Cl.[2] A41D *19/00*; A61B *19/04*
U.S. Cl. 2—163 **6 Claims**



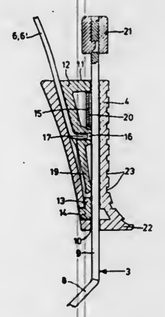
1. A highly stretchable glove with at least one finger having a front and a back, wherein the improvement comprises: a multidirection ovaled finger that has a fingertip area corresponding approximately to a midpoint of a wearer's fingernail ovaled in a side to side direction; and a knuckle area that is ovaled in a direction from a front to rear of the glove finger.

4,189,788

HEADSET

Walter Schenke, Postbauer, and Gerhard Krauss, Stein, both of Fed. Rep. of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Fuerth, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,187
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 7808135[U]
Int. Cl.[2] A42B *1/06*; H04M *1/05*
U.S. Cl. 2—209 **6 Claims**



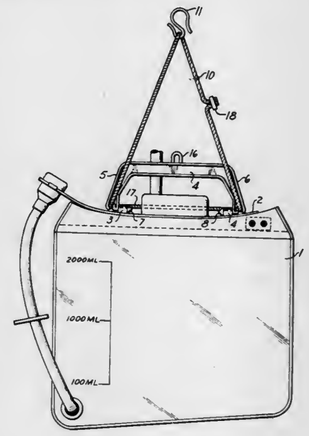
1. A headset comprising: a headband, a pair of ear pieces one at each end of said band, a pair of fork members each having one end secured to one of said ear pieces and a shank portion extending away from said one end, and means for coupling each of said fork member shank portions to one end of said headband, said last mentioned means comprising a support member having an upwardly tapering opening passing therethrough, said tapering opening terminating in a slot at the lower end of said support member and terminating in a wide mouth at the upper end of said support member, said fork member shank and portions of said headband extending into said opening, and a wedge member extending into said opening from said wide mouth between said shank and said headband portion and engaging and resiliently urging said shank and headband portions toward opposite surfaces of said support member defining said opening.

4,189,789

URINE COLLECTION CONTAINER WITH COUPLING FOR SUSPENSION LINE

Jack H. Hofstetter, Anaheim, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 25, 1978, Ser. No. 936,758
Int. Cl.[2] A47K *11/02*; B42F *13/04*
U.S. Cl. 4—144.1 **6 Claims**



1. A urine collection container, wherein the improvement comprises: a rigid handle with a grasping bar and two spaced apart depending legs which have lower end portions pivotally connected to the container; each leg having an opening adjacent to a lower end of the leg and a slot leading to this opening from an edge of the handle, and each slot being peripherally oriented relative to such opening and having a shape for non-threaded insertion of a suspension line adapted to suspend the container without pulling out of the handle opening.

4,189,790

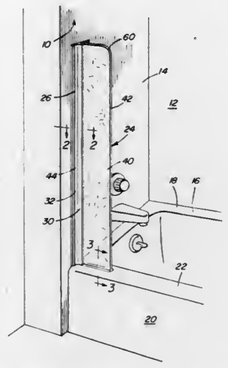
SHOWER SHIELD

Carson W. Masters, III, 52 E. Union Blvd., Bethlehem, Pa. 18018

Filed Oct. 6, 1978, Ser. No. 949,421
Int. Cl.[2] A47K *3/14*; *3/22*
U.S. Cl. 4—149 **1 Claim**

1. In combination with a tub-shower enclosure including an upright structural member defining one upright side of an entrance and exit opening for said enclosure and including a tub outer side wall extending horizontally away from said structural member and including an upper edge defining the lower extremity of said opening, an elongated upstanding panel structure including upstanding opposite longitudinal marginal portions, one of said marginal portions being transversely widened relative to the remainder of said panel structure and defining a generally planar edge surface extending along said one marginal portion and disposed generally normal to the plane of said panel structure, said surface being of a width appreciably greater than the width of the other longitudinal marginal portion of said panel structure and including a length of double sided adhesive stripping adhesively secured

thereover and generally centered relative thereto with the opposite side edges of said stripping spaced inwardly of the corresponding longitudinal marginal portions of said surface, the adhesive side of said stripping remote from said surface being adhered to said structural member with the lower end edge of said panel structure closely overlying and extending along said upper edge of said tub outer side wall, a pair of



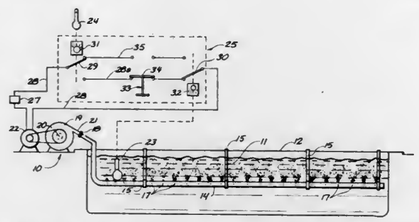
moisture sealing beads of sealant material extending between said marginal portions of said surface and the opposing surfaces of said structural members along both side edges of said adhesive stripping, and a second pair of moisture sealing beads of sealant material extending along opposite sides of the lower end edge of said panel structure and the adjacent opposing portions of said tub wall upper edge.

4,189,791

SWIMMING POOL HEATING AND COOLING SYSTEM

Gifford W. Dundas, Box 735, Lewiston, Id. 83501

Filed Jan. 5, 1979, Ser. No. 1,066
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172 **7 Claims**



1. Apparatus for heating or cooling water in a swimming pool, comprising:

a powered air pump having an air intake and a forced air discharge;

an air delivery manifold tube having an open end attached to the forced air discharge of said pump and adapted to be submerged within the pool;

a plurality of perforations formed through the tube for allowing escape of air;

air temperature sensing means for sensing ambient air temperature;

water temperature sensing means for sensing the water temperature within the pool;

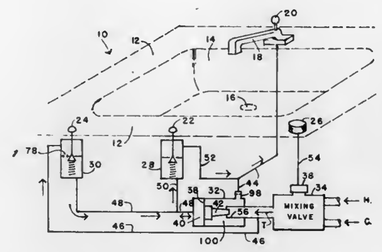
control means operatively connecting the air temperature sensing means and water temperature sensing means for activating the powered air pump when the temperature differential between the ambient air and water in the pool reaches a first prescribed value and for deactivating the powered air pump when the temperature differential between the air and water in the pool reaches a second prescribed value.

4,189,792

PUSH BUTTON CONTROLLED WATER SYSTEM

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed Sep. 18, 1978, Ser. No. 942,992
Int. Cl.[2] E03C *1/04*
U.S. Cl. 4—192 **10 Claims**



1. In a water supply system for a basin, such as a bathroom lavatory, kitchen sink, or the like, including a spout for delivering tempered water, consisting of a mixture of hot and cold water, to the spout for discharge into the basin, the improvements, comprising;

(a) a water source including water mixing apparatus communicating with supplies of hot and cold water adapted to mix same in selected proportions for delivery therefrom of water at a desired temperature,

(b) a supply valve communicating between the mixing apparatus and the spout having a movable wall forming a part of an expansible chamber and operatively connected to a metering valve for varying the rate of flow of the delivered water, dependent upon the volume of water in said chamber,

(c) a first normally closed control valve communicating with the chamber adapted to be opened by a manual controls to decrease its volume and permit the metering valve to move toward open position, and

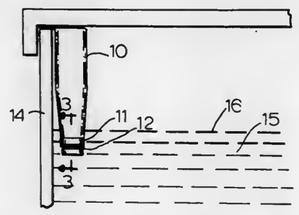
(d) a second normally closed control valve communicating between the source and the chamber adapted to be opened by another manual controls to increase its volume and move the metering valve toward closed position.

4,189,793

AUTOMATIC LIQUID DISPENSER FOR AN INVERTED BOTTLE

Clifton L. Williamson; Harvey L. Hocker, both of Fort Bragg, and John M. Alcamo, Modesto, all of Calif., assignors to Northwest Sanitation Products, Inc., Fort Bragg, Calif.

Continuation-in-part of Ser. No. 631,385, Nov. 12, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,921
Int. Cl.[2] E03D *9/02*
U.S. Cl. 4—228 **20 Claims**



1. A liquid dispenser for use in dispensing liquid from an inverted bottle having a neck into a tank at times when water in the tank drops below a normal, buoying level, including in combination:

a hollow annular stationary member having a neck-engaging portion joined by an annular radially inwardly-extending diaphragm to an inner tubular seat portion having at its ends an upper seat edge and a lower seat edge, and

a movable member comprising a piston that is slidable in said tubular seat portion and otherwise widely spaced from said stationary member, said movable member having an upper portion and a lower portion spaced apart by a charge-measuring portion and having adjacent its upper end first seating means for engaging the tubular seat portion and said upper seat edge to prevent flow therebetween, said charge-measuring portion, when said movable member is in a lower position with said upper edge engaged, then discharging its charge below said lower seat edge, said movable member having adjacent its lower end second seating means for engaging the tubular seat portion and said lower seat edge, said charge-measuring portion when said movable member is in an upper position with lower seat edge engaged, then receiving its charge, being open above said upper seat edge,

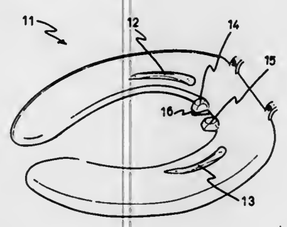
said lower portion of said movable member including a buoying portion having a first vertical wall, an outwardly extending bottom wall at the lower end, of the first vertical wall and an upwardly extending vertical wall extending up from said bottom wall to provide an annular chamber having a small drain opening through said bottom wall, said buoying portion serving to buoy said movable member up to said upper position when the water in said tank rises to a normal storage level, said charge-measuring portion then being filled by liquid from said bottle, and serving by its weight and that of slowly draining water in said annular chamber to carry said movable member down to said lower position when the water level drops, and then to discharge the liquid contents of said measuring portion, which flow down said first wall from said measuring portion.

4,189,794

TOILET SEAT

Pedro Alemán-Muciño, Lluvia No. 317, Mexico City 20, Mexico

Filed Jun. 15, 1978, Ser. No. 915,835
Claims priority, application Mexico, Jun. 23, 1977, 169584
Int. Cl.[2] A47K *13/00*
U.S. Cl. 4—237 **3 Claims**



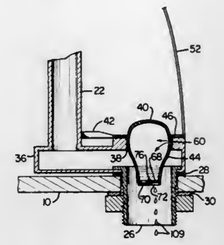
1. A toilet seat comprising a body having spaced side portions and at least a rear portion together defining an opening, a first pair of spaced posterior protuberances each have a longidutinal section which has substantially the shape of half avoid and projecting inwardly into said opening from said rear portion and a second pair of lateral protuberances upstanding one on the uppermost surface of each said side portion, posterior protuberances being spaced apart and located to engage one between the coccyx and the upper and outer portions of the great right sacrosciatic ligament and the other between the coccyx and the upper and outer portions of the great left sacrosciatic ligament of a person seated on said seat.

4,189,795

TOILET FLUSH VALVE

Angelo J. Conti, 411 Lakewood Cir., Apt. B-915, and Ira Pile, 411 Lakewood Cir., both of Colorado Springs, Colo. 80910

Filed Sep. 20, 1978, Ser. No. 943,880
Int. Cl.[2] E03D *1/14*
U.S. Cl. 4—324 **13 Claims**



8. In flush valve apparatus for toilets for controlling water flow from the toilet flush tank to the toilet bowl, which apparatus includes a drain opening in the bottom of the flush tank and a hollow ball valve with a substantially enclosed chamber therein and an opening in the bottom portion thereof to the exterior of the ball valve, wherein said hollow ball valve is movably positioned over the drain opening in the toilet flush tank for selectively opening the drain and closing the drain to the flow of water out of the flush tank, and wherein said ball valve is buoyant in water in the flush tank when said chamber is substantially filled with air and displaced upwardly from said drain opening, including a sealing surface near the upper extremity of the ball valve adapted for seating in the drain pipe of the flush tank when it is in closed position, the improvement comprising:

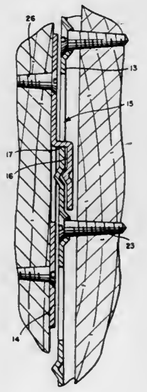
an air bleed hole extending through the upper portion of the ball valve near its upper extremity from the chamber to the exterior of the ball valve and under said sealing surface, and flow rate adjustment means on said air bleed hole for selectively adjusting the flow rate of air out of said ball valve.

4,189,796

ADJUSTABLE MECHANISM FOR GUARD RAIL OF A BUNK BED

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

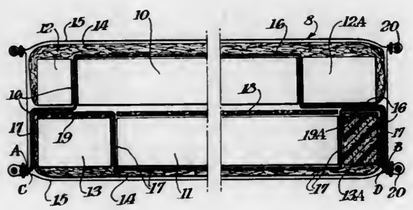
Filed Jul. 24, 1978, Ser. No. 927,487
Int. Cl.[2] A47C *17/40, 21/00*
U.S. Cl. 5—8 **6 Claims**



1. In a bunk bed having vertically-extending end post members and a horizontal guard rail member releasably connected

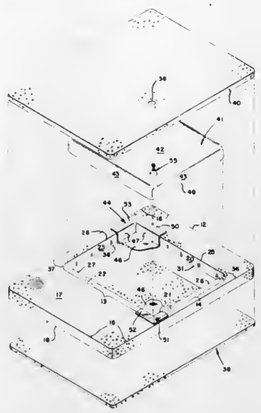
to said post members, a pair of horizontally spaced apart releasable locks connecting said guard rail member to said post members, each lock comprising a female part on one of said members and a male part on the other, said male part comprising a relatively elongated, generally planar plate having a plurality of longitudinally aligned, spaced notches therein each defining tongue-engaging edges whereby said tongue is positionable at a plurality of locations on said female part to adjust the relationship of said members, said female part being equipped with means for mounting said female part on one of said members to space said tongue engaging edges from said one member to accommodate introduction of said tongue between said one member and one of said tongue engaging edges.

4,189,797
MATTRESS
Steven Glackin, 309 E. Main St., Wilmington, Del. 19804
Filed Apr. 24, 1978, Ser. No. 899,090
Int. Cl.[2] A47C *27/22, 27/14, 27/12*
U.S. Cl. 5—448 **1 Claim**



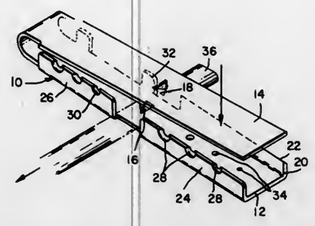
1. A mattress comprising
(a) a top resilient member,
(b) a bottom resilient member, each member containing two vertical slits through the member, which slits are positioned parallel with the ends of the member and which extend in length from between about ⅛ to ⅞ of the width of the members,
(c) a semirigid member between said top and bottom member containing two slits which substantially coincide with the slits in said bottom member,
(d) a nonwoven fabric laced through the slits of the bottom member and the semirigid member, said fabric extending from the bottom edge of one end of the bottom member upwardly over the top edge of the same end, then extending between said top and bottom member to downward through the first coinciding slits in the bottom member and the semirigid member, then upward through the other coinciding slits and finally, downward from the top edge of the other end of the member to the bottom edge of the same end,
(e) a second nonwoven fabric partially overlaying the first nonwoven fabric and extending from the bottom edge of one end of the bottom member upwardly over the top edge, then between said top and bottom members to and upward through the first slit in the top member, then extending downward through the second slit and between the top and bottom layers to the top edge of the other end of the bottom member and then down to the bottom edge of said other end,
(f) the first and second nonwoven fabrics being affixed to each other along their ends which terminate along the bottom edges of each end of the bottom member,
(g) felt made of cotton surrounding the outside of the resilient members, and
(h) a flexible, strong cover surrounding the entire assembly.

4,189,798
FOAM MATTRESS WITH FLOATATION TORSO SUPPORT
Donald C. Vessey, 7331 Kolb Pl., Dublin, Calif. 94566
Filed Apr. 20, 1978, Ser. No. 898,115
Int. Cl.[2] A47C *27/08, 27/14*
U.S. Cl. 5—451 **11 Claims**



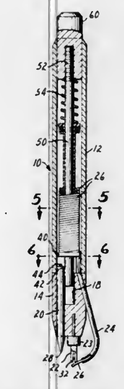
1. A laminated mattress assembly having an area and perimeter dimensioned for use as a sleeping bag comprising:
a. a first foam material member having an area and outer perimeter substantially registering with said area and perimeter of said mattress assembly, having generally uniform thickness, formed with upper and lower planar surfaces, and formed with an opening therethrough defined by inner perimeter walls dimensioned and located within said mattress assembly area to underlie the torso only of a person and leaving a substantial structural supporting border area between said inner perimeter walls and all points of said outer perimeter including a head carrying portion and a leg carrying portion;
b. a bottom sheet member dimensioned for coextensive registration with said first foam member and secured by bonding against relative lateral displacement substantially over said entire lower surface area and specifically adjacent said inner perimeter of said lower surface of said first foam member;
c. a second high resiliency foam material member dimensioned for substantially coextensive registration with said first foam member and secured by bonding against relative lateral displacement over substantially said entire upper surface area and specifically adjacent said inner perimeter of said upper surface of said first foam member;
d. a flexible, substantially inelastic liquid container for receipt and containment within said inner perimeter walls of said first foam member supported by a portion of, said bottom sheet member and underlaying a portion of said second foam member, and dimensioned so that when filled with liquid it occupies substantially the entire opening in said first foam member;
e. valve means connected to said liquid container for filling or emptying said container;
f. a passage formed in said second foam mattress connecting the outer surface of said mattress assembly and said chamber for filling said liquid container; and
g. said bottom sheet member and said second foam member have substantial resistance to elongation in all lateral directions so that when a weighted body rests on said mattress assembly said bottom sheet member and said second foam member are tensioned and resist lateral displacement of said inner perimeter walls.

4,189,799
CABLE STRIPPING TOOL
Melvin P. Litehizer, Jr., Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 5, 1978, Ser. No. 912,710
Int. Cl.[2] B25F *1/00*; H02G *1/12*
U.S. Cl. 7—107 **6 Claims**



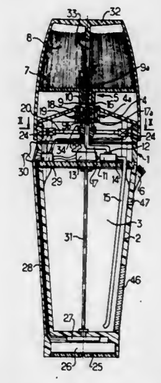
1. A tool for preparing ends of housewiring cable for termination, said tool comprising:
a unitary, elongated metal member folded upon itself to form a lower cutter portion and an upper backup portion;
a series of gauging apertures formed in one of said lower or upper portions;
a cutting blade formed in each said portion extending inwardly towards the opposite portion, said blades being transverse to the elongated dimension of said tool and being offset from each other sufficiently to be out of engagement;
a first abutment upwardly turned along one marginal edge of said lower cutter portion, said abutment having a sharpened free edge; and
at least one stripper portion upwardly turned along an opposite marginal edge of said lower cutter portion, said at least one stripper portion having at least one arcuate cutting surface in a free edge thereof, whereby insulation jacketing of said cable is slit by said blades and cut off by said abutment and insulation on individual conductors of said cable is stripped by said stripper.

4,189,800
SELF-CONTAINED BREADBOARD WIRING TOOL
Terry E. Roswell, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 6, 1978, Ser. No. 958,269
Int. Cl.[2] B25B *25/00*; H01R *43/00*
U.S. Cl. 7—107 **1 Claim**



1. Breadboard wiring tool comprising:
(1) a shaft having a longitudinal axis and threaded at one end;
(2) cutting means at the end of said shaft distal to said threaded end and displaced laterally from the axis thereof;
(3) an elongated supply spool of insulated wire on said shaft;
(4) cylindrical retaining means screwed to the threaded end of said shaft;
(5) spring means urging said supply spool away from said retaining means;
(6) a hollow head movably penetrated by said shaft and with retaining means for holding said cutting means in and protruding from said head and stop means for preventing entrance of said spool on said shaft into said head;
(7) a tip with shallow and deeper slots therein on said head offset from the center thereof and with said shallow slot radially aligned on said head;
(8) guide means conducting insulated wire from said supply spool toward said shallow slot; and
(9) cylindrical casing enclosing said shaft and supply spool secured to said head and extending over at least a portion but not all of said cylindrical retaining means.

4,189,801
FLUID PRODUCT PROJECTION APPARATUS FOR MAINTENANCE AND TREATMENT OF ALL SURFACES AS WELL AS THE BODY
Marie M. Lanusse, Embassy Ter. (Apt. 208), 3440, rue Durocher, Montreal H2X 2E2, Canada
Filed Feb. 28, 1979, Ser. No. 16,338
Int. Cl.[2] A46B *13/04*
U.S. Cl. 15—29 **8 Claims**



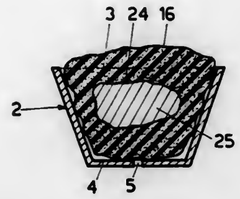
1. In an apparatus for projecting a fluid product for the maintenance or care and the treatment of all surfaces, including the skin of the human body, comprising: a casing with a container portion for the fluid product; a working head comprising a brush movable in rotation on the said casing; means for projecting the fluid product into the said working head, the said projecting means being constituted by a hollow shaft jointly rotatable with the working head and opening into the latter, the said hollow shaft being connected to the outlet of a pump whose inlet is connected to a suction tube dipping into the said container, the improvements consisting in that in the said casing is mounted a flux-conductive oscillating plate or the like jointly rotatable with the hollow shaft and the end faces of which extend each in confronting relationship to an electromagnet secured to the internal surface of the said casing, the said electro-magnets being connected to means for alternately energizing the same so as to impart to the said working head an alternating rotary motion.

4,189,802

BATH SPONGE HAVING INCORPORATED THEREIN A CORE OF DETERGENT SUBSTANCES, AND METHOD AND APPARATUS FOR MANUFACTURING SAME

Simon G. Lansbergen, D. Liekensland 42, Keerbergen, Belgium

Filed Jul. 26, 1978, Ser. No. 927,968
Claims priority, application Italy, Aug. 3, 1977, 21969/77[U]
Int. Cl.² C11D *17/04;* **B29C** *24/00;* **B32B** *5/18*
U.S. Cl. 15—104.93 **11 Claims**



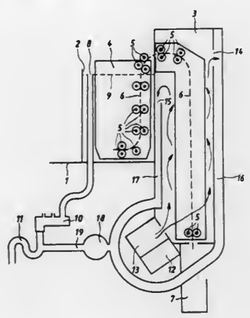
1. A bath sponge provided with an internal cavity cut therein, at least one detergent substance in solid state filling said cavity, the material of said sponge surrounding said cavity being uninterrupted, and said detergent substance which when introduced into said cavity is in fluid state, being slightly diffused into the superficial porous layer of said sponge defining said cavity.

4,189,803

WET-PROCESSING APPARATUS FOR PHOTOGRAPHIC EMULSION CARRIERS WITH NOVEL DISPOSAL OF DRIER-UNIT EXHAUST AIR

Helmut Schausberger, Unterhaching; Erwin Geyken, Neubiberg, and Peter Dawidowitsch, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,537
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735085
Int. Cl.² G03D *3/13*
U.S. Cl. 15—302 **7 Claims**



1. An improved apparatus for the wet-processing of photographic emulsion-carrying material, the apparatus being of the type comprising

a washing unit at which photographic emulsion-carrying material is washed with wash water, the washing unit including a wash-water tank containing a body of wash water and an outflow conduit system communicating with the wash-water tank for continual withdrawal of spent wash water from the wash-water tank, the wash water in the wash-water tank being wash water at a first location and the wash water in the outflow conduit system being wash water at a second location,

and a drier unit in which photographic emulsion-carrying material is dried, the drier unit including means for contacting photographic emulsion-carrying material with heated drying air and for exhausting used drying air from the drier unit,

the improvement comprising:

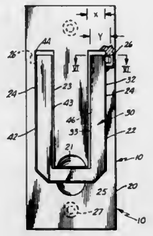
exhaust-air transmitting means receiving the exhausted drying air from the drier unit and transmitting the exhausted drying air into at least one of said locations.

4,189,804

BACK PLATE AND BAIL ASSEMBLY

Dale L. Flowerday, Holland, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Mar. 24, 1978, Ser. No. 889,737
Int. Cl.² A47B *95/02*
U.S. Cl. 16—126 **25 Claims**



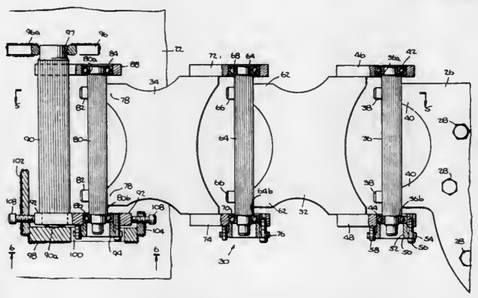
1. A bail and back assembly for furniture pulls on a furniture component and the like including a bail and a single back member, said bail being generally U-shaped and having a pair of legs, a first of said legs having a relief or a cutaway portion which in a first position of said bail will permit flexing of said first leg for removal of said first leg from said back member; and said relief or cutaway portion being orientable with respect to said back member to a second position wherein separation of said bail and back assembly and flexing of said first leg is resisted when a pulling force is applied to said bail for pulling on the furniture component.

4,189,805

ADJUSTABLE HINGE INSTALLATION

Harold A. Backus, Wynnewood, Pa., assignor to NL Industries, Inc., Hightstown, N.J.

Filed Aug. 23, 1978, Ser. No. 935,914
Int. Cl.² E05D *7/04*
U.S. Cl. 16—130 **24 Claims**



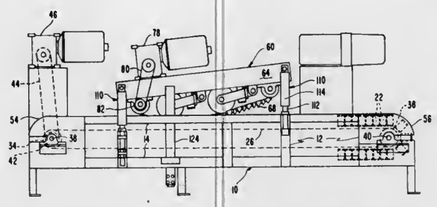
1. A hinge assembly for supporting a door on a door support, said hinge assembly comprising an elongated pivot rod attached to said door, upper and lower rotatable bearings connected to said pivot rod near its upper and lower ends, an elongated alignment bar extending close to and substantially parallel with said pivot rod and arranged to mount said upper and lower bearings, an upper support plate supported by and extending out from said door support, a rocking pivot interconnecting said upper support plate and said alignment bar, a horizontally extending lower support plate extending out from said door support, the lower end of said alignment bar resting slideably on and supported by said lower support plate and a lateral adjustment mechanism mounted on said lower support plate and adjustable to shift the lower end of said alignment bar horizontally on said lower support plate.

4,189,806

REMOVING BACK FAT FROM LOIN

Woeldrik P. Van Heyningen, Edmonton, Canada, assignor to Swift Canadian Co., Limited, Etobicoke, Canada

Filed Feb. 9, 1978, Ser. No. 876,343
Claims priority, application Canada, Feb. 15, 1977, 271794
Int. Cl.² A22B *5/16;* **A22C** *17/12*
U.S. Cl. 17—52 **8 Claims**



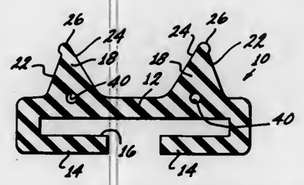
1. An improved method for removing back fat from loins, said method comprising: first separating loin portions with excess fat from both carcass halves; placing each said loin portion centrally and in an evenly balanced manner on an arcuate conveying surface with the fat side against said surface; engaging the fat with penetrating members centrally of said surface; moving each loin portion in a given direction at a given speed toward a relatively fixed symmetrically arcuate knife blade, said blade being positioned in the path of said loin portion and adjustable toward and away from said conveying surface so as to separate a fat layer of a desired constant thickness from said loin portion; and positively gripping the upper surface of said loin portion along two courses prior to reaching said knife blade and propelling same in said given direction and at said given speed; and continuing to grip and propel said upper surface of said loin portion across said knife blade to a point in said direction therebeyond.

4,189,807

CLAMP

Robert M. Byerly, Burbank, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Continuation of Ser. No. 741,938, Nov. 15, 1976, abandoned.
This application Mar. 20, 1978, Ser. No. 888,313
Int. Cl.² B65D *65/10;* **F16L** *3/12*
U.S. Cl. 24—16 R **3 Claims**



1. A cushion for clamping cables of different cross-sectional area, including,

a body portion defined by a pair of opposite ends,

a pair of projections extending from one side of the body portion in spaced relationship to each other and provided with a solid construction, the projections being disposed in inwardly spaced relationship from the ends of the body portion to provide for a support by the ends of the body portion and a controlled bending of the projections when the cable is clamped between the projections, the projections being made from a resilient material to act as resilient springs in response to the force exerted by the cable and shaped to bend only in directions away from each other in accordance with the cross-sectional area of the cables exerting forces on the projections,

a pair of lips extending from the body portion and toward each other in spaced relationship to the body portion,

the projections being disposed on the body portion and being shaped to control the bending of the projections by the cables disposed in the space between the projections and no ridges being disposed on the body portion between the projections,

each of the projections being provided with outboard and inboard sides in substantially a pyramidal shape and extending at a shallower angle from the body portion at the inboard side of the projections than at the outboard side of the projections, and

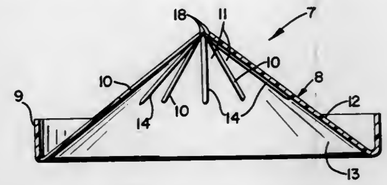
a bore having relatively small dimensions provided near the base of the pyramid defined by each projection to facilitate the controlled outward bending of each projection and the damping of vibrations by the cables.

4,189,808

RETAINER AND CLOSURE FOR A GARBAGE CAN LINER BAG

Theodore G. Brown, 5005 Stockton Blvd., Sacramento, Calif. 95820

Filed Sep. 20, 1978, Ser. No. 944,144
Int. Cl.² B65D *77/10*
U.S. Cl. 24—30.5 R **4 Claims**



1. A retainer and closure for a garbage can liner bag consisting of a body member formed of a thin elastic material having a plurality of slots which intersect with one another intermediate of their ends to form resilient prongs, said prongs tapering in width toward the point of intersection of said slots to define adjacently disposed pointed ends, said prongs being adapted to be spread by the insertion of a part of the mouth of a can liner bag through the body from one side thereof for restricting the bag mouth to retain it around the exterior of the open top of a garbage or trash can in which the remainder of the bag is disposed, the remainder of the bag mouth being adapted to be drawn through the body member in the same direction, after the bag is substantially filled and the bag mouth has been detached from the can, for completely closing the bag ready for disposal with said retainer or closure supported solely by the bag, said body member being conical, and including an upturned rim surrounding the enlarged part only of the cone and forming a finger-hold.

4,189,809

FASTENER DEVICE AND METHOD OF MANUFACTURING

Juan N. Sotos, Barcelona, Spain, assignor to Repla International S.A.H., Luxembourg, Luxembourg

Filed Nov. 10, 1977, Ser. No. 850,357
Claims priority, application Spain, Nov. 10, 1976, 453.167
Int. Cl.[2] A44B *17/00*; B29F *3/00*; B29C *17/02, 17/14*
U.S. Cl. 24—204 **7 Claims**



1. Fastener means comprising, a strip having on a first one of its faces a plurality of longitudinally aligned and spaced apart upstanding fastener segments, said strip including a plurality of flat longitudinal zones disposed on both sides of said aligned fastener segments, said segments including a base comprising two legs whose ends are integral at their edges relative to two contiguous ones of said flat zones, said strip having spaced openings extending therethrough intermediate said spaced apart fastener segments, said fastener segments including an enlarged top of greater size than the lateral extent of said openings between the flat zones and being longitudinally spaced from each other a distance at least equal to their longitudinal dimension, so as to define said openings by two successive fastener segments and two contiguous uncut flat zones with said openings adapted to receive identical said fastener segments from the other of its faces.

4. A method of manufacturing a fastener device comprising: extruding thermoplastic material to provide a strip having a plurality of longitudinally extending rows of ribs projecting from one face of said strip, forming said strip with a plurality of flat longitudinal zones connected to said rows of longitudinal ribs by two legs forming between them a longitudinal channel, the ends of said legs being integral at their edges with two contiguous flat zones, said longitudinal ribs provided with an enlarged top of a size greater than the space between adjacent ones of said flat zones, cutting said ribs transversely throughout their height down to the top surface of said flat longitudinal zones without cutting said flat zones to form a plurality of rib segments, stretching said strip to permanently elongate it and increase the longitudinal dimension between said rib segments and said stretching step forming elongated openings through said strip each defined by two contiguous uncut flat zones and by two successive rib segments with the longitudinal dimension of said openings being at least equal to the length of the rib segments.

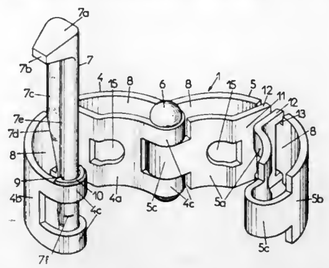
4,189,810

ASSEMBLY ELEMENTS, INTER ALIA FOR SCAFFOLDING

Bernard Beziat, Coye-La-Foret, France, assignor to Societe Nouvelle des Echafaudages Tubulaires Mills, Le Bourget, France

Filed Jun. 1, 1978, Ser. No. 911,455
Claims priority, application France, Jun. 23, 1977, 77 19272
Int. Cl.[2] A44B *24/00*
U.S. Cl. 24—249 R **10 Claims**

1. An assembly element for scaffolding or the like, used for clamping a cylindrical element after said clamping element is engaged axially or laterally on the cylindrical element for securing one or more transverse elements on to the cylindrical, said assembly element comprising two half-rings interconnected by two pins to define a complete ring, each said half-ring having a resiliently deformable inner part adapted to bear against the surface of the cylindrical element and to deform as said inner part bears against that surface, thereby to securely engage that surface and each said half-ring having an outer part adapted to co-operate with said inner part to bound spaces for receiving other elements, at least one of said two pins being



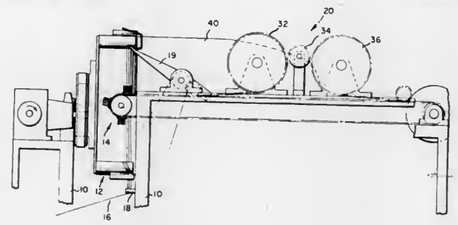
so shaped as to be adapted to tighten said two half-rings when said one pin is moved with respect thereto.

4,189,811

METHOD FOR PRODUCING NON-WOVEN WEBS OF CROSS-LAID STRANDS

Paul M. Cole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1978, Ser. No. 891,400
Int. Cl.[2] D04H *3/04*
U.S. Cl. 28—100 **6 Claims**



1. A method for converting a plurality of equally spaced strands cross-laid between spaced pairs of outer and inner rows of juxtaposed strand-restraining elements in an angled pattern to form a web having a predetermined width along the selvedge of the web into an orthogonal pattern, said method comprising: moving the pairs of rows at the same lineal speed; moving the outer row of each pair of rows out of the plane of travel of the inner row then back into the plane of travel of the inner row a lag distance approximately equal to said predetermined width, thereby displacing formerly juxtaposed strand-restraining elements relative to each other and permitting a portion of said strands to pass along said selvedge by sliding around displaced strand-restraining elements.

4,189,812

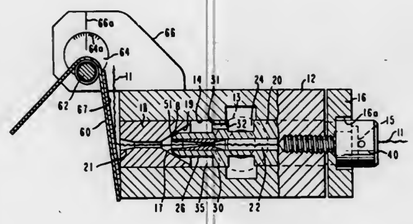
JET FOR FLUID TEXTURING YARN

Brian M. Agers, Wilmington, Del., and Maurice C. Todd, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 885,172, Mar. 10, 1978, abandoned, which is a division of Ser. No. 731,982, Oct. 13, 1976, Pat. No. 4,096,612. This application Feb. 16, 1979, Ser. No. 13,192
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—272 **2 Claims**

1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a nozzle block having a conical entrance located in said bore at said outlet end, and a yarn guiding element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through a flat exit end of said element to the conical entrance of the nozzle block, said element being provided with means for movement toward the conical entrance of the nozzle block for stringup and away from the nozzle block for normal fluid texturing operation, there being a space between said flat exit end of said element and said conical entrance for throttling the flow of pressurized fluid that flows into said space and out through the nozzle block to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage for stringup, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a venturi positioned in said passage, said venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded at an included angle of from about 6 to about 8 degrees from said constriction through the flat exit end of said element, the ratio of the maximum cross sectional area of said flared outlet to the cross sectional area of said constriction being in the range of from about 3 to about 9.

2. In a yarn texturing jet including a body having yarn inlet and oulet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a first venturi located in said bore at said outlet end, and a yarn guiding element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of a body past the gas inlet through the flat exit end of said element to the conical entrance of the first venturi, said element being provided with means for movement toward the first venturi for stringup and away from the first venturi for normal fluid texturing operation, there being a space between said flat exit end of said element and said first venturi for throttling the flow of pressurized fluid that flows into said space and out through the first venturi to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a second venturi positioned in said passage, said second venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded from said constriction through the flat exit end of said element, the ratio of the maximum cross sectional area of said flared outlet to cross sectional area of said constriction being in the range of from about 3 to about 9.

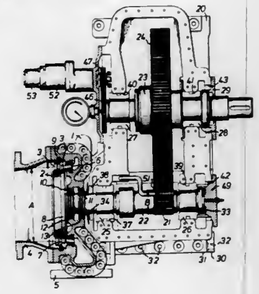


4,189,813

METHOD FOR MANUFACTURING SINGLE STAGE GEARED TURBINES

Gerd Ostermann, Nüremberg; Erwin Stiegler, Feucht; Erich Schliermann, and Peter Hirsch, both of Nüremberg, all of Fed. Rep. of Germany, assignors to AEG-Kanis Turbinenfabrik GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 804,016
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625903
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—156.8 R **13 Claims**



1. In a method for assembling a single stage geared turbine composed of a turbine casing, an assembly within the casing including a set of steam delivery nozzles and a rotor wheel provided with buckets and defining an impulse turbine stage of the Curtis type, a gear casing in which the turbine casing is overhung mounted, a gear rotatably mounted in the gear casing, and a pinion mounted for rotation with the turbine stage and drivingly engaging the gear, for operation at a selected power and gear rotation rate, the improvement wherein said turbine is formed by selecting said rotor wheel from a small number of rotor wheels having respectively different wheel pitch diameters and corresponding maximum rated powers differing by about 2000 HP between successive diameters and each having a rated speed inversely proportional to its associated pitch diameter and optimally corresponding to the maximum rated power relative to its high velocity ratio, a uniform blading being associated with each wheel of a given pitch diameter and, except for the bucket blade profiles in the border regions at the beginning and end of the corresponding output power range, all rotor wheels having the same blade profile configuration in their first row of buckets, and said rotor wheels having associated rated speed values such that all rotor wheels have substantially the same optimum velocity ratio, the selected rotor wheel having a maximum rated power corresponding to the selected power at which said turbine operates; selecting said set of steam delivery nozzles from a plurality of steam delivery nozzle sets for the selected rotor wheel, each nozzle being dimensioned with variable opening ratio $(F_{min}/txh)_{nozzle}$ in order to adapt it in each case to the at least minimum required reaction depending on the parameters and the throughput of steam, the selected nozzle set having an opening ratio providing the minimum required reaction; assembling the selected rotor wheel with the selected nozzle set to form a selected turbine stage assembly; selecting a turbine casing from a plurality of turbine casings each dimensioned to correspond to a respective wheel pitch diameter, the selected turbine casing corresponding to the diameter of the selected rotor wheel; mounting the selected turbine stage assembly in the selected turbine casing; selecting a gear casing from a plurality of gear casings each dimensioned to correspond to a respectively different value for the spacing between the axes of a pinion and a gear; selecting a pinion from a plurality of pinions having respectively different diameters staggered according to a standard series, the gear casing dimensions differing between gear casings in steps approximately equal in num-

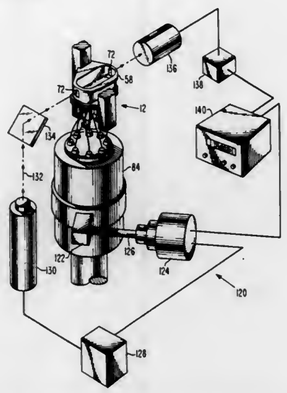
ber to the number of different pinion diameters so that all possible pinion/gear casing combinations yield a number of gear output speeds extending over the entire range of desired gear rotation rates and the entire desired rated power range, the pinions of larger diameter being provided for the rotor wheels having the higher rated powers, the pinions of smaller diameter being provided for the rotor wheels having the lower rated powers, and a respective group of pinions being provided for each rotor wheel having a rated power in the medium range; selecting that one of the pinions which is provided for the selected rotor wheel and which corresponds to the selected power and the rated power/speed ratio of the selected turbine stage assembly; selecting a gear dimensioned in accordance with the selected pinion and selected rotor wheel rated speed to produce the selected gear rotation rate; the selected gear casing being dimensioned to correspond to the spacing between the axes of the selected pinion and gear; and mounting the selected pinion and gear in the selected casing in power transmitting engagement with one another and connecting the selected pinion to rotate with the selected turbine stage assembly.

4,189,814

APPARATUS AND METHOD FOR AUTOMATICALLY ALIGNING A MULTIBEAM ELECTRON GUN ASSEMBLY WITH A CATHODE-RAY TUBE BULB

James G. Ottos, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,497
Int. Cl.² H01J *9/18*
U.S. Cl. 29—25.16 **10 Claims**



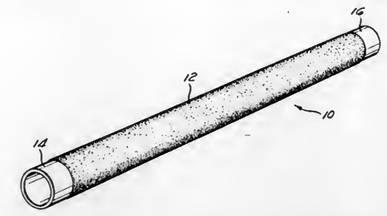
1. A method of aligning a multibeam cathode-ray tube electron gun assembly with at least a portion of a cathode-ray tube bulb, wherein an element of said gun assembly has two accurately positioned alignment apertures therein, a line connecting the centers of the alignment apertures being transverse to the central longitudinal axis of said gun assembly, said method including:
- positioning said tube bulb in known orientation relative to a light source with said gun assembly being located adjacent to said tube bulb having its central longitudinal axis substantially aligned with the central longitudinal axis of said bulb,
- directing light rays toward the alignment apertures from said light source,
- rotating said electron gun assembly about its central longitudinal axis,
- pulsing said light rays in predetermined relationship with the speed of rotation of said electron gun assembly, and
- counting a number of light pulses passing through the alignment apertures.

4,189,815

DEVELOPER TRANSPORT ROLL

Terry G. Seelenbinder, Elk Grove Village, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jan. 15, 1979, Ser. No. 3,201
Int. Cl.² B21B *27/02, 31/08;* B60B *15/00*
U.S. Cl. 29—121.8 **5 Claims**



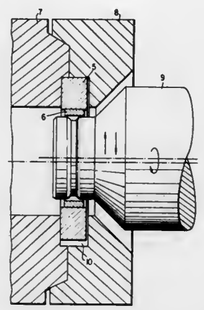
1. A developer feed roll for diazo photocopying machines comprising a roll having a surface of aluminum in which the RMS value of the roughness of the major portion of its surface is between 150 and 350 microinches and in which the thus roughened surface has been subjected to a hard coat anodizing treatment to provide an anodized layer of at least 0.0015 inches in thickness.

4,189,816

COMPOSITE BEARING RACE AND METHOD FOR ITS FABRICATION

M. Roger Chalansonnet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Oct. 17, 1977, Ser. No. 842,803
Claims priority, application France, Oct. 26, 1976, 76 32199
Int. Cl.² B21K *1/04*
U.S. Cl. 29—148.4 C **8 Claims**



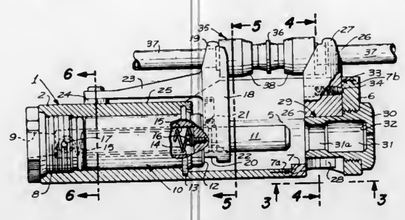
1. A method of manufacturing a composite bearing race including an inner and outer ring comprising:
- concentrically positioning said inner and outer ring in holder;
- deformably assembling said inner and outer ring member by rolling a first at least one ball groove in said inner ring member and deforming said outer ring member such that a second at least one ball groove is radially embedded in said outer ring member; and,
- heat treating said deformably assembled inner and outer ring members such that one of said inner member increases more in volume than said outer ring member to provide radial and annular cohesion therebetween wherein said inner ring member comprises 52100 steel in accordance with SAE specification J404 and comprises in weight percent C 0.95 to 1.10—Cr 1.50 to 1.60—Ni≦0.30—Mn 0.25 to 0.40—Si 0.10 to 0.35—P+S≦0.025—remainder: Fe and wherein said outer ring member comprises a low alloyed steel or a plain carbon steel for which the major selective factor is that carbon content thereof is less than 0.40 in weight percent.

4,189,817

HYDRAULIC ASSEMBLY TOOL FOR TUBE FITTINGS

Kurt O. Moebius, 30544 Oceanaire Dr., Rancho Palos Verdes, Calif. 90274

Filed Mar. 3, 1978, Ser. No. 883,226
Int. Cl.² B23P *19/04*
U.S. Cl. 29—237 **9 Claims**



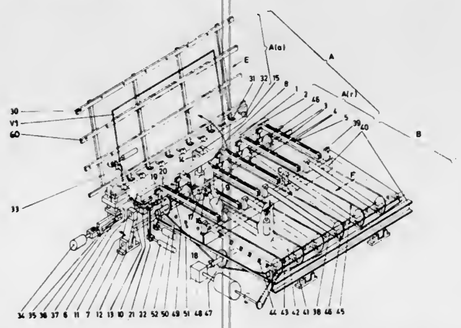
1. A hydraulic tool comprising:
- a. a body structure, including a hydraulic cylinder, a housing portion extending axially therefrom, and an end wall terminating the housing portion;
- b. a piston received in the cylinder;
- c. a shaft extending axially from the piston into the housing portion;
- d. a first carrier unit extending radially with respect to the shaft; and restrained in the end wall against angular movement;
- e. second carrier unit axially movable with the shaft to and from the first carrier unit;
- f. second carrier unit angular movement resisting means including an arm extending in parallel offset relation with the shaft from the second carrier unit over the hydraulic cylinder for sliding engagement therewith; and
- g. cooperating tool elements at the radial extremities of the carrier units defining a common axis parallel to the axis of the shaft.

4,189,818

APPARATUS AND METHOD FOR THE ASSEMBLY OF GLASS SHEETS

Yves Lavoisey, Asnieres, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 10, 1977, Ser. No. 850,355
Claims priority, application France, Nov. 15, 1976, 76 34284
Int. Cl.² B25B *27/14*
U.S. Cl. 29—281.5 **11 Claims**



1. Apparatus for moving plate shaped objects such as glass sheets into juxtaposition comprising a support for each of the plate shaped objects, at least one of said supports being pivotally mounted for fold back movement around at least two axes located near the glass sheet which it supports, each said axis being simultaneously parallel to the other and to the planes of the two supports, and said axes being unequally spaced from the support undergoing fold back movement.

4,189,819

METHOD OF MANUFACTURING METALLIC SPIRALLY WOUND GASKETS

Terence P. Nicholson, Derwentside, England, assignor to Corru-Seals Inc., North Haven, Conn.

Filed Sep. 6, 1978, Ser. No. 939,963
Claims priority, application United Kingdom, Jan. 31, 1978, 3911/78
Int. Cl.² B23P *17/00*
U.S. Cl. 29—417 **4 Claims**



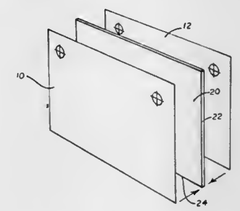
1. A method of manufacturing a metallic spirally wound gasket having an outer centring ring which comprises the steps of spirally coiling a corrugated strip of metallic material to form a sealing element of desired diameter, and surrounding the thus formed sealing element with a centring ring which is or has been formed by spirally coiling a metal strip which is of greater thickness than the sealing element strip and has a corrugated cross-section such that adjacent turns of the spiral sealing element and centring ring fit, without clearance one against the other.

4,189,820

TEMPLATE PATTERN ALIGNMENT

Otto G. Slack, 14 SE. 199th, Portland, Oreg. 97233

Filed Feb. 21, 1978, Ser. No. 879,219
Int. Cl.² B23P *17/00*
U.S. Cl. 29—425 **5 Claims**



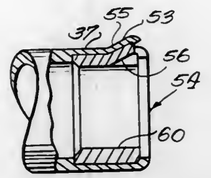
1. A method of promoting reverse-side pattern alignment employing a pair of sheet-like pattern templates intended for use on opposite sides of a substantially planar web to place aligned patterns thereon, where the periphery of the web includes a pair of selected edges that intersect at a known angle, said method comprising
- placing such templates in pattern-aligned, confronting, parallel-planar relationship,
- simultaneously trimming a pair of intersecting margins in the confronting templates to produce matching edges therein which intersect at such known angle, and
- fitting the trimmed templates on opposite sides of the web with the matching edges in the templates flush with the selected edges in the web.

4,189,821

METHOD OF MANUFACTURING SCREW JACK TUBES

Robert H. Potter, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Division of Ser. No. 834,272, Sep. 19, 1977, Pat. No. 4,127,343. This application May 15, 1978, Ser. No. 906,097
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432 **7 Claims**



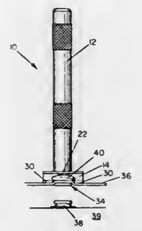
1. A method of manufacturing a tube assembly for use in jacks and the like, comprising the steps of forming an annular recess in one end of a hollow tube member of given wall thickness to a predetermined radial extent and axial depth within the tube, inserting in the formed recess a bushing of diametric extent less than the recess diametric extent and an axial length less than the recess axial length, crimping a tip of the recessed tube member wall over the outer end of the bushing, cutting the tube member and bushing along at least two parallel, axially oriented lines for an axial distance less than the axial length of the bushing, and radially outwardly deforming that portion of the tube member wall and bushing wall located between the cuts so as to form a male key and to lock the bushing inside the tube member against relative angular rotation.

4,189,822

METHOD OF FASTENING AND UNFASTENING SNAP FASTENERS

Irving W. Perline; Leonard Trapido, both of Kew Gardens; John J. Rottenkolber, Bronx, and Michael L. Rottenkolber, Mount Vernon, all of N.Y., assignors to Andrew Adams Developing Corporation, Bronx, N.Y.

Division of Ser. No. 748,472, Dec. 8, 1976, Pat. No. 4,096,618. This application Mar. 28, 1978, Ser. No. 891,052
Int. Cl.² B23P *11/02*
U.S. Cl. 29—453 **2 Claims**



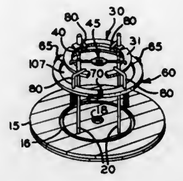
1. The method for fastening together the mating male and female members of a snap fastener in which each of said members is secured to material which materials are to be joined by the fastener, and in which at least one of said members has a distal portion of greater lateral width than an adjacent portion thereof and which distal portion is spaced from the material to which said one member is secured by said adjacent portion comprising engaging the exterior of said one member with said adjacent portion between the diverging prongs of a fork-type pronged element secured to one end of a handle, said engaging being effected with the prongs of said pronged element positioned between said distal portion and the material to which said one member is secured, manipulating the handle to align said engaged member with the other member of said fastener, and applying pressure to said engaged member through said handle to snap said engaged member into fastened relationship with the other member of the fastener.

4,189,823

METHOD AND APPARATUS FOR ASSEMBLING REELS

Theodoor Neyenhuys, P.O. Box 3627, Visalia, Calif. 93277

Filed May 30, 1978, Ser. No. 910,650
Int. Cl.² B23P *19/04*; B23Q *3/00*
U.S. Cl. 29—464 **13 Claims**



1. A method of assembling a reel having a pair of substantially circular flanges each having a circular groove concentric thereto and a plurality of bores within the groove with the bores of each flange being correspondingly positioned in their respective flanges, a plurality of staves having opposite ends fitted to the grooves in the flanges in a cylindrical assembly to form a drum, and tie rods having opposite ends receivable in corresponding bores of the flanges to draw the flanges toward each other against the staves comprising

A. inserting the tie rods through their respective bores in one flange,

B. positioning the one flange in a substantially horizontal attitude with the tie rods upwardly extended therefrom,

C. suspending an inner ring assembly of an outer diameter substantially equal to the inside diameter of the circular grooves in the flanges on the upper ends of the tie rods in a plane substantially parallel to the one flange,

D. suspending an outer ring assembly of an inside diameter substantially equal to the outside diameter of the circular grooves in the flanges on the inner ring assembly and in substantially parallel downwardly spaced concentric relation thereto defining an annular stave receiving channel therebetween,

E. inserting the lower ends of the staves downwardly into the groove of said one flange with the upper ends thereof extended through the channel and with the staves in interengaging cylindrical assembly.

F. removing the inner assembly with the upper ends of the staves upwardly extended from the outer assembly,

G. fitting the groove of the other flange downwardly over the upper ends of the staves for rested engagement of said other flange thereon,

H. threading the upper ends of the tie rods through their respective bores in said other flange,

I. tensioning the tie rods between the flanges to compress the flanges against opposite ends of the staves, and

J. removing the outer assembly.

4,189,824

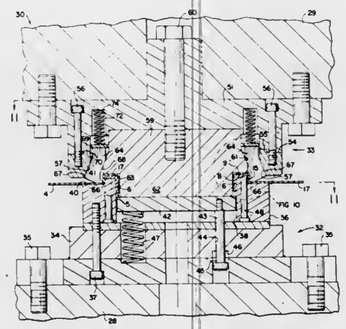
METHOD AND APPARATUS FOR MAKING CLOSURE CONSTRUCTION

Glenn W. Dillon, Crete, and Albert H. Lindell, Hazelcrest, both of Ill., assignors to Stock Equipment Company, Cleveland, Ohio

Division of Ser. No. 903,539, May 8, 1978, Pat. No. 4,135,639. This application Aug. 25, 1978, Ser. No. 936,887
Int. Cl.² B21D *39/00*; B23P *11/02*
U.S. Cl. 29—522 R **7 Claims**

1. The method of making a closure construction comprising placing together a flange member having an axially extending

portion with an axially extending opening and a previously formed thread and a radially extending metal flange portion rigidly connected to said axially extending portion, and a metal container wall having a major wall portion and a previously formed minor offset wall portion including an axially extending wall portion that closely surrounds the outer periphery of the flange portion of said flange member and a radially extending wall portion having an opening that surrounds the axially extending opening of the flange member and that bears against the adjacent surface of said flange portion of said flange member, then applying to said flange portion transversely thereof and axially of said flange member at spaced locations around the outer periphery of said flange portion compressive forces sufficient to form depressions in the metal of said flange portion at the periphery of said flange portion at such locations



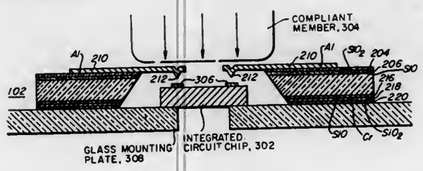
and to force the metal of said flange portion at such locations radially outwardly to form generally radially extending protuberances while holding the radially extending portion of said offset portion of said container wall against said flange portion of said flange member and while constraining against outward radial movement said axially extending portion of said container wall at locations offset from said radially extending portion of said container wall and adjacent those at which said protuberances are formed, whereby the metal of the container wall is deformed while said protuberances are formed to firmly engage said protuberances and extend around and under said protuberances and clamp them against said radially extending portion of said container wall thereby to firmly secure said flange member in said container wall against any movement relative to said container wall.

4,189,825

INTEGRATED TEST AND ASSEMBLY DEVICE

David R. Robillard, Westboro, and Robert L. Michaels, Marlboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 666,826, Mar. 15, 1976, Pat. No. 4,096,348, which is a division of Ser. No. 583,739, Jun. 4, 1975, Pat. No. 3,984,620. This application Sep. 1, 1977, Ser. No. 829,770
Int. Cl.² B01J *17/00*
U.S. Cl. 29—574 **3 Claims**



1. The method comprising the steps of:

(a) providing an interconnection substrate comprising the steps of:

(i) forming a plurality of apertures in a wafer of semiconductor material, at least some of said apertures being adapted for receiving an integrated circuit chip; and

(ii) forming a plurality of conductive leads upon at least one surface of said wafer with ends of at least some of said conductive leads extending over said apertures having a pointed tip at said ends facing said aperture;

(b) providing a plurality of integrated circuit chips, each one of said chips having a plurality of conductive bonding pads;

(c) positioning said chips in said apertures and aligning said pointed tips with said bonding pads;

(d) applying pressure to said ends of said leads forcing said pointed tips to make electrical contact with said bonding pads;

(e) testing the integrated circuit chips through said electrical contacts prior to bonding the leads to the pads;

(f) replacing integrated circuit chips which fail said testing; and

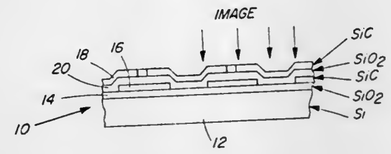
(g) thereafter bonding said pointed tips to said bonding pads.

4,189,826

SILICON CHARGE-HANDLING DEVICE EMPLOYING SIC ELECTRODES

Frank T. J. Smith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 775,147, Mar. 7, 1977. This application Dec. 22, 1978, Ser. No. 972,618
Int. Cl.² B01J *17/00*
U.S. Cl. 29—590 **2 Claims**



1. A method for use in fabricating a solid state imaging device comprising the steps of:

(a) heating a doped monocrystalline silicon wafer in an oxygen atmosphere to form an oxidic crust of silicon on the surface of said wafer;

(b) growing a first layer of polycrystalline silicon on said oxidic crust, said layer being less than 5 microns in thickness;

(c) selectively exposing part of said first silicon layer to a hydrocarbon and dopant source, thereby to convert said silicon layer part to a first pattern of transparent silicon carbide electrodes;

(d) growing a second polycrystalline silicon layer over said electrodes;

(e) heating said second silicon layer in an atmosphere of oxygen to oxidize said silicon layer;

(f) growing a third layer of polycrystalline silicon on said oxidized second silicon layer, said third silicon layer being less than 5 microns in thickness; and

(g) selectively exposing part of said third silicon layer to a hydrocarbon and dopant source, thereby to convert such silicon layer part to a second pattern of silicon carbide electrodes which are cooperable with said first pattern of electrodes.

4,189,827

TREATMENT OF ELECTROCHEMICAL CELL COMPONENTS WITH LITHIUM TETRACHLOROALUMINATE ($LiAlCl_4$) TO PROMOTE ELECTROLYTE WETTING

James G. Eberhart, Naperville, and James E. Battles, Oak Forest, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,619
Int. Cl.² B05D *5/12*; H01M *6/36*
U.S. Cl. 29—623.1 **9 Claims**

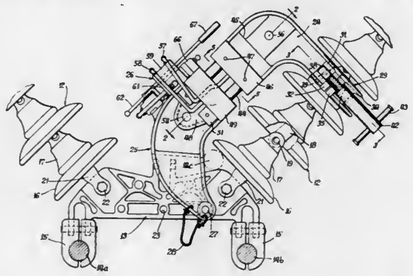
1. A method of improving the wettability of electrochemical cell components with molten electrolyte consisting essentially of alkali metal halides in a mixture having a melting point in excess of the melting point of $LiAlCl_4$, comprising:
contacting said component with $LiAlCl_4$; and
subsequently contacting said component with said molten electrolyte.

4,189,828

CONDUCTOR TRANSFER DEVICE

William H. Chadwick, Jr., Rossville, Ga., assignor to Sherman & Reilly, Inc., Chattanooga, Tenn.

Filed May 28, 1976, Ser. No. 690,918
Int. Cl.² H01R *43/00*
U.S. Cl. 29—762 **2 Claims**



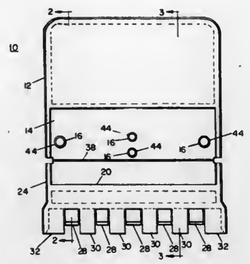
1. A device enabling movement of a conductor from one side to the other of a string of insulators coupled between a tower and a yoke plate, comprising an upper frame having clamping means at its upper end for engaging an intermediate portion of said string, a lower frame having securing means at its lower end for engaging said yoke plate, and means interconnecting the lower end of said upper frame and the upper end of said lower frame for effecting longitudinal movement of said frames relative to each other to permit uncoupling of a selected portion of said string to permit movement of said conductor past said selected portion from one side of said string to the other and subsequent recoupling of said selected portion of said string, wherein said clamping means and said securing means are aligned with each other longitudinally of the device to define a longitudinal axis, and the lower end of said upper frame, the upper end of said lower frame and said means for interconnecting the same are offset relative to said axis, and wherein said clamping means comprises a first semi-circular jaw formed at the upper end of said upper frame and having a lateral extension with a first slot in its outer end, a second semicircular jaw shaped complementally to said first jaw with a lateral extension having a second slot in one end aligned with said first slot and pivotally mounted at its opposite end on said upper frame, a bolt pivotally on said upper frame for movement into and out of said slots, and a nut threaded on said bolt for engagement with said lateral extension of said second jaw.

4,189,829

DUAL PURPOSE CUTTER PACKAGE/GUARD

Clemens A. Iten, Staunton, and Christopher J. Campbell, Richmond, both of Va., assignors to American Safety Razor Company, Verona, Va.

Filed Jun. 6, 1978, Ser. No. 913,164
Int. Cl.² B26B *29/00, 3/00*
U.S. Cl. 30—151 **19 Claims**



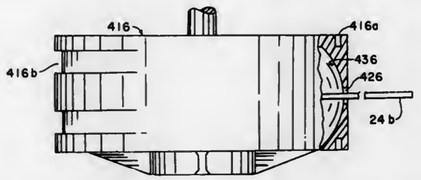
1. In a packaging means for a blade having a keen edge, an element comprising:
(a) a handle portion,
(b) a second portion connected to said handle portion,
(c) said second portion being frangibly connected to said handle portion,
(d) said second portion comprising first means for protecting said keen edge while frangibly attached to said handle portion and forming a part of said packaging means,
(e) said second portion further comprising first and second sets of teeth for gripping said blade after detaching said second portion from said handle portion,
(f) said first and second sets of teeth being arrayed along opposing faces of an edge of said second portion, for providing frictional gripping of said blade therebetween.

4,189,830

SELF-THREADING FILAMENT TRIMMER SYSTEM

Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Continuation-in-part of Ser. No. 713,147, Aug. 10, 1976. This application Jun. 26, 1978, Ser. No. 919,052
Int. Cl.² A01D *35/26*; A01G *3/06*
U.S. Cl. 30—276 **8 Claims**



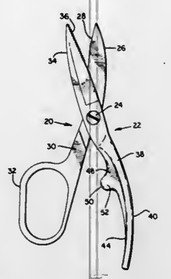
1. In a housing for use with a filament trimmer having means for supplying filament to a free end thereof to be threaded outwardly from within the housing through an aperture in a peripheral housing wall and orbited as a cutting end by rotation of the housing on operation of the filament trimmer, the improvement comprising: the aperture being in an extreme outward portion of the peripheral housing wall, and self-threading means for threading said free end through the aperture under centrifugal force on the filament upon said rotation, including vertical-incline structure leading outwardly along the inner surface of said peripheral housing wall to the aperture, and horizontal incline structure leading outwardly along the inner surface of said peripheral housing wall to the aperture.

4,189,831

INDUSTRIAL SCISSORS

Paul A. Sonntag, Doraville, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,150
Int. Cl.² B26B *13/12*
U.S. Cl. 30—232 **6 Claims**



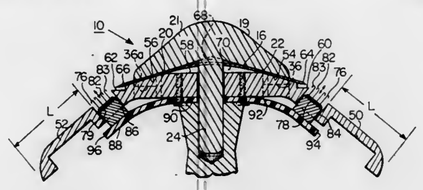
1. Industrial scissors comprising a first cutting element having a blade from which a first handle extends and a second cutting element having a blade from which a second handle extends, and with said first handle formed with a ring through which a finger may be inserted, and with said second handle formed with an elongated arched bar having a convex surface against which a user palm may be snugly seated and pressed and a generally concave surface opposite said convex surface from which a stop unitarily protrudes against a side of which a thumb may be pressed, said first and second cutting elements being pivoted together for unbiased pivotal movement with said first handle ring located adjacent said second handle concave surface and stop.

4,189,832

SHAVING IMPLEMENT

Allan C. Harper, Andover, Mass., and Edmund M. Buras, Jr., Silver Spring, Md., assignors to The Gillette Company, Boston, Mass.

Filed Jun. 19, 1978, Ser. No. 916,679
Int. Cl.² B26B *19/42*
U.S. Cl. 30—34.2 **5 Claims**



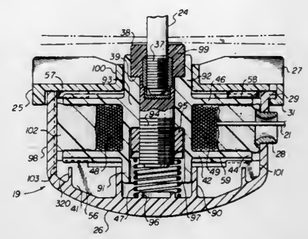
1. A shaving implement comprising:
a handle;
a blade having a cutting edge;
means for supporting said blade, said blade supporting means being attached to said handle and having a flange with a skin contacting surface adapted to distribute shaving force to substantially prevent stretching of said skin;
resilient hair raising means mounted on said flange immediately adjacent to said blade cutting edge for raising and holding hairs in an erect position for cutting by said blade cutting edge; and spring means mounted on said implement for biasing the hair raising means.

4,189,833

APPARATUS FOR CUTTING VEGETATION

James L. Kwater, Birmingham, Ala., assignor to Weed Eater, Inc., Houston, Tex.

Filed Aug. 15, 1978, Ser. No. 934,226
Int. Cl.² A01G *3/06*; A01D *55/18*
U.S. Cl. 30—276 **8 Claims**



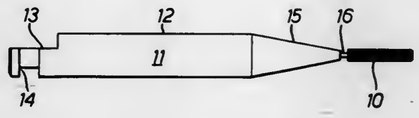
1. Apparatus for cutting vegetation comprising:
drive means including a shaft rotating at a predetermined speed about an axis,
a spool directly connected to said shaft for rotation therewith at said predetermined speed of rotation,
a head member associated with said spool in surrounding relationship thereto, said head member including a peripheral aperture,
at least one flexible non-metallic cutting line coiled on said spool and having a free end thereof extending outwardly of said head member through said aperture and into a cutting plane, and
means for moving said head member to a first position for engagement with said spool and for rotation therewith at said predetermined speed, and for moving said head member to a second position free of engagement with said spool and for rotation of said head member at a speed less than said predetermined speed of rotation of said spool.

4,189,834

DENTAL REINFORCING PINS

Andrew J. Smith, 3 Leighton Crescent, London N.W. 5, England

Continuation of Ser. No. 639,095, Dec. 9, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,831
Int. Cl.² A61K *5/02*
U.S. Cl. 433—225 **5 Claims**



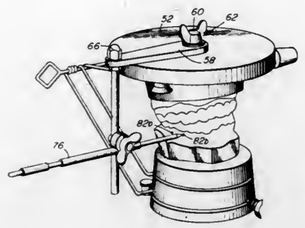
1. A dental anchoring device comprising a threaded portion for self-threading insertion in a bore formed in a tooth dentine, a connecting portion forming an integral unit with said threaded portion and having an elongated shank adapted for direct positive attachment in a powered dental hand-piece, and a weakened portion intermediate the threaded portion and one end of the connecting portion for permitting shearing and separation of the connecting portion from the threaded portion; the free end of the connecting portion having a flat portion and a part annular groove, whereby the connecting portion can be latched in a latching-type dental hand-piece to securely retain the dental anchoring device in the hand-piece without dropping therefrom and when said threaded portion is fully inserted in a bore said weakened portion shears to separate said connecting portion from said threaded portion.

4,189,835

METHOD OF DENTAL SURVEYING

Edward B. Seldin, Boston, Mass., assignor to Massachusetts General Hospital, Boston, Mass.

Filed Oct. 27, 1977, Ser. No. 846,202
Int. Cl.[2] A61C *11/00*
U.S. Cl. 433—214 **4 Claims**



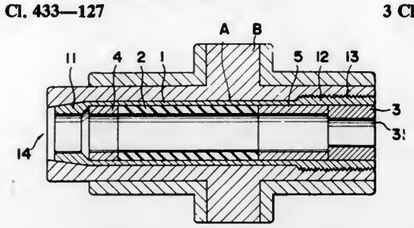
1. A method for preoperative evaluation comprising the steps of:
1. preparing maxillary and mandibular dental models, said models each having a base portion of a given configuration;
2. mounting a articulator base on a dental articulator, said articulator base having at least one positional keying means;
3. placing said models on the articulator in a first position that presents the patient's malocclusion and then temporarily securing the models in said first position;
4. casting a first template means having (i) a complementary replica of the base portion of one of said dental models when the model is in such first position and (ii) at least one positional keying means that mates with said at least one positional keying means of said articulator base;
5. detaching said dental models from said first position;
6. placing said dental models on the articulator in a second position that presents the patient's proposed corrective position and then temporarily securing the models in said second position;
7. casting a second template means having (i) a complementary replica of the base portion of said one of said dental models when the model is in said second position and (ii) at least one positional keying means that mates with said at least one positional keying means on said articulator base;
8. unsecuring said dental models from said second position;
9. placing the base of one of said dental models in the complementary replica thereof in one of said template means and engaging the positional keying means thereof with the positional keying means of articulator base;
10. mounting a stylus assembly with respect to one of said dental models, said stylus assembly including a movable stylus;
11. marking at least one of said dental models with the stylus;
12. substituting the other of said template means for said one of said template means without moving the stylus assembly relative to said one of said dental models;
13. marking again said at least one of said dental models with the stylus; and,
14. determining from the two stylus marks the translational movements required to move said one of said models from the first position to the second position.

4,189,836

CHUCK FOR DENTAL HAND-PIECE

Hiroshi Sugai, and Haruo Ogawa, both of Higashihama Minami, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 3, 1978, Ser. No. 921,230
Claims priority, application Japan, Jul. 4, 1977, 52/88985[U]
Int. Cl.[2] A61C *1/12*
U.S. Cl. 433—127 **3 Claims**



1. A chuck adapted to be snug fit into the rotor of a dental hand-piece comprising:
a substantially cylindrical cartridge case having an inner diameter formed to hold a chuck body and a stopper snug fit to said inner diameter of said cartridge case, said cartridge case having a tapered portion in the form of a truncated cone on the outer circumferential surface at one end thereof and a threaded, thickened outer circumferential surface at the opposite end thereof to enable said cartridge case to be snug fit into the rotor;
a chuck body having an inner diameter and adapted to securely engage the spindle of a dental tool within said inner diameter of said chuck body, said chuck body being snug fit to the inner diameter of said cartridge case;
front and rear collars each having an inner diameter equal to said inner diameter of said chuck body and each snug fit to the inner diameter of said cartridge case at opposite ends of said chuck body, said front and rear collars being adapted to securely engage the spindle of a dental tool within the inner diameters of said collars; and
a stopper having a square cross-sectional inner surface and having a smaller diameter than the inner diameter of said chuck body, said stopper being securely fitted to the inner diameter of said cartridge case at the end opposite the tapered end to thereby provide a stop for the spindle of a dental cutting tool.

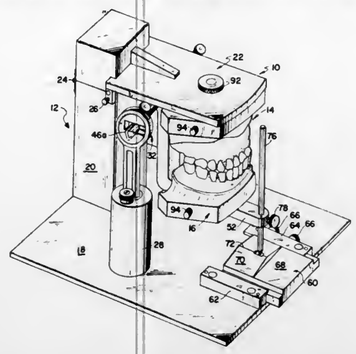
4,189,837

DENTAL JAW SIMULATOR

Aaron Stele, 10 Beechwood Ter., West Orange, N.J. 07052

Filed Jun. 23, 1977, Ser. No. 809,297
Int. Cl.[2] A61C *11/00*
U.S. Cl. 433—57 **18 Claims**

1. A dental jaw simulator for duplicating human jaw movements, comprising:
a support frame,
an upper jaw member pivotally mounted on said support frame for receiving an upper dental arch cast,
a lower jaw member mounted on said support frame for receiving a lower dental arch cast, and
means for moving said lower jaw member in protrusive and retrusive directions and in a lateral direction including a universal hinge arrangement in combination with an anterior platform mounted on said support frame and a forward pin member connected to said lower jaw member which engages and is movable relative to said anterior platform,
said anterior platform including first and second sloping planes meeting at the center of said platform to form a crest and sloping downwardly from said crest to the edge of said platform, said forward pin member being movable on said first and second sloping planes to guide said lower jaw member to move downwardly and in a retrusive direction about said hinge arrangement so that as said lower jaw member is moved laterally, it drops downwardly and moves in an arc for duplicating the movements of the lower human jaw during lateral movement thereof.

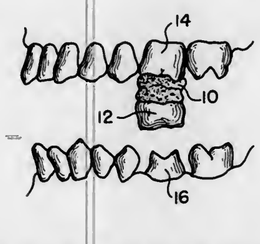


4,189,838

METHOD FOR REMOVING RESTORATIONS FROM TEETH

Richard A. Oliva, 3318 Club Dr., Los Angeles, Calif. 90064

Continuation of Ser. No. 958,051, Nov. 6, 1978, abandoned, which is a continuation of Ser. No. 820,426, Aug. 1, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,441
Int. Cl.[2] A61C *3/16*
U.S. Cl. 433—167 **9 Claims**



1. A process for the removal of a firmly affixed, stuck, binding or cemented dental restoration, and the like, from a tooth of a patient, which comprises: inserting an adhesive substance between the surface of the restoration and at least one opposing tooth of the patient; causing the patient to close his jaws to compress the adhesive substance against the surface of the restoration with at least 25 pounds pressure until a firm adhesive bond is achieved; and causing the patient to open his jaws in a snapping quick forceful rapid jerking movement to apply a reverse force to the adhesive substance in a direction to effect a removal of the restoration from the tooth.

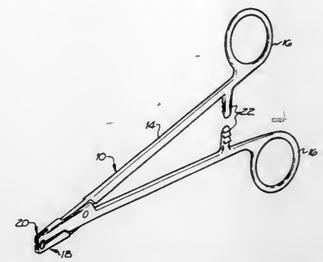
4,189,839

UNIVERSAL ORTHODONTIC PLIERS

John L. Manuel, 960 Alexander Dr., Haysville, Kans. 67060

Filed May 3, 1978, Ser. No. 902,559
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—4 **12 Claims**

1. A universal orthodontic pliers comprising:
a pair of lever arms pivoted together having handle means at one end and jaw means at the opposite end;
the jaw means including an upper and a lower jaw member;
a pair of transverse mating grooves, one in each jaw member;
a pair of positioning legs on the end of each jaw member oppositely positioned from each other;
a longitudinal slot passing through the upper jaw member between said pair of positioning legs;



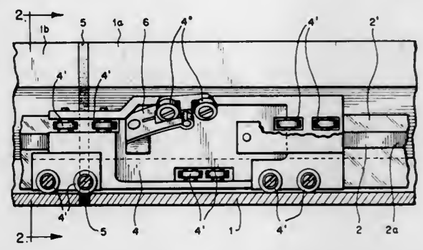
a partial longitudinal slot in the lower jaw member oppositely positioned from the slot in the upper jaw member with the pair of positioning legs defining the sides of the partial slot, both slots being of a width less than the width of the transverse grooves.

4,189,840

SCANNING UNIT

Siegbert Holstein, Stein a.d. Trun, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,053
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706926
Int. Cl.[2] G01B *11/04*
U.S. Cl. 33—125 C **6 Claims**



1. In a scanning unit for use in a length measuring device wherein the scanning unit is adapted to translate along a measuring scale in a longitudinal direction guided by a plurality of guide surfaces defined by the measuring device, said guide surface including a first guide surface having at least one joint defining a depression having a predetermined maximum width in the longitudinal direction, said scanning unit including a plurality of longitudinally spaced bearing locations which operate to position the scanning unit with respect to the first guide surface, the improvement comprising:
at least two bearings included in each of said bearing locations, wherein each bearing is mounted in a substantially fixed position with respect to the scanning unit such that, for each bearing location, each of the bearings independently operates to precisely support and position the scanning unit from the first guide surface in the absence of support from other bearings of that bearing location, and further, wherein the bearings of each bearing location are separated in the longitudinal direction by a spacing which is greater than the predetermined maximum width of the depression in the longitudinal direction; and
means for urging the scanning unit toward the first guide

surface such that the bearings included in said bearing locations are urged against the first guide surface.

4,189,841

METHOD AND DEVICE FOR MEASURING THE VARIATIONS OF THE CROSS-SECTIONAL DIMENSIONS OF A MOVING THREAD-LIKE STRUCTURE

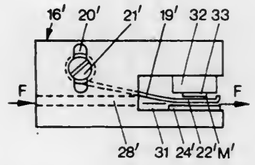
Erich Loepfe, Zollikerberg, Switzerland, assignor to Aktiengesellschaft Gebrüder Loepfe, Zürich, Switzerland

Continuation of Ser. No. 775,369, Mar. 7, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,455

Claims priority, application Switzerland, Aug. 28, 1976, 10882/76

Int. Cl.² G01B *7/04, 7/06*

U.S. Cl. 33—147 L **3 Claims**



1. A device for measuring a transverse dimension of a longitudinally travelling yarn, comprising sensing means including two opposite contacting members for contacting the travelling yarn, means for transducing instantaneous variations of the mutual distance of said contacting members into electrical sensing signals, at least one of the contacting members comprising a leaf spring having a free end arranged in opposite relationship to the other contacting member such as to form a measuring gap between said free end and the other contacting member and to exert contact pressure onto the travelling yarn, mechanical means adjoined to the leaf spring for adjusting the contact pressure, the sensing means further comprising a base body, said other contacting member being fixedly arranged at the base body, and said adjusting means comprising means for pivotably mounting said leaf spring at the base body.

2. A device for measuring a transverse dimension of a longitudinally travelling yarn, comprising sensing means including a base body and two opposite contacting members for contacting the travelling yarn, means for transducing instantaneous variations of the mutual distance of said contacting members into electrical sensing signals, at least one of the contacting members comprising a leaf spring having a free end arranged in opposite relationship to the other contacting member such as to form a measuring gap between said free end and the other contacting member and to exert contact pressure onto the travelling yarn, and mechanical means adjoined to the leaf spring for adjusting the contact pressure, and said mechanical adjusting means comprises means for shifting said leaf spring along its lengthwise axis.

4,189,842

COMPACT WIDE-RANGE DIGITAL STRETCH GAUGE

David L. Alter, Hoffman Estates, Ill., assignor to Semi-Mask, Inc., Elk Grove Village, Ill.

Filed Sep. 29, 1978, Ser. No. 946,961

Int. Cl.² G01L *7/00*

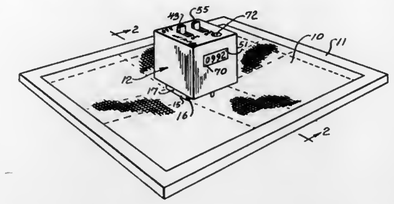
U.S. Cl. 33—149 J **8 Claims**

1. An instrument for detecting the degree of tension of a generally horizontal, tensioned sheet of limp material, said apparatus comprising:

a body including a base having a bottom with two spaced sides and of a size to be positioned on said sheet and having sufficient weight to cause said sheet to be depressed from a planar condition, whereby the sheet slopes upwardly from said sides;

a pair of arms above said bottom and pivotally connected to said body for movement about an axis located in a plane midway between said sides, said arms having distal ends at opposite sides of said plane respectively;

a pair of feelers positioned outboard of said sides respectively, each feeler being affixed to a respective arm adjacent the distal end of the respective arm and being immovable with respect to the respective arm during the normal operation of the instrument, each feeler extending downward from the respective arm and having a distal end



supported on the tensioned material outboard of the respective side, whereby an increase in the tension of the material will cause the feelers to descend closer to the elevation of said bottom and the respective arms to pivot accordingly and a decrease in the tension of the material will cause the opposite movements of the feelers and arms; and

means operatively associated with said arms for detecting and providing a visual indication of the pivotal positions of the arms with respect to each other.

4,189,843

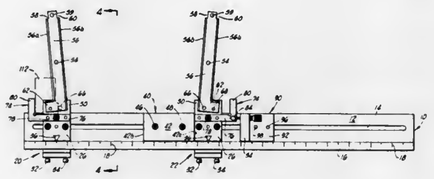
PIPE THREAD GAUGE

John R. Baldwin, Houston, Tex., assignor to Mustang Services Company, Houston, Tex.

Filed May 15, 1978, Ser. No. 905,724

Int. Cl.² G01B *3/40, 3/48*

U.S. Cl. 33—199 R **20 Claims**



1. A pipe thread gauge comprising:

an elongated rail;

a pair of blade block assemblies slidably mounted on said rail for longitudinal sliding movement therealong;

means for locking each of said blade block assemblies at a selected location along said rail;

a thread engaging blade pivotally connected to each of said blade block assemblies, said blades having their pivotal axes on said blade block assemblies extending substantially parallel to each other, whereby said blades pivot in substantially the same plane, each of said blades including a toe portion swingable through an arc upon pivotation of the respective blade;

means for selectively setting said blades at a selected angle to each other;

means for selectively spacing said blades from each other a selected distance; and

a stop pin carried on each of said blades and positioned to contact said blade angle setting means and stop further pivotation of the respective blade upon which it is carried when said blade extends at a selected angle to the other blade.

4,189,844

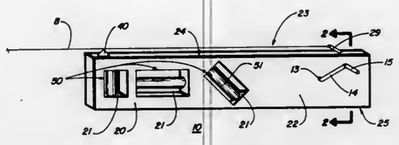
CHALK LINE PROTRACTING TOOL

Robert J. Riggins, Sr., 5150 Mercury Ct., Boise, Id. 83705

Filed Dec. 4, 1978, Ser. No. 965,943

Int. Cl.² G01B *19/62*

U.S. Cl. 33—414 **2 Claims**



1. A chalk line protracting tool comprising:

a substantially rectangular housing having a planar top portion, said housing including a chalk line compartment and a closure member operable to open and close the compartment for replacement of chalk and servicing of a chalk line holding means;

a tubular member communicating with the chalk line compartment and terminating above said planar top portion a predetermined distance, said tubular member adapted for threading a chalk line therethrough;

a chalk line holding means including a reel rotatably mounted to the interior of the housing compartment and a handle exterior to the housing, pivotally attached to said reel and adapted to fold downwardly upon, and substantially flush with, the exterior surface of said housing for storage thereof;

chalk line guide means attached to said housing and extending above the planar top portion a distance equal in distance to the uppermost terminal opening of said tubular member and in unobstructed alignment with the opening;

level indicating means including at least two spirit levels carried by said housing in planar right angular relationship to one another, one of said spirit levels in planar parallel relationship with the top portion of said housing whereby a chalk line rectilinearly extending between the tubular opening and said guide means and protracted beyond said guide means is operable to mark such protraction on a selected surface relative to level.

4,189,845

METHOD AND APPARATUS FOR ELECTROSTATICALLY FORMING A LAYER OF MATERIAL FROM A SLURRY THEREOF

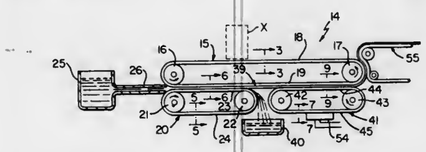
James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 809,945, Jun. 24, 1977, Pat. No. 4,135,307, which is a division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1976, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Nov. 7, 1977, Ser. No. 849,097

The portion of the term of this patent subsequent to Aug. 31, 1993; has been disclaimed.

Int. Cl.² F26B *3/34*

U.S. Cl. 34—1 **40 Claims**



1. In a method of forming a layer of material against a movable conveying means from a slurry of a liquid and said material by an electrostatic action so that said layer of material can be subsequently removed in layer form from said conveying means, the improvement comprising the step of disposing a plurality of needle-like projections in said slurry to assist said electrostatic action in forming said layer of material from said slurry against said conveying means.

4,189,846

PROCESS FOR THE CONTINUOUS PRODUCTION OF SOLIDS, IN PARTICULAR PROTEIN CONCENTRATES, FROM AQUEOUS SOLUTIONS, AND APPARATUS FOR THE PRACTICE OF THE PROCESS

Jürgen Fiedler, Nettetal, and Klaus Fricke, Krefeld-Gartenstadt, both of Fed. Rep. of Germany, assignors to GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung, Krefeld, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,554

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2707668

Int. Cl.² A23J *1/06;* **F26B** *5/08*

U.S. Cl. 34—8 **1 Claim**

1. A process for the continuous production of protein concentrate from an aqueous solution of blood, comprising the steps of:

(A) discharging superheated steam at a temperature of about 400° C. into a dryer chamber having a centrifugal atomizer disposed therein;

(B) delivering an aqueous blood solution onto the centrifugal atomizer, from which it is discharged in the form of a thin layer of minute droplets of a size smaller than 100 microns, the said droplets being discharged directly into the stream of superheated steam, which dries the droplets while the steam is cooled to about 200° C.;

(C) collecting the dried blood at the bottom of the dryer chamber and removing it therefrom; and

(D) delivering the cooled steam to a cyclone separator where entrained solids are removed before the steam is reheated for reuse.

4,189,847

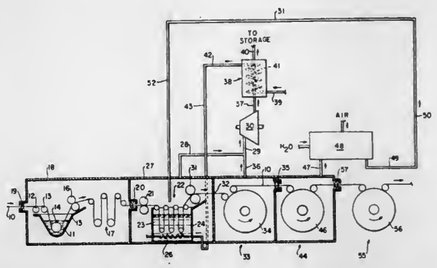
PROCESS AND APPARATUS FOR REMOVAL OF AMMONIA IN A LIQUID AMMONIA FABRIC TREATING SYSTEM

Jackson Lawrence, West Sand Lake, and Harry A. Webb, Menands, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Dec. 15, 1977, Ser. No. 860,921

Int. Cl.² F26B *7/00, 3/00, 21/14*

U.S. Cl. 34—19 **9 Claims**



1. The method of recovering ammonia (NH_3) from a fabric web throughout which said ammonia is interspersed comprising the steps of

(a) passing the web through an aqueous ammonia bath of water (H_20) saturated with ammonia (NH_3) maintained within temperature range of 60° F. to 120° F. to cause substantial vaporization removal of a major portion of said ammonia from said web;

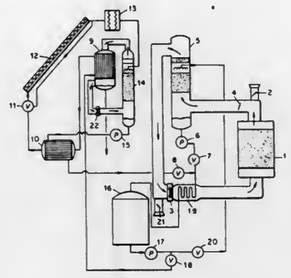
(b) removing the aqueous ammonia solution from the web.

4,189,848

ENERGY-EFFICIENT REGENERATIVE LIQUID DESICCANT DRYING PROCESS

Suk M. Ko; Philomena G. Grodzka, both of Huntsville, and Paul O. McCormick, Athens, all of Ala., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 4, 1977, Ser. No. 821,868
Int. Cl.² F26B *3/00*
U.S. Cl. 34—32 **7 Claims**



1. A method of drying a crop comprising the steps of continuously passing a regenerated, liquid desiccant from a storage tank through an absorption column and then through a first heat exchanger back to said tank; passing hot, dry air through a crop bin containing said crop for absorbing moisture therefrom; passing the moist exit air from said bin to said absorption column containing said regenerated, liquid desiccant for removing the moisture from said moist air; passing the exit air from said absorption column through said first heat exchanger for the heating and drying of said air before it is again passed through said bin in a closed-loop fashion; removing said desiccant from said storage tank after it becomes used and saturated with moisture and regenerating it comprising the steps of passing it through a condenser for preheating thereof, through a second heat exchanger for further preheating therof, and through heating means for regenerating (further heating) said saturated desiccant; then passing said regenerated desiccant exiting from said heating means through means for separating the water vapor therefrom; passing said separated water vapor through said condenser where it is condensed to water and passed to a drain, said water vapor being condensed in said condenser serving as an energy recovery mechanism to provide for said preheating of said saturated desiccant passing therethrough to said heating means, passing the now dry, hot, regenerated desiccant from said moisture separating means through said second heat exchanger for said further preheating of said saturated desiccant prior to its passing through said heating means and passing the regenerated, dry desiccant exiting from said second heat exchanger to said desiccant storage tank, and repeating all of said steps as many times as necessary to dry said crop to a desired dryness.

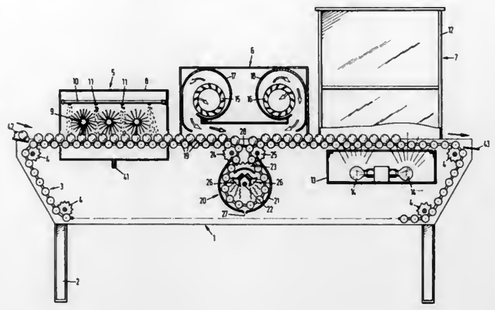
4,189,849

METHOD AND APPARATUS FOR DRYING A ROLLER CONVEYOR LOADED WITH ARTICLES, SUCH AS EGGS, AND APPARATUS FOR WASHING, DRYING AND CANDLING EGGS LOADED ON A ROLLER CONVEYOR

Jelle van der Schoot, Aalten, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Oct. 11, 1977, Ser. No. 840,725
Int. Cl.² F26B *3/00*
U.S. Cl. 34—33 **7 Claims**

1. In a method of transporting and drying articles supported on an endless conveyor, in which the conveyor and the articles pass through a liquid washing apparatus so that both the conveyor and the articles become wet, and in which drying air is then blown over the wet conveyor and the articles thereon in a drying stage, the improvement which comprises separating a length of the wet conveyor from the articles in the drying stage after partial drying of the articles and of the conveyor, further



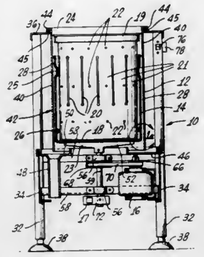
drying the wet length of the conveyor while separate from the articles, returning the length to the drying stage and reengaging the articles with the conveyor in the drying stage for further transport and drying of the articles.

4,189,850

SELF-CENTERING VEGETABLE DRYING APPARATUS

Frank L. Dieterich, 3727 S. Robertson Blvd., Culver City, Calif. 90230, and Stanton Abrams, Los Angeles, Calif., assignors to Frank L. Dieterich, Culver City, Calif.

Continuation-in-part of Ser. No. 794,556, May 6, 1977, Pat. No. 4,103,432. This application Jun. 8, 1978, Ser. No. 913,557
Int. Cl.² F26B *17/30*
U.S. Cl. 34—58 **13 Claims**



1. An apparatus for drying vegetables comprising: a plastic basket for containing the vegetables to be dried, said basket being of circular cross section, having an open top end, a closed bottom end and a sidewall that tapers toward said bottom end, said sidewall being divided by slots into generally vertical elongated bands capable of bending outwardly under centrifugal force, thereby increasing the diameter of said basket and permitting water to escape from said basket;

a rotatable holder for removably receiving said basket with a space between said holder and said basket through which water expelled from said basket under centrifugal force can escape, said holder being dimensioned to be engaged by said bands upon outward bending thereof;

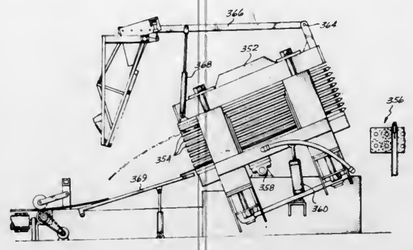
motor means connected to said holder for rotating said holder and said basket and thereby causing water to be expelled through said openings in said sidewall by centrifugal force.

4,189,851

UNLOADING APPARATUS FOR MULTI-OPENING WORK STATION

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,453
Int. Cl.² F26B *9/04, 25/00*
U.S. Cl. 34—236 **7 Claims**



1. In a work station of the type mounted on a base having a plurality of vertically spaced controllable openings for the insertion therein of substantially flat thin sheet workpieces and an unloading apparatus for singulating and discharging the finished sheets, comprising:

means for mounting the work station on at least one bearing positioned at the bottom thereof to provide the work station with a tilting axis about which the entire work station is pivotal from a horizontal orientation to an orientation where the openings are inclined downwardly at an angle of approximately 35° for unloading;

means in operative communication with the work station for sequentially pivoting the work station from its horizontal orientation to its inclined orientation;

means on the work station for sequentially opening each individual opening when the work station is in its downwardly tilted orientation; and

means located substantially adjacent the bottommost opening on the discharge side when the work station is in its downwardly tilted orientation for reducing damage to the singulated discharged sheets.

4,189,852

METHOD OF TEACHING READING

Emilie M. Chatlien, 6653 N. Chicora Ave., Chicago, Ill. 60646

Filed Jun. 13, 1977, Ser. No. 805,742
Int. Cl.² G09B *5/00*
U.S. Cl. 35—8 A **7 Claims**



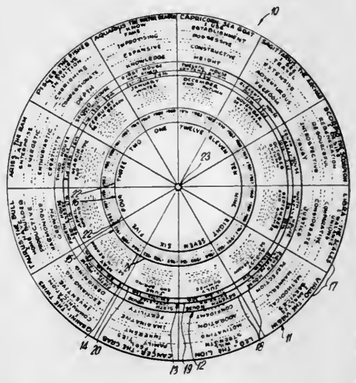
1. In a method of teaching reading in which a student looks at or scans the words in a book or the like containing written or printed words while said words at least in the main are simultaneously being audibly reproduced from previously recorded audible recording means and heard by said student while he looks at or scans said words, the improvement which comprises providing the student with a book or the like having written or printed words, providing said student with means for writing words or statements, providing in the aforesaid recorded material on said audible recording means a plurality of predetermined spaced audible signals each at the end of each of a plurality of the predetermined audible reproductions of words in said book or the like, said audible signals being followed by audible or written instructions to said student to perform writing acts in relation to the audibly reproduced words on said audible recording means, said student, in following said instructions, writing on said means for writing words or statements a word or words or a statement or statements responsive to the aforesaid instructions previously given to said student within given predetermined time periods, after each of said plurality of instructions has been given to said student, whereby a writing is produced by said student which readily permits of being graded to enable the nature of the progress of the student in learning to read to be ascertained and evaluated by the teacher and the student.

4,189,853

ASTROLOGICAL DEVICE

Jack Provenzano, 141 E. 55th St., New York, N.Y. 10022

Filed Oct. 25, 1978, Ser. No. 954,427
Int. Cl.² G09B *29/00*
U.S. Cl. 35—44 **10 Claims**



1. An astrological device comprising:

a first base wheel, said wheel being divided into twelve divisions, indicia indicating the signs of the Zodiac being disposed in each division around an annular portion of said wheel;

a second wheel, said second wheel being divided into twelve divisions, indicia indicating sequentially from one to twelve "houses" being disposed in each division around an annular portion of said second wheel;

a third wheel, said third wheel being divided into twelve divisions, indicia indicating grouped sequences of days of the month being disposed in each division around an annular portion of said third wheel, wherein said grouped sequences of days are as follows:

1-12-24,	2-13-25,	3-14-26,	4-15-27,
5-16-28,	6-17-29,	7-18-30,	8-19-31,
9-20,	10-21,	11-22,	and 23;

a fourth wheel, said fourth wheel being divided into twelve divisions, indicia indicating the months of the year being disposed in each division around an annular portion of said fourth wheel; and

a fifth wheel, said fifth wheel being divided into twelve divisions, indicia indicating grouped sequences of years being disposed in each division around an annular portion of said fifth wheel, wherein said grouped sequences of years is derived by disposing a base year in one division and continuing to count consecutive years, disposing each additional year in the next division of the wheel;

said five wheels being arranged so that said indicia on said wheels are simultaneously viewable by an observer and adapted to rotate about a common central point, said wheels providing astrological information about an individual when in alignment.

7. A method for using an astrological device having:

a first base wheel, said wheel being divided into twelve divisions, indicia indicating the signs of the Zodiac being disposed in each division around an annular portion of said wheel;

a second wheel, said second wheel being divided into twelve divisions, indicia indicating sequentially from one to twelve "houses" being disposed in each division around an annular portion of said second wheel;

a third wheel, said third wheel being divided into twelve divisions, indicia indicating grouped sequences of days of the month being disposed in each division around an annular portion of said third wheel, wherein said grouped sequences of days are as follows:

1-12-24,	2-13-25,	3-14-26,	4-15-27,
5-16-28,	6-17-29,	7-18-30,	8-19-31,
9-20,	10-21,	11-22,	and 23;

a fourth wheel, said fourth wheel being divided into twelve divisions, indicia indicating the months of the year being disposed in each division around an annular portion of said fourth wheel; and

a fifth wheel, said fifth wheel being divided into twelve divisions, indicia indicating grouped sequences of years being disposed in each division around an annular portion of said fifth wheel, wherein said grouped sequences of years is derived by disposing a base year in one division and continuing to count consecutive years, disposing each additional year in the next division of the wheel;

said five wheels being arranged to rotate about a common central point, said wheels providing astrological information about an individual when in alignment;

said method comprising the steps of:

locating the birth year of a subject individual on the fifth wheel;

aligning the birth year of said individual with the Zodiac birth sign of said individual on the first base wheel;

locating the current year on the fifth wheel; and

determining the personal year sign of the individual which is aligned on the first base wheel with the current year on said fifth wheel.

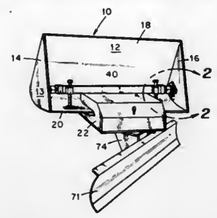
4,189,854

GRADER BLADE ATTACHMENT

John A. Haynes, Sylacauga, Ala., assignor to Danek Industries, Inc., Chattanooga, Tenn.

Filed Jul. 17, 1978, Ser. No. 925,094
Int. Cl.² E02F *3/76*
U.S. Cl. 37—117.5 **4 Claims**

1. A grader attachment for a bucket, including a scoop panel having a cutting edge and a pair of oppositely disposed side panels and defining an interior volume, said attachment comprising a bifurcated frame member including a first leg and a second leg cooperatively defining an elongated slot therebetween receiving the cutting edge and a substantial portion of the scoop panel of the bucket to locate an outboard end portion of the first leg within the interior volume defined by the bucket, longitudinally adjustable means for frictionally engaging said side panels, laterally adjustable means frictionally



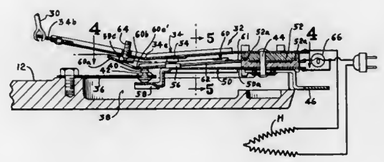
engaging the scoop panel, and a grader blade attached to said frame member.

4,189,855

ELECTRIC PRESSING IRON HAVING INDICATING READY LIGHT

George W. Robinson, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Continuation of Ser. No. 810,502, Jun. 27, 1977, abandoned. This application Jun. 20, 1978, Ser. No. 917,184
Int. Cl.² D06F *75/02, 75/26;* H05B *1/02*
U.S. Cl. 38—82 **13 Claims**



1. In an electric pressing iron having a heater circuit, the iron having mounted on the top of its soleplate a temperature-sensitive switch comprising a pair of superposed, spaced aligned contact blades cantilever-mounted and extending in the same direction, the switch including an upper blade and a lower blade, the blades carrying aligned contact zones, a bimetallic element cantilever-mounted on the soleplate in heat exchange relation therewith and adapted to engage with its distal end the lower blade to move the distal end of said lower blade away from the upper blade in conditions of no-heat-demand to separate the contact zones, temperature control setting means on the iron including means to raise and lower the distal end of the upper blade, the heater circuit being operatively connected in series with the switch, the improvement of a ready light circuit including a third blade mounted cantilever-fashion and disposed between and generally aligned with the other blades, the upper blade and third blade having aligned contact points, the bimetallic element adapted in conditions approaching heat-demand to cause upward movement of the distal end of the third blade to adjacent the upper blade to close the contact points, the ready light and the contact points being operatively connected in series and across the contact zones of the upper and lower blades.

4,189,856

RUG HOOKING RACK

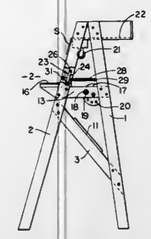
Leonard T. Cookson, 6539 N. 48th St., Paradise Valley, Ariz. 85253

Filed Feb. 22, 1978, Ser. No. 879,874
Int. Cl.² D05C *1/02;* D06C *3/08*
U.S. Cl. 38—102.4 **10 Claims**

1. A device for holding base material in a rug hooking operation comprising in combination:

means providing a table surface and frame means holding said table surface in selected fixed relationship to a base support;

restraining means holding a sheet of base material for said hooking operation in fixed relationship to said table surface and for advancing said sheet of base material stepwise at the will of an operator toward said table surface;



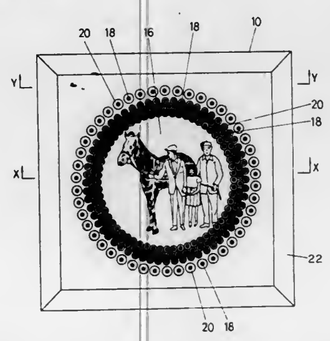
hold-down clamp means adjacent said table surface, having continuously opposed parts relatively shiftable for sandwiching said base material both loosely to permit free sliding thereof through said hold-down clamp means and, alternately, fixedly with respect to said table surface.

4,189,857

DECORATIVE ARTICLE ASSEMBLY

Kenichi Fujisawa, No. 21, Kano, Yanagi-machi, Gifu City, Gifu Prefecture Japan

Filed Jun. 17, 1977, Ser. No. 807,551
Int. Cl.² G09F *1/10*
U.S. Cl. 40—158 R **1 Claim**



1. A decorative article package for assembly with at least one inlay, such as a tapestry, or a photograph, comprising:

a shaped foundation pierceable by a needle, such as made of plastic foam;

a covering material for said foundation conformingly shaped with said foundation;

a transparent sheet conformingly shaped with said foundation and having peripheral edges permitting a fixed assembly of said foundation with said cover and inlay in parallel adjoinment;

at least a first set of mounting pins, each having a preferably decorative head and a pin-needle,

additional decorative pins, each having a decorative head, preferably of several sizes and configurations, and

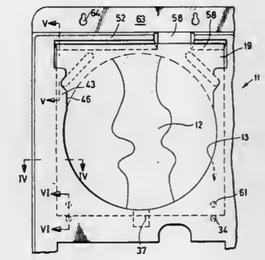
a frame conformingly shaped to extend over said foundation.

4,189,858

APPARATUS FOR JOINTLY EXAMINING AND DEPOSITING A PLURALITY OF TRANSPARENT PICTURES

Frank de Bruin, Kalk-Muhlheimer Strasse 400, 5 Koln 80, Fed. Rep. of Germany

Continuation of Ser. No. 723,703, Sep. 16, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 917,852
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541326
Int. Cl.² G09F *1/10*
U.S. Cl. 40—158 B **4 Claims**



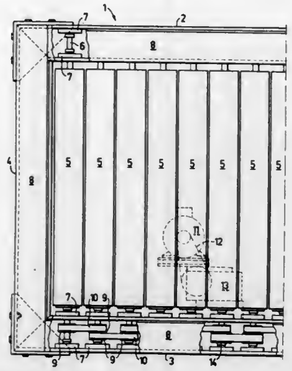
1. Apparatus for easily automatically and manually exchanging while readily retaining for jointly viewing, a plurality of transparent films in the vicinity of 10 CM×10 CM in size in front of a flat or planar light source such as a focusing screen, illuminated from the rear side, comprising; substantially planar frame means having front and rear cover plates of thermoplastic material defining pocket-like compartments arranged longitudinally and transversely therein, said plates being thicker than the film and being spaced apart in the area of said compartments by a distance several times greater than the thickness of the film and providing lateral guide means in said compartments spaced apart laterally by the width of the film and arranged and adapted for insertion and removal of a film therealong, stop means defining an end position for insertion of the film, said front cover plate and said rear cover plate having apertures adapted to the picture size of the film and aligned with each other, said apertures being free of glass and other facing and backing and at least partly arch shaped at their lower edges, said frame means having insert openings which extend on an inclined to the plane of said frame means and lead into said lateral guide means, narrow webs on said front cover plate extending at the sides of said compartments to overlap a small portion of the film and defining the side of said insert opening towards said apertures of said cover plates an inclined face on said frame means defining said insert opening on its upper side, said inclined face commencing from said rear cover plate without a stop or other blocking barrier to a position above the upper edge of a fully inserted film, the distance between the lower stop means and the inner edge of said inclined face being less than the length of the film, measured in the insert direction, by part of the width of the unexposed edge of the film so that said inclined face of the frame portion cooperates with said stop means to bend the upper portion of the film in its fully inserted position at the transition between said inclined face and said rear cover plate to readily retain the lower portion of the film in contact with said stop means, said frame portion which defines the insert opening at its upper side having a recess in it which maintains an edge of the film free and at a distance from said rear cover plate for easy removal of the film from said compartment, and one of said cover plates having a lower recess extending upwards into its aligned aperture for easy movement of the film, which recess is shielded by the other cover plate and extends below the stop means.

4,189,859

DEVICE AT DISPLAY ARRANGEMENT

Stig B. Ahlgren, Malmo, Sweden, assignor to Prisma Neon AB, Malmo, Sweden

Filed Aug. 8, 1977, Ser. No. 822,714
Claims priority, application Sweden, Aug. 9, 1976, 7608882
Int. Cl.² G09F *11/02*
U.S. Cl. 40—505 **4 Claims**



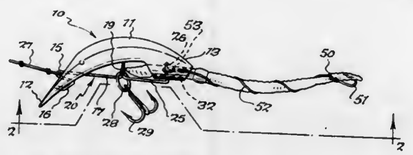
1. A display comprising:
a frame;
prisms rotatably mounted in said frame, each of said prisms including adjacent longitudinally extending side surfaces, each set of associated side surfaces of said prisms providing a display when rotated to a side by side position defining a permanently recurring sequence with the number of displays corresponding to the number of side surfaces on each prism;
each prism being provided with a first rotation axle at one end thereof and a second rotation axle at an opposite end thereof;
bearing means disposed on said frame for freely supporting said first and second axles of said prisms;
drive motor means and a transmission for rotating said prisms synchronously, said drive motor means being connected to one of said first rotation axles;
gear discs mounted on said first rotation axles of said prisms; and
belt means mounted on said gear discs for rotating said gear discs and said prisms when said one of said first rotation axles is driven by said drive motor means, said belt means being toothed for meshing with said gear discs.

4,189,860

BAIT CARRIER AND DRIVER

Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed May 8, 1978, Ser. No. 903,663
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.29 **7 Claims**



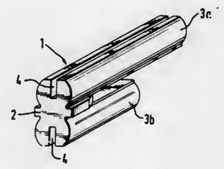
1. A bait carrier comprising;
a body having a driver lip, a floatation portion and a tail portion having a bait cavity;
a spring wire shank member having a laterally disposed anchor bend and pull eye at a first end, a laterally disposed bait keeper at a second end and a finger piece intermediate of the first and second ends;
wherein said shank member has said anchor bend and pull eye at its first end firmly imbedded in said body above said driver lip and below said floatation portion, about at the center of oscillation, while said finger piece and said keeper at its second end are free for movement but biased toward said body;
and whereby when said keeper is retracted, a fish bait may be entered into said cavity and retained therein when said keeper is released.

4,189,861

ASSEMBLY KIT AND A CONNECTING ELEMENT FOR CONNECTING STRUCTURAL ELEMENTS THEREOF

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, (Tumlingen), Fed. Rep. of Germany

Filed Jan. 20, 1978, Ser. No. 871,108
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708129
Int. Cl.² A63H *33/10*
U.S. Cl. 46—26 **14 Claims**



1. An assembly kit, comprising a first structural element having a face and at least one groove which is open at said face; a second structural element having a wall which has a predetermined thickness and a surface which is positionable onto said face of said first structural element, said second structural element having at least one further groove extending inwardly of said wall; and a substantially U-shaped connecting element having two elongated portions each having two sections which are spaced from one another in a direction of elongation, said elongated portions of said connecting element being connected with one another by an intermediate portion only in the region of their one end sections so that remainder sections of said elongated portions are not connected with one another and spaced from one another to form a gap therebetween which has a transverse dimension substantially equal to the thickness of said wall of said second structural element, one of said elongated portions of said connecting element being insertable into said further groove of said second structural element so that the remainder section of said one portion extends completely inwardly of said wall, the remainder section of the other elongated portion extends completely outwardly of said wall, the wall is received in said gap between said remainder sections of said elongated portions, and said connecting element is firmly clamped on said wall of said second structural element as a result of said dimensioning of said gap, said other elongated portion of said connecting element being insertable into said one groove of said first structural element so as to connect the structural elements with one another.

4,189,862

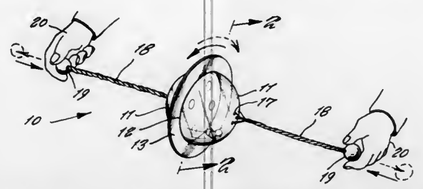
STRING TOP

Ana Lopez, 400 W. 43 St., Apt. 11N, New York, N.Y. 10036

Filed May 5, 1978, Ser. No. 903,090
Int. Cl.² A63H *1/28, 27/12*
U.S. Cl. 46—63 **1 Claim**

1. A string top, comprising in combination, a globe held between two sets of strings, said globe being comprised of two, hollow, transparent, hemi-spherical domes with a flat circular

disc therebetween, a plurality of holes through said disc and a plurality of marbles inside said globe so as to freely roll through said holes between said domes; a plurality of openings on diametrically opposite side of said globe, each said set of



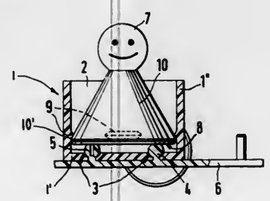
strings comprising a plurality of individual strings each one of which is directly attached in one of said openings, said openings at each said side of said globe being a distance apart that is greater than a diameter of a stranded cord formed by said strings when rolled up together.

4,189,863

HOLLOW STRUCTURAL ELEMENT AND AN ASSEMBLY KIT INCLUDING THE SAME

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,413
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 7635178[U]
Int. Cl.² A63H *13/00*
U.S. Cl. 46—116 **10 Claims**



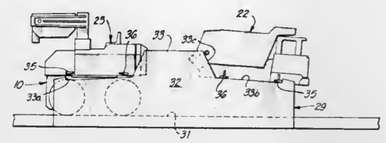
1. A toy assembly kit, comprising a hollow structural element forming a compartment and having a hollow body portion, said hollow body portion having an open end, a wall located opposite to said open end and provided with an opening, and side walls each having a projection; a toy figure insertable into said body portion through said open end and having a lower section adapted to be located inwardly beyond said projections of said body portion and to be engaged by said projections in inserted condition, so that said toy figure is retained in said body portion of said structural element, said lower section of said toy figure having a predetermined height; and another structural element having a connecting projection adapted to pass through said opening of said opposite wall of said body portion and to extend inwardly beyond said opposite wall by a predetermined height, so that said other structural element is connected with said hollow structural element, said projections of said side wall being spaced from said opposite wall of said body portion for a distance substantially equal to said predetermined height of said lower section of said toy figure plus said predetermined height for which said connecting projection of said other structural element extends inwardly beyond said opposite wall, so that said toy figure in the inserted condition abuts against said connecting projection of said other structural element when the latter is connected with said body portion.

4,189,864

SELF-POWERED TOY VEHICLE CHASSIS AND AUTOMATICALLY INTERCHANGEABLE BODIES

Makoto Saito, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,233
Claims priority, application Japan, Dec. 6, 1976, 51-146803
Int. Cl.² A63H *19/00*
U.S. Cl. 46—202 **3 Claims**



1. A wheeled vehicle toy comprising:
a chassis having a plurality of rollable wheels mounted thereon and at least one vehicle body adapted to be removably received by said chassis, and
vehicle body receiving and dispensing means whereby when said chassis rolls through said receiving and dispensing means with one of said vehicle bodies thereon, said vehicle body will be removed from the chassis without materially impeding the movement of the chassis, and wherein
said vehicle body receiving and dispensing means comprises a vehicle body support having a generally horizontal base portion defining a roadway for said wheeled chassis and a pair of spaced, generally vertical parallel mutually similarly shaped side walls with upper surfaces, at least a portion of each said upper surface thereof being relatively sharply inclined forwardly and upwardly relative to the direction of approach of said chassis to said vehicle body support and said vehicle body including a plurality of projection means extending therefrom and adapted to operatively engage that portion of the upper portion of said side walls defining said incline whereby when said chassis carrying one of said vehicle bodies passes through said vehicle body support, said projection means will engage said inclined portion of the upper surface of said side walls thereby lifting said body off said chassis and into an overhead storage position.

4,189,865

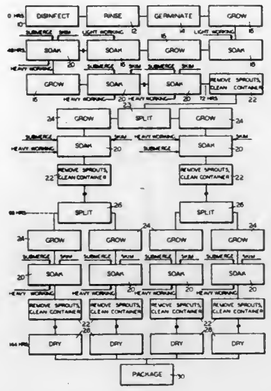
PROCESS FOR GROWING SPROUTS

William F. Stewart, 3814 NW. 122nd St., Vancouver, Wash. 98665, and Charles W. Baldwin, 7805 NE. 27th St., Vancouver, Wash. 98662

Filed Oct. 5, 1978, Ser. No. 948,828
Int. Cl.² A01G *31/02*
U.S. Cl. 47—14 **13 Claims**

1. The method of growing sprouts from seeds comprising:
(a) germinating the seeds into sprouts by submerging them in water until said seeds have germinated;
(b) circulating said water continuously so that said water is constantly being replaced by fresh water;
(c) draining the sprouts and thereafter allowing them to stand for a predetermined time interval;
(d) soaking the sprouts in fresh water for a time less than said predetermined time interval;
(e) draining said water from the sprouts and thereafter al-

lowing them to again stand for said predetermined time interval; and



(f) cyclically repeating steps d and e until the sprouts have matured to the desired degree.

4,189,866

POLYMER-OPTICAL BRIGHTENER COMBINATIONS IN TRANSPARENT FILM FORM USEFUL AS GLAZING MATERIALS CAPABLE OF MODIFYING PLANT GROWTH RATE

Michael F. Treadaway, Skelmersdale, England, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,592

Claims priority, application United Kingdom, Jan. 30, 1976, 3741/76

Int. Cl.² B32B *27/06, 27/18, 27/32;* **C09K** *11/06;* **F21V** *9/16*

U.S. Cl. 47—58 **4 Claims**

1. A process for promoting the growth of plant life which comprises subjecting said plant to visible light transmitted through a polymeric material comprising a polymer selected from the group consisting of polyvinyl chloride, polyethylene and copolymers of ethylene; a hydroperoxide scavenger, and 2,5-di(5-tert-butyl-2-benzoxazolyl) thiophene.

3. A polymeric material transmissive to visible light comprising a polymer substrate selected from the group consisting of polyvinyl chloride, polyethylene and ethylene copolymer and a surface coating thereon comprising 2,5-di-(5-tert-butyl-2-benzoxazolyl) thiophene and a hydroperoxide scavenger.

4,189,867

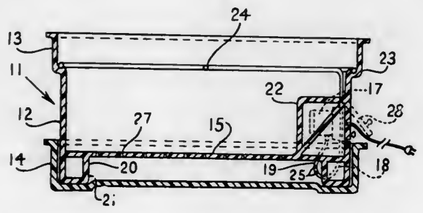
HYDROPONIC UNIT

Stuart Schneck, 766 Teresita Blvd., San Francisco, Calif. 94127

Filed Jan. 18, 1978, Ser. No. 870,477

Int. Cl.² A01G *31/02, 25/06*

U.S. Cl. 47—62 **8 Claims**



1. A hydroponic unit comprising:

a container for holding nutrient solution;

a tray for holding growing medium, the tray having a perforated bottom and a lower portion shaped to fit securely within the container and to define an enclosed space for nutrient solution between the underside of the tray bottom and the upper surface of the container bottom,

an air pump contained entirely within the tray in a compartment positioned above the enclosed space between the tray and container and below the top of the tray; and

a tube running from the pressure side of the pump downwardly into the enclosed space between the tray and container and then up the side of the tray to an upper level thereof, and along a peripheral supporting ledge on the inner sidewalls of the tray, said tube having a series of spaced-apart liquid exit apertures along the portion of the tube disposed at the upper level of the tray, and at least one liquid entry aperture at the portion which extends into the enclosed space between the tray and container, such that pressurized air flowing through the tube draws nutrient solution into the tube through the liquid entry aperture and dispenses an air-nutrient solution into said growing medium through the liquid exit apertures.

4,189,868

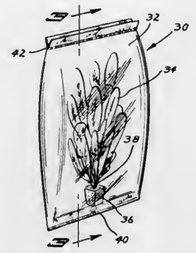
PACKAGE FOR PERISHABLE PRODUCE

Donald L. Tymchuck, Minnetonka; Nelson J. Beall, St. Michael; Noel Davis, Wayzata, and William M. Dreier, Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 22, 1978, Ser. No. 880,242

Int. Cl.² B65D *85/52*

U.S. Cl. 47—84 **6 Claims**



1. In combination, comprising a completely enclosed and sealed bag formed of a flexible, substantially gas impervious plastic film material, said bag having front and back side walls which are spaced relatively far apart intermediate the length thereof and converging downwardly to form a relatively narrow bottom portion and converging upwardly to form a relatively narrow top portion, produce enclosed within said bag and occupying a substantial portion of the bag's interior in a vertical direction, absorbent means within said bag in which said produce has been grown from seed, said absorbent means being positioned within the confines of said relatively narrow bottom portion whereby at least some of any moisture that has collected at said relatively narrow bottom is absorbed by said absorbent means and reused by the produce to compensate for the moisture lost by transpiration and at least an upper portion of said produce being positioned between said upwardly converging side walls, and means for storing and preserving said bag and produce in a refrigerated environment in which a temperature differential is apt to exist on the surface of the bag.

4,189,869

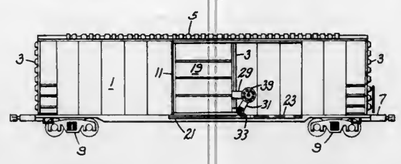
RAILWAY CAR DOOR MOVING MEANS

James J. Hennessy, Chambersburg, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed Jul. 26, 1978, Ser. No. 928,300

Int. Cl.² E05F *11/54*

U.S. Cl. 49—358 **16 Claims**



1. Door moving structure for a railway house car having a side wall with a door opening, a door slidable along the wall to close and expose the door opening, an elongated track below the door for movably supporting the door between closed and open positions, a toothed rack mounted on said door track and extending longitudinally thereof, bracket structure mounted on the door adjacent the rear edge thereof and extending rearwardly therefrom with its upper portion at a level substantially higher than said door track, a pinion meshing with said rack and having its shaft journaled on the lower part of said bracket structure and a sprocket on said pinion shaft, a driving sprocket having its shaft journaled on an upper portion of said bracket structure, an endless chain operatively connecting said sprockets and a manually actuable member fixed to said driving sprocket shaft for selective manual rotation of said pinion whereby to effect opening and closing movements of said door, said driving sprocket shaft and manually actuable member thereon being positioned at a level substantially higher than said door track whereby to permit and facilitate operation of said pinion by an operator standing on a surface near the level of said door track.

4,189,870

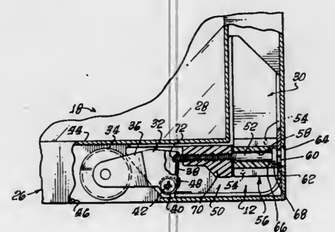
PATIO DOOR ROLLER ASSEMBLY

B. J. Helmick, 303 Deborah Ct., Upland, Calif. 91786

Filed Oct. 30, 1978, Ser. No. 955,960

Int. Cl.² E05D *13/02*

U.S. Cl. 49—420 **8 Claims**



1. A bottom supporting roller assembly for a sliding door, comprising:

a mounting bracket to be installed along the bottom edge of said door,

a roller bracket pivot on said mounting bracket on a normally horizontal axis for rotation between extended and retracted positions relative to said mounting bracket,

a roller on said roller bracket having its axis parallel to said pivot axis,

a rotary axially stationary combined lead and lock screw journaled in said mounting bracket with its axis normal to and laterally spaced from said pivot axis and having a tip end engageable in a threaded hole in said roller bracket when the latter bracket occupies its retracted position to releasably secure said roller bracket in said retracted position, and

a non-rotatable follower member threaded on said screw, whereby rotation of said screw in one direction unthreads said screw from said roller bracket to release said roller bracket for extension and thereafter advances said follower member against said roller bracket to extend said roller bracket.

4,189,871

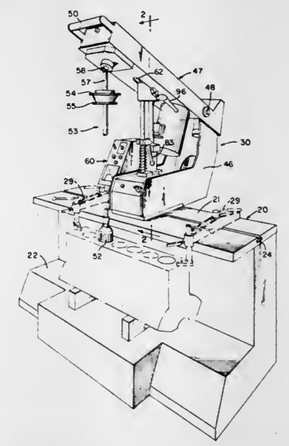
HONING MACHINE

Donald B. Rottler, Seattle; David Engnell, Issaquah, both of Wash., and Donald B. Rottler, Seattle, assignors to Rottler Boring Bar Co., Kent, Wash.

Filed Jun. 1, 1978, Ser. No. 911,494

Int. Cl.² B24B *5/08*

U.S. Cl. 51—34 J **17 Claims**



1. In a honing machine of the type having a base assembly, a power head unit mounted for vertical swinging movement on the base assembly, and a honing tool assembly suspended from a universal drive connection with the head unit, the improvement comprising,

double-acting cylinder means pivotally mounted on the base assembly for reciprocating said head unit up and down, and including a piston rod,

first clamping means pivotally mounted on the head unit and operatively associated with said piston rod for selectively clamping the head unit to the piston rod at selected locations therealong to define an upper limit of swing movement of the head unit, said head unit being free to be hand stroked up and down when said first clamping means is not engaged,

a second rod carried by said cylinder means in parallel relation to said piston rod and slidably received by said first clamping,

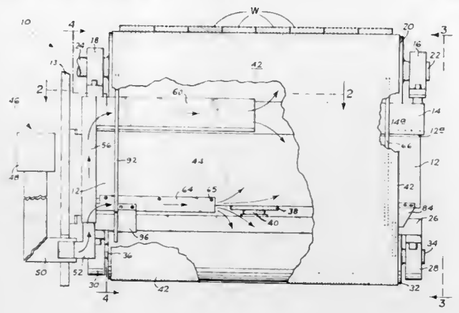
and second clamping means slidably mounted on said second rod below the head unit and adapted to grip the second rod at selected locations therealong, said second clamping means being arranged to be engaged by said first clamping means to define the lower limit of swing movement of the head unit when the head unit is power stroked or manually stroked up and down.

4,189,872

ABRADING APPARATUS AND METHOD HAVING INDUCED AIR

F. David Evans, Eugene, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.

Filed Jun. 5, 1978, Ser. No. 912,365
Int. Cl.[2] B24B *21/00, 1/00*
U.S. Cl. 51—135 R **11 Claims**



1. In apparatus for abrading a workpiece including a central support member having mounted thereon a power-driven contact roll and an idler roll, and an endless, abrasive belt trained over the rolls with an air space being defined between inside surfaces of the belt and the central support member, the improvement comprising:

sealing means provided adjacent opposite ends of each roll and on opposite sides of the central support member for substantially sealing the air space; and

pressurizing means operatively communicating with the air space for maintaining same at a pressure greater than the prevailing air pressure adjacent the outside surfaces of the belt to thereby create a plenum chamber and substantially prevent inflow of abraded debris to the air space.

8. A method for substantially preventing inflow of abraded debris into an air space in an abrading apparatus, the air space being defined as the entire region between the inside surfaces of an endless, abrasive belt and a central support member, the central support member supporting a power-driven contact roll and an idler roll over which the belt is trained, the method comprising:

substantially sealing the air space; and

pressurizing the air space to thereby create a plenum chamber so that the pressure therewithin is greater than the prevailing air pressure adjacent the outside surfaces of the belt.

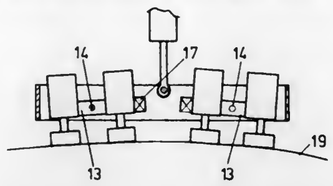
4,189,873

MACHINE FOR TRUING THE BEARING SURFACE OF THE RAILS OF A RAILROAD TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland and Frank Speno Railroad Ballast Cleaning Co. Inc., East Syracuse, N.Y.

Continuation of Ser. No. 645,472, Dec. 30, 1975, abandoned. This application Nov. 29, 1977, Ser. No. 856,767
Claims priority, application Switzerland, Feb. 25, 1975, 002372/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 **2 Claims**

1. A machine for truing the bearing surface of a rail of a railroad track, said machine comprising a frame movable over the rail, a train of contact elements coupled to said frame for being driven one behind the other over and along said rail tangentially of said bearing surface with said contact elements in contact with said rail, said contact elements each comprising a grinding means for truing the bearing surface of the rail, support means supporting said contact elements for movement relative to the frame in the direction of said bearing surface to permit said contact elements to reach a predetermined position relative to the rail as the frame moves over the rail, and locking means for locking said contact elements in said predetermined position, said train of contact elements comprising two groups each of two contact elements, a pair of beams and means mounting said groups on said beams, respectively, said support means including pivot means supporting the beams on said frame for pivotal movement thereof about axes located between the contact elements of said groups, said locking means comprising hydraulic cylinder means for locking a respective said beam and the contact elements thereon with respect to said frame, jack means acting on said frame for urging all the contact elements uniformly with greater or lesser force against the rail, said jack means comprising a jack connected to said frame midway between said beams, each contact element comprising an associated drive means coupled therewith.

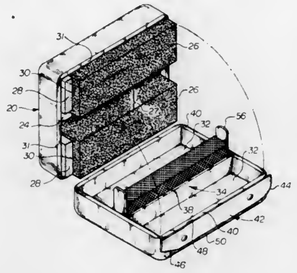


4,189,874

HAND HELD POCKET SIZE SKI REPAIR AND MAINTENANCE TOOL

Daniel J. Labriola, 35 Mt. Olympus Dr. SW., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 808,190, Jun. 20, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,899
Int. Cl.[2] B21K *17/00*
U.S. Cl. 51—181 R **16 Claims**



1. A hand held and used pocket size ski repair and maintenance tool operated for selected reconditioning steps undertaken to refurbish the running surfaces of snow skis, comprising:

(a) a two piece hollow, hand-held body with surrounding sides transversely separable across a major cross section, the upper hollow piece having a cavity, and the lower hollow piece having a cavity;

(b) cork material as a tool for polishing the bottoms of skis, mounted in the cavity of one of the hollow pieces and sized to leave a space to accommodate other tools and to extend down into a cavity of the other hollow piece;

(c) abrasive stone material for deburring ski edges and removing scratches, mounted adjacent the cork material and sized to be extended a shorter distance down into a cavity of the other hollow piece; and

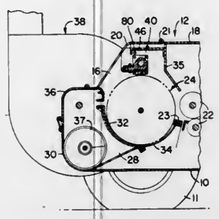
(d) file means to file both the vertical and horizontal surfaces of ski edges and bottom fitted into the cavity of the other hollow piece and sized to extend alongside the cork material and the abrasive stone material positioned in said one hollow piece of said tool.

4,189,875

HARVESTER CUTTERHEAD KNIFE SHARPENING DEVICE

John M. Flenniken, Senonches, France, assignor to Deere & Company, Moline, Ill.

Filed Jul. 10, 1978, Ser. No. 923,266
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—250 **9 Claims**



1. In a forage harvester having a cutterhead housing with opposite side walls and a door swingable between open and closed conditions to provide access to the housing interior, a rotary cutterhead mounted in the housing and having a plurality of knives with cutting edges generating a cylinder as the cutterhead rotates, and a knife sharpening mechanism mounted in the cutterhead housing and including an adjustable support structure and a sharpening element mounted on the support structure and shiftable therewith in opposite directions toward and away from the cutterhead periphery and means connected to the support structure for adjusting it in said opposite directions and including a rotatable element rotatable in first and second directions to respectively cause adjustment of the support structure toward and away from the cutterhead periphery, the improvement comprising:

a locking element on the rotary element;

a locking member mounted on the housing and shiftable between a first position wherein it is engageable with the locking element to prevent rotation of the rotatable element in at least the first direction and a second position wherein it clears the locking element;

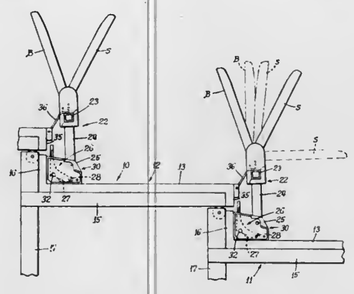
and means operatively connecting the door to the locking member to shift the locking member to its second position only when the door is closed.

4,189,876

BEAM-MOUNTED FOLDING CHAIRS

Philip E. Crossman, and Arthur L. Van Ryn, both of Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Aug. 7, 1978, Ser. No. 931,562
Int. Cl.[2] E04H *3/12*
U.S. Cl. 52—9 **13 Claims**



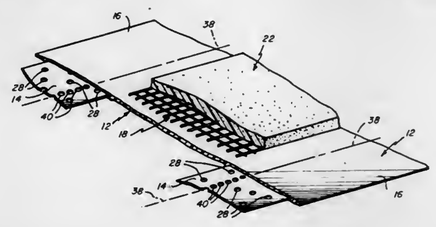
1. In combination with a telescoping row system including a plurality of rows extendable to a use position in which the rows are in stepped relation, and retractable to a storage position in which the rows are generally vertically aligned, said system including seating means and automatic mechanism for raising said seating means to a use position when said rows are extended and for lowering said seating when said rows are retracted, improved seating comprising: frame means adapted for movement between a use and a storage position by said automatic mechanism; at least one chair carried by said frame means and movable therewith, said chair including a seat, a back and hinge means for mounting said seat and said back to said frame means for independent pivotal motion about horizontal axes; resilient means for biasing said seat to a raised position when it is unoccupied while permitting said seat to be lowered for occupancy; and means permitting said back to be pivoted forwardly for closing, said seat and back fitting in the vertical space between rows when said rows are retracted.

4,189,877

EXPANSION JOINT COVER

Arthur P. Jentoft; Joseph P. Anghinetti, both of Kennebunkport, and Paul A. Couture, Emery Mills, all of Me., assignors to York Manufacturing, Inc., Sanford, Me.

Continuation of Ser. No. 708,877, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 584,051, Jun. 5, 1975, abandoned. This application Oct. 30, 1978, Ser. No. 956,083
Int. Cl.[2] E04B *1/68*
U.S. Cl. 52—58 **6 Claims**



1. An expansion joint cover comprising:

an elongate main strip of a predetermined width;

an elongate strip of insulative material secured to and extending along one surface of the main strip, the insulative strip being of less width than the main strip thereby to define a pair of longitudinally and transversely extending flange portions of the main strip on opposite sides of the insulative strip;

each of the flange portions having an elongate nailing strip embedded therein and extending along the length thereof, and being of a width which is more than one-half that of its respective flange portion, each of the nailing strips having a plurality of nailing holes formed therein; and

each of the nailing strips being formed to define a single, longitudinally extending bend line which is substantially weaker than any other portion of the nailing strip, said bend line being disposed at a predetermined location on the nailing strip, whereby when the nailing strip is bent, it will bend along said bend line, at said predetermined location.

4,189,878

HOUSE ROOF INSULATION VENT

Gerald A. Fitzgerald, 4937 Drew Ave. S., Minneapolis, Minn. 55410

Filed Apr. 15, 1977, Ser. No. 787,897
Int. Cl.[2] E04B *1/74;* **F24F** *7/00*
U.S. Cl. 52—95 **4 Claims**

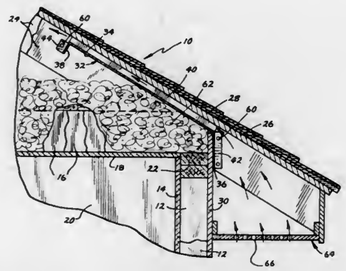
1. A house roof insulation vent for use in a house having an enclosed room partially defined by an outer wall including

vertical outer wall sheathing and a horizontal upper outer wall plate, spaced apart, parallel attic floor joists supported above said outer wall plate, and a room ceiling layer depending from said joists; said house also having spaced apart inclined roof rafters supported above said outer wall plate and extending beyond said outer sheathing, roof boards fastened on upper edges of said rafters, and insulating material covering said ceiling layer to a substantial depth; said insulation vent providing an air passage free of insulating material along and spaced from said roof boards from outside of said sheathing to well above the depth of insulating material; and said insulation vent including:

A. a rectangular roof clearing sheet extending between adjacent roof rafters;

B. roof clearing sheet spacer flanges extending integrally upwardly from said roof clearing sheet into contact with the underside of said roof boards to maintain said roof clearing sheet at a predetermined spaced relationship with respect to said roof boards;

C. a roof clearing sheet stiffener tab integral with an upper end of said roof clearing sheet and extending away from it and away from said roof boards in normal relationship to said roof clearing sheet;



D. stiffener tab positioning flanges integral with side edges of said stiffener tab and extending outwardly therefrom along the surfaces of adjacent roof rafters;

E. means fastening said stiffener tab positioning flanges to said rafters to maintain said tab in fixed relation to said roof clearing sheet; and

F. means at a lower portion of said roof clearing sheet for sealing said roof clearing sheet to said outer wall sheathing to prevent passage of insulating material between said roof clearing sheet and outer house wall, said means including:

(1) an outer wall sheathing contact sheet integral with a lower end of said roof clearing sheet and extending away from it and away from said roof boards,

(2) sheathing contact sheet positioning flanges integral with side edges of said sheathing contact sheet and extending outwardly therefrom along the surfaces of adjacent roof rafters, and

(3) means fastening said sheathing contact sheet positioning flanges to said roof rafters to fixedly position said sheathing contact sheet in sealing relationship with respect to said wall sheathing.

4,189,879

EARTH ANCHOR

Merle W. Patterson, 2635 E. 28th St., Tulsa, Okla. 74114

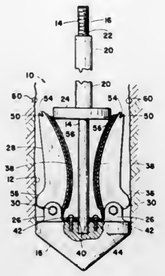
Filed Dec. 5, 1977, Ser. No. 857,781
Int. Cl.² E02D *5/74*
U.S. Cl. 52—161 **7 Claims**

1. An earth anchor for securing objects to the earth comprising:

(a) an elongated anchor rod having inner and outer ends;

(b) a plurality of extendable anchor arm members having inner and outer surfaces pivotally carried by the inner end of the anchor rod;

(c) a single flexible skirt member secured to the anchor arms such that when the anchor arms are extended into the earth, the skirt member is spread over the outer surface of the extended anchor arms to provide an enlarged retaining surface; and



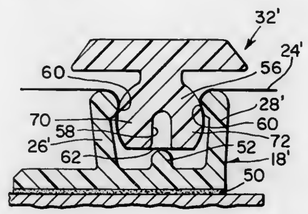
(d) cam follower means carried by the anchor rod and operably engageable with the anchor arm members through the skirt member for extending the anchor arms into the earth.

4,189,880

COMBINATION MOUNTING FRAME AND FILM FOR A WINDOW

Gene Ballin, P.O. Box 403, Locust Valley, N.Y. 11560

Filed Jun. 16, 1978, Ser. No. 915,976
Int. Cl.² E06B *3/26*
U.S. Cl. 52—202 **6 Claims**



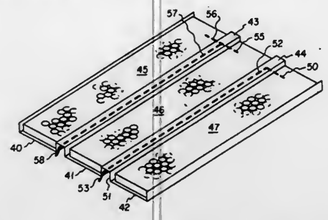
1. Improvements for a frame attached about a window for holding a plastic sheet in a taut condition in covering relation over said window of the type employing mounting strip means in surrounding relation to said window consisting of spaced apart walls bounding a sheet-engaging channel therebetween and having a sheet-engaging member sized to be inserted into said channel incident to frictionally engaging said sheet against said walls, the improvements to said frame comprising a cooperating pair of interfitting projection and groove means for stretching said plastic sheet free of wrinkles during said insertion of said sheet-engaging member into said channel, said projection being centrally located in upstanding relation along said channel and said groove being formed in said sheet-engaging member in facing relation thereto, whereby the initial movement of said member into said channel frictionally engages said sheet against said walls thereof to provide a corresponding initially taut condition in said sheet and subsequent insertion movement thereof thereafter forces said projection into said groove with said sheet in an interposed position therebetween to cause the further stretching out of any wrinkles in said sheet.

4,189,881

PHOTOVOLTAIC ROOF CONSTRUCTION

Wilbur W. Hawley, Danville, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 12, 1979, Ser. No. 19,960
Int. Cl.² E04D *12/00*; H01L *31/04*
U.S. Cl. 52—220 **4 Claims**



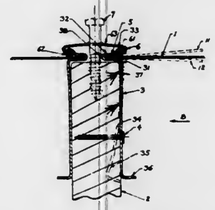
1. In a batten-seam and pan roof construction, the improvement comprising at least one photovoltaic cell module carried by said roof, and at least one electrical conduit means connected to said at least one photovoltaic module, said electrical conduit means being disposed primarily under the battens of said roof.

4,189,882

TRANSLUCENT ROOFING MEANS

Henry Harrison, and Henry C. Harrison, both of Locust Valley, N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,611
Int. Cl.² E04B *1/00*; E04C *1/34*; E04D *1/36*
U.S. Cl. 52—222 **5 Claims**



1. Roofing means comprising a panel capable of withstanding tension loads, means for securing the panel onto a frame comprising an elastic tensioned clamping member joining said panel in tensioned relation to said frame and a deformable elastic sealing member secured between said clamping member and said panel, said elastic clamping member comprises a clamping member having a channel adapted to receive the edge of said panel and a spline which can be jammed into said channel together with said panel edge to hold said panel edge in firm frictional clamped relation with said clamping member.

4,189,883

COMPOSITE SYSTEM FOR FLOOR FRAME MEMBERS

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940

Filed Aug. 4, 1978, Ser. No. 930,950
Int. Cl.² E04B *1/16*
U.S. Cl. 52—250 **4 Claims**

1. An improved composite steel and concrete slab system for floor framing members comprising:

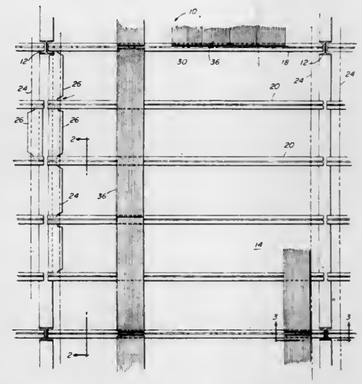
a plurality of spaced apart, weight bearing vertical columns;

a plurality of spaced apart, weight bearing horizontally oriented beams extending longitudinally between said columns;

a plurality of spaced apart, weight bearing composite-type joists extending transversely between said columns and secured thereto;

a plurality of intermediate, spaced apart, weight bearing non-composite-type joists extending transversely between said beams and secured thereto;

unpunched corrugated decking extending longitudinally from one composite-type joist to the next composite-type joist and extending laterally from one beam to the adjacent beam; thus covering an area defined by four columns at its perimeter;



a plurality of downward sloping beam pans secured to support rods positioned longitudinally along said beams and extending into the end positions of all of said joists such that poured in place concrete can flow down to said beams and haunch between the ends of abutting joists;

a concrete slab poured in place over said corrugated decking such that said composite-type joists become composite with said slab, said non-composite type joists have composite end connections with said slab, and said beams become composite with said slab.

4,189,884

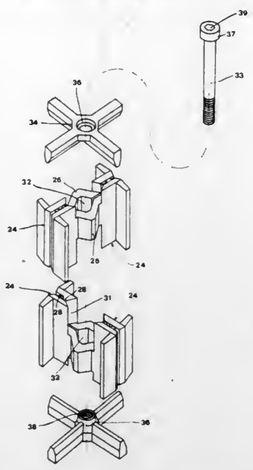
COMPLEX STRUCTURE OBTAINED FROM THE UTILIZATION OF PARTICULAR CLAMPS

Irmo Pecoraro, Via Palazzi, 2, Milano, Italy

Filed Oct. 28, 1977, Ser. No. 846,559
Int. Cl.² E04B *2/72*
U.S. Cl. 52—285 **4 Claims**

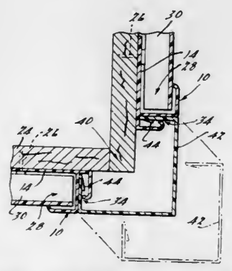
1. A three way or four way clamp adapted to carry out the assembly of at least two panels which comprises four members, each member being formed substantially by two rectangular plates which are parallel and connected by a dihedral structure, the said plates having inclined edges and being coupled in pairs, said plates being provided with a continuous relief, said clamp being intended for use with spiders by means of a screw, wherein the said dihedral structure is off-center relative to the transversal axis of the plates, so that said pairs fit into each other according to a mutually orthogonal arrangement, said dihedral structures delimiting a through-hole, said screw fitting into said through-hole, said screw connecting said spiders, wherein the said spiders show a central core of frustoconical

shape and are provided with arms having a substantially trapezoidal section, said spiders pressing on the inclined edges of the



two pairs of said plates and forming a cylindrical seat to receive the head of the said screw and an inner threading.

4,189,885
CHANNEL MEMBER FOR SIDING CONSTRUCTION
Jack E. Fritz, Walled Lake, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.
Filed Aug. 29, 1978, Ser. No. 937,878
Int. Cl.[2] E04F *13/06*
U.S. Cl. 52—287 **13 Claims**



1. An elongated trim strip for siding construction on a structure, said trim strip having a first channel adapted to retain a relatively thick edge portion of one siding element and a second channel adapted to retain a relatively thin edge portion of another siding element, said trim strip comprising:

a rear panel adapted to be secured to said structure;

a first transverse panel integral with said rear panel and extending outwardly therefrom;

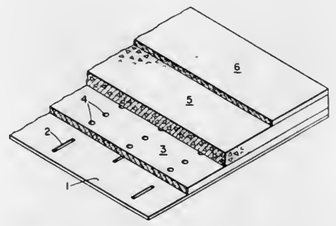
a front panel integral with said first transverse panel and extending generally parallel to said rear panel, said front panel cooperating with said first transverse panel and the portion of said rear panel adjacent to said first transverse panel to form said first channel;

a second transverse panel integral with said rear panel and extending outwardly therefrom, said second transverse panel being positioned on the same side of said rear panel as said first transverse panel, said second transverse panel extending generally parallel to, but a shorter distance than, said first transverse panel and being positioned on the other side of said first transverse panel from said front panel, said second transverse panel cooperating with said first transverse panel and the portion of said rear panel extending between said first transverse panel and said second transverse panel to form said second channel;

means for retaining a relatively thick edge portion of one siding element associated with said first channel; and

means for retaining a relatively thin edge portion of another siding element associated with said second channel.

4,189,886
VENTILATED INSULATED ROOFING SYSTEM
Robert T. Frohlich, Bedford; John L. Wright, Duxbury, and Bruce A. Blessington, Bolton, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.
Continuation of Ser. No. 484,818, Jul. 1, 1974, abandoned, which is a division of Ser. No. 409,849, Oct. 26, 1973, Pat. No. 3,884,009. This application Feb. 13, 1976, Ser. No. 658,145
Int. Cl.[2] E04B *1/16, 1/20*
U.S. Cl. 52—302 **1 Claim**



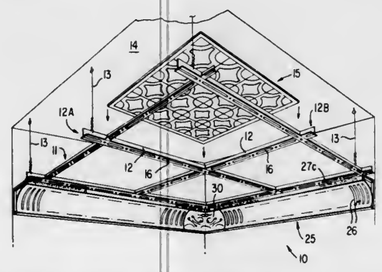
1. A ventilated, insulated roof comprising (a) a subdeck of substantially rigid metal sheeting having apertures therethrough for permitting passage of moisture; (b) a first layer of fluid moisture-bearing construction material over the metal subdeck; (c) a layer comprising a plurality of normally low-permeance insulation boards having upper and lower surfaces and comprised of cellular plastic material selected from the group consisting of foamed polystyrene and foamed polyurethane, said boards further having a plurality of openings therethrough, each said opening extending vertically from said upper surface through the body of said board to said lower surface so that each opening is surrounded by said cellular plastic material, all of said openings being dimensioned sufficiently to pass moisture therethrough, certain of said openings having a widthwise dimension of up to about 0.37 inch in order to prevent fluid, moisture-bearing construction material poured thereon at the job site from entering and substantially filling such openings, other of said openings being from about 1.5 to about 3 inches in a crosswise dimension in order that said construction material will flow into and substantially fill them and thus provide bridges of said construction material to be formed through said board; (d) a second layer of said fluid construction material extending over and in contact with the said upper surfaces of said boards, said second layer of fluid material extending into and substantially filling said openings having a crosswise dimension of from about 1.5 to about 3 inches but not substantially extending into the said openings having a widthwise dimension of up to about 0.37 inch; and (e) a surface layer of waterproofing material above said second layer of construction material, whereby moisture from said second layer of construction material can be directly vented through the vacant openings maintained in said boards, through said first layer of construction material and out said apertures in said metal sheeting.

4,189,887
COPING WITH INLAID TILE
James J. Gallant, 4655 Briercrest Ave., Lakewood, Calif. 90713, and Clarence T. Childress, Whittier, Calif. 90606
Filed May 15, 1978, Ser. No. 905,758
Int. Cl.[2] E04C *2/30*
U.S. Cl. 52—311 **5 Claims**



1. A coping specially formed with an upwardly rising top surface and an adjacent forward surface sloping downwardly opposite from said top surface and a ridge defining the juncture between said top and forward surfaces, and inset areas in said top and forward surfaces for mating inlaid tile.

4,189,888
DECORATIVE CEILING SYSTEM
Jacob H. Blitzer, Jr., 2231 Colby Ave., Los Angeles, Calif. 90064
Filed Mar. 2, 1978, Ser. No. 882,560
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—484 **9 Claims**



1. A decorative ceiling system comprising:

an inverted T-bar grid suspendable from an overhead structure, each T-bar in said grid having a vertical web and a horizontal flange;

a decorative plastic facing strip bonded to the bottom face of each inverted T-bar flange, said facing strip having repetitive design elements relief molded therein, and

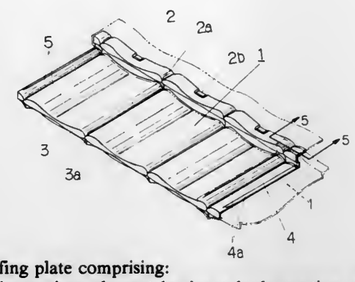
a plurality of like panels supported by said grid, each panel having:

like one of a plurality of different three dimensional decorative relief patterns of symmetric design molded therein, and

a peripheral shoulder recessed from the immediately adjacent panel design surface, said shoulder having a uniform width generally corresponding to the extent of projection of said T-bar flange to one side of said web,

each of said plurality of different panel symmetric designs having relief pattern elements which align with the relief molded repetitive design elements of said facing strip, so that said panels and said facing strips together give the appearance of a continuous geometric and symmetric pattern visually uninterrupted by T-bars.

4,189,889
SHAPED METALLIC ROOFING PLATE
Tomoo Yanoh, 3-1-7, Eifuku, Suginami-ku, Tokyo, Japan
Filed Mar. 16, 1978, Ser. No. 887,177
Int. Cl.[2] E04D *1/34, 1/36*
U.S. Cl. 52—530 **4 Claims**



1. A roofing plate comprising:

a water impervious element having a body portion, and a connected upper edge portion, a lower edge portion, and opposed side edge portions circumscribing said body portion,

said upper edge portion having a generally upwardly extending portion terminating in a forwardly extending projection having a reverse bend,

said reverse bend defining a nail flange,

said lower edge portion including a longitudinally extending depending flange having a complementary extending projection for complementing the forwardly extending projection of the upper edge portion of a like adjacent roofing plate,

and the respective opposed side edges of said plate include a transversely extended groove extending parallel to its respective side edge whereby said opposed side edge portion complements one another so that in the assembled position of like roofing plates, the groove formed adjacent one edge portion of one plate overlies the groove formed adjacent the other end portion of a like roofing plate in spaced relationship to define flow channel therebetween to prohibit any capilliary action from occurring between overlying side edge portions of adjacent roofing plates,

wherein said nailing flange is located at an elevation above said surface of the body portion.

4,189,890
PANEL JOINT
Gurdip S. Bains, and Niles J. Martin, both of Bonneauville Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 8, 1978, Ser. No. 931,647
Int. Cl.[2] E04C *1/18*
U.S. Cl. 52—584 **4 Claims**

1. A panel joint, comprising:

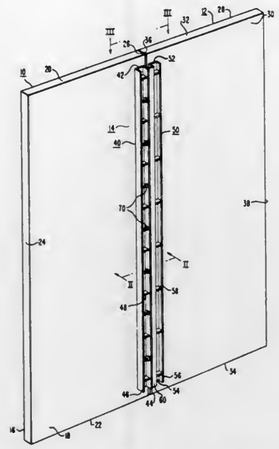
first and second adjoining, upstanding wall panels having front and rear surfaces and adjacent edges which are to be joined together with the front surfaces of the panels in a common plane,

first and second rigid metallic joint elements, said first and second joint elements each having web portions fixed to the rear surfaces of said first and second wall panels, respectively, adjacent to said adjacent edges,

said first joint element including an integral first leg portion perpendicular to its web portion and to the rear surface of said first wall panel, which extends along the edge of the first wall panel which adjoins an edge of the second wall panel,

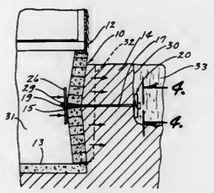
said second joint element including an integral first leg portion perpendicular to its web portion and to the rear surface of said second wall panel, which leg portion is in

spaced parallel relation with the first leg portion of said first joint element,
one of said first leg portions having an integral flanged end perpendicular thereto which extends towards and bridges the space between the other first leg portion, with the outermost edge of said flange contacting the facing side of the other first leg portion,
said first leg portions having a plurality of aligned openings located between the flanged end and said web portions,



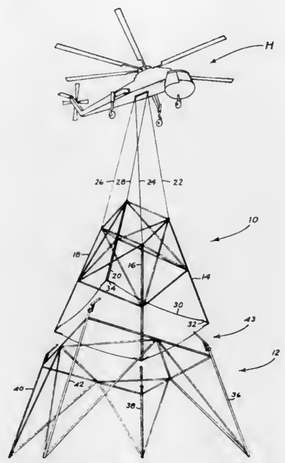
and clamping means including bolts disposed through the aligned openings in the spaced first leg portions of the first and second joint elements, and nuts tightened on said bolts to simultaneously force said flanged end against the facing surface of the leg portion, and to force at least a portion of the adjacent edges of said first and second wall panel members tightly together.

4,189,891
METHOD FOR ANCHORING AND STRAIGHTENING WALLS
Michael K. Johnson, Des Moines; Clarence E. Johnson, Winterset; Raymond E. Parker, Winterset, and John V. Wright, Winterset, all of Iowa, assignors to Grip Tite Mfg. Co., Winterset, Iowa
Filed Apr. 13, 1978, Ser. No. 895,944
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—742 **5 Claims**



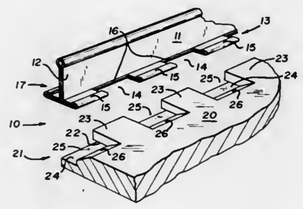
1. A method for anchoring and straightening a wall which extends below the ground comprising the steps of:
forming a hole in the ground at a distance from said wall;
forming an opening in said wall from one side of the wall at a level below the ground, said opening being substantially aligned with the hole in the ground;
forcing an elongated member through the opening in the wall and through the ground to a position in which one end of said member extends into said hole in the ground and the other end extends on said one side of the wall;
securing an anchoring means to said one end of the member;
attaching a wall plate to the other end of the elongated member; and
forcing the wall plate towards the wall along said shaft whereby the wall plate is forced against said wall and the wall is thereby moved towards being straightened.

4,189,892
ANGLE GUIDE APPARATUS
Harlan B. Smith, Canby, Oreg., assignor to Erickson Air Crane Co., Hillsboro, Oreg.
Filed Jul. 19, 1977, Ser. No. 817,046
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—749 **14 Claims**



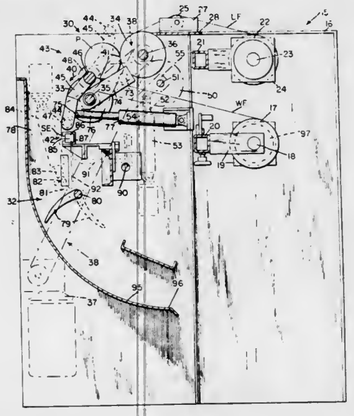
1. Apparatus for use in directing a first angle member toward a second angle member comprising:
guide means for providing a surface over which the first angle member may be slideably transferred;
clamping means provided on said guide means for detachably securing said guide means to the second angle member; and
bracing means extending from said guide means for preventing rotation of said guide means relative to the second angle member.

4,189,893
CEILING RUNNER AND PANEL ASSEMBLY HAVING SLIDING LOCKABILITY
Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed Sep. 11, 1978, Ser. No. 941,494
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—779 **18 Claims**



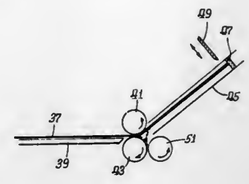
1. A suspended ceiling system comprising:
vertically adjustable hanger brackets depending from upper support structures and rigidly supporting inverted-T runners;
said inverted-T runners being in parallel relationship and having web portions terminating in lower arm flanges wherein at least one of the arm flanges has notches at periodic intervals thereby providing remaining tab portions;
ceiling tile engaging the tab portions along kerfed edges wherein upper portions of the kerfed edge are removed at periodic intervals corresponding to the spacing of the tab portions;
whereby the tile engage the inverted-T runners by being lifted and shifted to slidably lock the tab portions within the kerfed edges of the tile; and,
whereby the ceiling is levelled by means of vertically adjustable hanger brackets.

4,189,894
METHOD OF AND APPARATUS FOR WRAPPING PRODUCTS
Robert Laing, Sutton, Mass., assignor to Curtis & Marble Machine Company, Worcester, Mass.
Filed Aug. 28, 1978, Ser. No. 937,055
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—399 **32 Claims**



30. Method of wrapping a generally cylindrical product with plastic film having sufficient softness and frictional characteristics for enabling the film to adhere to the surface of the product upon contact therewith, comprising the following steps:
(a) extending a free end of the film from a supply of film over a supporting means to a cut-off line spaced from the supporting means,
(b) placing the cylindrical product against the film on the supporting means,
(c) transferring the free end of the film against the product so that it adheres to the product,
(d) rotating the product on the supporting means about its central longitudinal axis in one direction to wrap the wrapping film around the product,
(e) rolling the product toward said cut-off line to a point beyond the cut-off line so that the product rotates about its central longitudinal axis in the direction opposite from said one direction, thereby partially unwrapping the film from the product so that it extends across the cut-off line,
(f) cutting the film along the cut-off line, and
(g) rotating the product in said one direction to wrap the portion of the film which extends from the product to the cut-off line onto the product.

4,189,895
METHOD AND APPARATUS FOR MAKING ENVELOPE ASSEMBLIES
John K. Volkert, Northfield, and Robert B. Volkert, Wilmette, both of Ill., assignors to Compak Systems, Inc., Northfield, Ill.
Filed Dec. 16, 1977, Ser. No. 861,289
Int. Cl.[2] B65B *63/04, 11/48*
U.S. Cl. 53—429 **12 Claims**

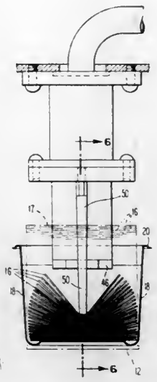


1. A method of producing an envelope containing a separate enclosure both of which are formed from the same sheet material, said method comprising
providing sheet material having first and second portions with said second portion being narrower than said first portion,
folding said sheet material so that said second portion and said first portion are superimposed one upon the other without making any adhesive interconnections therebetween and moving said sheet material with said fold being formed at the leading edge of said sheet material,
maintaining said first and second portions in substantially continuous motion from the time of said folding and then changing their direction of movement at least once,
at a moment when said portions change their direction of movement separating said second portion from said first portion by severing said sheet material along the leading edge which is common to said first and second portions while maintaining said portions in said superimposed relationship without any adhesive interconnections therebetween and
at said moment beginning folding said first portion about said separated second portion to envelop same while continuing to maintain said portions in said superimposed relationship and completing the folding and forming of the envelope by joining the folded wider regions of said first portion in surface contact with each other.

4,189,896
LIQUID IMPREGNATING SYSTEM
Charles G. Kolbach, Media, Pa.; Edward M. Niedziejko, Wilmington, Del., and Joseph P. Rizzo, Lester, Pa., assignors to Scott Paper Company, Philadelphia, Pa.
Filed Aug. 25, 1978, Ser. No. 936,863
Int. Cl.[2] B65B *3/00, 1/20*
U.S. Cl. 53—431 **17 Claims**

1. A method of introducing a liquid into absorbent sheets that are maintained in a stacked condition with at least a portion of the stack positioned within the interior of a container, said method including the steps of:
(a) applying a compressive force to only a limited region of the upper sheet of the stack in a manner to both reduce the height of said stack and reduce the intimacy of contact

between sections of at least some adjacent sheets of said stack; and



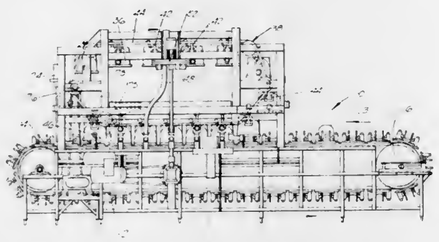
(b) directing a liquid into engagement with the sheets while maintaining said compressive force.

4,189,897

HIGH SPEED EVACUATION CHAMBER PACKAGING AND CLIPPING MACHINE

Harrison A. Ailey, Jr., Knoxville, Tenn.; L. George Andre, Cincinnati, Ohio, and Roman M. Tomczak, Raleigh, N.C., assignors to Acraloc Corporation and Rheem Manufacturing Company, both of Oak Ridge, Tenn.

Filed Nov. 1, 1978, Ser. No. 957,193
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—434 **27 Claims**



27. A method for high speed evacuation, clipping and trimming of bagged product, continuously and in rapid succession, which comprises the steps of:

(a) providing a first endless conveyor carrying a plurality of bagged product carrying platens, said first conveyor conveying said platens along a horizontal path of travel with said platens facing upwardly;

(b) providing a second conveyor carrying a plurality of hoods, said second conveyor conducting said hoods between and along upper and lower paths of travel;

(c) locating said second conveyor with respect to said first conveyor such that when each hood is shifted from its upper path of travel to its lower path of travel it will engage one of said platens traveling in its horizontal path of travel to form a chamber therewith;

(d) evacuating each said chamber;

(e) applying a clip to said bag in each said chamber to close said bag about said product;

(f) trimming the excess of each said bag in each said chamber following the clipping of said bag;

(g) devacuating each said chamber after said bag has been clipped and trimmed; and

(h) shifting said hoods from said lower path of travel to said upper path of travel so that they disengage from their respective platen, exposing said clipped and trimmed bagged product on said platen for further processing;

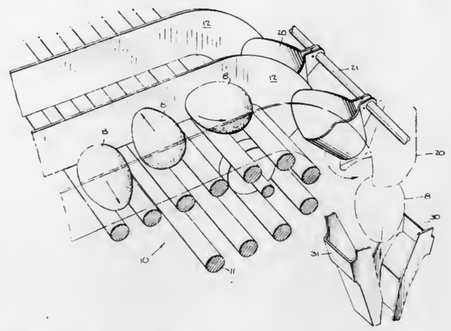
whereby said packaged products can be evacuated, clipped and trimmed continuously and in rapid succession.

4,189,898

EGG PACKER

Frank G. Moulds, Livonia, and Michael A. McCord, Wayne, both of Mich., assignors to Diamond International Corporation, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,462
Int. Cl.[2] B65B *35/56*
U.S. Cl. 53—446 **12 Claims**



10. A method of transferring eggs from a conveyor which includes an endless chain of rollers to a transportable receiving means which comprises

rotating the eggs along movable rollers of the endless chain conveyor while advancing the eggs thereon to cause the narrower end of the eggs to take a position in engagement with an abutment means disposed transverse to the longitudinal axis of the rollers and to cause the eggs to roll off the endless conveyor otherwise unassisted, the larger end of the falling eggs leading, disposing an egg catching receptacle adjacent the endless chain in a position to receive an egg which falls from the rollers,

receiving a falling egg in the receptacle with the larger end being received first in the receptacle,

rotating the receptacle to turn the received egg into a position with its narrow end oriented in a downward direction, and transferring the egg from the receptacle with its narrow end downwardly facing into a transportable receiving means.

4,189,899

APPARATUS FOR DE-AERATING AND VACUUMING PACKING WITH TIGHT CLOSING ANTI-POLLUTION DEVICE

Jean-Pierre Merat, 135 Avenue Gabriel Peri, Le Perreux, and Gaston Wiel, 60 Bd. Emik Augier, Paris, both of France

Filed Mar. 15, 1978, Ser. No. 873,439
Claims priority, application France, Jan. 6, 1978, 78 00283
Int. Cl.[2] B65B *43/26*
U.S. Cl. 53—570 **9 Claims**

1. Apparatus for filling a bag with a flowable material including:

a spout including a flexible portion adapted to be coupled with a source of said material;

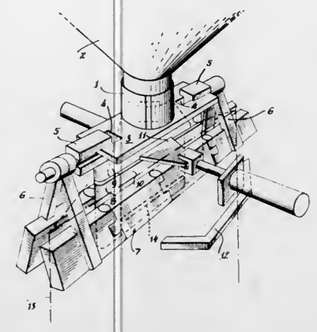
a pair of opposed, shiftable hinge plates respectively abutting opposite sides of said spout and having the opposite extremeties thereof connected with each other by hinges to allow shifting of said plates toward and away from each other whereby to distort said flexible spout portion and control the flow of said material through said spout portion, said hinge plates being adapted to have said bag sleeved therearound;

means operably coupled with said hinge plates for selectively shifting the latter toward and away from each other;

a horizontal support disposed above said hinge plates;

a pair of slide members respectively mounted for sliding movement on opposite extremeties of said horizontal support;

a pair of sliding supports respectively mounted on said slide members for sliding movement along with the latter;



a pair of grip members extending downwardly from said sliding supports and shiftably mounted on each of the latter for shifting movement toward and away from each other; and

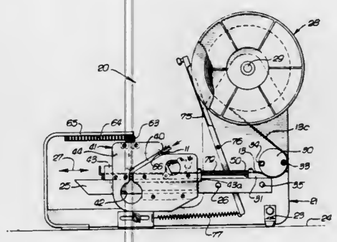
flexible structure connected to corresponding ones of said grip members and extending between the latter on opposite sides of said hinge plates, said flexible structure being shiftable into engagement with said bag upon shifting of said grip members toward each other whereby to releasably hold said bag against said hinge plates.

4,189,900

APPARATUS AND METHOD TO TWIST TIE ARTICLES

Leland H. Platt, Jr., 5637 "C" Lake Murray Blvd., La Mesa, Calif. 92041

Filed Jun. 9, 1978, Ser. No. 914,057
Int. Cl.[2] B65B *57/08*
U.S. Cl. 53—583 **15 Claims**



1. In apparatus for securing a section of a tie band about a localized wall of an article, the band being foldable, the combination comprising

(a) means for extending the band in a lengthwise feed direction,

(b) guide means for guiding the wall into position across a section of the extended band,

(c) means for effecting folding of said section of the band partially around the wall to provide two section arms relatively folded toward one another,

(d) means including a carrier to effect relative travel of the wall and folded arms in a travel direction, and

(e) means for twisting said folded arms during said relative travel to produce a tie about said wall,

(f) said fold effecting means defining a first zone located on the carrier in a direction of axial alignment with said twisting means to receive the wall after it has arrived at said position across said section of the extended band,

(g) said carrier including an elongated slide on which said fold effecting means is located, said slide having a top surface along which the unfolded band section initially extends, said top surface extending generally horizontally to define a plane below which said zone extends and above which said twisting means extends,

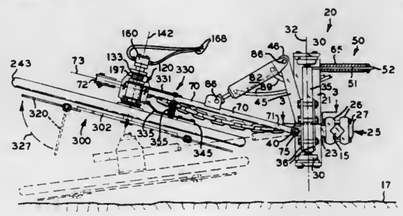
(h) the fold effecting means including surfaces at the sides of said zone to deflect the band section displaced into said zone by said wall so that said arms are simultaneously folded into positions adjacent said twisting means, said zone remaining in said direction of axial alignment with said twisting means and said surfaces extending in said direction.

4,189,901

FLAIL SHREDDER

Anton J. Poettgen, 994 Cypress, Wasco, Calif. 93280

Filed May 18, 1978, Ser. No. 907,099
Int. Cl.[2] A01D *50/00*
U.S. Cl. 56—10.4 **5 Claims**



1. A flail shredder comprising:

A. a drive shaft;

B. means mounting the drive shaft for rotation about an upwardly extended longitudinal axis;

C. means mounting the drive shaft for earth traversing movement along a line of travel transversely of the axis;

D. means mounting the drive shaft for adjustable movement transversely of the line of travel;

E. a flail assembly mounted on the lower end of the shaft;

F. drive means connected to the shaft;

G. a stop limiting adjustable movement of the shaft transversely of the line of travel in one direction;

H. means resiliently urging the shaft toward the stop;

I. a bearing mounted on the shaft above the flail assembly;

J. a circular guide wheel mounted concentrically on the bearing for rotation independently of the shaft and the flail assembly disposed for rolling engagement with obstructions to urge the shaft and the flail assembly away from the stop to pass about such obstructions; and

K. adjustable brake means for frictionally engaging the guide wheel and limiting the rotational speed thereof relative to the shaft.

4,189,902

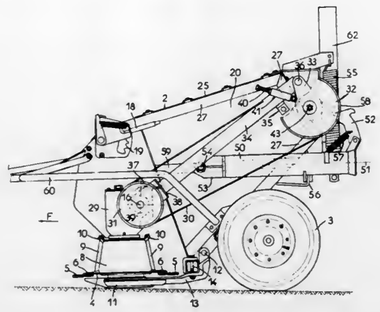
MOWER-CONDITIONER

Pierre Kaetzel, Saverne, France, assignor to Samibem, S.A., Marmoutier, France

Filed Feb. 2, 1978, Ser. No. 874,641
Claims priority, application France, Sep. 8, 1977, 77 27955
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—15.6 **5 Claims**

1. A mower-conditioner comprising a cutting mechanism and a conditioning mechanism having a conditioning passage having lateral walls, the said machine being hitched laterally beside a tractor, and comprising a post connected on one end

to a double-output control box fixed to one of the lateral walls of the conditioning passage and on the other end to the bearing of an input pulley, and a tube permitting the machine to oscillate about an axis oriented substantially according to the direc-



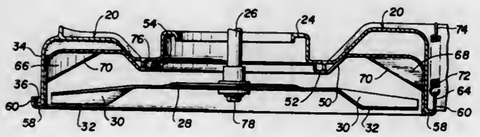
tion of travel of the machine, the said tube constituting its device for hitching in the working position, and the afore-mentioned post extending parallel with the wall of the conditioning passage nearer to the tractor.

4,189,903

ROTARY LAWN MOWER WITH REMOVABLE MULCHING ATTACHMENT

Harold P. Jackson, and Richard W. Rhinehart, both of McDonough, Ga., assignors to McDonough Power Equipment, Division of Fuqua Industries, Inc., McDonough, Ga.

Filed Jun. 23, 1978, Ser. No. 918,608
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—255 **28 Claims**



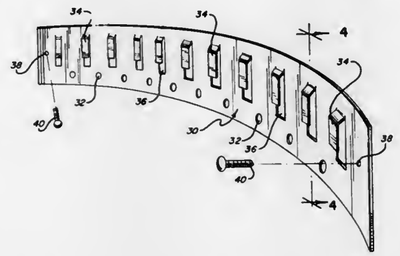
1. A rotary lawn mower comprising,
a housing including a top wall and a downwardly depending sidewall, and having a discharge chute opening formed in its peripheral portion,
wheel means supporting the housing for movement over a support surface,
a rotary blade supported for rotation in a plane generally parallel to the supporting surface and spaced below the top wall of the housing, the rotary blade including an airfoil portion for creating a flow of air upwardly and around the inner peripheral portion of the housing from beneath the plane of the blade for lifting the grass to be cut and for conveying the clippings around the housing and outwardly through the discharge chute opening,
drive means for driving said rotary blade,
an annular mulching liner mounted within the housing, said mulching liner including an upwardly extending, substantially circular skirt portion extending in contiguous relation with the inner surface of said sidewall within said housing throughout at least a substantial portion of its circumference, and a top panel extending inwardly from the top of said skirt beneath said top wall and above the path of said rotary blade, said top panel having a central opening extending therethrough,
said drive means including a generally vertical shaft extending downwardly through said housing and said central opening and supporting said rotary blade for rotation in said plane, and
attaching means for releasably retaining said mulching liner within said housing with said liner extending over and effectively blocking said discharge chute opening to permit operating the mower as a mulching mower,
said attaching means being releasable to permit removal of said mulching liner to enable lawn clippings to be discharged through said chute opening,
and wherein said multing liner has guide means for directing clippings inwardly toward said central opening.

4,189,904

LEAF MULCHER ATTACHMENT FOR LAWN MOWERS

Alexander D. Paker, 3 S 335 Williams Rd., Warrenville, Ill. 60555

Filed May 27, 1976, Ser. No. 690,398
Int. Cl.[2] A01D *75/00*
U.S. Cl. 56—255 **6 Claims**



6. A leaf mulching attachment for use with a rotary lawn mower having a housing, a rotating grass cutting blade located within the housing and a grass ejection chute opening defined by the housing, the improvement comprising: a plate adapted for connection to the interior of said housing, said plate having a size that is sufficient to cover a substantial portion of said chute opening; a plurality of tines extending inwardly and downwardly from said plate; said plate defining a plurality of openings; and means for connecting said plate to said housing whereby said plate and tines avoid contact with said grass cutting blade; said tines being struck from said plate and overlying a portion of the openings from which said tines are struck.

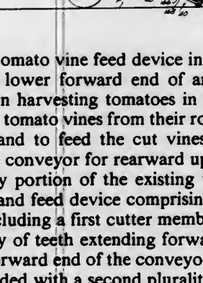
4,189,905

ATTACHMENT FOR DRIVE SHAFT OF ROTARY LAWN MOWERS

Alfred A. Frantello, Satellite Beach, Fla., assignor to Corinth Co. Inc., Satellite Beach, Fla.

Filed Feb. 24, 1978, Ser. No. 880,987
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **5 Claims**

1. An attachment for the vertically-extending drive shaft of a rotary lawn mower, edger or trimmer comprising, in combination
(a) a centrally apertured, flexible and longitudinally compressible spool;
(b) a rigid cylindrical housing of shorter length for said spool;
(c) upper and lower centrally apertured washers for contacting the corresponding ends of said spool and said rigid cylindrical housing;
(d) an elongated centrally disposed adjustable bolt extending through said spool, housing and washers and adapted for screw-threaded reception in a screw threaded recess in the lower end of the drive shaft; and
(e) a heavy-duty filament-type cutting strand wrapped around the spool so as to provide at least two free-travelling ends which extend outwardly through relatively short radially disposed tubes which are mounted on the periphery of said rigid cylindrical housing and in evenly spaced alignment with communicating apertures in the sidewall of said rigid cylindrical housing;



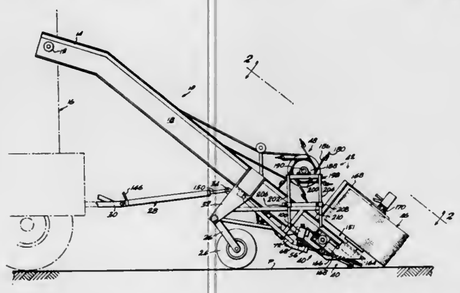
(f) the diameter and composition of said centrally apertured, flexible and longitudinally compressible spool being such as to permit the adjustment of said bolt and washers to preclude rotative movement between said spool and said rigid cylindrical housing.

4,189,906

TOMATO HARVESTER ATTACHMENT

George H. Cooper, 13841 SW. 252nd St., Princeton, Fla. 33032

Filed Jun. 12, 1978, Ser. No. 914,609
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—327 R **10 Claims**



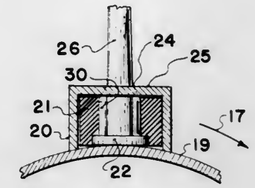
1. A cutter and tomato vine feed device in combination, for attachment to the lower forward end of an existing driven conveyor for use in harvesting tomatoes in fields where it is desirable to cut the tomato vines from their root systems above the ground level and to feed the cut vines onto the lower forward end of the conveyor for rearward upward movement into the main body portion of the existing tomato harvester device, the cutter and feed device comprising:
a cutter head including a first cutter member provided with a first plurality of teeth extending forwardly of a central portion of a forward end of the conveyor, a second cutter member provided with a second plurality of teeth in generally aligned contact with said first teeth and means to oscillate said second member relative to said first member to provide a shearing action between said first and second teeth,
means to pivotally attach said cutter head beneath the forward end portion of the conveyor, substantially rearwardly of said first and second teeth, to provide for vertical pivotal movement thereof,
follower means fixed to said cutter head intermediate said pivotal attachment and teeth, and between said head and the surface of the ground to impart vertical pivotal movement to said head in direct response to vertical variations in the ground level, when the harvester is in operation, to maintain said teeth above ground level at all times;
rotary vine engaging means comprised of a pair of relatively large rotary members of predetermined diameters, rotatably mounted above the forward end of the conveyor in a predetermined spaced apart relation,
drive means to rotate said rotary vine engaging members in opposed directions to engage and feed tomato vines cut by said cutter head onto said conveyor for movement into the main body portion of the harvester device, and
means operably connecting between a pair of existing opposed side hydraulic cylinder and piston assemblies and said cutter head to respond to said cutter head vertical pivotal movement to raise and lower the forward position of the conveyor in direct relation to the vertical variations in the ground level to automatically compensate for said variations in a manner so as to maintain said cutter teeth at a substantially constant elevation above the surface of the ground, the hydraulic cylinder and piston assemblies conventionally providing for manual control of raising and lowering of the conveyor.

4,189,907

PICK UP TINE

Victor Erdman, 2602-4th Ave. S., Lethbridge, Alberta, Canada

Filed May 15, 1978, Ser. No. 906,117
Int. Cl.[2] A01D *77/08*
U.S. Cl. 56—400 **8 Claims**



1. A flexible tine for mounting in a pick up portion of a grain harvester pick up, pick up reel for grain harvesters, side delivery rake, windrower, hay baler and the like comprising in combination an elongated tine portion and a base portion on said tine portion, the cross sectional configuration of said tine portion adjacent said base portion having a major axis and a minor axis with the length of the major axis being greater than the length of the minor axis thereby forming a tine having a lesser resistance to bending when said major axis is at right angles to the direction of travel and a greater resistance to bending when said major axis is parallel to the direction of travel, and means adjacent the base portion of said tine to detachably and selectively lock said tine in either desired relationship relative to said pick up portion.

4,189,908

FLEXIBLE RAKE

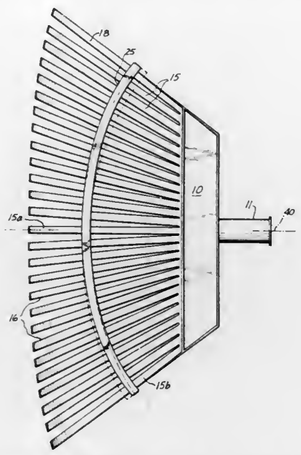
George F. Brock, Jr., 1025 Fallen Leaf Rd., Arcadia, Calif. 91006

Filed Feb. 21, 1978, Ser. No. 879,383
Int. Cl.[2] A01D *7/02, 7/06*
U.S. Cl. 56—400.17 **8 Claims**

1. A flexible rake comprising:
a supporting panel adapted to be held by a handle extending rearwardly from the panel;
a plurality of flexible tines rigidly connected to said panel spaced laterally from each other and extending generally forwardly from the panel in a fan-like array, the forward tips of said tines curving downward for raking debris;
tine-retaining strip means extending laterally across the tines

in a convex arc the most forward part of which is in the region of the central part of the rake;

said strip means comprising two overlaying strips, one passing across the upper surfaces of the tines and the other passing across the under surfaces of the tines, and separation means at least a plurality of which interconnect said



strips, and all of which extend into the spaces between adjacent tines and proportioned to allow free but limited movement of the tines, laterally and vertically and also limited fore-and-aft movement of said strip means; and

said strip means having a crown shape which causes the tines toward the sides of the rake to be depressed relative to tines at the center of the rake.

4,189,909

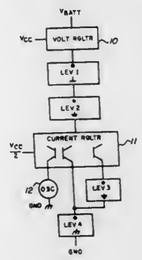
INTEGRATED INJECTION LOGIC ELECTRONIC SYSTEM WITH VOLTAGE REGULATOR FOR MULTIPLEXED LIQUID CRYSTAL DISPLAY

Steven E. Marum, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1978, Ser. No. 908,336

Int. Cl.² G04C 5/00; G04B 19/30, 17/00

U.S. Cl. 58—23 R **10 Claims**



1. An I^2L system comprised of:

(a) a current regulator coupled in series between first and second hierarchal levels of I^2L circuitry to receive output current from said first of I^2L circuitry and provide regulated current for said second level of I^2L circuitry;

(b) a voltage regulator coupled in said series between the first level of I^2L circuitry and a terminal for connection to a voltage source, said voltage regulator for producing a regulated voltage for driving a display, said current regulator including a center tap for producing a regulated fractional voltage for driving said display.

4,189,910

ELECTRONIC WATCH WITH ALARM MECHANISM

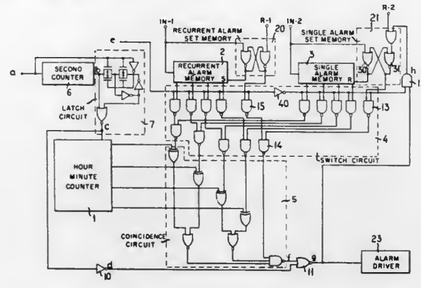
Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,465

Claims priority, application Japan, Oct. 28, 1975, 50-129583

Int. Cl.² G04C 21/00

U.S. Cl. 58—38 R **1 Claim**



1. In an electronic watch:

a time counter for counting a repetitive time standard signal, having a repetitive rate representative of an interval of time, to develop a count representative of present time;

a recurrent alarm time memory circuit for storing a recurrent alarm time therein;

a single alarm time memory circuit for storing a once-occurring alarm time and having a reset input;

an R-S flip-flop circuit for clearing the contents of said single alarm time memory circuit, said R-S flip-flop circuit having a first output terminal for developing an enabling signal when set flip-flop is in the set condition, a second output terminal to the reset input of said single alarm time memory for resetting the same when said flip-flop is reset, a set input connected for receiving a single alarm time memory circuit setting signal and a reset input;

a coincidence detecting circuit for detecting coincidence between the contents of said time counter and the contents of said memory circuits and for developing an output signal when coincidence is detected;

switching means for alternately applying the contents of said recurrent alarm time memory and said single alarm time memory to said coincidence detecting circuit to effect comparison between the contents of said time counter and alternate ones of said memories in response to the enabling signal from said R-S flip-flop and for applying the contents of only said recurrent alarm time memory in the absence of the enabling signal;

means responsive to the output signal of said coincidence detecting circuit for resetting said R-S flip-flop circuit to clear said single alarm time memory after the once-occurring alarm time has occurred;

and alarm means responsive to the output signal of said coincidence detecting circuit for developing an alarm signal each time the contents of said time counter coincides with the contents of one of said memories.

4,189,911

TOY TIMING DEVICE

James F. Kubiatowicz, Minneapolis, Minn., assignor to Custom Concepts Incorporated, Minneapolis, Minn.

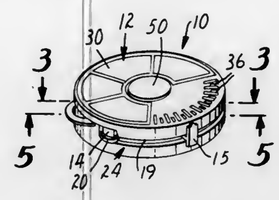
Filed Jun. 12, 1978, Ser. No. 914,438

Int. Cl.² A63H 33/30

U.S. Cl. 58—106 **9 Claims**

1. A mechanism comprising a first member having spaced projections, a second member mounted on the first member to

afford relative movement of the members between start and stop positions and having a friction surface that moves relative to and has portions between said projections during said relative movement, means for biasing the members toward their stop position with a force which decreases upon relative movement of the members from their start toward their stop position, and a length of elastic resilient material tensioned between said projections across and in engagement along one side with said friction surface, said friction surface being generally in the



plane of movement of said members except for a portion defined by a rib which projects normal to the direction of movement and decreases generally uniformly in height from a portion between the projections in the start position of the members along portions which pass between the projections as the members move toward their stop position to decrease the frictional engagement between the frictional surface and the elastic material and provide a slow and generally constant relative velocity for the members.

4,189,912

COMBINATION CALCULATOR AND TIMEPIECE

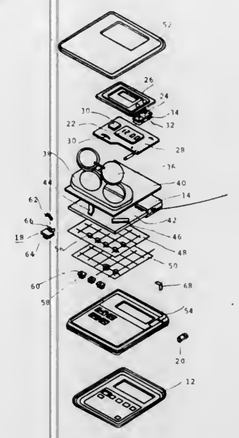
Isamu Washizuka, Kyoto; Junji Aoki, Kashiwara, and Tadashi Tomino, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1977, Ser. No. 801,002

Claims priority, application Japan, May 31, 1976, 51-71852[U]

Int. Cl.² G04B 37/12

U.S. Cl. 58—152 R **9 Claims**



1. A combination calculator and timepiece, comprising:

a housing means for defining and enclosing a cavity containing a variety of electrical components, said housing means having a first and a second major surface, the external side of said first major surface facing in a first direction, the external side of said second major surface facing in a second direction, said first direction being substantially opposed to and opposite from said second direction, said housing means further accommodating a means for introducing numerical information into said combination calculator and timepiece, said cavity of said housing means further containing a base frequency signal generator, a power supply, a power supply switch, a computation circuit means for calculator operation, a time information keeping circuit means for timepiece operation, a first digital display means for displaying information stored in said computation circuit means, and a second digital display means for displaying information stored in said time information keeping circuit means, said combination calculator and timepiece further comprising;

a common substrate means disposed within said cavity of said housing means for dividing said cavity of said housing means into a first compartment and a second compartment, said first digital display being supported by said common substrate and located within said first compartment, said first major surface of said housing means having a first window means disposed therethrough thereby defining a first hole in said first major surface for viewing a display within said housing means, said first digital display being visible from a position external to said housing means through said first window means disposed in said first major surface of said housing means,

said means for introducing numerical information into said combination calculator and timepiece comprising a plurality of key switch means secured on said common substrate means and disposed within said first compartment for introducing information into said combination calculator and timepiece, said first major surface further including a plurality of openings disposed therethrough, said plurality of key switch means being visible from a position external to said housing means and protruding through said plurality of openings in said first major surface of said housing means,

said second digital display being supported by said common substrate and disposed within said second compartment, said second major surface of said housing means having a second window means disposed therethrough thereby defining a second hole in said second major surface for viewing a display within said housing means, said second digital display being visible from a position external to said housing through said second window means disposed on said second major surface of said housing means; and

a time correction switch means secured by said common substrate and disposed within said second compartment for introducing a time correction command into said combination calculator and timepiece,

said second major surface further including at least one opening disposed therethrough, said time correction switch means being visible from a position external to said housing and protruding through said at least one opening in said second major surface of said housing means.

4,189,913

REFLEX AIR BURNER WITH AIRBLAST START

Denis R. Carlisle, Risley, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 7, 1978, Ser. No. 875,932

Claims priority, application United Kingdom, Feb. 11, 1977, 5885/77

Int. Cl.² F02O 7/22, 7/26

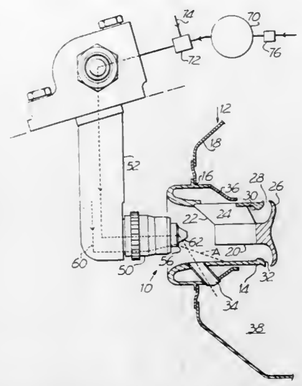
U.S. Cl. 60—39.14 R **5 Claims**

1. Combustion equipment for a gas turbine engine comprising:

a combustion chamber including a primary zone, a first duct extending into the primary zone, and a plurality of second ducts extending from said first duct into said primary zone; and

a fuel nozzle comprising a plurality of fuel outlets arranged to direct fuel through said first duct and into said primary zone during normal operation of the gas turbine engine, there being at least as many fuel outlets as there are said

plurality of second ducts, and fuel directing means arranged to impinge air onto fuel discharged from at least a number of said fuel outlets and to direct the same into a



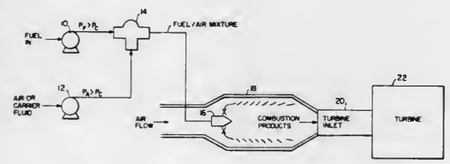
corresponding number of said plurality of second ducts to provide a fuel and air mixture through said second ducts for discharge into said primary zone of said combustion chamber.

4,189,914

SUPERCRITICAL FUEL INJECTION SYSTEM

Cecil J. Marek, Shaker Heights, and Larry P. Cooper, Strongsville, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,654
Int. Cl.[2] F02C *7/22*
U.S. Cl. 60—726 **7 Claims**



1. A fuel injection system comprising means defining a combustion volume; means for supplying pressurized fuel at a pressure above the critical pressure thereof, means for supplying a pressurized carrier fluid at a pressure above the critical pressure of the fuel, mixing means for mixing said pressurized fuel and said pressurized carrier fluid to produce a fuel/carrier fluid mixture, and means for supplying said fuel/carrier fluid mixture to said combustion volume for combustion therein.

4,189,915

SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Motohisa Miura, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 26, 1978, Ser. No. 900,308
Claims priority, application Japan, Apr. 28, 1977, 52-49410
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—290 **5 Claims**

1. A secondary air supply system for an internal combustion engine, comprising:

an air pump adapted to be driven by an engine;

a secondary air supply line extending between said air pump and the engine exhaust system;

valve means in said secondary air supply line for controlling the secondary air supply from said air pump into said engine exhaust system;

a valve actuator operatively associated with said valve means and comprising first and second air pressure chambers, a diaphragm between said air pressure chambers, a first spring member disposed in said first air pressure chamber to yieldably act on said diaphragm and restricted passage means intercommunicating said first and second air pressure chambers;

a first control pressure line through which the air pressure produced by said air pump is adapted to be supplied into said first air pressure chamber;

first controlling means in said first control pressure line for controlling the air pressure supply to said first air pressure chamber;

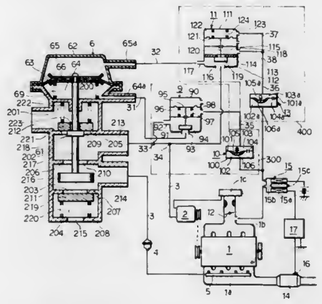
a second control pressure line through which the air pressure produced by said air pump is adapted to be supplied into said second air pressure chamber; and

second controlling means in said second control pressure line for controlling the air pressure supply to said second air pressure chamber;

wherein said valve means includes:

a valve housing defining therein a generally cylindrical space;

first to third partition walls disposed in said space to divide in into first to fourth chambers, said partition walls having respective first to third openings to communicate the opposed chambers with each other, said first and fourth



chambers being communicated to the atmosphere, and said valve housing having air inlet and outlet respectively communicating said second and third chambers with said air pump and said engine exhaust system;

a first valve member disposed in said third chamber and operatively connected to said diaphragm of said valve actuator for movement thereby to control the communication between said second and third chambers as well as the communication between said third and fourth chambers;

a second valve member disposed in said fourth chamber and a second spring member for biasing said second valve member toward said third opening of said third partition wall to close the same when the air pressure in said third chamber is smaller than the force of said second spring; and

a third valve member disposed in said first chamber and a third spring for biasing said third valve member toward said first opening of said first partition wall to close the same when the air pressure in said second chamber is smaller than the force of said third spring, said third valve member being linked to said first valve member in such a manner that said third valve member is moved away from said first opening to open the same when the movement of said first valve member toward said second opening of said second partition wall exceeds a predetermined stroke,

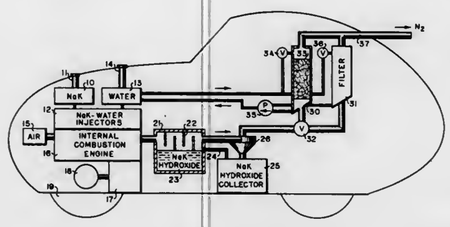
said first controlling means being operative to interrupt the supply of the air pressure into said first air pressure chamber while said second controlling means being operative to supply the air pressure into said second air pressure chamber at least at the initial stage of an engine acceleration operation whereby said first valve member is driven toward said third opening to close the same to thereby supply an increased amount of secondary air to said engine exhaust system.

4,189,916

VEHICLE SYSTEM FOR NAK-WATER-AIR INTERNAL COMBUSTION ENGINES

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 301,285, Oct. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 457,207, Apr. 2, 1974, Pat. No. 3,911,284, and a continuation-in-part of Ser. No. 464,454, Apr. 26, 1974, abandoned, and a continuation-in-part of Ser. No. 578,527, May 19, 1975, Pat. No. 4,020,798. This application Mar. 21, 1977, Ser. No. 779,788
Int. Cl.[2] F02C *3/20*; F01N *3/02*
U.S. Cl. 60—311 **1 Claim**



1. A method for separating alkali hydroxide particulates from exhaust gases comprising the steps of

reacting an alkali metal, water from a water reservoir, and air in a combustion chamber to form said particulates and gases,

separating a portion of said particulates from said gases in a first stage of an exhaust system, said step of separating comprising directing directing said particulates and gases to impinge upon a surface of molten alkali hydroxide, said surface retaining at least some of the particulates,

directing flow of remaining particulates and gases through a first filter, said first filter accumulating said remaining particulates,

directing flow of said remaining particulates and gases through a second filter, said second filter accumulating said particulates,

passing water from said water reservoir through said first filter to remove said accumulated particulates,

directing flow of said remaining particulates and gases back to the first filter, and

passing water from the water reservoir through the second filter to remove said accumulated particulates.

4,189,917

AIR HAMMER AND MUFFLER COMBINATION

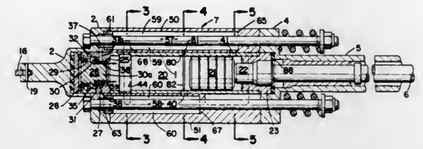
Samuel D. Gunning, Cleveland Heights, Ohio, assignor to Kent Air Tool Company, Kent, Ohio

Filed Sep. 18, 1978, Ser. No. 943,324
Int. Cl.[2] F15B *11/06*
U.S. Cl. 60—370 **19 Claims**

1. An air hammer including a body having a bore, an inlet passage, and an exhaust passage;

a piston reciprocable in the bore by pressurized air;

a muffler on the body for muffling the exhaust of the air; and



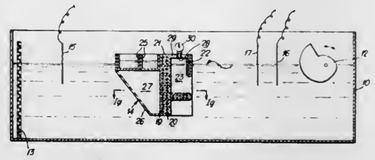
means rendered operative by removal of the muffler from the body, to render the piston inoperable by the pressurized air.

4,189,918

DEVICES FOR EXTRACTING ENERGY FROM WAVE POWER

George W. Moody, East Kilbride, and Robert A. Meir, Cambustang, both of Scotland, assignors to The Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 14, 1978, Ser. No. 933,671
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—398 **8 Claims**



1. A device for extracting energy from waves on a liquid upon which the device is adapted to float, wherein the improvement comprises,

(a) the device being free to move in response to said waves in a vertical plane aligned in the direction of propagation of the waves incoming towards the device, and

(b) that portion of the device adapted to be below the surface of the liquid being of asymmetric shape in said vertical plane; said shape, the position of the centre of gravity of the device, and the value of the radius of gyration about the centre of gravity in said plane being arranged so that the motion of the device in response to said waves inhibits to a substantial extent the transmission and reflection of waves by the device itself.

4,189,919

MOTOR-VALVE APPARATUS FOR HYDRAULIC FAN DRIVE SYSTEM

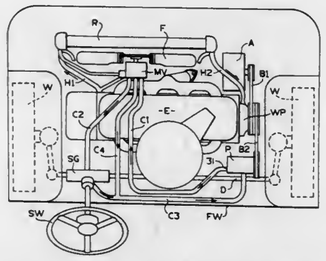
Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 907,064, May 18, 1978. This application Dec. 6, 1978, Ser. No. 966,984
Int. Cl.[2] F15B *11/16*
U.S. Cl. 60—420 **11 Claims**

1. Motor-valve apparatus for use in a hydraulic fan drive system including a pump having a fluid outlet port, a fluid inlet port, and a pumping element operable to deliver fluid at a rate proportional to engine speed, the pump comprising the sole source of pressurized fluid for the system and including flow control valve means operable to limit the fluid delivery rate of the pump to X at higher engine speeds, said motor-valve apparatus comprising:

(a) housing means defining an inlet port for connection to the outlet port of the pump and further defining at least one

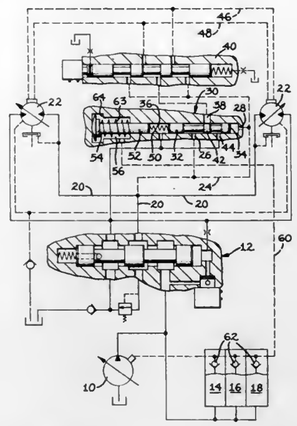
outlet port, said one outlet port being in fluid communication with the inlet port of the pump;
(b) a positive displacement, fluid pressure actuated rotary device operably disposed within said housing means, said device being adapted to transmit torque to a fan, and defining expanding and contracting fluid chambers;
(c) said housing means defining a fluid pressure port and a fluid return port communicating with said expanding and contracting fluid chambers respectively;
(d) said housing means defining an inlet passage, an outlet passage, and a bypass passage communicating between said inlet and outlet passage, said inlet passage permitting fluid communication between said inlet port and said pressure port, and said outlet passage providing fluid communication between said return port and said outlet port;
(e) bypass valve means disposed in one of said inlet passage and said bypass passage and including a bypass valve member movable between a first position substantially preventing fluid communication from said inlet passage to



said bypass passage, and a second position permitting fluid flow from said inlet passage to said bypass passage at a flow rate which is at least a major portion of X, the bypass flow through said bypass passage and the return flow through said return port being recombined in said outlet passage;
(f) said valve member being biased toward said second position by fluid pressure in said inlet passage;
(g) said valve means or said housing means and said valve means defining a signal chamber, said valve member being biased toward said first position by fluid pressure in said signal chamber;
(h) means communicating pressurized fluid into said signal chamber; and
(i) pilot valve means operable in response to changes in a predetermined condition between a first position blocking fluid communication between said signal chamber and said outlet passage, and a second position permitting fluid communication from said signal chamber to said outlet passage.

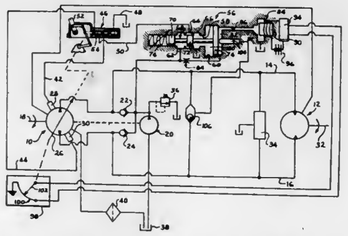
4,189,920
LOAD SIGNAL CONTROL OF HYDRAULIC MOTOR DISPLACEMENT
Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 8, 1979, Ser. No. 35,120
Int. Cl.[2] F15B *11/16*
U.S. Cl. 60—420 **7 Claims**

1. In a vehicle drive and work performing system including a rotary output variable displacement hydraulic drive motor (22) adapted to drive a vehicle, at least one hydraulic implement motor (14, 16, 18) adapted to power a work performing implement, a hydraulic pump (10) for providing hydraulic fluid under pressure to said motors, a flow control valve (12) for controlling fluid flow from the pump to at least the drive motor, and a pressure control valve (30) for controlling the displacement of the drive motor to achieve a desired fluid pressure level at the drive motor, the improvement comprising load sensing means (60,62) connected to said implement motor for providing a signal representing the load thereon, and means (54) responsive to said signal for causing the pressure control



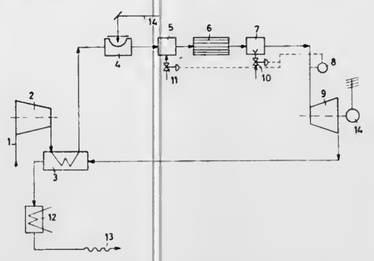
valve to change the displacement of said drive motor to thereby change the fluid pressure level thereat to a value different from said desired fluid pressure level.

4,189,921
HYDRAULIC CONTROLLER
Kenneth K. Knapp, Spencer, Iowa, assignor to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 801,884, May 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 701,790, Jul. 2, 1976, abandoned. This application Feb. 22, 1979, Ser. No. 14,171
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 **35 Claims**



1. A control for use with a variable hydraulic pump unit or motor unit having fluid operable means for varying the displacement of said unit, a source of fluid under pressure, and a drain, said control comprising:
(a) a housing defining a bore;
(b) a first port in said housing communicating with said bore and adapted for fluid communication with said fluid operable means;
(c) a second port in said housing communicating with said bore and adapted for fluid communication with said source of fluid;
(d) a third port in said housing communicating with said bore and adapted for fluid communication with said drain;
(e) a fourth port in said housing communicating with said bore and adapted for fluid communication with said fluid operable means;
(f) valve means in said bore for selectively communicating said ports with one another, said valve means having a first position communicating said first port solely with said second port and said third port solely with said fourth port, a second position communicating said first and fourth ports solely with said third port, and a third position communicating said fourth port solely with said second port and said first port solely with said third port, said valve means is moved through said positions from said first to said second to said third to said second to said first;
(g) first biasing means to bias said valve means toward said first position;
(h) second biasing means to bias said valve means toward said third position, said second biasing means including:
(i) a fluid chamber,
(ii) inlet conduit means adapted to communicate a source of fluid under pressure with said fluid chamber,
(iii) means responsive to the pressure of fluid within said fluid chamber to bias said valve means toward said third position, and
(iv) means responsive to a signal to vary the pressure of the fluid within said fluid chamber.

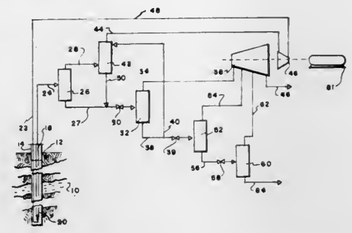
4,189,922
CONVERTING SOLAR ENERGY INTO ELECTRIC POWER
Oreste Bellofatto, Milan, Italy, assignor to Snamprogetti S.p.A., San Donato Milanese, Italy
Filed Mar. 8, 1978, Ser. No. 884,400
Claims priority, application Italy, Mar. 22, 1977, 21483 A/77
Int. Cl.[2] F03G *7/06;* F02C *1/04, 1/06*
U.S. Cl. 60—641 **4 Claims**



1. A method for the production of electric power by exploiting solar energy and using an expansion turbine unit, comprising the steps of compressing ambient air up to a pressure of at least from 6 to 30 bars, preheating the ambient air with the heat of the air emerging from the expansion turbine unit, further heating the preheated and compressed air in a solar heater to a temperature of at least from 500° C. to 900° C., causing the heated and compressed air to flow first through a combustion system actuated at the start of the method, then through a heat accumulator and through an auxiliary burner actuated when the solar energy is inadequate, allowing the heated and compressed air to be expanded in the turbine unit to which the electric power generator is connected, and recycling the air after the expansion in the turbine unit for at least preheating the ambient air.

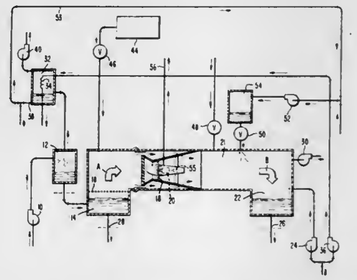
4,189,923
GEOTHERMAL ENERGY RECOVERY
Clyde Berg, 3655 E. Ocean Blvd., Ste. 2-H, Long Beach, Calif. 90803
Filed Mar. 22, 1978, Ser. No. 889,038
The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.
Int. Cl.[2] F03G *7/00*
U.S. Cl. 60—641 **11 Claims**

1. A method for recovery of energy and production of useful work from a high temperature geothermal brine in a well substantially filled with said brine with a casing having a production tubing in communciation therewith at its lower end and which comprises:
(a) introducing a vapor under high pressure into said casing and passing said vapor as a confined stream to a subterranean depth in said casing;
(b) injecting said vapor into said production tubing to admix with said brine therein and to form an intimate mixture with said brine having a density sufficiently less than the density of said brine whereby said brine in said casing surrounding said production tubing exerts a hydrostatic head on said mixture to lift said mixture to the surface through said tubing;



(c) discharging said mixture from said tubing into a vessel and separating said mixture into vapor and brine while maintaining the mixture under superatmospheric pressure sufficient to prevent the release of gases from said brine and the concomittant deposit of calcium carbonate scale in said tubing;
(d) expanding said separated vapor to generate work therefrom; and
(e) forming high pressure vapor for introduction into said casing in step (a).

4,189,924
OCEAN THERMAL ENERGY CONVERSION SYSTEM AND METHOD FOR OPERATION
Bernard L. LaCoste, Wilmington, Del., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 22, 1978, Ser. No. 918,127
Int. Cl.[2] F03G *7/04*
U.S. Cl. 60—641 **12 Claims**



1. An ocean thermal energy conversion system comprising:
a flash evaporator for vaporizing water supplied thereto into steam, said steam being at a lower pressure than said water, said evaporator including means for separating the resulting steam and unflashed water;
first means for pumping relatively warm ocean water to said flash evaporator;
turbine means for expanding steam within a subatmospheric pressure range of less than 15 pounds per square inch and converting its expansion energy into mechanical energy,

said turbine means having a steam inlet, steam outlet, and exhaust neck, said steam inlet being in fluid communication with said flash evaporator, said steam outlet constituting a port through which expanded steam is exhaustible into the exhaust neck;

means for condensing steam exhausted from said turbine means, said condensing means including an enclosing structure which is in fluid communication through said exhaust neck with said steam outlet, said condensing means including an intermingling apparatus for mixing relatively cold ocean water with the exhausted steam within the enclosing structure to cause the steam to condense;

second means for pumping relatively cold ocean water to said condensing means intermingling apparatus;

means driven by said turbine for generating electricity; and

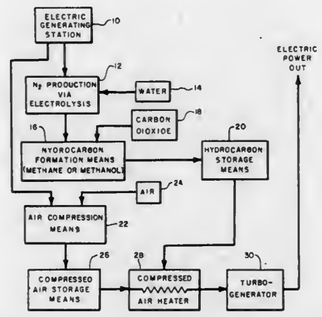
means for introducing a fluid into said exhaust neck to regulate the exhaust neck's pressure and control the tubine's steam flow.

4,189,925

METHOD OF STORING ELECTRIC POWER

George Long, Naperville, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed May 8, 1978, Ser. No. 903,754
Int. Cl.² F01K *13/00*
U.S. Cl. 60—652 **9 Claims**



9. A method for storing electric power generated during off peak periods and later utilizing the stored power to generate additional electric power comprising the following steps:

storing a first portion of the electric power as chemical energy in molecular hydrogen;

reacting molecular hydrogen with carbon dioxide to produce methane;

storing the methane as a gas in a natural gas storage facility;

using a second portion of the electric power to produce compressed air;

storing the compressed air; and

operating a turbogenerator using the stored methane as a fuel and the compressed air as a source of energy in order to generate electricity.

4,189,926

TURBINE-CONDENSER SUPPORT SYSTEM

James J. Hsu, Cincinnati, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1978, Ser. No. 915,690
Int. Cl.² F01K *11/00*
U.S. Cl. 60—687 **5 Claims**

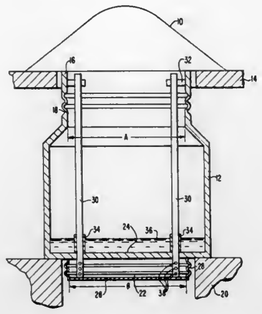
1. A turbine-condenser support configuration comprising:

an elastic fluid turbine having an exhaust port for exhausting motive fluid therethrough;

a support structure for bolstering said turbine;

a condensing apparatus in fluid communication with said turbine through said exhaust port, said condenser constituting an enclosure within which the motive fluid is condensed and an outer wall which is flexibly joined thereto to define a vacuum balancing chamber, said flexible joint permitting relative movement of said enclosure and outer wall; and

means for rigidly connecting said outer wall to said turbine,



said connecting means providing atmospheric pressure force transmissibility from said outer wall so as to reduce the load on the turbine's support structure;

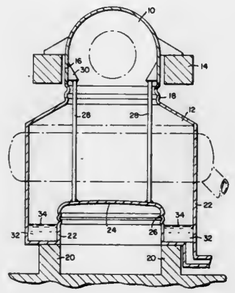
said connecting means comprising a plurality of conduits which extend through said enclosure and provide fluid communication between the turbine's exhaust port and vacuum balancing chamber for equalizing the pressure therebetween.

4,189,927

CONDENSER VACUUM LOAD COMPENSATING SYSTEM

Lewis Gray, Nether Providence, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1978, Ser. No. 919,571
Int. Cl.² F01K *11/00*
U.S. Cl. 60—687 **6 Claims**



1. A turbine-condenser support configuration comprising:

a turbine having an exhaust port for exhausting motive fluid therethrough;

a foundation structure for supporting said turbine;

a condensing apparatus for condensing motive fluid, said condensing apparatus being in fluid communication with said exhaust port and having first and second enclosing portions, said first portion being flexibly connected to said turbine and said second portion, said first portion including a floor, said second portion being disposed above the floor; and

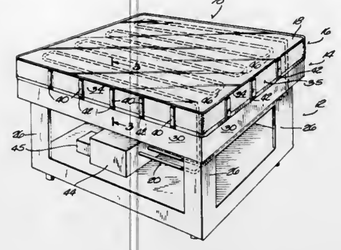
means for structurally connecting said second enclosing portion to said turbine so as to reduce the operational load on said turbine foundation.

4,189,928

ICE TOP MEAT CUTTING APPARATUS

Adrian F. Cerny, P.O. Box 44, Bloomington, Wis. 53084

Filed Aug. 23, 1978, Ser. No. 936,023
Int. Cl.² F25C *1/12*
U.S. Cl. 62—66 **15 Claims**



15. An ice top meat cutting apparatus comprising:

a frame having an upper support member extending substantially above floor level;

enclosure means connected to said upper support member for movement to a first position for defining an enclosure having an open top and for containing liquid which can be frozen to provide an ice top having an upper cutting surface suitable for cutting meat thereon, and movable to a second position displaced from said first position for providing said ice top with an unobstructed upper cutting surface;

support means movable connected to said upper support member for supporting said enclosure means when in said first position, and for being moved relative to said enclosure means to allow said enclosure means to be displaced from said first position to said second position; and

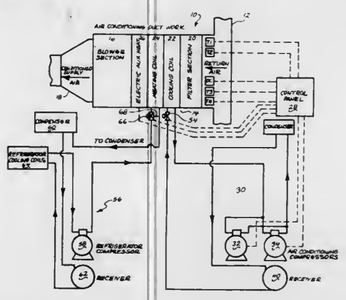
cooling means for freezing liquid contained within said enclosure.

4,189,929

AIR CONDITIONING AND DEHUMIDIFICATION SYSTEM

Lillard G. Russell, Salisbury, N.C., assignor to W. A. Brown & Son, Inc., Salisbury, N.C.

Filed Mar. 13, 1978, Ser. No. 885,967
Int. Cl.² F25D *17/04*
U.S. Cl. 62—175 **13 Claims**



1. An air conditioning and dehumidification system comprising:

(a) means for compressing refrigerant and selectively operable at generally full and reduced capacities;

(b) means for evaporating refrigerant and having means for selectively operating at generally full and reduced capacities;

(c) means for directing compressed refrigerant from said compressing means to said evaporating means for evaporation therein; and

(d) means for controlling said compressing meand and said means for selectively operating said evaporating means selectively responsive to the temperature and moisture content of air ambient to said evaporating means for selectively:

(aa) operating said compressing means at full capacity and said evaporating means at full capacity for substantially maximum comfort cooling without substantial dehumidifying of said ambient air,

(bb) operating said compressing means at a reduced capacity and said evaporating means at a corresponding reduced capacity for corresponding reduced comfort cooling of said ambient air, and

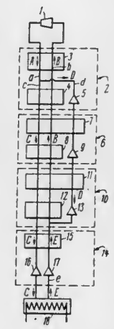
(cc) operating said compressing means at full capacity and said evaporating means at a reduced capacity for substantially maximum dehumidifying of said ambient air without substantial frosting of said evaporating means.

4,189,930

METHOD OF OBTAINING REFRIGERATION AT CRYOGENIC LEVEL

Anatoly B. Davydov, ulitsa Udaltsova, 14, kv. 147; Sergei M. Korsakov-Bogatkov, 5 Parkovaya ulitsa, 56/6, kv. 74; Boris D. Krakovsky, Narodnaya ulitsa, 13, kv. 136; Vasily D. Nikitkin, Tsvetnoi bulvar, 25, kv. 95; Evgeny V. Onosovsky, ulitsa Z. i A. Kosmodemyanskikh, 8/7, kv. 131; Vladimir G. Pronko, B. Kozlovsky pereulok, 11, kv. 42; Leonid M. Stopler, Krasnobogatyrskaya ulitsa, 21, kv. 136; Boris A. Chernyshev, Smolenskaya naberezhnaya 2, kv. 16, and Boris A. Antipenkov, 1 Truzhenikov pereulok, 13, kv. 6, all of Moscow, U.S.S.R.

Filed Jun. 17, 1977, Ser. No. 807,745
Int. Cl.² F25B *1/00*
U.S. Cl. 62—502 **5 Claims**



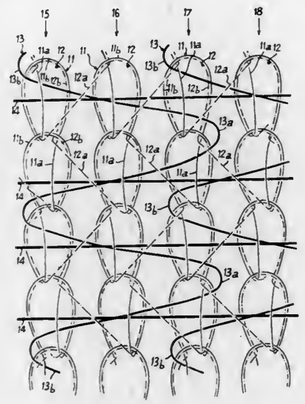
1. A method of obtaining refrigeration at cryogenic level comprising compressing a gaseous fluid constituting an incoming stream, stepwise cooling the incoming stream, expanding the incoming stream with its liquefaction, feeding the liquid fluid so formed to sustain at least one refrigerative load wherein the liquid is transformed into vapour constituting a return stream flowing back from the refrigerative load sustained, and adiabatically compressing the return stream flowing back from the refrigerative load so as to attain a temperature close to the temperature of the incoming stream before the expansion thereof with liquefaction; said stepwise cooling of the incoming stream being effected with said return stream.

4,189,931

COMPLEX STITCH FABRIC OF FLUFFY CHARACTER FOR LINING AND REINFORCING APPAREL AND METHOD OF MAKING SAME

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie, Peronne, France

Filed Sep. 3, 1975, Ser. No. 609,924
Claims priority, application France, Sep. 5, 1974, 74 30158
Int. Cl.[2] D04B *23/08*
U.S. Cl. 66—193 **3 Claims**



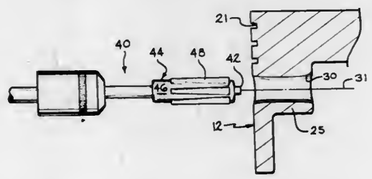
1. A warp knit fabric for use in making reinforcing plastrons for apparel comprising:
- a base fabric having a sheet of relatively thin, flexible warp yarns knitted into stitches forming wales and courses, each yarn being knit alternately in separate wales which are connected by lengths of said yarn;
- relatively thick, wiry weft yarns inlaid in the courses of said base fabric and lying between the stitches and the said connecting lengths of said warp yarns; and
- a plurality of inlaid, relatively thick and undulating warp yarns, each having a relatively roughened or napped surface and being tied to said base fabric by said connecting yarn lengths and overlying said inlaid weft yarns, each undulating warp yarn crossing a plurality of wales between succeeding undulations.

4,189,932

PISTON PIN BORE AND METHOD OF FINISHING

David F. Fielder, Richmond, Ind., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 752,221, Dec. 20, 1976, Pat. No. 4,124,010. This application Jun. 12, 1978, Ser. No. 914,639
Int. Cl.[2] B21D *53/84*
U.S. Cl. 72—370 **4 Claims**



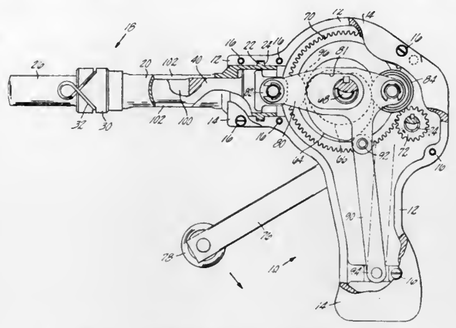
1. A method of finishing a piston pin bore in a piston comprising the steps of prestressing the bore, enlarging the diameter of at least one end portion of the bore, and smoothing the bore, wherein said steps of prestressing, enlarging and smoothing are accomplished substantially simultaneously by roll burnishing.

4,189,933

HAND OPERATED LOCKBOLT SETTING TOOL

David J. Holloway, Aldridge, England, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 22, 1978, Ser. No. 944,711
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 **8 Claims**



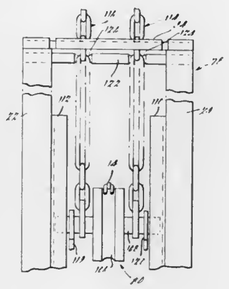
1. A pull-type fastener-setting tool comprising:
- a housing having a barrel portion;
- an abutment on said barrel portion for engagement with one part of a fastener;
- pulling means slidable in said housing for engaging a pulling stem of the fastener;
- actuating means including a cam rotatably mounted in said housing and a cam-follower mounted on an arm pivotably connected to said pulling means, and
- a link having one end thereof pivotably connected to said arm and the other end thereof pivotably connected to said housing at a point remote from said cam follower, whereby said cam follower reciprocates along an arc of substantially large radius without moving significantly out of aligment with said pulling means.

4,189,934

PULLING APPARATUS

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed Dec. 16, 1977, Ser. No. 861,200
Int. Cl.[2] B21D *1/12, 1/14*
U.S. Cl. 72—447 **13 Claims**



1. A pulling apparatus comprising:
- a base member;
- a pair of spaced vertically extending members each of said vertical members including an opposed facing longitudinally extending channel;
- a first pair of spaced support members connected between each of said vertical members and said base member;
- a second pair of spaced support members connected between each of said vertical members and said base member;

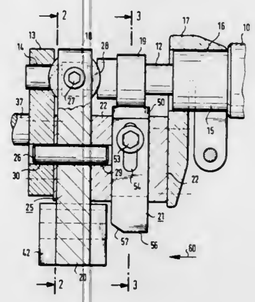
said first pair of support members being substantially longer than said second pair of support members and cooperating therewith to support said vertical members upon said base member;
- guide means movably located between said opposed facing channels of said vertical members and movably supported from a load holding assembly supported on the upper ends of said vertical members by at least one chain, said load holding assembly including a load holding door having a slot adapted to receive one link of said chain and to prevent the next adjacent link from passing therethrough, said load holding assembly further including a pair of spaced members adapted to engage respective of said vertical members for supporting said load holding door therebetween and a rotatable cylindrical member extending between said spaced members, said cylindrical member having a reduced diameter portion adapted to receive said chain during movement of said guide means;
- pulling means supported on said base member; and
- flexible connecting means having one end connected to said pulling means and extending through said guide means, another end of said flexible connecting means being adapted to be connected to a workpiece;
- said flexible connecting means, said guide means, and said pulling means cooperating to exert a pulling force upon said workpiece and anchor means disposed on the opposite side of said vertically extending members from said workpiece.

4,189,935

FOLDED SEAM CLOSING MACHINE

Franz Bleyer, Vienna, Austria, assignor to Peter Wukovich OHG, Vienna

Filed Feb. 27, 1978, Ser. No. 881,898
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714427
Int. Cl.[2] B21J *9/18*
U.S. Cl. 72—452 **11 Claims**



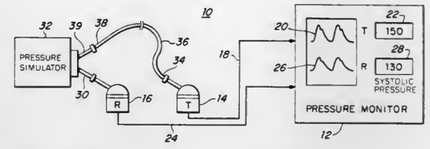
1. A machine for closing a folded seam, said machine comprising:
- at least two opposing cheeks, one of said cheeks formed as an anvil, the other of said cheeks being driven, said at least two opposing cheeks further comprising opposed complementary helical surfaces juxtaposed to carry out the shaping action of the fold;
- eccentric drive means engaging said cheeks for executing an impact movement of the cheeks on a fold located between one and the other of said cheeks; and
- a hammer mounted contiguous to said eccentric drive means for striking said fold, said hammer cooperating with said eccentric drive means to execute an impact movement of the hammer transversely to the direction of movement of the cheeks, said hammer striking said fold further being located in a first position following the cheeks in the direction of operation.

4,189,936

PRESSURE GENERATOR

David M. Ellis, 11 Fern Way, Bedford, Mass. 01730

Filed Oct. 13, 1978, Ser. No. 951,021
Int. Cl.[2] G01L *27/00*
U.S. Cl. 73—4 R **3 Claims**



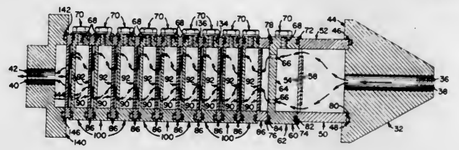
1. A pressure measuring system comprising:
- a high compliance pressure generator for producing a predetermined pressure variation pattern;
- a reference pressure transducer connected directly to said pressure generator for directly sensing the pressure produced therein;
- a test pressure transducer connected through tubing to said pressure generator for sensing the pressure transmitted through said tubing from said pressure generator; and
- a pressure monitor responsive to said test transducer to indicate the pressure sensed through said tubing and responsive to said reference transducer to indicate the pressure sensed directly at said pressure generator for determining the difference in the pressure variation pattern introduced by the tubing.

4,189,937

BOUNCELESS HIGH PRESSURE DROP CASCADE IMPACTOR AND A METHOD FOR DETERMINING PARTICLE SIZE DISTRIBUTION OF AN AEROSOL

Philip A. Nelson, 18615 SE. Covington Sawyer Rd., Kent, Wash. 98031

Continuation-in-part of Ser. No. 464,158, Apr. 25, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,608
Int. Cl.[2] G01N *15/02*
U.S. Cl. 73—28 **23 Claims**



1. A cascade impactor for sampling a particle laden gas for particle size distribution, said impactor comprising:
- a. a gas inlet and a gas exit;
- b. a plurality of stages, each stage comprising a jet plate and a collector plate except that the first jet plate may be a part of or may be replaced by the inlet nozzle;
- c. a collector plate downstream from each jet plate, and a jet plate upstream from each collector plate;
- d. each jet plate having one or more hole(s) through which the particle laden gas passes wherein said hole(s) are positioned so that the gas from the jet plate is directed to the collector surface on the respective collector plate downstream from said jet plate;
- e. a fluid flow path between each collector plate and the jet plate immediately downstream and which path allows relatively unrestrained flow of the particle laden gas from each collector plate to the next succeeding jet plate;
- f. appropriate sealing means between a jet plate and a collector plate to cause the gas to flow entirely through the jet plate holes and through the designated passageways between collector plate and succeeding jet plate; and, one or

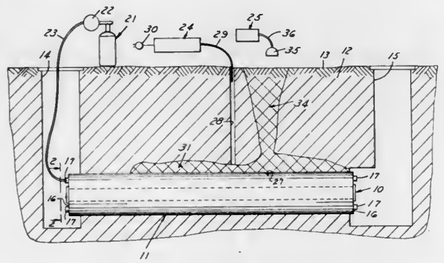
more said jet plates vary in thickness and in which jet plates the jet hole is less than 0.10 inch in diameter and in which the ratio of the length of a jet hole to the diameter of said jet hole to the diameter of said jet hole is greater than 8, and expressed as t/D is greater than 8, and where t is defined as the length of the cylindrical section of the jet hole and for square edged holes, t equals the thickness of the jet plate and with the edges of the jet hole countersunk t is less than the thickness of the jet plate and D is equal to the diameter of the cylindrical section of the jet hole.

4,189,938

DOUBLE TRACER GAS PROCESS FOR LOCATING CONDUIT LEAKS

Paul M. Heim, Franklin, Mass., assignor to Heath Consultants, Incorporated, Stoughton, Mass.

Filed Dec. 13, 1978, Ser. No. 969,284
Int. Cl.² G01M *3/22*
U.S. Cl. 73—40.7 **3 Claims**



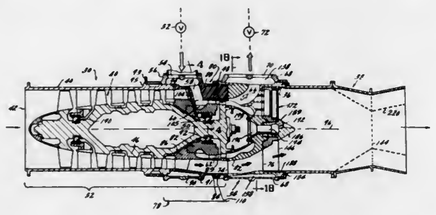
1. A double tracer gas process for locating conduit leaks in a conduit, comprising the steps of:
(a) inserting a double tracer gas comprising a mixture of a lighter than air gas which will rise to the surface from a leak in the conduit and be vented to the atmosphere, and a heavier than air gas which will escape from a leak in the conduit into the sub-surface atmosphere around the conduit;
(b) detecting the leakage of the lighter than air hydrocarbon gas by a flame ionization detector; and,
(c) detecting the leakage of the heavier than air gas by a gas detection means.

4,189,939

COMPACT MULTIMISSION AIRCRAFT PROPULSION SIMULATOR

Harrison West, and Bobby R. Delaney, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 12, 1977, Ser. No. 860,032
Int. Cl.² G01L *3/00*
U.S. Cl. 73—116 **45 Claims**



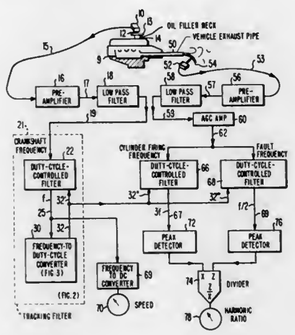
8. A compact multipurpose aircraft propulsion simulator for simulating the in-flight aerodynamic characteristics of a gas turbine engine comprising:
a flow inlet sized to a reduced size linear scale in relation to the engine to be simulated;
a compressor sized to pressurize a flow of air from said inlet substantially identical to that of the engine to be simulated times the square of the linear scale factor;
a turbine drivingly connected to said compressor;
means for routing an externally generated flow of high pressure motive air to said turbine to rotationally drive said turbine and compressor;
means for mixing a portion of the turbine motive air with the air pressurized by the compressor to generate a mixture having a generally uniform pressure profile with a pressure ratio across the simulator substantially identical to the engine to be simulated; and
a nozzle downstream of said mixing means, sized substantially identical to the engine to be simulated times the linear scale factor and having associated therewith a nozzle flow function substantially identical to the engine to be simulated, for discharging said mixture as a propulsive jet.

4,189,940

ENGINE FAULT DIAGNOSIS

Leonard R. Hulls, Marblehead; Stephen C. Hadden, Acton, and Lee R. Armstrong, Newton, all of Mass., assignors to RCA Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,891
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.3 **4 Claims**



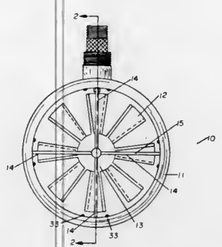
1. An engine diagnostic apparatus, comprising
a tachometer for generating an electrical signal varying in proportion with engine speed, said tachometer including a transducer for translating a cyclic variation within the engine to a corresponding electrical signal having a frequency component which varies in frequency in direct proportion with engine speed,
a second transducer for translating a pressure waveform at the exhaust opening of said engine into a corresponding electrical waveform having frequency components which vary in frequency in proportion with engine speed,
a first controllable filter which passes and tracks a cylinder firing frequency component in the output of one of said transducers under control of the electrical signal from said tachometer, and
a second controllable filter which passes and tracks a fault frequency component in the output of said second transducer under control of the electrical signal from said tachometer, and
means to compare the outputs of said first and second controllable filters.

4,189,941

VANE STRAIGHTENER RETAINER

Stanley B. Loesch, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 856,476, Dec. 1, 1977, Pat. No. 4,122,717. This application Oct. 26, 1978, Ser. No. 954,814
Int. Cl.² G01F *1/10, 15/18*
U.S. Cl. 73—231 R **6 Claims**



1. A fluid flow straightening device comprising:
a hollow housing having a recessed area extending about a portion of the interior surface of said hollow housing and through only a portion of the thickness of said hollow housing;
fluid flow straightening means including a central member having bore means therein;
retaining means having a portion inserted in the recessed area in said hollow housing and having portions substantially conforming to a portion of the exterior surface of said fluid flow straightening means, said retaining means comprising:
a center portion having an aperture therein; and
a plurality of radial members secured to the center portion with at least one radial member having deformable tab means thereon substantially conforming to a portion of the exterior surface of said fluid flow straightening means when said retaining means is secured to said fluid flow straightening means;
fastening means securing said retaining means to said fluid flow straightening means by said fastening means abutting the center portion of said retaining means, passing through the aperture in the center portion of said retaining means and engaging the bore means in the central member of said fluid flow straightening means
whereby both longitudinal and rotational movement of said fluid flow straightening means in said hollow housing is prevented by said retaining means engaging said hollow housing and substantially conforming to a portion of the exterior surface of said fluid flow straightening means when said retaining means is secured to said fluid flow straightening means by said fastening means.

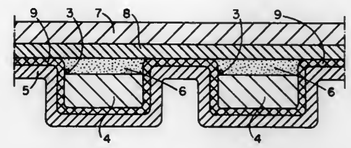
4,189,942

TEMPERATURE INDICATING DEVICE USING A PRESSURE SENSITIVE POLYISOBUTYLENE ADHESIVE SEAL

Egenius A. Giezen, Rheden; Gerrit D. B. van Houwelingen, Otterlo, and Mariëtta Cramer, Arnhem, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 13, 1978, Ser. No. 896,114
Claims priority, application Netherlands, May 2, 1977, 7704765
Int. Cl.² G01K *11/08, 11/12;* **B32B** *3/26*
U.S. Cl. 73—356 **23 Claims**

1. A temperature indicating device comprising
(a) a thermally conductive foil as a carrier layer provided with one or more cavities formed by depressions in the foil material, at least one of which depressions is filled with a solid mixture which melts at a predetermined temperature and includes ortho-chloronitrobenzene, ortho-bromonitrobenzene and a dyestuff, and
(b) a transparent cover layer sealing said cavities and their



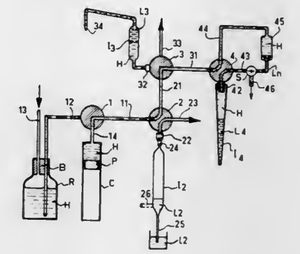
contents, characterized in that said transparent cover layer and said carrier layer are bonded to each other by means of an adhesive layer of a pressure-sensitive adhesive, said adhesive being substantially polyisobutylene.

4,189,943

APPARATUS FOR VOLUME MEASUREMENT OF LIQUIDS

Jean M. Faure, 28 Avenue Aristide Briand, Savigny sur Orge, 91600, France

Continuation-in-part of Ser. No. 670,236, Mar. 25, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 842,032
Claims priority, application France, Mar. 25, 1975, 75 09286; Jul. 30, 1975, 75 23833
Int. Cl.² B01H *3/02*
U.S. Cl. 73—425.6 **10 Claims**



1. An apparatus for transferring a liquid in one or more successive volumes and immediately reusable for transferring another different liquid, said apparatus comprising first means for containing a liquid to be transferred, second means for bringing said liquid into position in said first means, a single control liquid immiscible with said liquid to be transferred and forming a liquid piston to distribute said liquid, wherein said liquid piston contacts said liquid to be transferred without a dead air volume therebetween, and wherein said liquid to be transferred is not contaminated by a previously dispensed liquid, and wherein said first means comprises a containing element made of a material not wettable by said liquid to be transferred or by said control liquid.

4,189,944

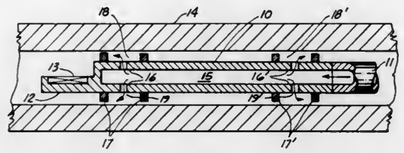
HYDRODYNAMIC ULTRASONIC PROBE

Robert A. Day, Livermore, and Armond E. Conti, San Jose, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,620
Int. Cl.² G01N *29/04*
U.S. Cl. 73—623 **3 Claims**

1. In an ultrasonic unit for inspecting an elongated hollow workpiece for wall thickness and flaws, the improvement comprising a hydrodynamic probe; said probe comprising a longitudinally extending cylindrical body member having a cavity extending longitudinally therein and adapted to be

connected with an associated pressurized fluid source, said body member being provided with a plurality of sets of longitudinally spaced holes defining fluid passages between said cavity and an outer surface of said body member, and at least two pair of radially outwardly extending flexible members secured in spaced relation about said outer surface of said body member, each of said pair of flexible members being positioned such that at least one set of said plurality of sets of spaced holes



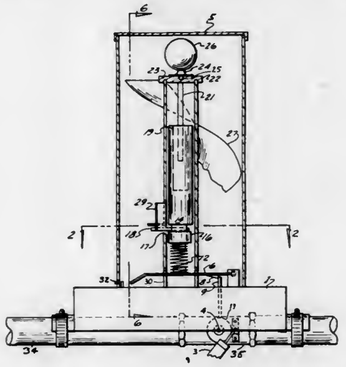
is located therebetween with respect to said outer surface of said body member, each pair of flexible members defining an annulus therebetween, whereby when said body member is inserted into an associated hollow workpiece to be inspected and fluid under pressure is directed into said cavity and outwardly through said spaced holes, each of said annulus functions as a fluid pressure plenum with respect to such an associated workpiece to maintain said body member centrally located within such an associated workpiece.

4,189,945

SEISMIC RESPONSIVE OPERATING DEVICE

Sheldon G. Whiting, 3488 Albee St., Eureka, Calif. 95501

Filed Oct. 30, 1978, Ser. No. 955,636
Int. Cl.[2] H01H *35/14*; G01V *1/16*
U.S. Cl. 73—652 **8 Claims**



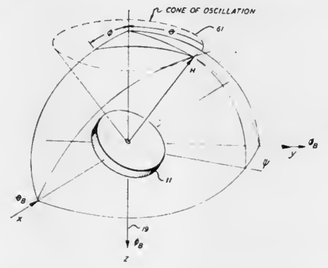
1. In a safety device automatically operated by vibration, the combination with a support,
an actuating handle pivoted on the support and being connectable to a device to be actuated,
a column on said support,
a seat on the top of the column for a spherical ball,
a device for controlling said actuating handle including
a releasable holding element on the support,
coacting members on said releasable holding element and on said actuating handle for restraining said actuating handle in inoperative position,
resiliently compressible restraining means related to said column bearing on said releasable holding element to hold it in restraining position.
cocking means related to said column to cock said resiliently compressible restraining means in compressed position,
a catch member engaging said cocking means to hold it in cocked position,
a spiral guide around said column in operative relation to said column to receive and guide said spherical ball when dislodged by vibration,
an abutment member being in the path of said spherical ball on said spiral guide to be abutted by said ball and related to said catch member to move it out of engagement from said cocking means thereby to permit said resiliently compressed restraining means to cause said coacting members to move said holding element out of restraining position and free said actuating handle for actuation,
and means to urge said actuating handle into actuating position when freed.

4,189,946

THREE AXIS GYRO

Jay Hoffman, Livingston, and Lincoln S. Ferriss, Lincoln Park, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 16, 1977, Ser. No. 851,942
Int. Cl.[2] G01C *19/28, 19/30*
U.S. Cl. 74—5.4 **11 Claims**



1. In a gyroscope including a rotor spinning about a spin axis, said rotor gimbaled about two mutually perpendicular axes so as to provide rate information along two axes, a method of also causing said gyro to provide rate information about its blind, spin axis comprising:
(a) causing the gyroscope spin axis to nutate in a cone about its nominal, blind, spin axis at a controlled amplitude and at a frequency which is at least close to the natural nutation frequency of the gyro; and
(b) detecting any variation in at least one of the coning parameters of amplitude and frequency to thereby obtain a measure of the rate about said blind axes.

4. In a gyroscope including a rotor spinning about a spin axis, said rotor gimballed about two mutually perpendicular X and Y axes, and cross coupled closed loops operative on said two mutually perpendicular axes so as to provide rate information about said two axes the improvement comprising:
(a) means to cause the gyroscope spin axis to nutate in a cone about its nominal, blind spin axes at a controlled amplitude and at a frequency which is at least close to the natural nutation frequency of the gyro; and
(b) means to detect any variation in the nutation about said spin axes to thereby obtain a measure of the rate about said spin axes.

4,189,947

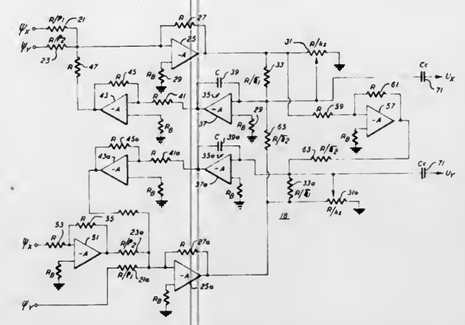
NUTATION DAMPER FOR TWO-AXIS GYROSCOPE

Bernard Friedland, West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 14, 1977, Ser. No. 850,940
Int. Cl.[2] G01C *19/04*
U.S. Cl. 74—5.5 **8 Claims**

1. In a two-axis gyroscope having mutually perpendicular first and second reference axes, a rotor with a spin axis, a first pickoff which produces a first pickoff signal whose magnitude is proportional to the angle the rotor spin axis makes with respect to the first reference axis, a second pickoff which

produces a second pickoff signal whose magnitude is proportional to the angle the rotor spin axis makes with respect to the second reference axis, a first torquer which produces angular accelerations of the rotor about the first reference axis, a second torquer which produces angular accelerations of the rotor about the second reference axis, and control means for producing first and second torquer control signals from the first and second pickoff signals which control the amount of angular accelerations produced by the first and second torquers, respectively, the improvement comprising: the control means



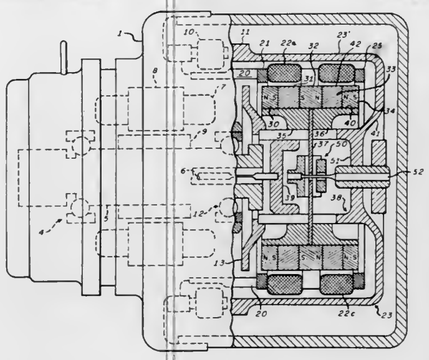
including damping means for stably damping variations in the magnitudes of the first and second pickoff signals occurring at the nutation frequency which damping means use the first and second pickoff signals to produce torquer control signals which cause substantial angular accelerations only when the first and second pickoff signal variations occur at the nutation frequency and which cause no angular accelerations when there are no variations in the magnitudes of the first and second pickoff signals at the nutation frequency; and blocking capacitors disposed between said damping means and the first and second torquers.

4,189,948

PERMANENT MAGNET TORQUER FOR FREE ROTOR FLEXURE SUSPENDED GYROSCOPES

Charles G. Buckley, and James A. Kiedrowski, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,486
Int. Cl.[2] G01C *19/30*
U.S. Cl. 74—5.46 **4 Claims**



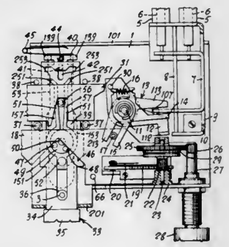
1. In gyroscopic apparatus:
housing means,
drive shaft means journalled in said housing means,
rotor means adapted for spinning about a spin axis by means of said drive shaft means,
means for supporting said rotor means for tilting about first and second tilt axes substantially perpendicular to said spin axis,
inner cylindrical shell means forming a first portion of said rotor means,
outer cylindrical shell means forming a second portion of said rotor means,
primary annular axially magnetized magnet means supported on said rotor means coaxially between said inner and outer cylindrical shell means spaced apart from said outer cylindrical shell means and forming a radial cylindrical gap with respect to said outer cylindrical shell means,
first and second annular magnetizable flux focusing means supported on said rotor means axially adjacent said primary magnet annular means for directing its axial magnetic flux radially across said radial cylindrical gap,
secondary annular axially magnetized means adjacent said first and second annular flux focusing means,
said secondary annular axially magnetized magnet means being polarized so as to oppose the axial flux of said primary annular magnet means for further focusing the flux of said primary annular magnet means radially across said radial cylindrical gap, and
energizable cell assembly means disposed within said radial cylindrical gap for torquing said rotor means with respect to said housing means about said first and second tilt axes in response to tilt thereof.

4,189,949

PUSHBUTTON TUNER

Nardino Righi, and Mario Canni Ferrari, both of Milan, Italy, assignors to Ri-El Ricerche Elettroniche S.p.A., Cologno Monzese, Italy

Filed Jul. 13, 1978, Ser. No. 924,485
Claims priority, application Italy, Jul. 14, 1977, 12691 A/77; May 12, 1978, 12611 A/78
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.33 **7 Claims**



1. A pushbutton tuner particularly adapted for automobile radio sets, comprising a plurality of pushbutton assemblies arranged side by side and parallel to each other, each pushbutton assembly being movable in its longitudinal direction and carrying an abutment element which is angularly adjustable around an axis which is perpendicular to the plane of the pushbutton assembly, locking means for locking the said abutment element in a predetermined angular position, said abutment element cooperating with two inclined edges of a V-shaped notch or opening obtained in a control bar slidably arranged transversely with respect to the pushbutton assemblies, said control bar being operatively connected with the tuner group of the radio set, wherein the improvement consists in the fact that the abutment element of each pushbutton assembly comprises at least two abutment members secured onto a common supporting element which is mounted angularly adjustable on the pushbutton assembly, whereby, whenever the pushbutton assembly is pushed to a position for the selection of the desired frequency, firstly one of the said abutment members abuts against one of the two inclined edges of the said V-shaped notch of the control bar, and promotes the shifting of the said control bar in its longitudinal direction, until the other

one of the said abutment members abuts against the other one of the inclined edges of the said V-shaped notch.

4,189,950

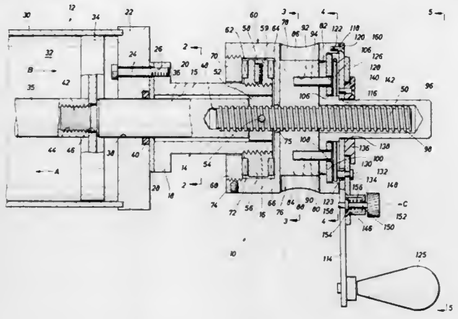
MANUAL CONTROL APPARATUS

Henry R. Killian, Sugarland, Tex., assignor to Keystone International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 712,371, Aug. 9, 1976, Pat. No. 4,080,844. This application Feb. 13, 1978, Ser. No. 877,689

Int. Cl.[2] F16H *1/18*

U.S. Cl. 74—424.8 A **25 Claims**



1. A selectively engageable manual drive apparatus comprising:

a body having a bore therethrough;

a housing secured to said body and having an axial bore registering with said bore in said body;

rotatable split drive nut means in said housing;

drive screw means mounted for axial movement in said registering bores in said body and said housing;

camming means for selectively engaging and disengaging said drive nut means and said drive screw means whereby engagement of said drive nut means and said drive screw means and rotation of said drive nut means causes axial movement of said drive screw means; and

biasing means operatively connected to said split drive nut means, said biasing means serving to exert a biasing engaging force on said drive nut means when said drive nut means encounters a given magnitude of resistance toward engagement.

4,189,951

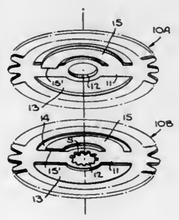
ANTI-BACKLASH GEAR

Charles A. Sauter, Westbury, N.Y., assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,542

Int. Cl.[2] F16H *55/18*

U.S. Cl. 74—440 **5 Claims**



1. An anti-backlash twin gear constituted by a pair of half-gears, each half-gear comprising a toothed wheel stamped out of sheet metal and provided with a diametrical spoke having a center mounting bore, the arched area between one side of the spoke and one half-section of the wheel being fully excised to form an open region, the arched area between the opposite side of the spoke and the other half-section being contour-cut to define a C-shaped untensioned flat spring whose foot is integral with said spoke, the spring having an element at the free end thereof which is offset with respect to the plane of the wheel whereby when a pair of such half gears are juxtaposed so that the offset element of each half-gear is received within the open region of the other and abuts the edge of the spoke forming this region, the two half-gears are angularly displaced by the untensioned springs to a predetermined degree to produce an anti-backlash twin gear in which the corresponding teeth of the half-gears overlap, and when this twin gear is intermeshed with a driving pinion engaging both half-gears, the springs are then tensioned, thereby exerting pressure on opposite tooth flanks of the pinion to avoid lost motion.

4,189,952

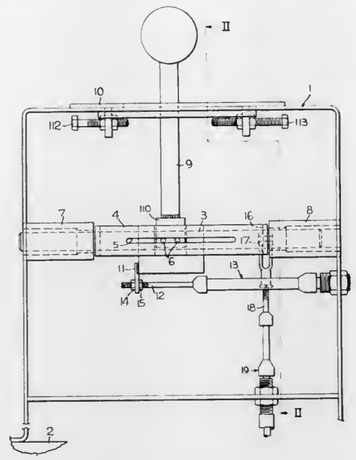
VEHICLE TRANSMISSION SHIFTING MECHANISM

William J. Zajichek, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 14, 1977, Ser. No. 851,146

Int. Cl.[2] G05G *5/10, 9/16*

U.S. Cl. 74—477 **10 Claims**



1. A vehicle transmission shifting device comprising, a shift lever, means slidably and pivotally mounting said shift lever, a transmission including a shifting member and means slidably and pivotally supporting said shifting member, a gear ratio selector mechanism connected between said shifting member and said shift lever, a gear shifter mechanism connected between said shift lever and said shifting member, at least two shift rails slidably mounted in said transmission, said shift lever selectively and alternatively operating said shifting member for selective and alternative engagement of one of said shift rails, said shift lever selectively and alternatively operating said shifting member for reciprocating one of said shift rails for shifting the selected gear ratio of said transmission, an interlock mechanism including a camming device connected to said gear shifter mechanism, a plurality of cam followers, a plurality of interlock pins reciprocated by said cam followers in response to the operation of said gear shifter mechanism for selectively locking selected shift rails in the neutral position and in the gear engaging position.

4,189,953

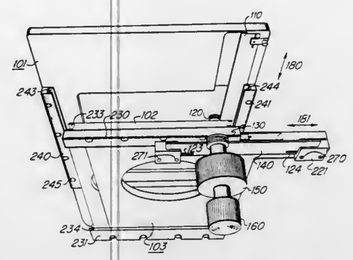
DRIVE SYSTEM FOR MENSURATION STAGES OR THE LIKE

Karl G. Volk, San Jose, Calif., assignor to SemPrex Corporation, Campbell, Calif.

Filed Apr. 15, 1977, Ser. No. 787,884

Int. Cl.[2] B23Q *3/18*; G02B *21/26*; G05G *11/00*

U.S. Cl. 74—479 **10 Claims**



1. Drive apparatus for translating the sample platform along a first axis of a mensuration stage, said drive apparatus comprising:

an intermediate plate coupled to the sample platform;

a first drive wheel having a grooved tread axially mounted on the intermediate plate of the mensuration stage;

a first drive bar movably mounted along the first axis of the sample platform having a tapered longitudinal edge for frictionally engaging the grooved tread of the drive wheel; and

first manually rotatable control means axially coupled to the first drive wheel for linearly translating the drive bar in response to rotational torque applied to said first control means.

4,189,954

SPEED CONTROL DEVICE FOR A BICYCLE

Yoshihiko Nakamura, and Masashi Nagano, both of Sakai, Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

Filed Oct. 4, 1977, Ser. No. 839,457

Claims priority, application Japan, Nov. 4, 1976, 51-149402[U]

Int. Cl.[2] G05G *11/00*

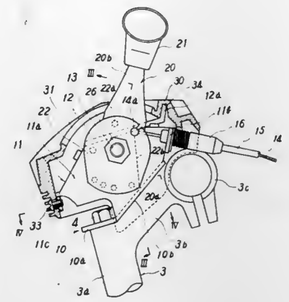
U.S. Cl. 74—488 **7 Claims**

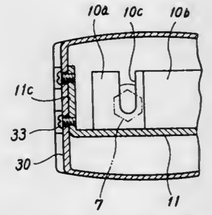
1. A speed control device for a bicycle which is fixable to a handle bar fixed to a handle lug extending from the upper portion of a handle stem which is fixed to a front fork by an expansion bolt, said speed control device comprising:

(a) a base member having an open-ended slot fittable around a stud of said expansion bolt so that said base member is fixed to the uppermost end of said handle stem by tightening said bolt,

(b) a mounting member, fixed to said base member and having a rising higher than the upper surface of said handle stem, and

(c) a speed control lever, rotatably pivoted to said rising through a horizontal pivot so as to be operable in swinging motion above the handle bar longitudinally of the bicycle





body and positioned substantially above the top of the handle stem.

4,189,955

RACK AND PINION STEERING GEAR FOR AUTOMOTIVE VEHICLES

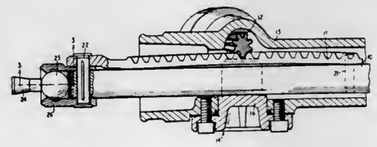
Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia

Filed Jun. 16, 1975, Ser. No. 587,286

Claims priority, application Australia, Jun. 21, 1974, PB7941

Int. Cl.[2] B62D *5/10*

U.S. Cl. 74—498 **9 Claims**



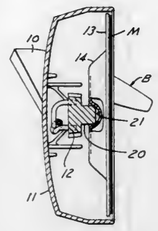
1. A rack and pinion steering gear wherein a pinion is carried on a shaft driving interconnected with a braking device and means whereby, on the application of a road shock force from the rack to the pinion acting to turn the pinion about the axis of the shaft, lost motion of the said shaft is utilized to actuate said braking device to inhibit the rotation of the shaft and thus the transmission of forces from the rack to a steering wheel, means being provided whereby the said braking device is actuated only when the force applied by the rack to the pinion exceeds a predetermined value, further means being provided whereby said braking device is not actuated or is actuated to a reduced extent, by means of forces applied by the pinion to the rack.

4,189,956

REMOTE CONTROL MIRROR

James E. Brubaker, Greenville, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Dec. 19, 1977, Ser. No. 861,835
Int. Cl.² G05G *1/00*
U.S. Cl. 74—501 M **7 Claims**



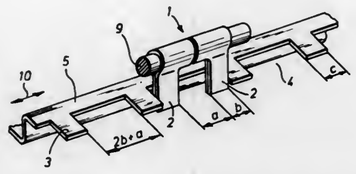
1. In a remote control mirror, the combination comprising
a mirror support,
a base,
said base having a projection fixed thereto and extending therefrom,
said mirror support having a groove into which said projection extends,
said groove having a configuration which is arcuate both longitudinally and transversely of the groove,
the radius of curvature of the groove longitudinally being greater than the radius of curvature of the groove transversely,
said projection having at least two curved contact areas engaging said groove,
said contact areas of the projection having a lesser radius of curvature than the radius of curvature of the groove in a direction transversely of the groove.

4,189,957

ARRANGEMENT FOR ARRESTING A SEAT OF A VEHICLE

Alfred Gedig; Burckhard Becker, and Heinz Bauer, all of Solingen, Fed. Rep. of Germany, assignors to C Rob Hammerstein GmbH, Solingen, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,949
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729770
Int. Cl.² G05G *5/06;* F16M *13/00;* A47C *1/02*
U.S. Cl. 74—535 **16 Claims**



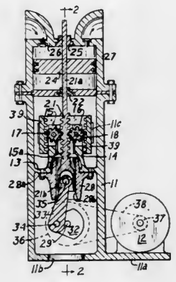
1. An arrangement for arresting a movable member, particularly a seat of a vehicle, comprising an elongated stationary element having a row of separate recesses which correspond to a plurality of possible positions of the movable member; means for arresting the movable member in a desired position and including a mounting member and at least two blocking elements both mounted on said mounting member and movable jointly to a rest position in which the movable member is free to move lengthwise of said row and each being movable independently of the other and relative to said mounting member to an arresting position in which said blocking elements are inserted in respective ones of said recesses independently of one another to thereby prevent further movement of said movable member; and means for actuating said blocking elements so as to displace them independently of one another and relative to said mounting member from said rest position into said arresting position to arrest the movable member, and to alternately displace them jointly from said blocking position into said rest position to thereby set the movable member free to move.

4,189,958

COMPRESSOR

Anton Braun, 6421 Warren Ave., Edina, Minn. 55435

Filed Jan. 9, 1978, Ser. No. 867,871
Int. Cl.² F16H *57/02*
U.S. Cl. 74—606 R **9 Claims**



1. A piston type of compressor comprising a first housing section with a piston therein, a second housing section with spaced side walls and driving means for the piston therein, said driving means including a crankshaft extending through a hole in said second housing, a piston-type of crosshead reciprocable in an axially extending bore in said second housing section and connected to said crankshaft by a connecting rod and operably connected to a piston rod extending from said piston by a balancing mechanism, said balancing mechanism having a portion thereof which moves in the opposite direction to that of said piston and which is constructed and arranged to equalize the masses of the oppositely moving parts of the compressor, said second housing section including a pair of pinions on shafts extending between a pair of generally parallel shaft support means spaced inwardly from side walls of the compressor and substantially equally spaced from the axis of said bore and arranged to enable transversely extending shaft receiving holes to be formed therein when said hole for said crankshaft is formed in a side wall of said second housing section to assure exact parallel arrangement of said shafts and said crankshaft when said compressor is assembled, and means connecting said first and second housing sections together.

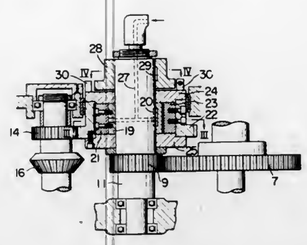
4,189,959

BIDIRECTIONAL DRIVING MECHANISM

Kiyoshi Sawada, Shizuoka, and Katsuo Yamazaki, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,670
Claims priority, application Japan, Feb. 17, 1977, 52-16477
Int. Cl.² F16H *47/00*
U.S. Cl. 74—720 **3 Claims**

1. In a bidirectional driving mechanism of the type comprising a rack, two pinions meshing with said rack, and gear trains through which power is transmitted respectively to said pinions from a common driving source, the improvement wherein at least one of the gears of said gear train is a ring gear provided on a shaft and a plurality of variable volume oil chambers containing pressurized oil are formed between said ring gear and the shaft of said ring gear so that driving torque is transmitted from said ring gear to said shaft through said oil chambers.

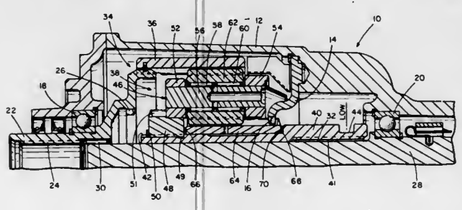


4,189,960

UNDERDRIVE TRANSMISSION WITH SUN GEAR AND CARRIER SLIDABLE AS A SUBASSEMBLY

Holdeman John W., Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 15, 1977, Ser. No. 851,648
Int. Cl.² F16H *57/10, 3/44*
U.S. Cl. 74—781 R **4 Claims**



1. A transmission comprising a housing, an input member supported for rotation in siad housing, an output shaft supported for rotation in said housing, and a planetary gear assembly in said housing, said planetary gear assembly including a ring gear secured to said input member for rotation therewith, and a sub-assembly, said sub-assembly including a shift sleeve splined to said output shaft for rotation therewith and sliding movement relative thereto, a sun gear rotatably supported by said shift sleeve, a carrier secured to said shift sleeve for rotation and sliding movement therewith, and a plurality of planet gears rotatably supported by said carrier in mesh with said ring and sun gears, said shift sleeve being slidable to a first position in which said sun gear is engaged with said housing and to a second position in which said carrier is engaged with said input member.

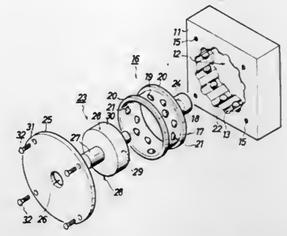
4,189,961

SPEED REDUCTION MEANS

Toshio Yamashita, No. 3-5, Higashi Nihonbashi 2-chome, Chuo-Ku, Tokyo, and Hisashi Kaburagi, No. 3-15, Akabanekita 2-chome, Kita-Ku, Tokyo, both of Japan

Filed Jun. 29, 1977, Ser. No. 810,962
Int. Cl.² F16H *13/08*
U.S. Cl. 74—798 **4 Claims**

1. In a speed reduction means, a combination comprising an input rotary body; an output rotary body; a stationary body for supporting said input and output rotary bodies for rotation about a common axis; a primary set of power transmitting balls arranged at regular intervals in two mutually shifted rows forming a zig-zag pattern between said power input rotary body and said power output rotary body; a secondary set of power transmitting balls arranged at regular intervals in a single row between the power output body and said two rows of balls in said primary set; an eccentric portion provided on said power input rotary body for compressing at one point said primary set of balls in radial direction to displace in axial direction said secondary set of balls between said two rows; one of said set of balls being held in a stationary position by said stationary body; and said single row in said secondary set including n balls and each row in said primary set including n+1 balls.

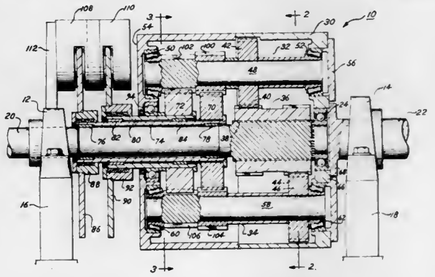


4,189,962

MULTIPLE SPEED GEAR REDUCER

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Feb. 16, 1977, Ser. No. 769,057
Int. Cl.² F16H *1/28*
U.S. Cl. 74—802 **6 Claims**



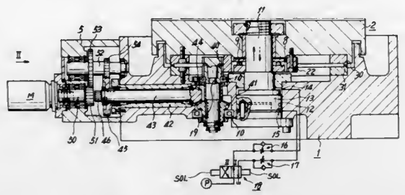
1. A multiple speed gear reducer comprising a torque input element, a torque output element disposed in end-to-end relation with said input element, two gear reduction trains operatively disposed between said input and output elements, means supporting said gear trains for orbital movement about the axis of said input element, a pair of reaction gears at least one of which is disposed concentrically with respect to said input element and radially outwardly therefrom, pinions in said gear trains for each of said reaction gears, first sleeve means disposed concentrically with respect to said input element and connected to one of said reaction gears, second sleeve means disposed coaxially with respect to said first sleeve and connected to the other of said reaction gears, clutch means connected to said sleeves and having rotating means, and means for selectively restraining the rotation of said rotating means to obtain a predetermined gear reduction between said input and output elements, said means supporting said gear trains consisting of a rotatable carrier having end members, said gear trains including shafts parallel with said input element and journaled in said end members, and said output element consisting of a shaft extending axially outwardly from one end of one of said end members.

4,189,963

INDEX APPARATUS FOR ROTARY TABLE

Yoshikazu Sano, Kariya; Kyosuke Haga, Anjo, and Kengo Yoshioka, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Jul. 26, 1978, Ser. No. 928,250
Claims priority, application Japan, Aug. 8, 1977, 52-94868
Int. Cl.[2] B23B *29/24;* B23Q *17/00*
U.S. Cl. 74—821 **6 Claims**



1. An index apparatus for indexing a rotary table comprising:
a base;
a rotary table rotatably and vertically slidably received within said base;
a first annular toothed coupling member secured to said rotary table;
a second annular toothed coupling member engageable with said first annular coupling member and secured to said base;
a hydraulic actuator formed in said base and connected to said rotary table for lifting said rotary table to disengage said first coupling member from said second coupling member to permit rotation of said rotary table relative to said base and for lowering said rotary table to engage said first coupling member with said second member;
means connected to said drive means for generating a signal, each time said rotary table is rotated a unit angle corresponding to one pitch of the teeth of said first and second coupling members;
first control means connected to said drive motor for controlling the operation thereof;
means for instructing a desired angular position of said rotary table;
second control means responsive to said instructing means and a signal from said generating means for causing said first control means to reduce the rotational speed of said rotary table, when said rotary table is rotated to a position spaced a predetermined angular distance from the desired angular position thereof; and
means operated responsive to said second control means for restricting the rotation of said rotary table when said rotary table is rotated to the desired angular position;
said hydraulic actuator being operable to lower said rotary table to engage said first coupling member with said second coupling member, after said restricting means is operated.

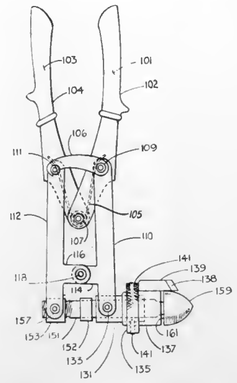
4,189,964

DEVICE TO REMOVE CONCENTRIC KNOCKOUTS IN ELECTRICAL APPARATUS

James W. Gray, Tucson, Ariz., assignor to Thomas J. Eaton, Jr., Tucson, Ariz., a part interest

Filed Jun. 16, 1978, Ser. No. 916,110
Int. Cl.[2] B25B *27/00*
U.S. Cl. 81—3 R **10 Claims**

1. A device to remove concentric metal knockouts from electrical apparatus comprising handles adapted to open and close about a pivotal point, a first lever operably attached at a first end to one of said handles proximate said handles pivotal point, a second lever operably attached at a first end to the other of said handles proximate said handles pivotal point, said first and second lever operably attached to each other to form



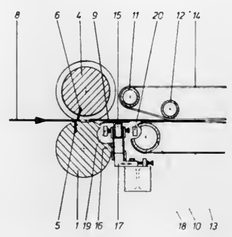
a common fulcrum, and a shearing and punch assembly operably attached to said first and second levers second end.

4,189,965

REVOLVING CROSS CUTTER

Rolf Kollann, Windthorststr. 7, Herlen-Westerholt, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,897
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743801
Int. Cl.[2] B26D *1/40*
U.S. Cl. 83—155 **2 Claims**



1. A revolving cross cutter for material in web form, comprising two driven knife drums, a transfer table following same in the line of transport of the web, and transport means following the transfer table, means mounting the transfer table for yielding movement in the line of transport comprising spring means and means for adjustably biasing same.

4,189,966

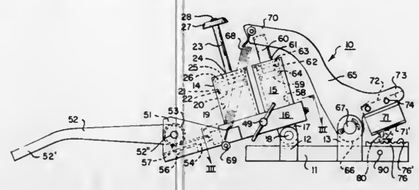
HYDRAULIC HAND TOOL

Ronald E. Keigley, P.O. Box 86, Salem, W. Va. 26436

Filed Apr. 18, 1978, Ser. No. 897,352
Int. Cl.[2] B26D *1/30, 5/12*
U.S. Cl. 83—178 **14 Claims**

1. A hand tool comprising a base, means on the base interchangeably receiving one of inside and outside cutter members, a cutter member interchangeable on said means, a lever pivoted on said base and having means receiving interchangeably said inside and outside cutter members, resilient means biasing said lever to a normal position in which said outside cutter members are separated and said inside cutter members are joined; pressure responsive means for pivotally moving said lever to effect the cooperative relation of said cutter members; a hydraulic pressure system having a reservoir, a pump

having a piston of relatively small area and conduit means communicating hydraulic pressure created by operation of said pump to said pressure responsive means, a second pump having a piston of relatively large area side by side with said pressure responsive means, operative to rapidly displace a relatively large volume of hydraulic medium from said reservoir to said



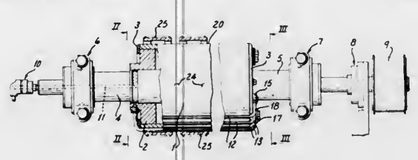
pressure responsive means to effect the initial movement of said lever whereby cutting contact of said cutting members with the object to be cut is effected, and carrier means pivoted on said base carrying said pumps and pistons and said pressure responsive means for unitary pivotal movement on said base whereby said pressure responsive means rotates on the base to follow the lever.

4,189,967

SLITTER ROLLERS

Edward G. Calvert, Flaxbourton, England, assignor to Masson Scott Thrissell Engineering, Ltd., Great Britain

Filed Dec. 16, 1977, Ser. No. 861,242
Claims priority, application United Kingdom, Dec. 30, 1976, 54350/76
Int. Cl.[2] B23D *35/00, 19/04*
U.S. Cl. 83—665 **5 Claims**



1. A roller supporting annular slitter members and having pneumatic tubes in recesses formed in its circumferential surface for holding said members in desired axial positions thereon, in which said recesses and tubes extend lengthwise of the roller and are all located on one side of a plane containing the rotational axis of said roller, and a flat formed on the outer circumferential surface of the roller in a position diametrically opposite the region of said surface containing said grooves and pneumatic tubes.

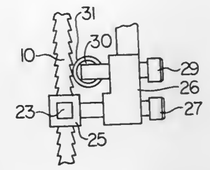
4,189,968

MOBIUS STRIP BANDSAW BLADE

Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 30, 1978, Ser. No. 938,136
Int. Cl.[2] B23D *55/08;* B27B *13/10*
U.S. Cl. 83—816 **3 Claims**

1. A bandsaw comprising a frame, a lower band wheel mounted for rotation upon said frame, an upper band wheel mounted for rotation upon said frame, a continuous bandsaw blade of Mobius strip construction positioned for movement around said upper band wheel and said lower band wheel, said blade having a knife edge, tensioning means for adjusting said upper band wheel relative to said lower band wheel to adjust the tension in said blade positioned therearound, means for supporting a workpiece to be cut, upper blade guide means and lower blade guide means, wherein each of said blade guide means comprise a thrust bearing mounted for rotation in the cutting plane of said blade, said thrust bearing having a circumferential V-shaped groove, wherein the included angle of said groove is smaller than the angle of said knife edge.

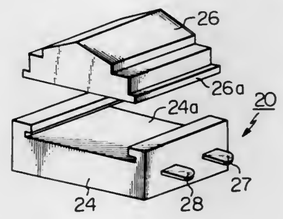


4,189,969

PICKUP UNIT AND PICKUP ASSEMBLY FOR MUSICAL INSTRUMENT

Shinji Katayama, and Kazuo Murakami, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha

Filed Jun. 14, 1977, Ser. No. 806,356
Claims priority, application Japan, Jul. 21, 1976, 51-96063
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.14 **16 Claims**



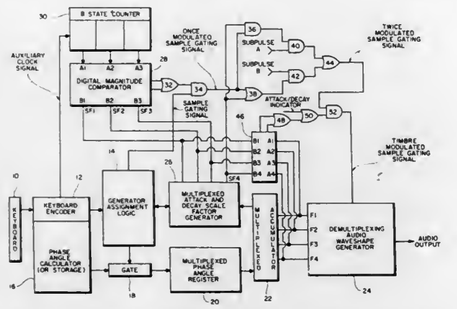
1. A pickup unit for a musical instrument having tone sources for producing mechanical vibrations, said pickup unit comprising:
a piezoelectric element having opposite responsive surfaces;
a pair of elongated electrode strips, each being arranged in contact with one of said responsive surfaces and each partly projecting out of the contour of said piezoelectric element and each extending to a respective free end;
a unitary molded shield block, made of synthetic resin, internally and wholly confining said piezoelectric element and said electrode strips thereof in such a manner that said free ends of said electrode strips project out of said shield block to form a pair of output terminals of said pickup unit; and
a crest receptive of mechanical vibrations generated by at least one of the tone sources, said crest being disposed atop said shield block in such an arrangement that mechanical vibrations received by said crest are almost all transmitted to said responsive surfaces of said piezoelectric element via said shield block, said crest being releasably coupled to said shield block such that said crest may be removed from said shield block and replaced by a new crest.

4,189,970

METHOD AND APPARATUS FOR ACHIEVING TIMBRE MODULATION IN AN ELECTRONIC MUSICAL INSTRUMENT

Robert P. Woron, Allentown, Pa., assignor to Allen Organ Company, Macungie, Pa.

Continuation-in-part of Ser. No. 787,695, Apr. 14, 1977, abandoned. This application Aug. 29, 1977, Ser. No. 828,917
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.19 **8 Claims**



1. Apparatus for achieving timbre modulation in an electronic musical instrument including an audio wave shape generator responsive to octavely related note frequency signals, comprising:

means for generating a variable magnitude digital signal,

means connected to the audio wave shape generator for generating octavely related note frequency signals,

digital magnitude comparator means for comparing said variable digital signal with said octavely related note frequency signals and for producing an output signal based on predetermined comparisons,

means for generating a sample gating signal indicative of the desired state of the audio wave shape generator, and

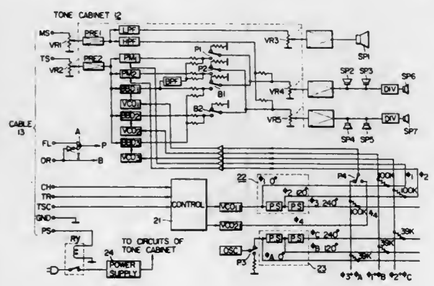
digital logic means connected to the audio wave shape generator for accepting said sample gating signal and said digital magnitude comparator output signal and for producing a timbre modulated sample gating signal for controlling the audio wave shape generator.

4,189,971

ELECTRONIC MUSICAL INSTRUMENT SYSTEM HAVING INDEPENDENT TONE CABINET

Rokurota Mantani, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 27, 1978, Ser. No. 890,418
Claims priority, application Japan, Apr. 4, 1977, 52-38220
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.24 **14 Claims**



1. An electronic musical system comprising:

an instrument body;

at least one tone cabinet located remote from said instrument body and being separated therefrom; and

means for electrically connecting said instrument body to said at least one tone cabinet;

said instrument body including:

a playing section;

a plurality of tone coloring circuits connected to receive a tone signal for producing a plurality of differently tone-colored musical tone signals;

musical tone signal selection means coupled to said tone coloring circuits for selecting and providing at least one of said plural musical tone signals to one output terminal; and

musical effect selection means ganged with said musical tone signal selection means for selecting one of a plurality of musical effects to be given to the musical tone signal or signals selected by said musical tone signal selection means in accordance with the at least one tone color selected by said musical tone signal selection means; said at least one tone cabinet including:

musical effect imparting circuit means having an input for receiving said selected tone signal or signals and including tone signal modulating means for modulating said selected tone signal or signals in accordance with at least one modulation signal for imparting a selected musical effect or effects to said selected tone signal or signals;

control means coupled to and responsive to said musical effect selection means of said instrument body to set said musical effect imparting circuit means into a state for imparting the musical effect selected by said musical effect selection means to said selected tone signal or signals; and

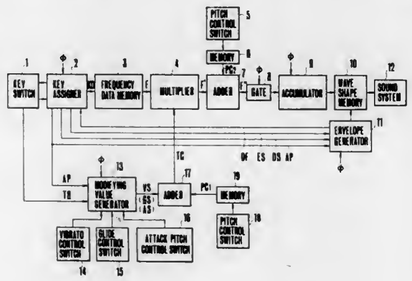
a sound system having at least one loudspeaker and having an input coupled to the output of said musical effect imparting circuit means.

4,189,972

ELECTRONIC MUSICAL INSTRUMENT OF NUMERICAL VALUE PROCESSING TYPE

Shigeru Yamada, and Kiyoshi Ichikawa, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 22, 1978, Ser. No. 880,203
Claims priority, application Japan, Feb. 26, 1977, 52-20443
Int. Cl.[2] G10H *1/04, 5/00*
U.S. Cl. 84—1.25 **3 Claims**



1. An electronic musical instrument conprising:

a key switch circuit designating notes to be played by key operation;

a first circuit for generating a numerical value corresponding to a frequency related to a designated not corresponding to an operated key;

a second circuit for modifying said numerical value to produce a modified signal;

a third circuit for producing a musical tone having a frequency corresponding to said modified signal;

a fourth circuit which generates a modification coefficient of said numerical value related to the designated note; and

means for supplying said modification coefficient to said second circuit to modify said numerical value;

said fourth circuit including circuit means responsive to the key operation for generating a periodic signal as said modification coefficient, said circuit means having a circuit for generating said periodic signal including a portion in which the amplitude of said periodic signal increases at a predetermined rate and a succeeding portion in which the amplitude is constant, and means for varying said rate;

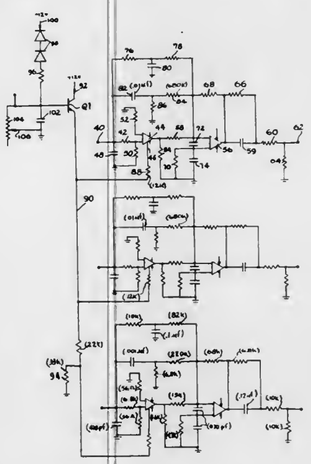
said rate varying means including means for providing a low rate as said predetermined rate so that the increase of said amplitude of the periodic signal takes place gradually enough to be perceived by human ears, means for providing a high rate as said predetermined rate so that said increase takes place too quickly to be perceived by human ears, and means for switching said rates.

4,189,973

ELECTRONIC EXPRESSION CONTROL

Patrick K. Doane, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jul. 8, 1977, Ser. No. 813,834
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.27 **20 Claims**



1. A circuit for effecting expression control in an electronic organ or the like comprising:

variable gain amplifier means having a signal input terminal and a signal output terminal,

said amplifier means having gain control terminal means separate from said input terminals so that signals on said control terminal means are not joined with any signal on said input terminal,

a source of control voltage,

a player controlled circuit connected between said source of control voltage and said control terminal means, said player controlled circuit comprising a transistor connected between said source of voltage and said control terminal means, a potentiometer connected to a control terminal of said transistor, said potentiometer comprising a slider engaging and movable along a resistor element, a high frequency low impedence shunt means including a capacitor, said shunt means being connected to a point between said potentiometer means and said transistor controlled terminal for smoothing out sudden changes in potentiometer output as sensed by said transistor control terminal and for shunting away from said transistor control terminal the high frequency components present in any scratch produced by said potentiometer,

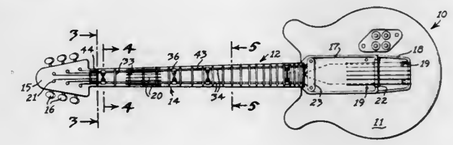
said amplifier means including means associated with said control terminal means for controlling the gain of said amplifier means in response to said control terminal.

4,189,974

GUITAR NECK ASSEMBLY

James O. Martin, 249 Ridgewood Rd., Goodlettsville, Tenn. 37072; Rex D. Fathergill, Rte. 6, Frankfort, Ky. 40601, and David L. Krimm, 286 Tangley Way, Lexington, Ky. 40503

Filed Sep. 22, 1978, Ser. No. 944,927
Int. Cl.[2] G10D *3/06*
U.S. Cl. 84—293 **9 Claims**



1. A neck assembly for a stringed musical instrument comprising:

(a) an elongated, channel-shaped, open-top, neck body, having elongated first and second upper edge portions,

(b) a plurality of elongated fret members having first and second end portions,

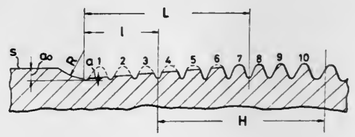
(c) means securing said fret members to said neck body to substantially span the open top of said neck body, so that said fret members are disposed transversely and spaced longitudinally of said neck body and beneath the strings of a stringed musical instrument of which said neck body forms a part.

4,189,975

SCREWED CONNECTION HAVING IMPROVED FATIGUE STRENGTH

Sinichi Nisida, Kitakyushu; Chikayuki Urashima, Nakama, and Hiroki Masumoto, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Nippon Steel Bolten Company Ltd., Fukuoka, both of, Japan

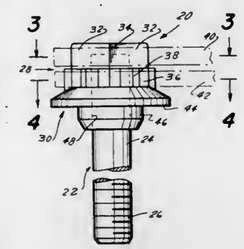
Continuation of Ser. No. 771,386, Feb. 23, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 891,026
Int. Cl.[2] F16B *33/00*
U.S. Cl. 85—1 T **4 Claims**



1. A screwed connection comprising an internal thread member and an external thread member, said external thread member having an axially extending threaded part and a cylindrically shaped unthreaded part having an outside diameter at least equal to the maximum diameter of said threaded part and extending axially from one end of said threaded part, the threaded part of said external thread member being provided with at least one complete thread and a plurality of successive crest-cut-off threads arranged to constitute at least a fraction of the threaded part thereof and having heights of said crest-cut-off threads progressively decreasing from said at least one complete thread in the screwing up direction of said connection to the unthreaded part thereof while maintaining constant the major diameter of the internal thread and the minor diame-

ter of the external thread respectively, the crest-cut-off thread having the least height being located adjacent to the unthreaded part, and an axially extending clearance section of moderate concave curvature extending between the radially outer surface of said crest-cut-off thread having the least height and said unthreaded part and the least diameter of said axially extending clearance section being at least equal to the diameter of the thread root of said axially extending threaded part.

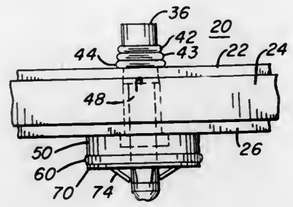
4,189,976
DUAL HEAD FASTENER
Stephen P. Becker, Poughkeepsie, N.Y., assignor to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y.
Filed Jun. 29, 1978, Ser. No. 920,161
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—9 R **10 Claims**



1. A fastener element adapted for use as a bolt head, nut and the like comprising; an operative structure adapted for removably interconnecting with at least one other element of a fastener assembly to complete the assembly, a head extending from the operative structure and having an exterior surface adapted to be removably engaged by a tool for rotation of the element, the head being hexagonal in configuration on its outer surface for a predetermined portion of its height and being of a twelve pointed configuration on its outer surface for a predetermined portion of its height thereby permitting the use of a fastener element with a tool adapted for engagement with a six pointed surface or a tool for engagement with a twelve pointed surface, the head being hexagonal in configuration and having a projection extending from each side thereof a predetermined height less than the height of the head and being circumferentially aligned to thereby cooperate with the edges of each adjoining pair of sides to the head to form a twelve point head portion at the location of the projection while retaining a six point head portion at the remainder of the head formed by the point of joinder of the six sides thereby permitting the use of the fastener element with either a six point or a twelve point wrench.

4,189,977
WEATHER TIGHT BLIND FASTENER
Carman R. Hintz, Pittsburgh, Pa., and Warren K. Jahns, Chicago, Ill., assignors to H. K. Porter Company, Inc., Pittsburgh, Pa.
Filed Jan. 6, 1978, Ser. No. 867,463
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—70 **27 Claims**

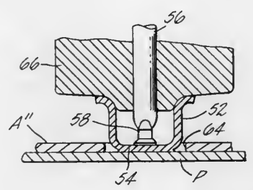
1. A blind weather tight fastener for joining together two or more members having aligned openings formed therethrough comprising:
- a tubular member extending through the members to be joined having a flanged end portion which engages the outer member when the blind fastener is inserted through the aligned openings;
- a mandrel having a headed portion, defining an annular surface engaging the unflanged end of said tubular member to cause controlled collapsing of the unflanged end of said tubular member when an axial setting force, relative to said tubular member, is applied to said mandrel;
- a rigid metallic washer having a thickness greater than the thickness of the flange of said tubular member, having a counterbore formed in the center thereof to receive the flanged end of said tubular member, disposed on said mandrel with the flanged end portion of said tubular member positioned in the counterbore;
- a circular retainer, slidable in one direction only, disposed over the end of said mandrel, which projects from the flanged end of said tubular member, to resiliently hold said

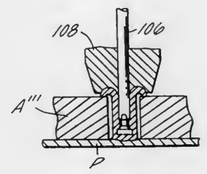


mandrel within said tubular member when the fastener is set;
- a resilient washer formed of resilient material sandwiched between said rigid metallic washer and said circular retainer having a diameter at least as great as said circular retainer and said rigid metallic washer; and,

said rigid metallic washer having sufficient rigidity to transmit a holding force applied to its periphery to the flanged end of said tubular member to cause the collapse of said tubular member when the axial setting force is applied to the mandrel.

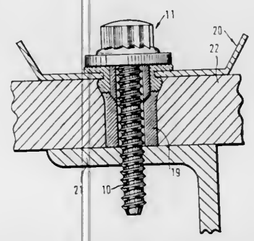
4,189,978
FASTENER
Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.
Filed Nov. 29, 1977, Ser. No. 855,606
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656130
Int. Cl.[2] F16B *13/04, 33/04*
U.S. Cl. 85—72 **3 Claims**





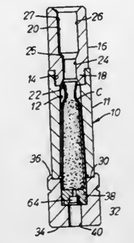
1. A fastener for use in securing an article to a support without making a hole in the support comprising a tubular shank of substantially constant outside diameter open at one end, and an end wall closing said shank at the other, said end wall being weldable to the support or adapted to be bonded thereto, and a pin centrally disposed with respect to said shank, partly accommodated therein and in part projecting therefrom at one end remote from said end wall, said pin having a head accommodated in a recess in said shank adjacent said end wall and being closely surrounded by an intermediate portion of said shank such that said head cannot be retracted relative to said shank without radial expansion of said shank, and a portion of said shank at said open end having a slightly larger internal diameter than said intermediate portion whereby said open end of said shank is disposed in spaced relation with said projecting part of said pin being adapted to be splayed radially outwardly by an anvil bearing thereagainst with a force counterbalancing that of a pull applied to said pin.

4,189,979
FASTENER FOR SECURING AND SEALING SHEET MATERIAL IN SPACED RELATION TO A SUPPORT
Colin Silverwood, Pudsey, England, assignor to British Screw Company Limited, Leeds, England
Filed Oct. 11, 1977, Ser. No. 840,528
Claims priority, application United Kingdom, Oct. 14, 1976, 42666/76
Int. Cl.[2] F16B *13/04, 29/00*
U.S. Cl. 85—74 **5 Claims**



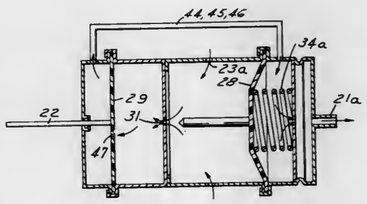
1. A threaded fastener assembly for securing together first and second apertured sheet members in spaced relation, the assembly comprising:
- a threaded fastener having a head and a shank with a free end portion remote from the head, at least the free end portion being screw threaded;
- a rigid expander assembled with the fastener to surround the shank thereof adjacent the head and having an externally tapered lead-in portion at its end remote from the head;
- a resilient sealing washer comprising an annular body and an annular external flange at one end of the body, the sealing washer being assembled with the fastener to surround the shank thereof with the flanged end disposed adjacent the rigid expander;
- a rigid spacer means surrounding the shank of the fastener and abutting the resilient sealing washer at the end thereof remote from the flange;
- the rigid spacer means, the body of the sealing washer and the rigid expander being of such a size as to be capable of passing through the aperture of the first sheet member, the flange of the resilient sealing washer being too large to pass through said aperture, the resilient sealing washer being capable of riding over and being expanded radially outwardly by the rigid expander as the assembly is being secured to said sheets, the resilience of the sealing washer and the dimensions of the sealing washer and expander being so selected in relation to the size of aperture in the first sheet member as to permit the expander to move to a position within the body of the resilient sealing washer and extending through said aperture, whereby the resilient sealing washer is expanded into abutment with both faces of the first sheet member.

4,189,980
METHOD AND APPARATUS FOR RELOADING A CENTERFIRE CARTRIDGE
Gordon N. Schaenzer, 11737 N. Solar Ave., Mequon, Wis. 53092
Filed Jan. 16, 1978, Ser. No. 869,822
Int. Cl.[2] F42B *33/00*
U.S. Cl. 86—24 **6 Claims**



1. A cartridge reloading apparatus comprising:
- a resizing die having a longitudinal bore formed therein which includes a funnel portion, and a coaxial resizing portion for receiving a used cartridge therein and for reshaping the external configuration of a cartridge driven therein by mechanical force; an anvil for supporting said resizing die, said anvil including a bore therein having a diameter larger than the diameter of said cartridge and for receiving a portion of said cartridge; means for removing the primer from said cartridge by mechanical force and for forcing said cartridge out of said resizing die while said resizing die is seated on said anvil, the removing means being a rod including an end receivable in said cartridge and supporting a pin extending axially from said end for striking said primer; cartridge priming means for forcing a primer into said cartridge; means for flaring the neck opening of said cartridge to form a funnel which cooperates with the funnel portion of said resizing die to facilitate filling said cartridge with gunpowder and to facilitate the insertion of a bullet therein; a bullet seating tool for forcing a bullet into said shell neck; and crimping means for crimping said neck against said bullet.

4,189,981
COMBINATION THROTTLE KICKER AND DECELERATION VALVE
George C. Ludwig, Owosso, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.
Filed Dec. 30, 1977, Ser. No. 865,983
Int. Cl.[2] F15B *13/042*
U.S. Cl. 91—52 **10 Claims**



1. A combination throttle kicker and deceleration device comprising
- a housing,
- a wall dividing said housing,
- a first diaphragm on one side of said wall forming a chamber with an end of said housing,

said housing having a connection for connecting the cham-

ber between said first diaphragm and said housing to vacuum,

said wall having an opening therein providing communication between the two sides of said wall,

means defining a vent passage from the space between said first diaphragm and said wall to the ambient atmosphere exterior of said housing,

said diaphragm being adapted to engage said wall and prevent the flow of air through the opening in said wall,

spring means yieldingly urging said first diaphragm toward said wall,

a second diaphragm on the other side of said wall forming a chamber with an end of said housing,

means defining an orifice in said second diaphragm providing free access of air between said second diaphragm chamber and said wall,

and a shaft adapted to be moved by said second diaphragm upon movement away from said wall,

said shaft extending exteriorly and being adapted to be linked to a throttle,

and means providing communication between the chambers formed between the diaphragms and the ends of the housing.

4,189,982

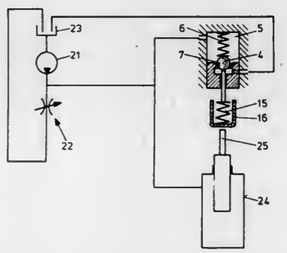
FEED PRESSURE BYPASS VALVING FOR SERVOMOTORS

Armin Lang, Schwabisch Gmund-Bettringen, and Rolf Fassbender, Mutlangen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrickshafen, Fed. Rep. of Germany

Filed Jan. 4, 1977, Ser. No. 756,738

Int. Cl.[2] F15B *15/20*

U.S. Cl. 91—400 **7 Claims**



1. In a feed pressure bypass valve means actuatable by the piston of a servomotor, the improvement comprising a valve (4, 7) and bias spring (6) biasing said valve to closed position; having valve actuator means (15, 16, 9, 10) comprising an actuator spring (15); said valve actuator means being disposed to be engaged by piston movement wherein said actuator spring is compressed in opposition to the bias spring;

said valve actuator means being operative by force of predetermined compression in said actuator spring (15) to overcome the bias of said bias spring (10), to initiate and to continue the opening of said valve responsive to movement of said piston toward the end of a stroke;

a housing (1) for said bypass valve means having support structure (17) for said valve actuator means whereby said bypass valve means effects a unitary device independently mountable;

said housing having an inlet passage means (2) for conducting feed pressure to said valve upstream in the closing direction thereof and having outlet passage means (3) connecting to said valve downstream thereof wherein feed pressure is operative as a bias force in the closing direction of said valve.

4,189,983

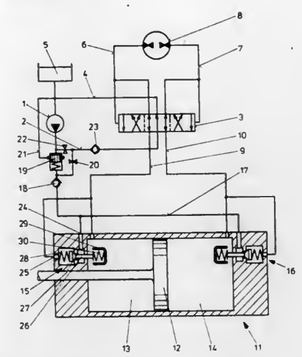
SERVOMOTOR PRESSURE CONTROL RESPONSIVE TO PISTON TRAVEL

Rolf Fassbender, Mutlangen, and Armin Lang, Schwäbisch Gmünd-Bettringen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 4, 1977, Ser. No. 756,794

Int. Cl.[2] F15B *15/22*

U.S. Cl. 91—400 **8 Claims**



1. In a booster steering system of the kind described and which comprises a servomotor having a piston with means effecting feed pressure thereto and including feed pressure bypass means to relieve pressure from said servomotor by bypassing feed pressure to a sump responsive to travel of the servomotor piston toward the end of a stroke and said bypass means comprising bypass valve means operable by piston travel, and including means for effecting throttled feed pressure in the opening direction of said bypass valve means;

the improvement which comprises: said bypass valve means comprising a bypass valve construction having a valve head with a resilient closure bias means and a resilient opening means disposed to be increasingly compressed by piston travel toward the end of a stroke to oppose the resilient closure bias means for effecting gradual opening force on said valve head to the point where said throttled feed pressure can effect opening thereof to prevent abrupt pressure drop in said servomotor by gradually reducing the force needed to overcome the closure bias means.

4,189,984

PISTON-CYLINDER ARRANGEMENT FOR A COMPRESSOR

Hans J. Tankred, Sonderborg, and Erling B. Kristensen, Austenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 18, 1978, Ser. No. 906,958

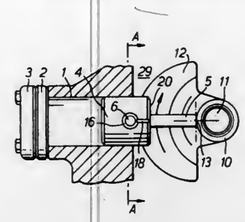
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724332

Int. Cl.[2] F15B *21/04*

U.S. Cl. 92—82 **4 Claims**

1. A compressor assembly, comprising, a casing forming a cylinder and a crankcase, a piston member having no sealing ring, said piston being reciprocally mounted in said cylinder and having a transversely extending bore, a pin member in said bore having a length which is shorter than the diameter of said cylinder so as to define recesses at opposite ends thereof, a crankshaft in said crankcase, a crank extending between and connected at opposite ends thereof to said pin member and to said crankshaft, said piston member having a stroke relative to said cylinder so that said recesses extend beyond the lower edge of said cylinder when said piston member is at the bottom

of its stroke, throttle passage means in at least one of said members providing fluid communication between said recesses



and the interior of said crankcase when said recesses are entirely above the lower edge of said cylinder.

4,189,985

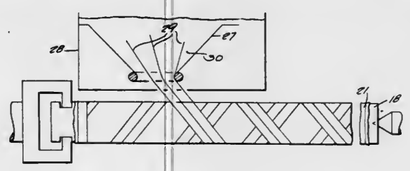
FABRIC-LINED EPOXY RESIN CYLINDER WITH LUBRICANT RETAINING GROOVES

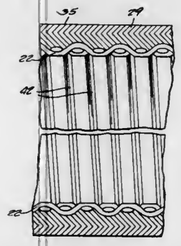
Bernard Harris, Bayside, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 21, 1977, Ser. No. 862,808

Int. Cl.[2] B32B *1/08, 1/10*; B65H *81/06*; F01B *11/00*; F16L *9/16*

U.S. Cl. 92—153 **8 Claims**





1. A fluid actuated device comprising a wound glass filament reinforced resin bodied cylinder and a piston axially movable in the cylinder by a fluid under pressure, said cylinder having an axially extending series of circumferential grooves and lands which form the inner surface thereof, said lands providing the support of the piston against radial loads and said grooves providing recesses for retaining portions of the fluid as a lubricant, said cylinder further including a fabric embedded in the resin and having relatively uncrimped circumferential filling yarns and axial warp yarns, said lands including the radially inward crimps of the warp yarns, said grooves being formed by capillary action adjacent the crimps of the warp yarns, said fabric being in the form of a seamless woven sleeve having a continuous filling yarn and in the order of 80 warp yarns per inch, said grooves and lands being of spiral form.

4. A cylinder in which a piston may be disposed for axial movement by a fluid under pressure within the cylinder and having an axially extending series of voids which appear as circumferential grooves between lands which form the inner surface of the cylinder, said lands providing support of the piston against radial loads and said grooves providing recesses for retaining portions of the fluid as a lubricant, said cylinder comprising a resin body and a fabric embedded therein and having circumferential filling yarns and axial warp yarns, said lands including the radially inner crimps of the warp yarns, said grooves overlying the intersections of the warp yarns, said fabric being in the form of a seamless woven sleeve having a continuous filling yarn such that the grooves comprise a single, spiral groove.

7. The method of making a glass filament reinforced resin bodied cylinder in which a piston may be disposed for axial movement by a gas under pressure within the cylinder and having an apparently axially extending series of circumferential grooves and lands which form the inner surface of the cylinder, said lands being provided for the support of the piston against radial loads and said grooves providing recesses for retaining gas-borne fluid as a lubricant for the lands, said method comprising (1) providing a seamless fabric sleeve of yarns of a 1×1 weave consisting of a continuous relatively uncrimped circumferential filling yarn and relatively larger lengthwise warp yarns of nominal twist, (2) providing a rigid, smooth cylindrical mandrel with a non-wettable outer coating, (3) circumferentially fitting said sleeve on said mandrel whereby the inner crimps of the warp yarns are pressed against and conform closely to the mandrel, (4) applying a thermosetting resin over the outer face of the sleeve and winding a series of helical glass filaments in several layers thereover such that while the resin generally soaks readily through the yarns to the face of the mandrel the surface tension of the resin causes the formation of a minute voids at the apices between the mandrel and the radially inner crimps of the warp yarns and causes the resin to form a generally spiral groove at the surface of the mandrel, (5) curing the resin while the cylinder is on the mandrel and thereafter (6) removing the cylinder from the mandrel, said groove then constituting said lubricant grooves intermediate said lands.

4,189,986

METHOD AND APPARATUS FOR HEAT SEALING A PACKAGE BLANK

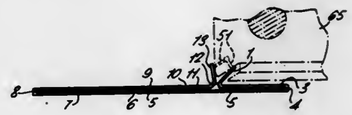
Stanley M. Silver, London, England, assignor to Paxall Inc., Chicago, Ill.

Continuation of Ser. No. 830,102, Sep. 2, 1977, abandoned, which is a division of Ser. No. 234,105, Mar. 13, 1972, Pat. No. 4,046,308. This application Aug. 3, 1978, Ser. No. 930,517

Claims priority, application United Kingdom, Mar. 24, 1971, 7709/71; Apr. 21, 1971, 10351/71; Apr. 21, 1971, 10352/71; Jun. 9, 1971, 19550/71

Int. Cl.[2] B65B *1/02*

U.S. Cl. 93—36 M **10 Claims**



1. A method of end-sealing a blank with heat-sealable characteristics suitable for packaging, said blank being formed from a sheet of laminated material comprising a substratum and sheeting of pack-lining material delaminably adhered to the substratum by a moisture-resistant heat-weakenable laminant, and said sheeting surface having pressure-cohesive characteristics when heated; said blank having fold lines defining at least two pairs of opposable body walls and at least one foldable end closure panel connected to each body wall end, and at select opposable edge margin areas of the blank, fold lines defining flange panels, at least one of which flange panels has an extension and at least one of which flange panels is connected to a body wall, the aggregate of said flange panels and extension being of greater length than the edge of said body wall parallel thereto, and said flange panels being sufficiently cut free on three edges and being co-operable to permit folding into a sealable side fin; and said end closure including a main closure

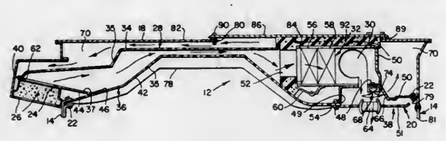
panel, lateral gussets and a flange closure panel at least almost wholly cleanly laterally severed therefrom for forming a heat-sealed joint co-extensive with the gussets at the corners of an erect package; said method including the steps of folding the said blank such as to bring the roots of said fin flange panels into interengagement, subjecting superposed body walls to pressure contact, applying heat and pressure to at least said roots to cause their sheeting to fuse, heating and outfolding one fin flange panel and an adjacent panel to strip the sheeting therefrom, folding and adhering regions of the stripped substratum to at least one opposed panel thereby to define a substratum tube around a sheeting tube; downfolding the main closure panel with outfolding of the gussets and outfolding of the flange closure panel, applying heat and pressure to at least partly seal the sheeting thereof and so define an at least partially sealed end membrane, lifting the said main closure panel to strip it from the said end membrane, infolding the gussets, downfolding the stripped main closure panel and sealing down the said folded-down main closure panel.

4,189,987

VEHICLE CAB TEMPERATURE CONTROL SYSTEM

Arthur A. Amberg, Plainfield, and Ture R. Zetterlund, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jul. 3, 1978, Ser. No. 921,384
Int. Cl.[2] B60H *1/24*
U.S. Cl. 98—2.14 **6 Claims**



1. In a vehicle cab air temperature control system for a cab having an operator enclosure with a roof and an outwardly exposed air filter means attached to the roof of said operator enclosure, the improvement including, in combination:

a duct secured within said operator enclosure in close proximity below and in spaced relationship to said roof, thereby providing an insulating chamber containing trapped air between substantially the entire expanse of said roof and said duct, said duct is secured to said air filter means and has an inlet aperture adjacent said air filter means within said enclosure to provide an air passage between said duct and said air filter means, an outlet aperture spaced from said inlet aperture to provide an air passage between said duct and said enclosure and a bleed aperture located between said inlet and said outlet apertures to provide an air passage between said duct and said chamber;

blower means mounted within said duct for supplying a flow of air from outside said air filter means through said air filter means, said inlet aperture, said duct, into said operator enclosure through said outlet aperture and into said chamber through said bleed aperture; and

temperature control means mounted within said duct between said bleed aperture and said inlet aperture for controlling the temperature of the air flowing from said duct into said operator enclosure and said chamber.

4,189,988

INSULATION AND VENTILATION SYSTEM FOR MOBILE HOMES

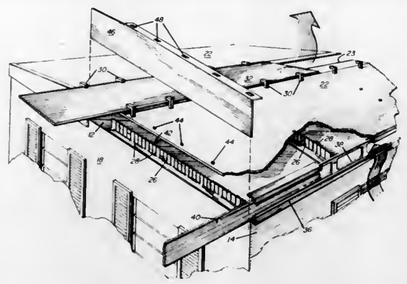
Noah Shaver, 32 W. Harvard St., Orlando, Fla. 32804

Filed Jan. 16, 1978, Ser. No. 869,537
Int. Cl.[2] F24F *7/02*
U.S. Cl. 98—31 **8 Claims**

1. A system for use with a conventional building having an existing roof, said system comprising:

a flexible sheet having dimensions generally conforming to said roof, said sheet including a central opening extending along said sheet parallel with a first edge of said roof;

means for conforming said sheet to the pitch of said roof and for holding said sheet in spaced relation above said roof so as to define a void therebetween communicating with said central opening, said sheet and said roof further defining peripheral openings permitting movement of a cooling fluid from the ambient into said void, said holding means including a plurality of brace plates between said roof and



said sheet and normal to said first edge, each plate having plural slots therein extending from said sheet toward said roof;

said holding means further including means for substantially restricting flow of said fluid through said peripheral openings along substantially parallel paths through said void and out of said central opening;

means for closing said central opening; and

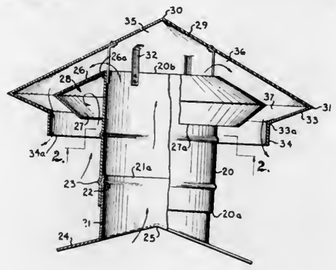
means for closing said peripheral openings.

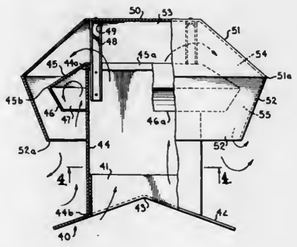
4,189,989

GABLE VENTILATORS

Perry V. Maze, 701 Morton, Falls City, Nebr. 68355

Filed Feb. 21, 1978, Ser. No. 879,762
Int. Cl.[2] F24F *7/02*
U.S. Cl. 98—42 R **15 Claims**





1. A ventilator construction comprising, in combination,

a normally vertical, hollow centered stack for flowing air or gas therethrough,

said stack made up of a continuous, enclosing wall having upper and lower ends both open,

the lower end of the stack adapted to be put into communication with an opening in the roof of a housing structure to receive air or gas flow therefrom,

the upper end of the stack adapted to discharge the said air or gas upwardly therefrom,

a first hoodlike canopy overlying and partially enclosing the upper end of said stack, said first hoodlike canopy made up of a first uppermost portion centrally overlying the stack and, at least peripherally of the stack upper end, angling outwardly and downwardly, the outermost portion of the first hoodlike canopy extending downwardly and inwardly past the upper edge of said stack,

a second, inboard hoodlike canopy surrounding the stack adjacent the upper end of the stack and circumferentially connected thereto,

said inboard second hoodlike canopy having an upper portion extending circumferentially outwardly and slightly downwardly from its connection to the stack peripherally and circumferentially thereof, with a lower portion of said second hoodlike canopy extending downwardly and inwardly toward the periphery of the stack from the periphery of the first portion thereof,

the inboard hoodlike canopy defining a dead air capture space closely adjacent the top of the stack but immediately peripheral thereto,

the two hoodlike canopies defining between them and the stack a central plenumlike zone, a first circumferential air passage extending outwardly and downwardly from the plenumlike zone and a further air passage extending downwardly and inwardly to discharge below the lowermost portions of the two canopies,

the lowermost portion of the outboard first canopy extending substantially below the inboard second canopy lowermost portion circumferentially thereof, and

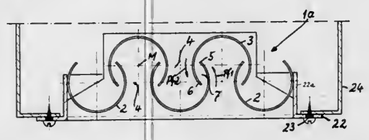
means connecting each of the said hoodlike canopies to the upper end portion of said stack.

4,189,990

FALSE CEILING

Helmut Kittler, Freiburg, Fed. Rep. of Germany, assignor to GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH, Freiburg, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,491
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718611
Int. Cl.[2] F24F *13/08*
U.S. Cl. 98—121 R **32 Claims**



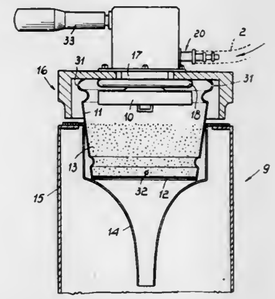
1. An air-permeable barrier, particularly a false ceiling or grate for interception of solid and/or liquid constituents of ascending air, comprising a plurality of parallel, substantially horizontal and substantially trough-shaped neighboring slats each bounding an internal space of a predetermined width and including two elongated marginal portions each having a marginal edge, said marginal edges flanking a substantially longitudinally extending opening and being spaced apart by less than said predetermined width as considered across said opening, the opening of one slat of each pair of neighboring slats facing substantially upwardly and the opening of the other slat of each pair of neighboring slats facing substantially downwardly, one marginal portion of one slat of each pair of neighboring slats extending with clearance through said opening and into said internal space of the other slat of the respective pair and vice versa, said marginal portions of each pair of neighboring slats cooperating with one another to define a respective passage through which air can flow between the upper side and the underside of the barrier said passages having flow-through cross-sectional areas which are narrower at, and wider at a distance from, the respective marginal edges of at least one of said cooperating marginal portions of the respective pair of neighboring slats.

4,189,991

PRESSURIZED FLUID SUPPLY AND CONTROL DEVICE, PARTICULARLY FOR COFFEE-MAKING MACHINES

Adrien Haddad, Neve-Avivim, Israel, assignor to Officine Cimbali Giuseppe S.p.A., Binasco, Italy

Filed Apr. 13, 1978, Ser. No. 895,997
Claims priority, application Italy, Apr. 18, 1977, 22543 A77
Int. Cl.[2] A47J *31/34*
U.S. Cl. 99—302 R **9 Claims**



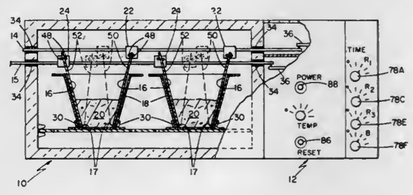
1. A device for supplying pressurized liquid, particularly in a coffee-making machine, comprising means for generating said pressurized liquid, a bowl for receiving said pressurized liquid, a charge of powdered material, particularly ground coffee, in said bowl, means for supplying said pressurized liquid to said charge in said bowl, means for holding said bowl air-tight closed during the supply of said pressurized liquid and for venting said bowl to atmosphere when the supply of said pressurized liquid ceases, and means for causing said pressurized liquid to be supplied intermittently from said means for generating said pressurized liquid to said bowl and for causing repetition of a number of alternate supply and venting cycles for said bowl.

4,189,992

BREAD BAKING

John D. A. Barry, 115 Hazelwood Ave., San Francisco, Calif. 94133

Filed Jan. 15, 1979, Ser. No. 3,227
Int. Cl.[2] A47J *27/62*
U.S. Cl. 99—327 **12 Claims**



1. A bread baker including;

an oven;

a pair of plates within said oven and arranged to be positioned within a baking pan on opposite sides of a quantity of bread dough within said pan;

a driver engaging said plates and arranged to move said plates towards and away from each other to squeeze the bread dough between the plates; and,

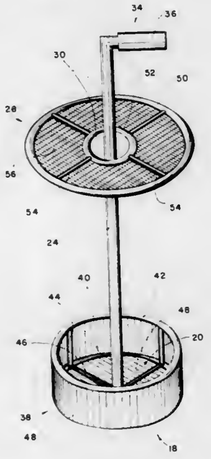
a controller coupled with said driver and with means for heating said oven, and arranged to activate said driver to squeeze said bread dough at a first predetermined time following a first predetermined time interval, and to activate a selected one of said driver and said means for heating said oven following a second predetermined time interval subsequent to said first predetermined period of time and time interval.

4,189,993

OIL SPLATTER SCREEN FOR A DEEP FAT FRYER

Joseph R. Kaufman, 1331 Oakbrook Dr., Largo, Fla. 33540

Filed Feb. 3, 1978, Ser. No. 874,811
Int. Cl.² A47J *37/12*
U.S. Cl. 99—403 **5 Claims**



1. A food carrying device for a deep fat frying vessel having a bottom and side walls forming a cavity with a transverse inner dimension and depth and an upper lip at the top opening, with cooking oil in the bottom thereof, comprising:

a food basket having a bottom platform for supporting food to be fried, having a transverse dimension less than said transverse dimension of said vessel;

a rod mounted to said bottom platform and projecting upwardly therefrom, having a vertical dimension greater than said depth of said vessel, for supporting said basket while being lowered into said vessel;

said food basket further comprising lower and upper rings of wire each having a transverse dimension less than said transverse dimension of said vessel, coaxially mounted in spaced, horizontal planes by a support wire vertically mounted to said lower and upper rings; a transverse wire diametrically mounted to said lower ring, serving as the base to which said rod is attached; and a wire mesh covering said lower and upper rings forming said bottom platform and a side wall of said food basket with an open top for the admission of food to be fried;

a splatter screen slideably mounted to said rod, having a transverse dimension greater than said transverse dimension of said vessel;

said splatter screen being supported by and remaining at said lip of said vessel while said basket is lowered into said cavity of said vessel by means of said rod sliding past said screen;

said splatter screen further comprising an outer ring of wire having a transverse dimension greater than said transverse dimension of said vessel; an inner ring of wire having a transverse dimension greater than the cross-sectional dimension of said rod; a radial wire mounted to and supporting said inner and outer rings in coplanar, coaxial relationship; and a screen covering said inner and outer rings, with an opening in the screen within said inner ring to admit said rod;

said wire mesh of said basket having larger openings therein than the openings in said screen of said splatter screen, to permit cooking oil to drain through said basket;

said screen being composed of a wire mesh having a mesh size in the range of from 8 mesh to number 50 mesh, to permit the interception of oil droplets splattered from the cavity of said vessel;

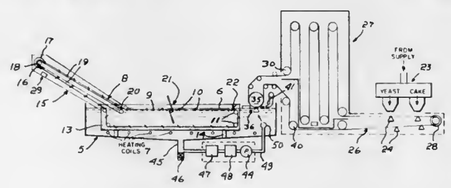
whereby hot cooking oil splattered from the cavity of said vessel will be caught by said screen at the lip of the vessel.

4,189,994

METHOD AND APPARATUS FOR USE IN FRYING DOUGHNUTS

Richard W. Schmader, 50 Myopia Rd., Winchester, Mass. 01890

Filed Apr. 3, 1978, Ser. No. 893,058
Int. Cl.² A47J *37/12*
U.S. Cl. 99—405 **10 Claims**



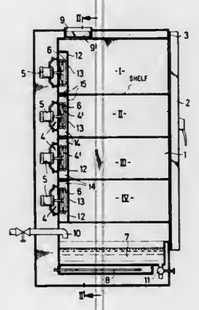
1. Apparatus for use in frying doughnuts, said apparatus including a tank for a predetermined volume of hot oil, an endless conveyor within said tank and extending lengthwise thereof and including transverse flights, the upper course of said conveyor traveling from a transverse pickup zone adjacent the rear end of the tank towards the other end of said tank with the flights at a level to engage and convey floating doughnuts at a rate such that the doughnuts are cooked when they reach said other end, means operable to deliver successive transverse series of uncooked doughnuts into the hot oil in a transverse receiving zone spaced rearwardly of said pickup zone with a predetermined time interval between the delivery of each series, the spacing of the conveyor flights related to said interval to render each flight operable to engage a series of doughnuts at the pickup zone, and means establishing at least one fluid stream operable to carry doughnuts from the receiving zone into said pickup zone at a rate such that the interval between the depositing of successive series may closely approach the rate at which the deposited doughnuts rise, said means including means operable to withdraw hot oil from the tank forwardly of the pickup zone and discharge it in said rear end in the form of a transverse series of jets directed to establish a curtain-like stream flowing upwardly through said receiving zone and forwardly into said pickup zone and operable to convey all the doughnuts of each delivered series away from the receiving zone during said interval.

4,189,995

APPARATUS FOR HEATING FOOD

Alfred Löhr, Bochum; Günter Winterhoff, Dortmund, and Wolfgang Tschek, Seiwerath, all of Fed. Rep. of Germany, assignors to Kuppersbusch Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,520
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739198
Int. Cl.² F24H *3/04*
U.S. Cl. 99—447 **2 Claims**



1. In an apparatus for heating food including a treating chamber; a plurality of horizontally oriented, vertically spaced, superposed shelves dividing the treating chamber into compartments and serving for the support of the food to be heated; a plurality of blowers arranged in the treating chamber; and separate heating elements associated with each of the blowers for generating hot air currents; the improvement wherein all said blowers are arranged in a vertically spaced, superposed relationship at one side of said treating chamber; each said compartment having a separate one of said blowers in alignment therewith; the improvement further comprising

(a) means defining vertically oriented lateral shafts in said one side of said treating chamber;

(b) a detachable hood arranged at each blower and having a central suction opening aligned with the respective blower and lateral outlet openings; each compartment being in communication with said lateral shafts through the central suction opening and the lateral outlet openings of the respective hood for directing the air currents generated by each blower towards another, opposite side of said treating chamber;

(c) means for driving said blowers independently from one another and with different rpm's;

(d) a bottom zone forming part of said treating chamber and communicating with said lateral shafts;

(e) a basin provided in said bottom zone of said treating chamber;

(f) means for filling said basin with water;

(g) means for draining said basin;

(h) an electric heater arranged in said basin for heating the water contained therein;

(i) a top side forming part of said treating chamber;

(j) means defining an opening in said top side; and

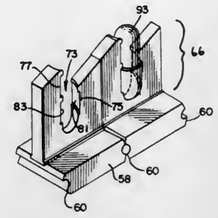
(k) a movable throttle flap disposed in said opening for controlling the cross-sectional flow passage area thereof.

4,189,996

CONVEYOR LINK AND CAPSULE GUIDE FOR PRINTERS

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R.W. Hartnett Company, Philadelphia, Pa.

Filed Dec. 12, 1977, Ser. No. 859,303
Int. Cl.² B41F *17/36*
U.S. Cl. 101—37 **5 Claims**



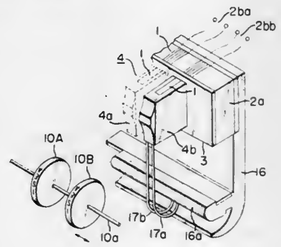
1. In apparatus for printing objects that are all similar in size and shape, which apparatus includes a conveyor for transporting said objects along a predetermined path, hopper means located at an upstream location of said conveyor and including a discharge which feeds said conveyor, the improvement which comprises the combination of carrier means on said conveyor having pocket means therein arranged to receive objects fed thereto, means operable for printing upon said objects as they are advanced by said conveyor, including a guide member stationarily mounted and extending along one side of said conveyor proximate said carrier means, said guide member having a recessed area thereof that extends in the direction of said predetermined path, means for operating said printing means at a surface speed in excess of the linear speed of said conveyor thereby to rotate each said object as it is being printed, and means for ejecting said objects from said carriers downstream from said printing means, said pocket means comprising a pair of upstanding wall members defining beveled surfaces to facilitate in ejection of said objects therefrom, each wall being provided with a recessed relief portion aligned with said guide member recessed area and extending about said pocket and spacing a portion of said pocket from said object so that indicia printed on the object in the area proximate said relief area are not smeared on said pocket or said guide member during printing.

4,189,997

PRINTER

Mineo Nozaki, and Mitsuaki Seki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 757,287, Jan. 6, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,721
Claims priority, application Japan, Jan. 16, 1976, 51-3885
Int. Cl.² B41J *9/02*
U.S. Cl. 101—93.09 **11 Claims**



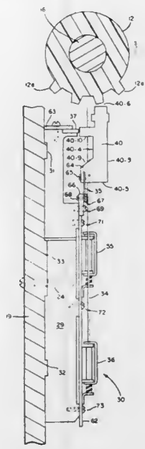
1. A printer comprising:

a type member including a plurality of type characters, said type member comprising a non-magnetic material;
ink supplying means for supplying ink to said type member;
a hammer head arranged to move against selected ones of the plurality of type characters, said hammer head consisting of non-magnetic material;
an elastic member connected to said hammer head at one end and to a base plate at the other end, said elastic member biasing said hammer head toward a printing position;
magnetic field producing means comprising a permanent magnet mounted in said printing hammer head to hold said hammer head at a non-printing position in such a way that the permanent magnet contacts with a magnetic material disposed at the non-printing position whereby mechanical energy is stored in said elastic member; and
an electromagnetic assembly disposed at the non-printing position for producing a magnetic field opposed to the magnetic flux of said permanent magnet when selectively actuated so that the mechanical energy stored in said elastic member is released to move said hammer head in the direction towards its printing position.

4,189,998
PRINT HAMMER AND INTERPOSER CAPTIVATING LINKAGE

Donald R. Morreall, New Hartford, N.Y., and Ronald F. Deuel, Shrewsbury, Pa., assignors to Mohawk Data Sciences Corp., Parsippany, N.J.

Division of Ser. No. 724,427, Sep. 17, 1976, Pat. No. 4,106,406.
This application Mar. 9, 1978, Ser. No. 884,865
Int. Cl.[2] B41J *9/36*
U.S. Cl. 101—93.31 **4 Claims**

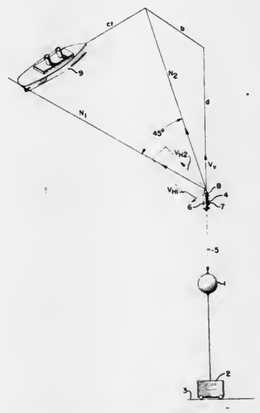


1. In an impact printer having a printer frame to which is mounted carrier means for periodically presenting a plurality of type die to a print line adjacent a document on which a printing operation is to be performed, and a print impacting mechanism, including at least one print hammer arranged to impact the document with selected ones of the type die at the print line, a source of mechanical energy including an impeller having at least one impeller tooth rotating in synchronism with the periodic presentation of the type die by the carrier means, an interposer having a mass smaller than the mass of the hammer and associated with the hammer and arranged for selective movement by a control element from a normal position into the path of motion of the impeller tooth such that the impeller tooth engages the interposer driving it and the associated print hammer from a rest position toward the print line to impact the document with a selected type die, said impeller tooth and hammer having the same plane of motion; said print impacting mechanism being characterized by the print hammer having a pair of spaced apart and generally parallel surfaces defined by a base end, a hammer head end and by a front and a back edge, the hammer head end having a hammer face toward the front edge and an interposer striking face toward the back edge, first and second spaced apart portions projecting from the back edge near the hammer head and base ends, respectively, with the base end being secured to the printer frame to allow pivotal motion of the hammer; by said interposer having a length **l** and a generally rectangular cross-section of dimensions x and y, where x is greater than y, and which is arranged to have its surface defined by the x dimension engaged by said impeller tooth; by said interposer being mechanically coupled to said print hammer in a linkage which allows motion of the interposer into and out of the path of said impeller tooth and captivates the smaller mass interposer to travel with the larger mass hammer after engagement of the interposer by the impeller tooth; by said interposer being flexible in the plane of motion of said hammer and impeller tooth and flexing in such plane when engaged by the impeller tooth such that a relatively smooth accelerating force is imparted to the print hammer and such that the removal of the interposer from the path of the impeller tooth and return to the normal position after such engagement is enhanced by such flexing and by the captivation linkage to the print hammer; said linkage being characterized by an aperture through said second portion in a direction generally parallel to said surfaces and large enough to allow insertion of the interposer with its x dimension parallel to said surfaces and to also allow rotation thereof until its y dimension is parallel to said surfaces and further characterized by a T-shaped opening through the first portion in a direction generally parallel to said surfaces and both legs of the T having a width slightly larger than y with the cross leg of the T having a length slightly larger than x so that the interposer may be inserted through both the aperture and the opening with its x dimension parallel to said surfaces and then rotated until it fits entirely within the cross leg of the T-shaped opening with its y dimension parallel to said surface.

4,189,999
VECTOR ACOUSTIC MINE MECHANISM

Lloyd D. Anderson, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1956, Ser. No. 569,662
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 R **5 Claims**

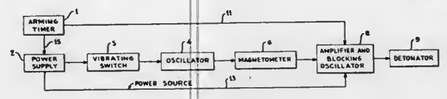


1. A submarine mine actuating system responsive to the acoustic pressure signature of a target vessel moving through the water in the vicinity of the system comprising; an array of hydrophones including a first velocity hydrophone having a cosine response pattern and generating an electric signal in response to received underwater acoustic signals originating from said target vessel, and a second velocity hydrophone having a response pattern similar to that of said first hydrophone and disposed in orthogonal relation therewith whereby the axes of maximum sensitivity of said hydrophones are mutually perpendicular so that the signals produced by said hydrophones undergo a phase reversal as the target vessel crosses an axis of maximum sensitivity of one of said hydrophones; a pair of transformers each having a primary coil coupled to the output of a respective one of said hydrophones to receive an output signal therefrom, a ring demodulator circuit having a first and a second pair of input terminals each connected across the respective secondaries of said transformers, a center-tap at each secondary winding of said transformers for providing an output signal from said demodulator circuit correlative to the phase relationship of the signals applied across the input terminals of said circuit to thereby indicate a phase reversal of the received acoustic signal as the target vessel cross the axis of one of said hydrophones of said array.

4,190,000
MINE PROXIMITY FUSE

John M. Shaull, Bethesda, Md.; Godfrey R. Gauld, Seattle, Wash., and Lawson E. Richtmyer, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1962, Ser. No. 232,924
Int. Cl.[2] F42B *23/00*
U.S. Cl. 102—19.2 **4 Claims**



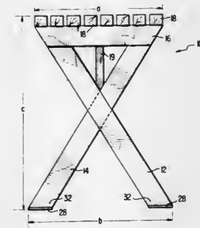
1. A proximity fuze for a stationary mine comprising:
(a) a power supply;
(b) a vibration sensitive switch having a stationary contact and a vibratory contact, one of said contacts being connected to said power supply;
(c) an LC ringing circuit connected to the other of said contacts, said vibration sensitive switch intermittently conducting current from said power supply to said LC ringing circuit when activated by vibrations in the region of said mine thereby setting up a series of exponentially decaying sinusoidal oscillations in said LC ringing circuit;
(d) magnetometer connected to said LC ringing circuit and excited by the sinusoidal oscillations produced thereby; and
(e) amplitude discriminating circuit means connected to said magnetometer for producing a firing pulse when the output of said magnetometer exceeds a predetermined value.

4,190,001
SPORT BENCH

Gregory Cecala, 86 Clapboard Ridge Rd., Greenwich, Conn. 06830

Filed Jun. 12, 1978, Ser. No. 914,946
Int. Cl.[2] A47B *13/00*
U.S. Cl. 108—161 **6 Claims**

1. A bench member to provide rest during strenuous or demanding athletic activity, said bench comprising:
(a) first and second pairs of leg members for supporting opposed ends of said bench member,
(1) each of said pairs of legs having centrally joined areas to form X-shaped end support legs,
(2) each of said pairs of legs having load bearing cross lapped areas with said legs interfitting at said central areas to form said X-shaped end support legs,
(b) top crossbar members secured to the tops of respective X-shaped end support legs,
(1) each pair of X-shaped leg members being end lapped at the top of said legs with one of said top crossbar members,
(c) and a seat member comprising individually spaced narrow but relatively thick members spanning and secured to said top crossbar members,

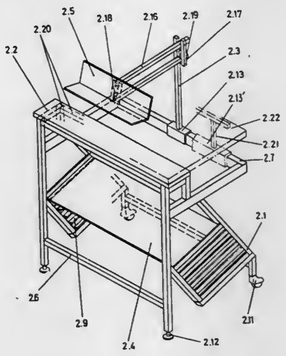


(1) each pair of X-shaped leg members being spread apart at the bottom of the leg members a distance greater than the width of the seat member to provide increased stability,
(d) said bench having a height from the bottom of said X-shaped end support legs to the top of said seat member of about twenty-four inches thereby requiring substantially less effort and knee flexure in transferring a user's weight to or from said bench member.

4,190,002
WORKPLACE EQUIPMENT

Peter Redemann, Berlin, Fed. Rep. of Germany, assignor to Schering, A.G., Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 667,117, Mar. 15, 1976. This application Apr. 7, 1978, Ser. No. 894,446
Int. Cl.[2] A47B *37/00*
U.S. Cl. 108—50 **2 Claims**



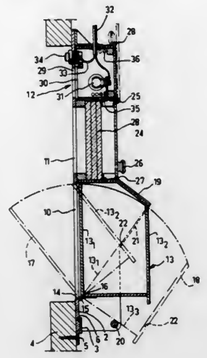
1. A worktable for belt conveyors (**2**) comprising two end sections (**2.1**), in the lower zone of which there are provided mounting rungs (**2.9**) for a vertically adjustable footrest (**2.4**) and which are connected by tubes (**2.6**) the top part of the table containing a step comprising a tabletop (**2.2**) with stop blocks (**1.7**) attached to the underside, said blocks holding said tabletop between tubes (**2.20**) extending between said end sections, a free space being provided beside said tabletop (**2.2**), for receiving a conveying means; said free space being bounded by a rearward longitudinal tube (**2.7**) connected between said end sections and wherein a second tabletop (**2.22**) is removably positioned in said free space supported on structure attached to said rearward tube (**2.7**).

4,190,003

COUNTER WINDOW FOR USE IN PARTICULAR IN CHEMIST'S SHOPS

Claude Bourlier, Saint Maurice, France, assignor to Societe Hygiaphone V.B., Fontenay sous Bois, France

Filed Aug. 18, 1978, Ser. No. 934,864
Claims priority, application France, Oct. 7, 1977, 77 30272
Int. Cl.² E05G *7/00*
U.S. Cl. 109—19 **8 Claims**



1. A protected counter window comprising

a frame for being secured over an opening through a partition wall which separates a private side from a public side,

said frame having a frame plane part on the public side and having a transfer passage through the frame forming a private side opening on the private side of the frame and a public side opening which is located in the frame plane part and has a selected contour in the frame plane part,

a trough including a plane public side trough wall part which has a contour that fits said contour of the public side opening and a private side trough wall part,

said public side trough wall part and said private side trough wall part having upper edges that define a filling opening for the trough,

guide means mounting said trough in said transfer passage for movement between a first position on the public side in which the filling opening of the trough is located at least partially, on the public side, beyond the public side opening of the frame, while the private side trough wall part totally blocks the transfer passage of the frame, and a second position in which the filling opening is located at least partially, on the private side, beyond the private side opening of the frame, while the public side trough wall part totally blocks said transfer passage,

stop means of the frame and on the trough to limit the movement of the trough between said first and second positions,

a protective part extending on the private side of the frame and arranged crosswise in relation to the frame plane part on the public side,

said protective part including at least an upper part having a surface at least equal in size to the filling opening of the trough,

said trough being mounted by said guide means for movement to a third position intermediate said first and second position and whereat the plane public side trough wall part is located substantially in the plane of the public side opening of the frame plane part, while the upper part of the protective part totally blocks the filling opening of the trough, and

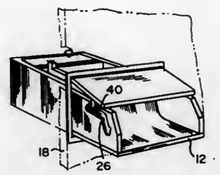
releasable locking means on the frame and on the trough to immobilize the trough in said third position so that the trough, in this third position, is totally inaccessible from either the private side or the public side.

4,190,004

TRANSACTION DRAWER

Daniel E. Richardson, St. Louis County, Mo., assignor to Shure Manufacturing Corporation, St. Louis, Mo.

Filed Sep. 22, 1978, Ser. No. 944,754
Int. Cl.² E05G *7/00*
U.S. Cl. 109—19 **5 Claims**



1. A transaction drawer assembly for use in carrying out transactions through the wall of a building comprising a drawer framework, means for mounting said framework to an opening in the wall, a runway projecting into said building as part of the frame work to support a drawer for movement along the runway, rotatable means on the drawer to cooperate with said runway to facilitate movement of said drawer through the opening in the wall to, in part, project outside said wall, a panel at the end of the framework which is mounted to the opening in the wall, which panel is hinged to the framework at its top so that it closes the opening in the wall and is parallel to the wall and contiguous thereto when in closed position, a cam surface attached to a side of the drawer adjacent the end of said drawer which is adjacent the panel when the drawer is in said framework in closed position, cam follower means attached to the panel in a location to cooperate with said cam surface to move the panel out of alignment with the wall when the drawer is moved through said opening so that it projects through the wall.

4,190,005

PROCESS FOR PULVERIZING COAL USING COMBINATION GAS IN FLUID ENERGY PULVERIZERS

Donald H. Cookson, Pittsburgh, and Clifford W. McCoy, Oakdale, both of Pa., assignors to COMCO - Dravo Corporation and Electric Fuels Corporation, both of Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 969,695
Int. Cl.² F23B *7/00*
U.S. Cl. 110—347 **5 Claims**

1. In a process for pulverizing coal to form a coal-oil mixture and combusting said mixture to produce heat, wherein coal and a carrier gas stream, said carrier gas stream being at an elevated temperature and under superatmospheric pressure, are charged to a fluid energy pulverizer, with pulverized coal therefrom mixed with oil to form the coal-oil mixture, and hot combustion gases are produced by the combusting of the mixture, the improvement wherein:

said hot combustion gases are directed to a heat exchange unit;

a portion of said hot combustion gases are separated from the remainder thereof prior to reaching the heat exchange unit;

said portion of hot combustion gases is cooled, compressed and redirected to said heat exchange unit for heat exchange with said remainder of the hot combustion gases; and

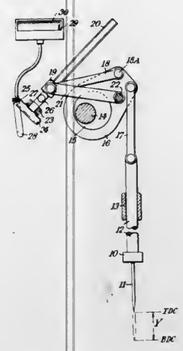
said resulting heated, compressed portion of combustion gases is charged to the fluid energy pulverizer as said carrier gas for pulverizing of further coal.

4,190,006

TUFTING MACHINES

Leslie Mellor, Blackburn, England, assignor to Edgar Pickering (Blackburn) Limited, Lancashire, England

Filed Jul. 5, 1978, Ser. No. 922,100
Claims priority, application United Kingdom, Aug. 5, 1977, 33009/77
Int. Cl.² D05C *15/00*
U.S. Cl. 112—79 R **2 Claims**



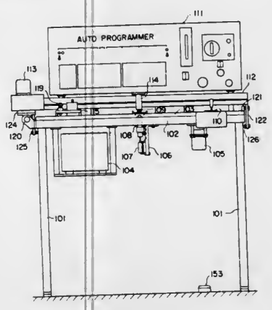
1. A tufting machine comprising a vertically reciprocable needle bar, push rods for imparting movement to the needle bar, a main shaft disposed parallel to the needle bar, and a linkage between the main shaft and each push rod, comprising a screw, an eccentric on the main shaft, a main link embracing the eccentric, another link connecting the main link to the push rod, a control link pivoted at one end to the main link and at the other end to a nut on the screw, a control yoke, of the same length as the control link, which is pivoted at one end to the nut coaxially with the control link and at the other end on a fixed pivot, the pivotal axes of the ends of the control link and the control yoke remote from the nut being coincident in the bottom dead centre position of the needle bar, and adjusting means accessible from the exterior of the machine for rotating all the screws to adjust the positions of the nuts thereon.

4,190,007

PROGRAMMING APPARATUS OF AUTOMATIC SEWING MACHINES

Koya Kimura, Numazu; Shinji Machi, Mishima, and Takao Manabe, Shizuoka, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,022
Claims priority, application Japan, Jun. 14, 1977, 52-70070
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **13 Claims**



1. In a programming apparatus for an automatic sewing machine comprising:

a programmer table for mounting a sheet member provided with marks and positions corresponding to stitch positions along a sewing pattern curve,

a moveable member having a connecting member for removably mounting a stylus which is to be positioned at said marks of said sheet member onto the table,

a drive means including pulse motors for moving for said movable member on said table in the X and Y directions of rectangular coordinates,

first control means including:

pulse generating means for generating pulses supplied to said pulse motors,

memory medium including a memory area for storing a number of pulses which are applied to said pulse motors for moving said stylus between adjacent ones of said mark along said sewings pattern curve corresponding to at least one address, and

a ROM writer for transferring the contents of said memory medium to a nonvolatile memory means,

the improvement which comprises,

second control means including:

means for reading out the content for said memory medium or said nonvolatile memory means for producing an instruction pulse train to relatively move said movable member, and

circuit means for supplying said instruction pulse train to said pulse motors, thus moving said movable member in accordance with the content stored in said memory means or in said nonvolatile memory means, and

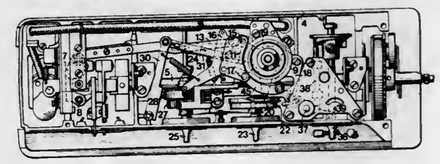
means for forming a pattern contour corresponding to the content of said memory medium or nonvolatile memory means on a not yet worked cloth clamping plate mounted on said movable member by said connecting member during the operation of said second control means.

4,190,008

ZIGZAG STITCH SEWING MACHINE

Olindo Baruffa, Thonex, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

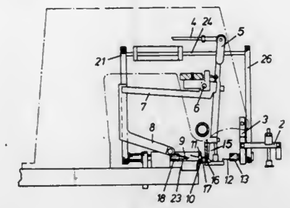
Filed Dec. 18, 1978, Ser. No. 970,158
Claims priority, application Switzerland, Dec. 22, 1977, 15855/77
Int. Cl.² D05B *3/00*
U.S. Cl. 112—158 B **4 Claims**



1. A zig-zag stitch sewing machine comprising a laterally displaceable needle, a reciprocatable carrier bar for said needle, said carrier bar having a central position and two terminal decentered positions, pivotable cradle means for said reciprocatable carrier bar, a connecting rod having first and second ends pivotally connected, at said first end, to said cradle means, a pivotable slider contactable with said second end of said rod, lever means for displacing said second end of said rod along said slider, a pivot axis for said slider, said pivot axis being displaceable, pivotable lever means carrying said pivot axis for said slider such that said pivot axis has a free end, said slider carrying feeler means, cam means contactable with said feeler means, a cam shaft for said cam means, drive means for said cam shaft, selector means for selecting a desired cam from said cam means and means for displacing said pivotal axis of said slider while said free end of said pivot axis is immobilized in a terminal angular position whereby displacement of said second end of said connecting rod along said slider causes the needle

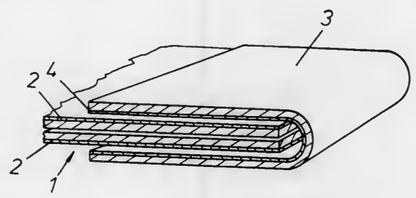
carrying bar to be displaced between said two terminal decentered positions.

4,190,009
LINKING MACHINES
Denis Matthews, Sutton in Ashfield, England, assignor to Mathbirk Limited, Sutton in Ashfield, England
Filed Jun. 8, 1978, Ser. No. 914,233
Claims priority, application United Kingdom, Jun. 15, 1977, 24963/77
Int. Cl.² D05B *1/00, 97/00*
U.S. Cl. 112—262.1 **6 Claims**



1. A linking machine having a plurality of radially extending points for impalement of two or more pieces of fabric to be joined together by a seam and a pair of reciprocal imperforate hooked needles, each needle being adapted to form a simple single thread chain stitch, wherein one needle is disposed on and operates from one side of fabrics impaled on the points and the other needle is disposed on and operates from the other side of the impaled fabrics, separate thread providing means for each needle, each said thread providing means being disposed on the side of the impaled fabrics opposite to the side on which its associated needle is disposed, said needles being operable to join the fabrics by a balanced seam which includes two separate single thread chain stitches.

4,190,010
WATERPROOF INWARDLY FACING GARMENT SEAMS PRODUCED BY HIGH FREQUENCY WELDING
Noel Bibby, East Bridgford, England, assignor to Noel Bibby Limited, Nottingham, England
Filed Mar. 10, 1978, Ser. No. 885,232
Claims priority, application United Kingdom, Mar. 18, 1977, 11506/77
Int. Cl.² A41D *27/24;* **B29C** *27/04;* **B32B** *3/06, 7/08;* **C09J** *5/10*
U.S. Cl. 112—419 **18 Claims**



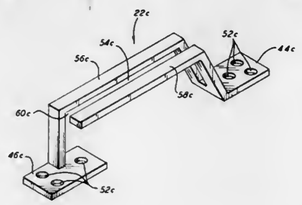
1. A garment comprising a seam joining together two edges of a fabric, in which each edge has a face coated with a high frequency activated material and a binding strip has one face coated with a high frequency activated material, the seam being formed by said two edges of fabric being located with the said coated faces in contact with the coated face of the binding strip, and in which the adjacent coated faces are welded together by the application of a radiofrequency field, said seam facing inwardly of said garment.

2. A garment according to claim 1, in which the said two edges are sewn together, the sewing being covered by the binding strip.

3. A garment according to claim 1, in which the binding strip is sewn on to the said two edges before welding of the said coated faces.

10. A method of forming a seam on the inside of a garment which seam joins together two edges of a fabric of said garment, each edge of said fabric having a face coated with a high frequency activated material, which comprises locating together the said two edges with the said coated faces facing outwardly, locating a binding strip over the said coated faces, the face of the binding strip in contact with the coated faces itself being coated with a high frequency activated material, and applying a radiofrequency field to the seam to weld together adjacent said coated faces of the binding strip and fabric.

4,190,011
BOAT MOORING APPARATUS
Stephen F. Guthmann, 1 Brandon Rd., Onondaga County, N.Y. 13214
Continuation-in-part of Ser. No. 734,290, Oct. 20, 1976, Pat. No. 4,109,603. This application Jun. 5, 1978, Ser. No. 912,725
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.² B63B *21/00*
U.S. Cl. 114—230 **30 Claims**



15. A boat mooring cleat apparatus for enabling quick releasable mooring of a boat to a mooring post means by a mooring line means having an associated diameter and a plurality of longitudinally spaced apart bulges therealong, said bulges having transverse dimensions greater than said mooring line means diameter, said cleat apparatus comprising a pair of substantially parallel spaced apart members comprising a convex and a concave side defining a slot for insertably receiving a portion of the proximal end of said mooring line means, said slot being narrower in width than the transverse dimensions of any one of said bulges, said spaced apart members defining a stop member on the concave sides of said members for an adjacent one of said bulges of said inserted mooring line means proximal end portion for preventing removal of said inserted mooring line means proximal end portion from said cleat apparatus by a force along said mooring line means while enabling both quick insertion of said mooring line means proximal end portion and quick intentional removal of said inserted mooring line means proximal end portion from said slot by a sufficient force substantially normal to said mooring line means, one pair of ends of said spaced apart members being in transverse registration, means to interconnect said one pair of ends and to mount said interconnected pair of ends on a support, said spaced apart members being configured to extend away from the support adjacent to said pair of ends and thereafter to extend along and spaced from said support, a single one of said members being inverted U-shaped and configured to extend to an end at the support, the other of said spaced apart members terminating short of said end of said one member to provide an access opening spaced away from the longitudinal center of said inverted U-shaped member for insertion of a bulge along said mooring line means, mounting means adjacent to said end of said one member closest to said access opening adapted to be fastened to said support such that said access opening is positioned further away from said mooring post means than said transversely registered ends, so that a tensile force acting on the mooring line means from the mooring post means draws the inserted bulge away from the access opening, said slot enabling a predetermined slippage of said inserted mooring line means within said slot dependent upon the longitudinal extent between the transversely registered ends and said access opening.

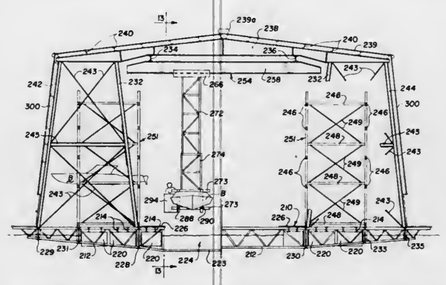
4,190,012
FAIRED TOW CABLE WITH STUBS FOR STRUM REDUCTION
Peter P. Rispin, Washington, D.C.; Bruce L. Webster, Sterling, Va.; John Stasiewicz, Gaithersburg, and Jesse S. Diggs, Rockville, both of, Md. assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Continuation of Ser. No. 690,348, May 27, 1976, abandoned. This application Dec. 28, 1978, Ser. No. 973,988
Int. Cl.² F15D *1/10*
U.S. Cl. 114—243 **1 Claim**



1. Fairing means on the periphery of a towing cable for reducing strumming vibrations induced in the cable as it is towed generally longitudinally of its length through water comprising:

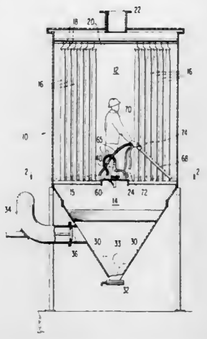
a plurality of discontinuous elongate stubs longitudinally spaced apart from one another along respective coextensive right hand and left hand helical paths which crisscross one another about the periphery of the cable.

4,190,013
FLOATING DRY STORAGE FACILITY FOR SMALL BOATS
Roger W. Otis, and Stephen H. Otis, both of P.O. Box 518, McAlester, Okla. 74501
Continuation-in-part of Ser. No. 780,236, Mar. 22, 1977, Pat. No. 4,070,979. This application Jan. 30, 1978, Ser. No. 873,313
Int. Cl.² B63B *35/44*
U.S. Cl. 114—263 **15 Claims**



9. A floating dry storage facility for removing and storing boats of a maximum predetermined length comprising: a platform having a plurality of spaced horizontal members positioned through the length of the facility and spanning across the facility means connecting said horizontal members; flotation means secured under said platform between the spaced horizontal members to float the platform on the surface of a body of water; a housing secured on said platform; boat storage means secured in said housing for dry storage of the boats on a plurality of levels above the platform; and lift means adapted to move the boats from the body of water to said boat storage means and back again.

4,190,014
INDUSTRIAL DUST COLLECTOR CLEANING SYSTEM AND METHOD
Hugh N. Jenkins, 3555 Duberry Ct., N.E., Atlanta, Ga. 30319, and Robert P. Black, 4151 Echo Woods Dr., Clarkston, Ga. 30021
Filed Jun. 19, 1978, Ser. No. 916,470
Int. Cl.² B01D *46/02*
U.S. Cl. 116—266 **10 Claims**



1. A system for cleaning the filtration chamber of an industrial dust collector of the type having a gas intake chamber including a gas inlet, a filtration chamber having a clean gas outlet, the filtration chamber being in communication with the gas intake chamber and a plurality of fabric filter bags having filtering surfaces disposed within the filtration chamber wherein the bag filtering surfaces are in fluid communication with the gas intake chamber, said cleaning system including means for collecting dust in said filtration chamber, and means for directing collected dust from said filtration chamber and into said gas intake chamber, and said dust directing means comprising a venturi having a first inlet in fluid communication with said filtration chamber, a source of compressed air, a second inlet in fluid communication with the source of compressed air, and an outlet in fluid communication with said gas intake chamber.

9. A method of locating ruptures in the filtering surfaces of fabric filter bags mounted in the filtration chamber of an industrial dust collector with the filter bags filtering surfaces in fluid communication with a gas intake chamber and with said method comprising the steps of forcing gases from the gas intake chamber into the filtration chamber through the fabric filter bags while simultaneously evacuating dust from the filtration chamber exteriorily of the filter bags and directing the evacuated dust from the filtration chamber into the gas intake chamber, whereby evacuated dust may be forced back into the filtration chamber within the filter bags and through any bag ruptures thereby rendering such ruptures visible to an observer stationed within the filtration chamber.

4,190,015
APPARATUS FOR DISPENSING LIQUID TO SPINNING WORKPIECES
Gary Hillman, Livingston, N.J., assignor to Machine Technology, Inc., Whippany, N.J.
Filed Dec. 8, 1977, Ser. No. 858,516
Int. Cl.² B05B *13/04;* **B05C** *5/00*
U.S. Cl. 118—696 **5 Claims**

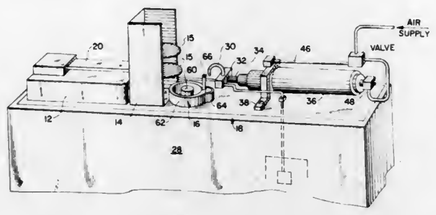
1. In a machine for dispensing liquid to workpieces which are to be coated by spinning said workpieces to disperse said liquid, liquid dispensing apparatus, comprising:

a dispensing nozzle for dispensing said liquid over a central

area of a workpiece which is spun to disperse said liquid outwardly from said central area over the surface of said workpiece;

liquid supply means connected to said nozzle for supplying liquid thereto, said liquid supply means including valve means for selectively controlling the flow of liquid to said nozzle; and

means for preventing the undesired dispensing of liquid onto said workpiece including moving means for moving said nozzle between a first position situated above said central area of said workpiece to which said liquid is to be dispensed and a second position beyond the periphery of said workpiece, and control means for controlling said moving means and said valve means so that said moving means moves said nozzle from said second position to said first position and said valve means allows liquid to be dispensed, and so that said valve means interrupts the flow of liquid and said moving means moves said nozzle from said first position to said second position substantially simultaneously so that while said nozzle is being moved from above the central area of said workpiece to beyond the periphery of said workpiece, undesired dispensing of liquid on said workpiece is prevented.

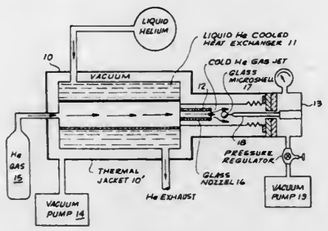


4,190,016

CRYOGENIC TARGET FORMATION USING COLD GAS JETS

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1979, Ser. No. 20,121
Int. Cl.² G21B *1/00*
U.S. Cl. 118—724 **11 Claims**



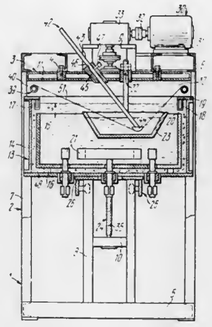
1. An apparatus for forming a substantially uniform layer of cryogenic material on an inner surface of a spherical member comprising: means for supporting a spherical member containing cryogenic material within means defining a chamber, jet nozzle means adapted to be positioned about a spherical member mounted within said chamber, means for directing gas through said jet nozzle means onto the spherical member to freeze said cryogenic material, and means for controlling the temperature of the gas flowing through said jet nozzle means, which includes means for raising the temperature of said gas to a point above the solidification temperature of the cryogenic material thereby allowing the cryogenic material to vaporize, and includes means for lowering the temperature of said gas to a point below the solidification temperature of the cryogenic material causes same to form into a substantially uniform layer within the spherical member.

4,190,017

TANK FURNACE FOR HOT-DIP METAL COATING

Nikolai K. Bizik, ulitsa Geroev Sevastopolya, 23, kv. 6; Isidor I. Frumin, ulitsa Bolshaya Zhitomirskaya, 17, kv.6; Vladimir P. Sotchenko, ulitsa P. Tychiny, 13, kv. 210; Valery F. Barabash, ulitsa Sholom-Aleikhema, 15/2, kv. 34; Petr F. Chernyak, Brest-Litovsky prospekt, 47a, kv. 23; Evgeny I. Frumin, ulitsa Shumskogo, 8, kv. 306; Grigory B. Asoiants, bulvar Lesi Ukrainki, 2, kv. 16, all of Kiev; Vadim A. Kulesha, ulitsa Pushkinskaya, 51a, kv. 25, Beloretsk Bashkirskoi ASSR; Viktor A. Golomazov, ulitsa Lenina, 64, kv. 8, Beloretsk Bashkirskoi ASSR; Dias A. Ibragimov, ulitsa, Fedora Alexeeva, 37, kv. 36, Beloretsk Bashkirskoi ASSR; Nikolai I. Kozhevnikov, ulitsa Khudai Berdina,20o, Beloretsk Bashkirskoi ASSR; Nikolai P. Chernenko, ulitsa Poschinskaya, 13, kv. 31, Orel; Vitaly S. Starchenko, Moskovskoe Shosse, 157, kv. 12, Orel, and Alexei S. Kalosha, ulitsa Komsomolskaya, 77, kv. 29, Orel, all, U.S.S.R.

Filed Jan. 10, 1978, Ser. No. 868,463
Claims priority, application U.S.S.R., Jan. 21, 1977, 2437802
Int. Cl.² B05C *3/15*
U.S. Cl. 118—74 **5 Claims**



1. A tank furnance for hot metal coating, comprising: a stationary body; a first container mounted inside said body containing a molten flux; electrodes mounted in said first container; a second container containing a molten coating metal being rigidly connected to said stationary body for positioning inside said first container and forming a coating zone in the course of applying a coating to an article; hoisting means mechanically connected to said first container; advancing means for advancing articles to the coating zone mounted substantially above said second container, said advancing means having guide rollers mounted at the sides of said second container, and control means for controlling the depth of immersion of the articles to be coated, said control means being formed with cantilevered bar means and header means between said guide rollers for guiding said articles being coated through grooves in said rollers for advancing coated articles.

4,190,018

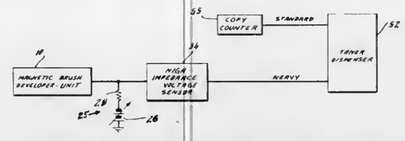
POWDER DENSITY CONTROL CIRCUIT FOR A PHOTOCOPIER

Robert C. Ariotti, Stamford; Harold M. Stahl, Ridgefield, and Lawrence E. Clifford, Danbury, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 2, 1979, Ser. No. 8,728
Int. Cl.² G03G *15/09*
U.S. Cl. 118—690 **6 Claims**

1. A powder density control circuit for use in a photocopier machine of the type in which a photoconductor is charged in accordance with an image to be recorded thereon and is developed by contact with a toner powder attracted thereto from a mixture of carrier particles and toner powder carried by a magnetic brush of a developer assembly including a replenishment means for periodically adding toner powder to said machine comprising:

(a) a resistor stabilized bias power supply coupled to the magnetic brush of the developer assembly,



(b) means for sensing the change in voltage of the resistor stabilized bias power supply during toning of an image on a photoconductor, and

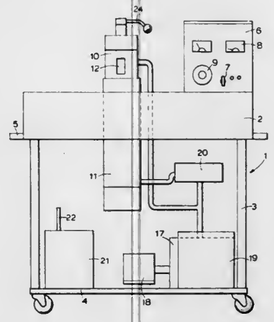
(c) means for controlling the replenishment means in response to a predetermined change in voltage during toning thereby controlling the amount of toner powder which is replenished to the mixture in the developer assembly.

4,190,019

VACUUM METALLIZING INTERIOR OF HOLLOW ARTICLE WITH MASKING SHIELD

Claude J. L. Hunt, Hinton Hall, Peterchurch, Herefordshire, England

Filed Sep. 14, 1977, Ser. No. 833,340
Claims priority, application United Kingdom, Sep. 18, 1976, 38768/76; Mar. 25, 1977, 12554/77
Int. Cl.² B44D *1/34*; C23F *1/34*
U.S. Cl. 118—720 **9 Claims**



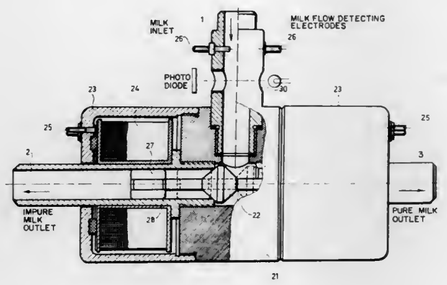
1. Apparatus for vacuum metallising the interior surface of hollow articles made of plastic material, the apparatus comprising a hollow body connected to a high vacuum source, a seating on said hollow body for engagement by a hollow plastic article so that the interior of said article and said hollow body are in communication, a heating assembly having a filament for vaporising coating metal mounted within said hollow body and a shield enclosing said heating assembly, said shield having an aperture aligned with said seating whereby vaporised coating metal is directed towards the interior of said plastic article.

4,190,020

PROCESS AND EQUIPMENT FOR MACHINE MILKING TO PROVIDE STERILE MILK FREE FROM BLOOD AND PUS

Károly Tamás, Kalocsa; Ferenc Vörös, Kaposvár, and Ilona Bedö, Budapest, all of Hungary, assignors to Mezogazdasagi Foiskola, Kaposvar, Denesmajor, Hungary

Filed Jan. 3, 1978, Ser. No. 866,783
Int. Cl.² A01J *7/00*
U.S. Cl. 119—14.08 **6 Claims**



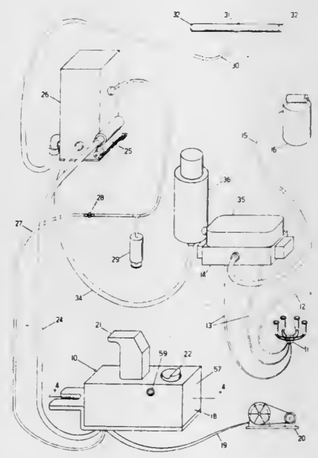
1. A process for milking a cow, comprising attaching milking apparatus to the cow and operating said apparatus to withdraw milk from the cow, diverting to a bypass tank for a predetermined time that portion of the milk which first flows from the cow, thereafter diverting the flow of milk from the cow to a main vessel, continuously colorimetrically monitoring the milk during its flow to said main vessel, and rediverting the milk from said main vessel to said bypass tank whenever the color of the milk changes from a predetermined color characteristic of healthy milk.

4,190,021

AUTOMATIC STIMULATION APPARATUS FOR MILKING MACHINES

Rolf W. Reisgies, 2101 Norco Dr., Norco, Calif. 91760

Filed May 22, 1978, Ser. No. 908,078
Int. Cl.² A01J *5/04*
U.S. Cl. 119—14.44 **8 Claims**

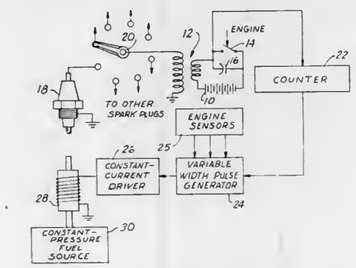


1. Apparatus for providing selected automatic stimulation pressures to the teat cups of a milking machine through the atmospheric air input port of the vacuum line pulsator, comprising:

(a) an air flow supply restrictor adapted to be connected to a source of air under pressure;
(b) an air flow control valve connected to receive air flow from said restrictor and also adapted to receive atmospheric air and being switchable in response to a control signal to switch from providing air flow to its output to providing atmospheric pressure air to its output, the output of said air flow control valve being adapted to be connected to the atmospheric air input port of a vacuum line pulsator;
(c) timing means responsive to an input signal and connected to said air flow control valve means to provide a control signal thereto to cause said control valve means to switch from providing air flow to its output to providing atmospheric pressure air to its output a selected period of time after said timing means has received an input signal indicative of the initiation of milking;
whereby for a selected period of time after initiation of milking, the teat cup inflations are provided with alternating low and high pressure to stimulate let-down in the animal being milked, and whereby, after the selected period of time said timing means provides a control signal to switch said control valve such that atmospheric air is thereafter provided to the pulsator and the pulsator subsequently provides alternating low and atmospheric pressure to the teat cups as in normal milking.

4,190,022
FUEL INJECTION SYSTEM WITH CORRECTION FOR INCIDENTAL SYSTEM VARIABLES

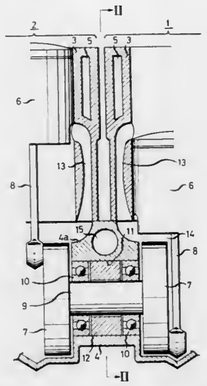
E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.
Continuation of Ser. No. 629,353, Nov. 6, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,412
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EF **2 Claims**



1. For use in an internal combustion engine, an improved fuel injection system comprising at least one injector having an actuating coil and means for generating an actuating pulse to actuate said injector, wherein the improvement comprises:
(a) first semiconductor means having an input port adapted to receive said actuating pulse and an output port, said first semiconductor means being in a first state of conduction and adapted to change to a second state of conduction when said actuating pulse is received;
(b) reference means for establishing a stabilized reference voltage, said reference means being adapted to provide said reference voltage only when said first semiconductor means is in its second state of conduction and said reference means being connected to the output port of said first semiconductor means;
(c) second semiconductor means in a first state of conduction, said second semiconductor means having an input port connected to said reference means and an output port, and said second semiconductor means being responsive to said reference means such that said second semiconductor means changes to its second state of conduction when said reference means provides said reference voltage to the input port of said second semiconductor means;
(d) third semiconductor means in a first state of conduction, said third semiconductor means having an input port associated with the output port of said second semiconductor means and an output port associated with said coil of said injector, said third semiconductor means being responsive to said second semiconductor means such that when said second semiconductor means changes to its second state of conduction said third semiconductor means changes to its second state of conduction, thereby providing a predetermined actuating current to said coil of said injector, said current being essentially independent of variations in the impedance of said coil, the specific resistance of the wire used in said coil and the voltage supplied to the fuel injection system.

4,190,023
COOLING SYSTEM FOR LIQUID-COOLED TYPE OF TWO-CYCLE MULTICYLINDER ENGINE

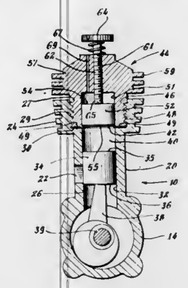
Tetsuzo Fujikawa, and Michio Nishimura, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan
Continuation of Ser. No. 688,027, May 19, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,075
Int. Cl.[2] F02F *1/14*
U.S. Cl. 123—41.72 **1 Claim**



1. In a two-cycle multicylinder engine including cylinder block means defining at least a pair of cylinders located adjacent each other, said pair of cylinders defining a first side and a second side opposite thereto, carburetor means including fuel intake means for said pair of cylinders located on said first side of said pair of cylinders, exhaust means located on said second side of said pair of cylinders, a crankcase including a thick-walled portion thereof located in an area generally between said adjacent cylinders, a crankshaft approximately equidistantly spaced between said first and second sides, piston means operatively associated with said cylinder means, connecting rod means and crank web means operatively interconnecting said piston means with said crankshaft, said crank web means including a pair of crank webs located on opposite ends of said crankshaft, crankshaft bearing means located between said crankshaft and said thick-walled portion of the crankcase, and liquid jackets located in said cylinder block means, the improvement comprising:
a cooling system for said engine consisting essentially of a cooling liquid passage formed to extend through said thick-walled portion of said crankcase in a generally straight configuration from said first side to said second side of said pair of cylinders at a location generally equivalently spaced from each of said adjacent cylinders;
said cooling liquid passage being located in an area generally above said crankshaft and being in the form of a through-hole formed through said thick-walled portion of the crankcase and located in proximity to said crankshaft bearing means at a point approximately equidistantly spaced from said pair of crank webs;
a liquid pump having a delivery port connected in flow communication to one end of said coupling liquid passage at said first side of said pair of cylinders
said liquid pump being mounted beneath said carburetor means and attached to said crankcase at said first side of said pair of cylinders; and
means on said second side of said pair of cylinders flow-connecting the other end of said cooling liquid passage to said liquid jacket in said cylinder block means at a location adjacent said exhaust means.

4,190,024
VARIABLE CHAMBER DIESEL ENGINE

Robert Davis, 125 Welch's Point Rd., Milford, Conn. 06460
Filed Jul. 21, 1977, Ser. No. 817,691
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—48 A **26 Claims**

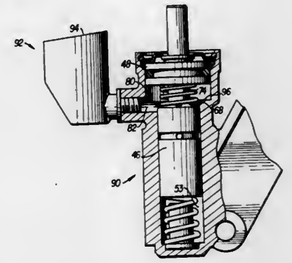


1. A diesel engine comprising an engine cylinder having a cylindrical internal bore, said bore containing a movable, cylindrical piston having a top and a bottom, a combustion chamber being disposed inside said bore above said top of said piston, the rate of firing of said engine being inversely proportional to the size of said combustion chamber, and a flexible membrane being disposed in said bore and partially defining said combustion chamber so that the size of said combustion chamber is variable by selectively flexing said membrane, said membrane sublimating when safe operating temperatures are exceeded inside said combustion chamber thereby allowing any gas in said combustion chamber to escape from said combustion chamber.

19. A method for converting a two-cycle glow-plug engine to a diesel engine, said glow-plug engine comprising an engine cylinder having a central cylindrical bore, a cylindrical piston movably mounted in said bore, said piston having a top and a bottom, said bottom being attached to one end of a connecting rod, the other end of said connecting rod being attached to a rotatable crankshaft in such a manner that reciprocal movement of said piston in said bore causes rotational movement of said crankshaft, a combustion chamber disposed in said bore above said top of said piston, a glow plug head mounted in the end of said bore opposite said piston, said glow plug head sealing said combustion chamber and supporting a glow plug for ignition of fuel in said combustion chamber, wherein said method comprises:
A. removing said glow plug head and said glow plug;
B. inserting a flexible, heat-reflective membrane into said bore;
C. positioning said flexible membrane in said bore so that said membrane is disposed above said top of said piston so as to become the top of said combustion chamber;
D. securing said membrane in place forming a gas-tight seal with the remainder of said combustion chamber;
E. securing to said engine cylinder a diesel head having means for flexing said membrane whereby the decreasing and increasing of the size of said combustion chamber may be controlled.

4,190,025
TIMING CHAIN TENSIONERS

Heinz Wahl, 2418 N. Utah St., Arlington, Va. 22207
Filed Jan. 25, 1978, Ser. No. 872,259
Int. Cl.[2] F01L *1/46*; F16H *7/12*
U.S. Cl. 123—90.31 **8 Claims**



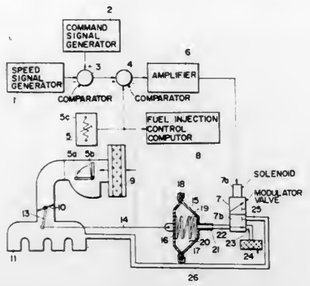
1. In a chain tensioner for a timing chain of an internal combustion engine having a crankshaft, a chain tensioner wheel arranged on a pivotable support arm in meshing engagement with said timing chain, said chain tensioner and timing chain arranged in a timing chain housing of said engine, said chain tensioner comprising a chain tensioner housing, a hydraulic dashpot arranged in said chain tensioner housing, said hydraulic dashpot including a cylinder, a dashpot valve and a piston arranged in said cylinder, said piston having a plunger bearing against said support arm and pivoting said chain tensioner wheel into tensioning relationship with said timing chain, a resilient element in said cylinder for urging the plunger of said piston toward said support arm, the improvement comprising a fluid reservoir affixed to said chain tensioner housing in fluid communication with the cylinder, said fluid reservoir having an upwardly open end for exposing the fluid in said reservoir to the atmosphere in said timing chain housing and for collecting oil droplets entrained in said atmosphere, baffle means arranged adjacent the open end of the reservoir for limiting loss of oil from said reservoir caused by centrifugal forces acting on the oil in said reservoir, said baffle means comprising a pair of plates affixed to said reservoir adjacent the upper open end thereof, said plates having confronting edges defining an elongated aperture therebetween, the lengthwise axis of said aperture extending substantially parallel to the crankshaft of said engine.

4,190,026
AUTOMOBILE SPEED CONTROL METHOD AND SYSTEM

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Co., Ltd., Japan
Filed Sep. 27, 1977, Ser. No. 837,291
Claims priority, application Japan, Oct. 26, 1976, 51-129173
Int. Cl.[2] B60K *31/00*
U.S. Cl. 123—102 **5 Claims**

1. A speed control system for use with a motor vehicle having an engine coupled with an intake manifold housing a throttle valve, said speed control system being of the type including a tachometer which is operatively connected to said engine and which generates a first signal corresponding to the vehicle's speed; a second signal generator which generates a preselected driving speed signal; a third signal generator which generates a negative feedback signal; comparator means for receiving the first signal, the preselected driving speed signal and the negative feedback signal, comparing those three signals, and generating a throttle valve position control signal;

and means responsive to the throttle valve position control signal for moving the throttle valve, wherein the improvement comprises: the third signal generator is an intake air flow rate



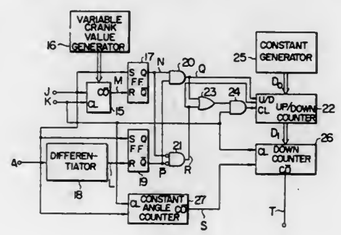
detector which is operated by the intake air flow into the intake manifold of the engine of the motor vehicle, the intake air flow rate being detected at a point before the incoming air reaches the throttle valve.

4,190,027

ELECTRONIC SPARK TIMING ADVANCING APPARATUS

Tomoji Inui; Yasunori Mori, both of Katsuta; Seiji Suda, and Toshio Furuhashi, both of Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 27, 1977, Ser. No. 836,956
Claims priority, application Japan, Sep. 29, 1976, 51/115798
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **11 Claims**



1. An electronic spark timing advancing apparatus for an internal combustion engine including an ignition device, comprising:

first means for sensing the crank rotation angle of the engine;

second means for sensing the cylinder internal pressure of the engine;

third means for detecting the crank angle at which the internal pressure sensed by said second means reaches a peak value in accordance with the crank angle sensed by said first means and generating a crank angle signal representative thereof;

fourth means for generating a first command signal representative of a first crank angle at which the cylinder internal pressure is to assume a first peak value under a first set of given conditions including at least one of the conditions of rapid acceleration of the engine, warm-up of the engine and engine braking, and for generating a second command signal representative of a second crank angle at which the cylinder internal pressure is to assume a second peak value under a second set of given conditions comprising a steady state operation of the engine, and for supplying one of said first and second command signals to an output thereof depending upon the corresponding one of said first and second sets of given conditions under which the engine is operating;

fifth means for detecting a deviation between the crank angle signal provided by said third means and the one of said first and second command signals supplied at the output of said fourth means; and

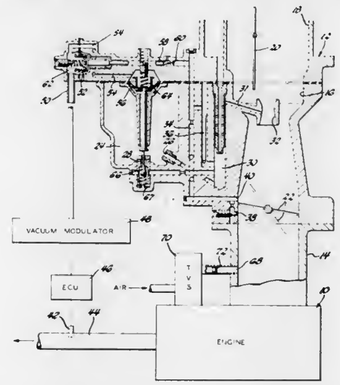
sixth means, responsive to the deviation detected by said fifth means, for controlling the spark timing of said ignition device to minimize and said deviation.

4,190,028

MIXTURE FORMING ASSEMBLY FOR CLOSED LOOP AIR-FUEL METERING SYSTEM

Clifford R. Carlson, Fenton, and Alan F. Chiesa, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1978, Ser. No. 927,504
Int. Cl.² F02M *23/04, 21/02*
U.S. Cl. 123—119 EC **3 Claims**



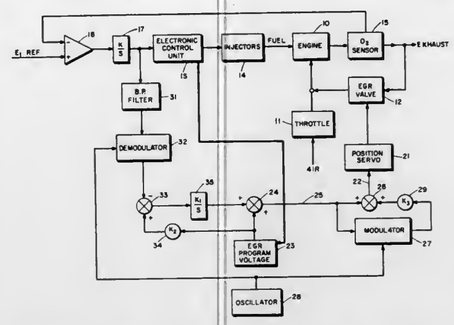
1. In an engine having means for measuring the air-fuel ratio of the air-fuel mixture delivered to the engine, an air-fuel mixture forming assembly comprising an induction passage having an air inlet, a throttle disposed in said induction passage and movable between idle and part throttle positions for controlling flow therethrough, idle and main fuel passages opening to said induction passage for delivering fuel thereto when said throttle is in said idle and part throttle positions respectively to thereby form idle and part throttle air-fuel mixtures therein, and metering apparatus controlling fuel flow through said fuel passages and regulated between a lean mode causing restriction of fuel flow through said passages and a rich mode permitting increased fuel flow through said passages, said metering apparatus being regulated by said measuring means to maintain the idle and part throttle mixtures at a selected air-fuel ratio, wherein the part throttle mixture is leaner than the idle mixture in a particular regulated mode of said metering apparatus during certain engine operating conditions, and wherein said assembly further comprises means for leaning the idle mixture only during said certain engine operating conditions to thereby cause said measuring means to regulate said metering apparatus to said rich mode, whereby said metering apparatus is regulated to said rich mode as said throttle is moved from said idle position to said part throttle position and a lean part throttle mixture is avoided during said certain engine operating conditions.

4,190,029

CONTROL OF EGR IN A CLOSED LOOP EFI ENGINE

Lael B. Taplin, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 826,002, Aug. 19, 1977. This application Oct. 30, 1978, Ser. No. 955,851
Int. Cl.² F02M *7/00*
U.S. Cl. 123—119 A **11 Claims**



1. In an internal combustion engine having sensor means exposed to exhaust gases from the engine providing a feedback signal, means for controlling the quantity of exhaust gas recirculated from the exhaust of the engine to form a part of the combustion charge therefore, said control means comprising,

an adjustable valve for metering exhaust gas from the exhaust of the engine to the combustion chamber thereof;

program voltage source means for generating a plurality of electrical signals each indicating the desired exhaust gas recirculation;

adjusting means for adjusting said valve in accordance with one of said signals for said program voltage source means;

means for imposing an oscillation upon the adjustment provided by said adjusting means, said oscillation having a predetermined frequency and an amplitude constituting a fixed percentage of said adjustment;

means for detecting oscillation in the output of the sensor means occurring at said predetermined frequency of oscillation imposed upon said adjustment, the level of the output of said detecting means being proportional to the amplitude of said predetermined frequency oscillation in the sensor output;

means for comparing the output level of said detecting means with said signals from said program voltage source means to determine the relationship of said output level with the amplitude of said oscillation imposed upon said adjustment; and

means responsive to said comparing means for modifying the adjustment of said adjusting means until the output of said detecting means bears a fixed relationship to the amplitude of said oscillation imposed upon said adjustment.

4,190,030

CARBURATION SYSTEM

Jerry D. Chester, Rte. #2, Sturgis, Mich. 49091

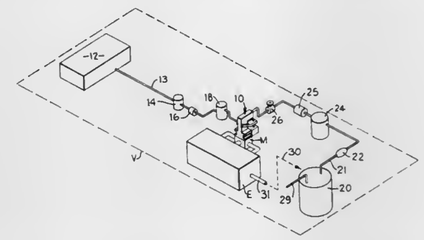
Filed Dec. 21, 1977, Ser. No. 863,054
Int. Cl.² F02B *31/00, 39/00, 13/03*
U.S. Cl. 123—119 R **16 Claims**

1. A carburation system for supplying a fuel air mixture to an internal combustion engine, comprising:

a hollow base securable to said engine for supplying said fuel air mixture thereto, and having a mixing chamber therein;

fuel-pressurized air premix means having a fuel passage connected to a fuel supply and a pressurized air passage connectible to pressurized air supply, a fuel throttling valve and a pressurized air throttling valve interposed in said fuel passage and pressurized air passage, respectively, for controlling flow therethrough, and premix nozzle means including fuel jet means at the outlet of said fuel passage and pressurized air jet means at the outlet of aid pressurized air passage and located near said fuel jet means for atomizing fuel therefrom and directing pressurized air carrying finely divided fuel particles into said mixing chamber through a premix opening in said hollow base, said fuel-pressurized air premix means being secured at said nozzle to said hollow base;

atmospheric air means having an atmospheric air passage and an atmospheric air throttling valve interposed in said atmospheric air passage for controlling flow therethrough, said atmospheric air passage having an outlet opening to said mixing chamber for supplying a final mixture of atmospheric air and the premixture of fuel and pressurized air from said nozzle means to said engine;



an operator controllable throttle member operatively connected to said fuel throttling valve, pressurized air throttling valve and atmospheric air throttling valve, said fuel throttling valve and pressurized air throttling valve having actuators extending movably from said premix means, said throttle member being a lever with means pivoting same with respect to said premix means, said throttle lever extending from said pivot means past said actuators for said fuel and pressurized air throttling valves to a remote portion, said atmospheric air throttling valve having an actuator actuable by said remote portion of said throttle lever, said atmospheric air and pressurized air and fuel throttling valves being reciprocating spring closed valves each having as its actuator a stem engaging said throttling lever through an axial adjustment means presettable for setting the closed position of the corresponding throttling valve at a desired position of said throttling lever.

4,190,031

DEVICES FOR RE-CYCLING THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

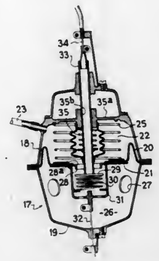
Jacques Sigwald, Frepillon, and Michel Achard, La Garenne Colombes, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed May 5, 1978, Ser. No. 903,131
Claims priority, application France, May 11, 1977, 77 14416
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**

1. A device for regulating the flow of exhaust gas re-cycled in the induction pipe of an internal combustion engine, comprising an induction pipe of the engine, a depression take-off orifice in the induction pipe, throttling means in the induction pipe, an exhaust pipe of the engine, a re-cycling passageway interposed between and interconnecting the induction pipe and exhaust pipe, a valve for regulating the flow of re-cycled gas inserted in the re-cycling passageway between the exhaust pipe and the induction pipe, the regulating valve comprising a closure member for said passageway, and control means for controlling the regulating valve and comprising a depression case comprising a movable wall which is

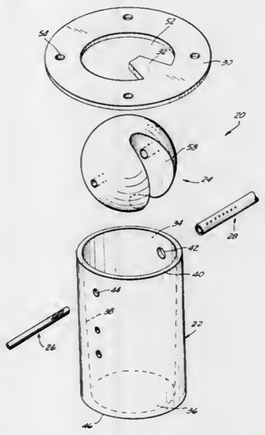
movable relative to the depression case, first connecting means connecting the movable wall to the closure mem-

ber for shifting the closure member upon movement of the movable wall relative to the depression case, a first chamber and a second chamber defined within the case by the movable wall on opposite sides of the movable wall, the second chamber communicating with the atmosphere, the movable wall of the depression case comprising a seat which is movable with the movable wall relative to the depression case and defines an opening which puts the first chamber in communication with the second chamber, a valve member movably mounted in the depression case



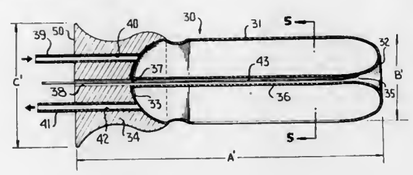
and cooperative with the seat for selectively opening and closing said opening, a rod movably mounted on the depression case, second connecting means connecting the rod to the throttling means to shift the rod by movement of the throttling means, and a spring which biases the valve member against said seat to close said opening, the rod being operative on the valve member to shift the valve member away from the seat, in opposition to the action of the spring, when the throttle is closed, and to allow the valve member to be shifted toward the seat by the action of the spring when the throttle is opened.

4,190,032
FLOW HOMOGENIZER
Albert T. Wright, 4 Palmer Ave., Corinth, N.Y. 12822
Filed Nov. 29, 1978, Ser. No. 964,471
Int. Cl.² F02M *7/22*
U.S. Cl. 123—141 **12 Claims**



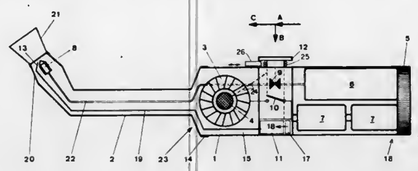
1. A flow homogenizer for an internal combustion engine comprising:
a hollow housing open at both ends;
a first tube extending through the walls of the housing and adapted to be connected to a fuel source;
a second tube concentrically mounted on the first tube in tight fitting relationship but being able to rotate about the first tube;
the first tube having at least one slot therein in the portion thereof in the housing and the second tube having a plurality of holes therein in a predetermined arrangement and positioned so that as the second tube rotates relative to the first tube the number of holes exposed to each slot can be changed thereby controlling the size of opening for fuel to flow through the tubes into the housing;
a damping member mounted on the second tube in the housing to rotate therewith and the damping member having a recess in a surface portion thereof to expose the opening in the second tube and to open the passageway through the housing from end to end;
the damping member being rotatable between a closed position blocking the opening between the ends of the housing and opened positions exposing the recess and the damping member to both ends of the housing;
the opened positions coordinated with the number of holes to the slot as the damping member is rotated thereby facilitating close control of the fuel and air mixture passing through the housing;
the homogenizer adapted to be connected to a source of vacuum for drawing the fuel and air mixture therethrough;
means on the homogenizer for attachment to control means for rotating the second tube and damping member in a desired manner to control fuel and air mixture parameters.

4,190,033
CLOSED FLOW CALORIC TEST METHOD
Thomas M. Foti, 10937 Deborah Dr., Potomac, Md. 20854
Continuation of Ser. No. 771,340, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 734,291, Oct. 21, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,718
Int. Cl.² A61B *5/00*
U.S. Cl. 128—742 **4 Claims**



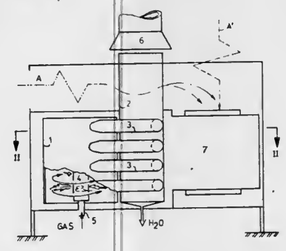
1. The method of caloric vestibular testing comprising:
(a) inserting a flexible, thin-walled, distensible receptacle into an ear canal, the receptacle having provision for enabling circulation of pressurized calorized fluid therethrough and being inflatable by such fluid;
(b) admitting pressurized calorized fluid into the receptacle to cause its expansion laterally within the ear canal and longitudinally up to the tympanic membrane, such expansion filling the cross sectional area of at least a portion of the ear canal;
(c) while inflating the receptacle, venting air trapped between the receptacle and the tympanic membrane to atmosphere; and
(d) circulating a volume of calorized fluid through the receptacle for a time period and at a temperature consistent with and while carrying out a caloric vestibular function testing procedure.

4,190,034
APPARATUS FOR STARTING AND FANNING A FIRE
Franz Wonisch, Arnsberg, Fed. Rep. of Germany, assignor to Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete, Arnsberg, Fed. Rep. of Germany
Filed Feb. 7, 1978, Ser. No. 875,859
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706762
Int. Cl.² F24B *3/00*; F23Q *7/12*
U.S. Cl. 126—25 B **14 Claims**



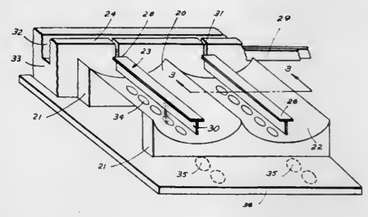
1. An apparatus for igniting and fanning a fire, comprising hollow housing means, fuel gas nozzle means in said hollow housing means, battery operated fan means in said hollow housing means, ignition means arranged to ignite fuel gas emerging from said fuel gas nozzle means, manual control means arranged in said hollow housing means and operatively connected to said ignition means, and to said fan means for activating the just mentioned components for a predetermined cooperation wherein said ignition means comprise piezoelectric crystal means (11) located substantially centrally in said housing and operable through force applying means responsive to said control means, said manual control means including gas closure valve means (9) operatively interposed in the gas supply line (22) between said fuel gas nozzle means (8) and a gas supply source (6), said manual control means further including two position switch means (10) operatively interposed between an electric motor of said fan means and a source of power (7) for said fan means, said manual control means further including a mechanical actuating member (12) operatively connected to said piezo-electric crystal means (11), to said valve means (9), and to said two position switch means (10), said apparatus further comprising mechanical air intake means (4) for adjusting the air supply to said battery operated fan means (3).

4,190,035
FLUID HEATER
Gerardus L. Beusen, v. Twillerstraat 25, Nijkerk, Netherlands
Filed Oct. 25, 1977, Ser. No. 845,054
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649174
Int. Cl.² F24H *3/06*
U.S. Cl. 126—99 A **10 Claims**



1. A device for heating fluids comprising:
a housing;
a combustion chamber positioned within said housing having means for igniting and burning fuel;
a chimney positioned within said housing for removing combustion products from said combustion chamber;
substantially curved channels positioned within said housing for interconnecting said combustion chamber and said chimney in such manner that combustion products are conveyed directly from said combustion chamber to said chimney, said combustion chamber and said chimney being located next to each other with all of said channels being substantially tangential to said chimney, said combustion chamber and chimney having exterior heating surfaces positioned inside said housing; and
means for moving a fluid over substantially the entire heating surfaces of said combustion chamber and said chimney.

4,190,036
SOLAR ENERGY COLLECTOR-LIGHT EMITTING PANEL
William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301
Filed Aug. 29, 1977, Ser. No. 828,496
Int. Cl.² F24J *3/02*
U.S. Cl. 126—439 **2 Claims**



1. In a solar energy concentrating collector, at least one parabolic reflective surface and at least one heat absorbing conductor means disposed in operative relation to said parabolic reflective surface, said heat absorbing conductor means arranged to absorb heat energy from solar rays directed thereto by the parabolic reflective surface, said heat absorbing conductor means having a surface treated to reflect visible portions of the solar rays back toward the said parabolic reflective surface, apertures in said parabolic reflective surface through which visible portions of the solar rays reflected from the treated surface of the heat absorbing conductor means may travel, and a contact surface behind the parabolic reflective surface against which the visible portions of the solar rays impinge whereby to illuminate portions of the said contact surface.

4,190,037
SOLAR ENERGY COLLECTOR
William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301
Filed Aug. 29, 1977, Ser. No. 828,497
Int. Cl.² F24J *3/02*
U.S. Cl. 126—438 **9 Claims**

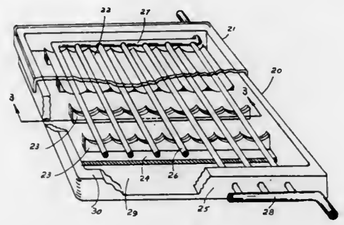
1. A solar energy collector including;
a heat collector means,
a reflective means which is a single flexible sheet of longitudinal parabolic configuration arranged to collect, concentrate, and direct solar rays toward the heat collector means,
heat transfer fluid in contact with said collector means at a distance from said reflective means,
said collector means being conductive and coated with absorptive means for improving heat transfer to said heat transfer fluid, and arranged co-incident with the focal line of a parabolic curve, said curve calculated according to any value of P in formula $X^2=2Py$,
a plurality of non-conductive support members disposed in

full contacting transverse relationship with said reflector means from zenith to zenith of same, and being spaced from each other,

said support members having major planar surfaces disposed in transverse relationship to the axis of the reflector means,

said planar surfaces each having a bottom edge and a top edge, said top edges being parabolic in shape, the projection of said bottom edge having a length equal to a straightline distance between the zeniths of said parabolic shape of the reflective means,

the said reflective means being in continuous contact with and supported by the top edges of said support members, whereby the spaced apart support members underlie, and provide intermittant load bearing surfaces for, the said reflective means.



4,190,038

SOLAR HEATER

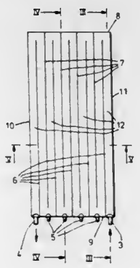
Herbert Heitland; Rudolf Kroll, and Edgard Grundmann, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,652

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648114

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—445 **8 Claims**



1. A mat-shaped solar heater comprising:

(a) means forming two outer and a plurality of inner parallel flow channels for a heat-carrying medium all of which flow channels are in communication with each other, any two adjacent ones of said flow channels having a common linear divider, at least every other one of said dividers terminating short of an edge of said mat-shaped solar heater so as to form a plurality of pairs of two adjacent inner flow channels which communicate with each other near said edge;

(b) inlet and outlet conduits communicating with the interior of said inlet and being in general alignment and therefore in direct communication with said two outer flow channels, respectively, for allowing heat-carrying medium to be introduced into and to flow out of all of said flow channels during normal operation of the solar heater, and;

(c) means forming a plurality of closable discharge conduits which communicate with the interior of said solar heater in the region of said edge thereof, each of said closable discharge conduits being in general alignment and therefore in direct communication with two flow channels which constitute a respective pair of adjacent inner flow channels so that when said discharge conduits are closed during normal operation of the solar heater, said inlet and outlet conduits form the sole communication between the interior and exterior of said solar heater, whereas for purposes of draining the medium from the solar heater, said discharge conduits can be opened to allow the medium to flow out not only through said inlet and outlet conduits but also through said discharge conduits, thereby facilitating the removal of the medium from the interior of said solar heater and particularly from said inner flow channels.

4,190,039

SOLAR ENERGY LIQUID HEATING DEVICE

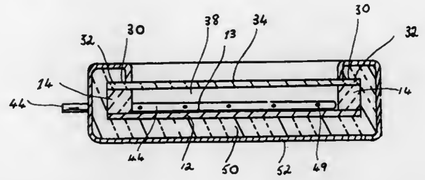
David A. Zani, P.O. Box 165, Kingshill, St. Croix, V.I. 00850

Filed Apr. 17, 1978, Ser. No. 896,997

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—450 **3 Claims**



1. A solar energy liquid heating device comprising:

a. a collector plate;

b. a wall member extending perpendicular from the plane of the collector plate;

c. a panel having a peripheral portion bearing against a wall member to form an enclosure, said panel having a transparent central portion capable of transmitting solar energy therethrough;

d. a heat absorbing surface within the enclosure, the wall member of the enclosure having apertures whereby liquid can be passed therethrough during use to extract solar energy absorbed in the enclosure; and

e. insulation covering the outside of the enclosure excepting said transparent central portion of the panel to form a rigid structure to enclose the transparent panel, wall member and collector plate,

f. an elastomeric membrane covering the outside of the insulation.

4,190,040

RESEALABLE PUNCTURE HOUSING FOR SURGICAL IMPLANTATION

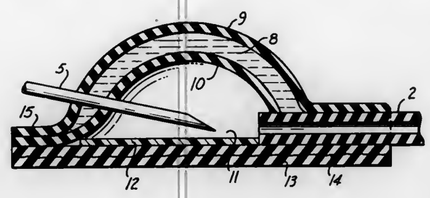
Rudolf R. Schulte, Santa Barbara, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 3, 1978, Ser. No. 921,559

Int. Cl.[2] A61B *19/00;* **A61F** *1/00*

U.S. Cl. 128—1 R **11 Claims**

1. A housing for surgical implantation having an encased sealant for repairing hypodermic punctures, wherein the improvement comprises: a generally dome shaped sealant layer sandwiched between inner and outer wall portions of the housing; and the wall portions are domed in a common direction to provide a reservoir chamber under the domed inner wall, whereby hypodermic punctures into the housing can be made through the sealant layer from widely angled positions.



4,190,041

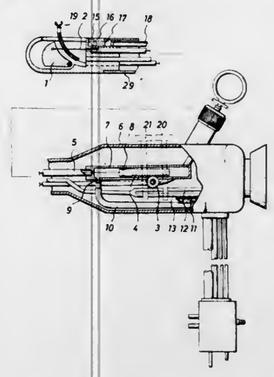
CLEANING DEVICE FOR WIRE GUIDE TUBE IN AN ENDOSCOPE

Toshio Chikama, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,338

Int. Cl.[2] A61B *1/00*

U.S. Cl. 128—4 **9 Claims**



1. An endoscope having a handle and an operating end interconnected by a sheath, a liquid tube means carried within said sheath for carrying air and liquid, a wire guide tube carried within said sheath housing a guide wire, said guide wire extending from a handle end to a pivoted deflector at said operating end, said guide tube being open at said operating end and being open at said handle end so that said guide tube is open at both its ends, and cleansing means communicating with said open handle end of said wire guide tube enabling cleansing of the interior of said wire guide tube.

4,190,042

SURGICAL RETRACTOR FOR ENDOSCOPES

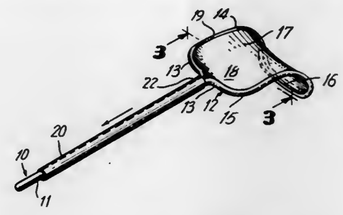
Manfred Sinnreich, 160 Fort Hill Rd., Scarsdale, N.Y. 10583

Filed Mar. 16, 1978, Ser. No. 887,120

Int. Cl.[2] A61B *17/02*

U.S. Cl. 128—20 **3 Claims**

1. An improved collapsable surgical retractor comprising: a hollow barrel defining an elongated channel having proximal and distal ends; a unitary molding of resilient synthetic resinous material including an elongated rectilinear shaft member slidably disposed within said channel, a bifurcated member on a distal end of said shaft, selectively positionable within said channel and having a relatively unstressed configuration when positioned outwardly of said channel, said bifurcated member including a plurality of interconnected segments having inwardly and outwardly directed peripheral surfaces, and defining a hook-like appendage of substantial transverse width, and forming an angle with respect to the axis of said shaft member, said segments defining an at least partially enclosed area; and a thin web-like membrane interconnecting the inwardly directed surfaces of said bifurcated member, and extending over said enclosed area; whereby when said bifurcated member is positioned completely within said channel, it assumes a rectilinear configuration, and when extended outwardly past said distal end of said channel, said bifurcated member resiliently expands to relatively unstressed operative configuration, said membrane being thereby tensed to prevent the accidental entry of tissue into said enclosed area, and preventing the pinching of said tissue upon withdrawal of said bifurcated member within said channel.



4,190,043

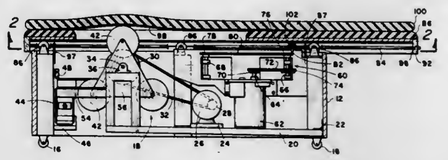
MASSAGE TABLE DRIVE SYSTEM

Terry D. Thompson, 2205 W. 8th St., Coffeyville, Kans. 67337

Filed Aug. 28, 1978, Ser. No. 937,207

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—33 **3 Claims**



1. An improved drive system for a massage table which includes a cabinet housing having an open top area, massage means formed to said housing, and a massage table top having an upper side for allowing a patient to be supported thereon and a lower side and wherein said system comprises motor means formed within said housing; gear reduction means connected to and powered by said motor means; a continuous chain formed from a plurality of links moved by said gear reduction means such that the path of said chains forms a plane; an upwardly extending ear link in said chain to act as a driver for said table top; a transverse bracket slot on said lower side of said top for receiving said ear link therein; a plurality of removable parallel drill rods extending longitudinally across and spaced from said lower side; a plurality of security brackets extending from said open top area of said housing, each bracket having an opening to accept a drill rod therethrough; and a plurality of caster means extending from said open top area and aligned in a plane parallel to said plane of said chain to allow said table top to slide reciprocally longitudinally thereon.

4,190,044

TELESCOPING INTERMEDULLARY PIN

Eugene W. Wood, P. O. Box 672, Magnolia, Ark. 71753

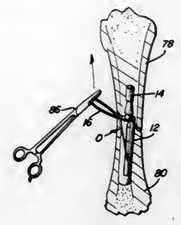
Filed Aug. 16, 1978, Ser. No. 933,990

Int. Cl.[2] A61F *5/04;* **A61B** *17/18*

U.S. Cl. 128—92 BC **9 Claims**

7. An intermedullary pin device for use in setting bone fractures comprising: a base with a plunger telescopingly re-

ceived therein, said base being adapted to be received within a drilled out cavity in one section of said fractured bone; a flexible extension means connected to said plunger for extending



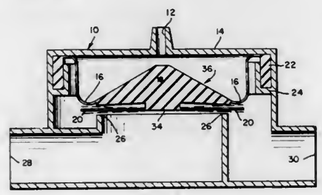
said plunger into a drilled out cavity in a second section of said fractured bone, said extension means being formed in a loop and being accessible externally of the bone.

4,190,045

NOISE REDUCING EXHALATION VALVE AND DIAPHRAGM

Harold U. Bartels, Corona, Calif., assignor to Bourns Medical Systems, Inc., Riverside, Calif.

Filed Apr. 24, 1978, Ser. No. 899,604
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—205.24 **2 Claims**



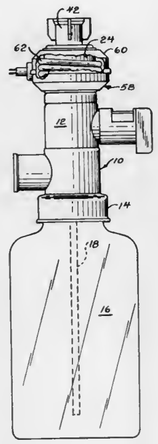
1. A noise reducing exhalation valve for use with medical respiratory systems comprising:
valve body means;
patient exhalation flow port means in said valve body means for accepting expiratory fluid flow from a patient using said medical respiratory system;
valving means in said valve body means in fluidic communication with said patient exhalation flow port means to control fluid flow by permitting and restricting said expiratory fluid flow therethrough;
operating control pressure chamber means in said valve body;
operating pressure inlet port means communicating with said operating control pressure chamber means for admitting fluid operating pressures to said valve body means for controlling said valving means;
said valving means including a valve seat in said patient exhalation flow port means and an integrally molded diaphragm means in said valve body means responsive to said fluid operating pressures supplied by way of said operating pressure inlet port means and operable with said valve seat to open and close said valving means, said diaphragm means and said body means defining said operating control pressure chamber means, said integrally molded diaphragm means comprising:
a cone-shaped central portion;
a cylindrical boss, one base of which is integrally molded onto the flat surface of said cone-shaped central portion;
a thin circular sheet integrally molded to the other base of said cylindrical boss;
a flexible extension integrally molded to the periphery of said cone-shaped central portion;
a securing flange integrally molded to the periphery of said flexible extension;
retaining groove means in said valve body means for receiving and securing said securing flange; and
patient exhalation overboard flow port means in fluid communication with said patient exhalation flow port means by way of said valving means for exhausting said expiratory fluid flow exhaled by a patient using said medical respiratory system.

4,190,046

NEBULIZER CAP SYSTEM HAVING HEATING MEANS

Robert A. Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 10, 1978, Ser. No. 885,240
Int. Cl.[2] A61M *11/02*
U.S. Cl. 128—200.21 **4 Claims**



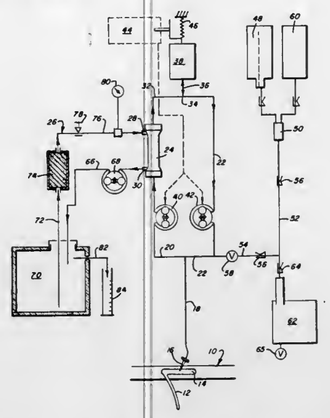
1. A nebulizer cap useful for respiratory therapy comprising:
a cap body;
means for connecting the cap body to a container for holding liquid to be nebulized;
a dip tube carried by the cap body in a position to extend into the container when the cap body is attached thereto;
conduit means, including a continuous open channel defined in the surface of an upstanding portion of the cap body, having one end connected to said dip tube for transmitting liquid from the dip tube through the cap body;
liquid inlet means connected to the other end of said conduit means for delivering liquid being transmitted through the conduit means to a prescribed point in the cap body;
a gas port defined in the cap body for transmitting gas into the cap body from an exterior source;
gas inlet means connected to said gas port for delivering gas from the gas port into the cap body adjacent the prescribed point of liquid delivery, the gas and liquid inlets means being arranged to define a nebulizing venturi, whereby liquid from the liquid inlet is sucked into and mixed with the gas being delivered from the gas inlet;
a metal heat exchange shell positioned over the upstanding portion of the cap body, thereby essentially enclosing the open channels to heat liquid passing through the channels; and
outlet means in said cap body through which the nebulized mixture is exhausted from the cap body.

4,190,047

METHOD AND APPARATUS FOR PERITONEAL DIALYSIS

Stephen C. Jacobsen; Robert L. Stephen; David F. Knutti, and Carl Kablitz, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Aug. 26, 1977, Ser. No. 828,073
Int. Cl.[2] A61M *5/00, 1/03*
U.S. Cl. 128—213 A **11 Claims**



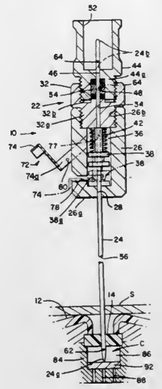
1. A method of removing metabolic waste products from the blood of a patient including pumping dialysis solution into the peritoneal cavity of the patient, the improvement comprising (a) removing a portion of the dialysis solution from the peritoneal cavity through a single access path in the abdominal wall to the peritoneum to both insert and remove dialysis solution to and from the peritoneal cavity which portion is no more than essentially 90 percent of the total amount of dialysis solution administered to said peritoneal cavity, (b) replacing said portion with additional, fresh dialysis solution, sequentially repeating steps (a) and (b) until the desired amount of metabolic waste products have been removed from the patient, (c) dialyzing said dialysis solution which has been removed from the peritoneal cavity against a second dialysis solution for removal of metabolic waste products therefrom, (d) returning said removed dialysis solution to the peritoneal cavity of the patient as cleansed dialysis solution, (e) passing said second dialysis solution through absorbent means to regenerate said second dialysis solution for further dialysis against the dialysis solution removed from the peritoneal cavity, (f) directing said dialysis solution into and out of the peritoneal cavity in the manner responsive to the weight of dialysis solution in a reservoir positioned in flow communication with the peritoneal cavity, flowing said dialysis solution into and out of the peritoneal cavity of a patient through a flow circuit which defines communication means with said catheter, (g) providing first and second branch conduits positioned in branched relationship with said connection means, a primary circuit having one end connected to said first conduit and another end connected to said second conduit, said primary circuit passing through pump means and dialyzer means for purification of the solution, said first branch conduit communicating with a third branch conduit, upstream of said pump, which in turn communicates with a reservoir for dialysis solution, said second branch conduit being in flow communication with a fourth branch conduit, said fourth branch conduit also communicating with said reservoir; and valve means for alternatively opening and closing fluid flow through pairs of branch conduits, said pairs of branch conduits comprising respectively the first and fourth and the second and third branch conduits, whereby flow of dialysis solution takes place through only one pair of said branch conduits on an alternative basis, to permit the withdrawal of dialysis solution from the peritoneal cavity and the storage thereof in said container when the second and third branch conduits are open, and to permit the reinfusion of dialysis solution from the container to the peritoneal cavity when the first and fourth branch conduits are open.

4,190,048

INFUSATE INJECTION APPARATUS

Edward J. Sampson, Concord, Mass., assignor to Metal Bellows Corporation, Sharon, Mass.

Filed Jul. 14, 1978, Ser. No. 924,623
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 **3 Claims**



1. Apparatus for injecting infusate percutaneously through a septum into an infusate chamber implanted in a body comprising:
A. a housing,
B. a needle projecting from the housing, said needle having a longitudinal passage,
C. means for slidably mounting the needle in the housing so that it is movable between an extended positon and a retracted position,
D. means for biasing the needle toward its extended position,
E. means for conducting fluid into the housing, and
F. valve means in the housing for controlling the flow of fluid from the housing into the needle, said valve means being closed when the needle is in its extended position and said valve means being open when the needle is in its retracted position whereby fluid infusate cannot flow through the needle unless the exposed end of the needle bottoms against a stop in the chamber thereby facilitating moving the needle to its retracted position, said valve means comprising:
1. a transverse passage through the needle near its inner end, said transverse passage intercepting the longitudinal passage through the needle, and
2. a resilient seal mounted in the housing so as to cover the ends of said transverse passage when the needle is in its extended position, the ends of said transverse passage being free of said seal when the needle is in its retracted position.

4,190,049

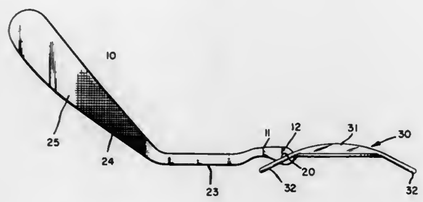
POSTERIOR LENS IMPLANT TOOL

Clarence L. Hager, 16037 Miami Way, Pacific Palisades, Calif. 90272, and Ronald P. Jensen, 4156 Dorset Pl., Pasadena, Calif. 91103

Filed Aug. 8, 1977, Ser. No. 822,511
Int. Cl.[2] A61F *9/00, 1/16*
U.S. Cl. 128—303 R **2 Claims**

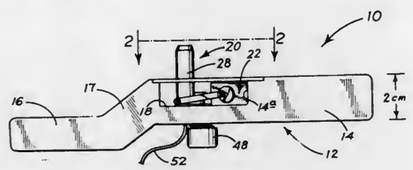
1. A posterior lens implant tool for use in combination with an intraocular lens for implantation in the posterior chamber of a human eye, said intraocular lens including:

a. a plano-convex lens, which is formed from an optical material that is suitable for an implantable lens, which is adapted to be inserted into the posterior chamber of the human eye within the capsular membrane thereof; and
b. a pair of supporting loops, which are formed from a material that is suitable for implantation into the eye, mechanically coupled to the peripheral edge of the plano-convex lens and disposed at an angle in the range of 0° to 25° to the plane surface of said plano-convex lens so that their end portions are below the plane surface of said plano-convex lens; said implant tool comprising:
a. pair of prongs each of which has a tip and an adjacent section and which are mechanically coupled in order to form a pair of forceps;



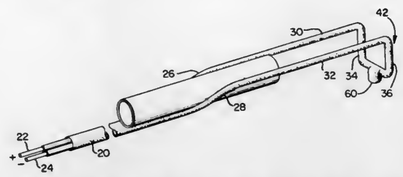
b. a first grooved means for securing the tip of each of said prongs to the inside surface of one of the supporting loops; and
c. second groove means for securing the tip of each said prongs to the peripheral edge of the plano-convex lens whereby each of said prongs is adapted so that its said tip may be inserted into one of the supporting loops and its said adjacent section may extend parallelly to the plane surface of the plano-convex lens substantially in the same plane as the plano-convex lens so that no portion of its said adjacent section extends above or below the intraocular lens.

4,190,050
TREPHINE INSTRUMENT FOR USE IN CORNEA REMOVAL AND TRANSPLANT
Paul F. Bailey, 4885 NW. Barnes Rd., Portland, Oreg. 97210
Filed Jul. 28, 1977, Ser. No. 819,884
Int. Cl.² A61B *17/16*
U.S. Cl. 128—305.1 **16 Claims**



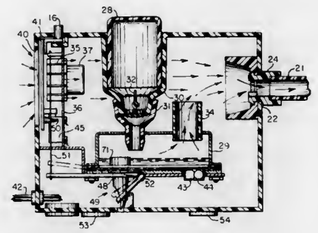
1. A trephine instrument for use in surgical removal of a cornea comprising:
elongate handle means for gripping by a surgeon with both hands when in use including first and second handle portions having their longitudinal axes laterally spaced and longitudinally offset from one another, said first and second handle portions being joined together by an interconnecting portion;
guide means mounted on said first handle means portion including a concave end face dimensioned for seating against a cornea;
blade means having an annular cutting edge mounted on said guide means and extending outwardly from said first handle portion;
power-driven means operable for selectively imparting cutting motion to said blade means; and
shifting means mounted on said handle means selectively operable for extending and retracting said blade means relative to said handle means.

4,190,051
LITHOTRITE FOR ELECTROHYDRAULIC CYSTOLITHOTRIPSY
Jose J. Iglesias, 1341 North Ave., Elizabeth, N.J. 07603
Filed Jun. 6, 1978, Ser. No. 913,112
Int. Cl.² A61B *17/22*
U.S. Cl. 128—328 **3 Claims**



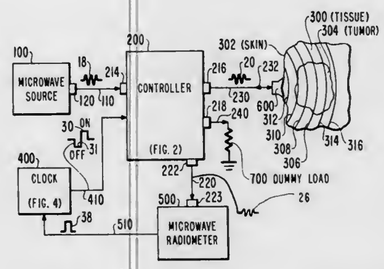
1. A lithotrite for use in an electrohydraulic system for disintegrating bladder calculi in situ, comprising at least one elongated hollow stem having proximal and distal ends, two electro-conductive wires extending longitudinally within the stem and at the proximal end of the stem being adapted for connection, respectively, to the positive and negative terminals of a source of direct current, each wire having a part protruding from the distal end of the stem, the protruding parts of the wires being rigid and comprising parallel sections adjacent the distal end of the stem and parts depending from the parallel sections distal to the distal end of the stem, the depending part of one wire being formed at its lower end as a horizontal open loop, the depending part of the other wire being vertical with its lower end within and concentric with the open loop of the one wire, and electrical insulating material surrounding all parts of the wires distal of the stem except only the lower surface of the open loop and the lower end surface of the other wire which is within and concentric with the open loop.

4,190,052
STEAM FACIAL APPARATUS
Edward F. McCarthy, Medford, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 18, 1978, Ser. No. 970,748
Int. Cl.² A61H *33/00*
U.S. Cl. 128—368 **12 Claims**



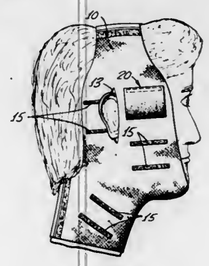
1. A facial treatment apparatus comprising
housing means including a plurality of air vents and a steam exit means;
steam generator means positioned in said housing means and including a heater assembly and a boiler for generating steam, said boiler including a steam exit means for releasing steam from said boiler for combination with air in said housing to said steam exit means;
air moving means positioned in said housing means and proximate said vents for drawing air through said vents and creating a pressure increase in said housing means and in said boiler through said steam exit means; and
a fill means including a one-way valve positioned in said fill means, connected to said boiler for providing fluid communication to said boiler and for substantially preventing fluid communication to said boiler when said air moving means creates a pressure increase in said boiler or when steam is generated in said boiler.

4,190,053
APPARATUS AND METHOD FOR HYPERTHERMIA TREATMENT
Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Jun. 20, 1977, Ser. No. 808,292
Int. Cl.² A61N *5/02*
U.S. Cl. 128—399 **10 Claims**



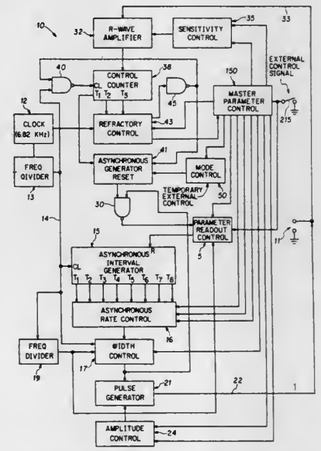
1. Apparatus for heating living tissue with microwave signals and detecting radiant energy from that tissue comprising:
a. source means for providing irradiating microwave signals at a selected frequency and intensity;
b. means for coupling said microwave signals to irradiate said living tissue to thereby increase the heat energy and thereby the temperature of said tissue;
c. means to interrupt the coupling of said signals to said tissue; and
d. detecting means coupled to said tissue to detect radiant energy related to said frequency from said tissue only when said microwave irradiation signals to said tissue are interrupted, said radiant energy being indicative of the temperature of said tissue.

4,190,054
THERAPEUTIC BANDAGE WITH REMOVABLE HOT OR COLD PACKS
H. George Brennan, 10800 Ambazac Way, Bel Air, Calif.
Filed Dec. 14, 1977, Ser. No. 860,327
Int. Cl.² A61F *7/00*
U.S. Cl. 128—402 **2 Claims**



1. An article of manufacture comprising:
a removable bandage attachable to a body part for covering same, said bandage being made from an elastic material so as to hold the flesh of said body part firmly in place;
a flexible fluid retaining envelope, the fluid therein being heatable and coolable so that said envelope functions as a hot or cold pack; and
means provided on the outside surface of said bandage for removably and selectively attaching said envelope to said outside surface of said bandage without moving the inside surface thereof out of contact with said body part to apply heat or cold to said body part.

4,190,055
CIRCUIT FOR DETERMINING THE PARAMETER CONTROL STATES OF AN IMPLANTED PACER
Robert A. Walters, Pittsburgh, and Russell E. Hirtz, Arnold, both of Pa., assignors to ARCO Medical Products Company, Leechburg, Pa.
Filed Jul. 5, 1977, Ser. No. 812,571
Int. Cl.² A61N *1/00*
U.S. Cl. 128—419 PT **7 Claims**

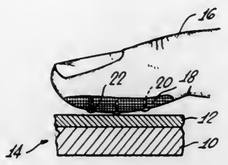


1. In combination with a heart pacer of the type in which operating parameters of the pacer are controlled by logic states established in a register connected to parameter controlling circuitry and having an externally selectable asynchronous mode in which said pacer produces asynchronously occurring stimulation pulses,
means for producing serial logic states corresponding, in order, to each of said established logic states, and
a delay circuit for selectively adding, in correspondence with the logic state of a respective one of said serial logic states, a delay between successive asynchronous stimulation pulses to provide an observable indication of said established logic states when said asynchronous mode of said pacer is selected.

4,190,056
METHOD AND MEANS FOR RECORDING SWEAT GLAND ACTIVITY
Robert Tapper, West Los Angeles; Arthur S. Diamond, Ventura, and Ajit S. Arora, San Francisco, all of Calif., assignors to General Medical Company, Los Angeles, Calif.
Filed Oct. 31, 1977, Ser. No. 846,800
Int. Cl.² A61B *5/00*
U.S. Cl. 128—630 **99 Claims**

1. A method for recording sweat gland activity by obtaining a clear resolute image which is directly proportional to the amount of perspiration exuded at each sweat gland orifice, the method comprising the steps of:

(a) providing a dry sensitized substrate having a surface layer comprising a mixture of a starch and an oxidizing agent;
(b) treating a skin area to be recorded with an iodide solution of a compound selected from the group consisting of sodium iodide, calcium iodide, potassium iodide and mixtures thereof;



(c) allowing the iodide treated skin area to dry in areas where no perspiration exists and to receive perspiration where it develops at each gland orifice; and
(d) momentarily contacting the surface layer of the sensitized substrate with the iodide treated skin area to produce the clear resolute image.

4,190,057

DEVICE FOR DETERMINING THE PATENTCY OF A BLOOD VESSEL

J. Donald Hill, San Francisco; Robert J. Harvey, Danville, and David E. Downie, Lafayette, all of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Dec. 27, 1977, Ser. No. 864,626
Int. Cl.² A61B 5/02
U.S. Cl. 128—675 **2 Claims**



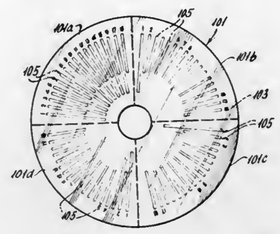
1. A device for determining the patentcy of a blood vessel comprising a physiologically inert, implantable flexible bulb closed except for a first opening; inexpansible means for securing said bulb in motion transferring relationship to the wall of a blood vessel; a physiologically innocuous, implantable reservoir closed except for a second opening; and a physiologically inert, implantable catheter at one end secured to said bulb and communicating therewith through said first opening and at the other end secured to said reservoir and communicating therewith through said second opening, said reservoir having a wall which is made of a material having the property of permitting the passage therethrough of a hypodermic needle and having the property of self-sealing upon the withdrawal therefrom of a hypodermic needle.

4,190,058

DEVICE FOR USE IN EARLY DETECTION OF BREAST CANCER

Zsimond L. Sagi, Denville, N.J., assignor to Arden Industries, Inc., Lake Hiawatha, N.J.

Filed May 22, 1978, Ser. No. 908,154
Int. Cl.² A61B 10/00
U.S. Cl. 128—736 **12 Claims**



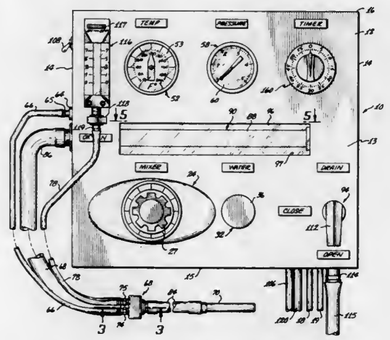
1. A device for use in early detection of breast cancer, which device comprises:
(a) a flexible, heat-conductive web,
(b) an adhesive layer on one side of said web and a pealable layer removably adhered to said web by said adhesive layer,
(c) an array of spaced-apart indicatorson the other side of said web, each of said indicators comprising a dye or a pigment and a temperature-sensitive substance having a relatively precise melting point approximately 0.5° F. different from the melting point of the temperature-sensitive substance in the adjacent indicator, and wherein each indicator displays a change in color upon melting of each of said temperature sensitive substance, and
(d) a transparent flexible layer conformably overlying said web and sealably secured thereto for visual examination of the change in color of said indicators.

4,190,059

APPARATUS FOR COLONIC LAVAGE AND SPECIMEN COLLECTION

Gregory G. Holt, Phoenix, Ariz., assignor to Colonics Diversified, Inc., Scottsdale, Ariz.

Filed Oct. 25, 1978, Ser. No. 954,352
Int. Cl.² A61B 10/00; A61M 7/00
U.S. Cl. 128—750 **22 Claims**



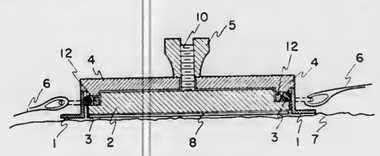
1. An apparatus for colonic lavage comprising:
(a) a water mixing valve for receiving hot and cold water under pressure and mixing them to arrive at a desired temperature, said mixing valve having an outlet port;
(b) water pressure regulating valve means coupled to the outlet port of said water mixing valve for receiving water therefrom, said water pressure regulating valve means having an outlet and including first valve means for limiting the maximum pressure of the water at its outlet and second valve means for adjusting the water pressure to specific valves below that maximum limit;
(c) a water temperature gage coupled to the outlet of said water pressure regulating valve means to provide a visual indication of the water temperature;
(d) a water pressure gage coupled to the outlet of said water pressure regulating valve means to provide a visual indication of the water pressure at the outlet of said water pressure regulating valve means;
(e) a speculum for insertion into the anal canal of a patient for lavaging the patient's colon and extracting matter lodged therein; and
(f) manifold means connected between the outlet of said water pressure regulating valve means and said speculum for delivering water to said speculum and for receiving the extracted matter therefrom, said manifold means having a discharge port through which the extracted matter passes.

4,190,060

SWEAT COLLECTION CAPSULE

John E. Greenleaf, Sunnyvale, and Robert W. Delaplaine, Woodside, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1978, Ser. No. 897,828
Int. Cl.² A61B 10/00
U.S. Cl. 128—760 **4 Claims**



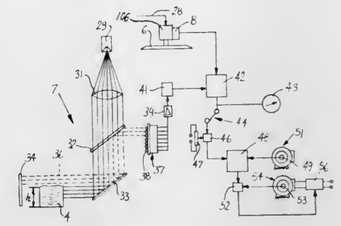
1. A capsule for collecting sweat from the skin of a human subject, which comprises:
(a) a frame;
(b) a removable closure adapted to mount on the frame and which, when mounted, leaves a cavity on one side of the frame; said closure comprising (1) a circular base plate adapted to fit within the frame and having a rod protruding perpendicularly from its center; (2) an O-ring for placement on the rod side of the base plate; (3) a cover plate for placement on top of the O-ring and the base place, said cover plate being centrally perforated to accommodate the rod of the base plate; and (4) a locking device operable to engage the rod of the base plate in such a way as to cause the O-ring to expand beyond the perimeter of the base plate and push against the frame in airtight cooperation;
(c) means for absorbing sweat, located within said cavity; and
(d) means for attaching the frame to the skin in an immobile and airtight manner.

4,190,061

METHOD AND APPARATUS FOR PRODUCING A ROD-LIKE TOBACCO FILLER

Uwe Heitmann, Schwarzenbek; Wolfgang Steiniger, Börnsen; Uwe Holznagel, Glinde; Hartmut Kaebernick; Joachim Pfannmüller, both of Hamburg, and Joachim Reuland, New Börnsen all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 2, 1977, Ser. No. 821,179
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635391
Int. Cl.² A24C 5/14, 5/39
U.S. Cl. 131—21 B **13 Claims**



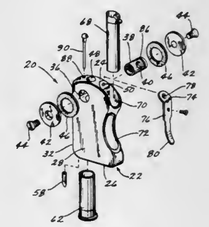
7. Apparatus for producing a continuous filler of fibrous material, particularly tobacco, comprising adjustable means for transporting fibrous material at a variable rate along a predetermined path; means for converting said fibrous material into a continuous stream which contains fibrous material in excess of that required in the filler; means for removing the surplus of fibrous material from said stream; means for monitoring the height of said stream ahead of and downstream of said removing means, including means for generating first and second signals whose characteristics respectively denote the height of said stream prior to removal of said surplus and the height of the remainder of said stream; means for deriving from said first and second signals third signals having characteristics denoting the differences between the characteristics of said first and second signals; means for adjusting said transporting means as a function of changes in characteristics of said third signals so as to reduce said rate when the quantity of removed surplus increases and vice versa; and means for converting the remainder of said stream into said filler.

4,190,062

SMOKING DEVICE

Jack R. Paden, P.O. Box 80211, Lincoln, Nebr. 68501

Continuation-in-part of Ser. No. 837,899, Sep. 29, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,503
Int. Cl.² A24F 1/26, 3/00
U.S. Cl. 131—180 **24 Claims**



1. A smoking device comprising,
a housing, said housing having a cavity for the storage of a smoking substance therein,
flame generating means in said housing, and

a bowl body rotatably supported in said housing and having a smoking chamber therein,

said bowl body having a first opening for the insertion and removal of smoking substance from said smoking chamber and a second opening small enough to substantially block the passage of smoking substance therethrough,

said housing having a smoking substance discharge opening in communication with said bowl body, a flame and air intake opening in communication with said bowl body and situated adjacent said flame generating means, and an elongated smoke passage in communication with the bowl body at one end and open at the other end for drawing smoke therethrough,

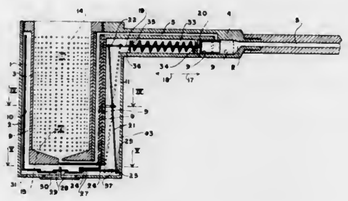
said bowl body being rotatable between a loading position wherein said first opening is registered with said cavity for receiving smoking substance therefrom, a smoking position wherein said first opening is registered with said flame and air intake opening and said second opening is registered with said smoke passage whereby flame from said flame generating means may be drawn into the smoking chamber to incinerate the smoking substance in response to air being drawn through the smoke passage, and a discharge position wherein said first opening is registered with said discharge opening for removing smoking substance from said chamber and housing.

4,190,063

SMOKER'S PIPE

Denver R. Turner, 405 Oakdale Ave., South Charleston, W. Va. 25303

Filed May 12, 1977, Ser. No. 796,136
Int. Cl.[2] A24F *1/02, 5/04*
U.S. Cl. 131—195 **3 Claims**



1. A smoker's pipe, comprising

a tobacco bowl for burning tobacco said tobacco bowl having an outer tobacco bowl and a perforated inner tobacco bowl of smaller diameter than the outer bowl coaxially positioned in the outer bowl for holding burning tobacco;

a stem extending from the outer bowl; and

control means for permitting a draft, wherein said inner bowl has perforations that are open when the control means is not being drawn or puffed on, via a free flow of air through tobacco in the inner bowl whereby the tobacco burns freely and evaporates moisture in the tobacco and eliminates nicotine and tar to provide a milder smoke when the pipe is free from drawing and puffing by a smoker, and for drawing smoke from burning tobacco in the inner bowl through the stem to the smoker's mouth said perforations of said inner bowl are closed when the smoker draws or puffs.

4,190,064

HAIR TREATMENT COMPOSITION AND METHOD OF TREATING HAIR WITH THE SAME

Harry W. Gordon, Bronx, and Sharif Amanat, Elmshurst Queens, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,152
Int. Cl.[2] A45D *19/00*
U.S. Cl. 132—7 **25 Claims**

1. A method of treating hair, comprising the steps of:

(a) mixing henna material having a natural lawsone component and a natural fixer component in an aqueous-based carrier;

(b) mixing a glycol with the henna material in the carrier and thereby extracting quantities of the natural lawsone and fixer components from the henna material to thereby form a henna extract;

(c) mixing synthetic lawsone with the extract to thereby form a sub-mixture for increasing the color intensity imparted to the hair to a level above that imparted to the hair by the extracted natural lawsone component alone;

(d) mixing a cationic polymeric fixing agent with the sub-mixture to thereby form a hair treatment composition for fixing both the synthetic lawsone and the extracted natural fixer component to the hair in a time period which is shorter than the time required for the extracted natural fixer component alone to fix the extracted natural lawsone component to the hair; and

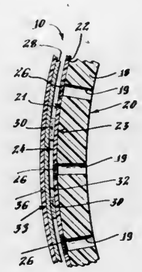
(e) applying the hair treatment composition to the hair for toning the same with the increased color intensity and in the shorter time period.

4,190,065

EXOTHERMIC HAIR CURLER

Walter J. Kulpa, Norwalk, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.

Filed Aug. 18, 1977, Ser. No. 825,638
Int. Cl.[2] A45D *2/12*
U.S. Cl. 132—33 R **30 Claims**



1. A laminated hair curler assembly comprising:

a. first sheet formed of a liquid impervious material and having a plurality of apertures formed in a thickness thereof;

b. a second non-perforated sheet formed of a liquid impervious material and sealed with said first sheet to provide an enclosure therebetween into which a reaction activating liquid can flow through said apertures;

c. a sheet of liquid absorbent material positioned between said first and second sheets;

d. means positioned between said absorbent sheet and said second sheet for creating an exothermic reaction when activated by a fluid in said enclosure;

e. means provided on said absorbent sheet for venting said exothermic reaction through said apertures; and

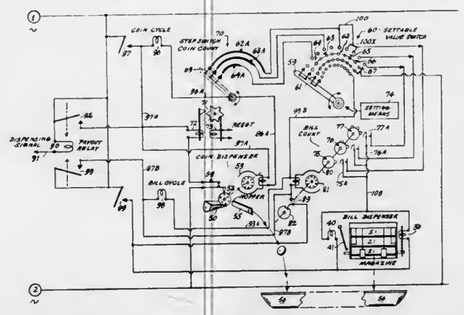
f. said assembly formed into an elongated body having an arc-shaped cross-sectional configuration.

4,190,066

COIN AND PAPER MONEY PAYOUT SYSTEM

Walter M. Burnside, Waukegan, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,928
Int. Cl.[2] G07D *1/00*
U.S. Cl. 133—4 R **8 Claims**



1. Currency dispensing apparatus wherein coin-dispensing means is operative to dispense coins in preset numbers from a bulk supply, and bill-dispensing means is operative to dispense bills of predetermined denomination and preset number from a supply source, said dispensing means being operative in dispensing cycles initiated by a dispensing signal and terminated responsive to counting switch means governed by settable value determining switch means operative to determine the number of coins or bills to be dispensed in a given cycle responsive to such signal, characterized in that the value-determining switch means includes settable value contactor means selectively positionable in a field of value contacts wherein coin contacts in one range when engaged by said contactor means enable said coin dispensing means to dispense coins in increasing numbers up to a predetermined arbitrary limit, and bill contacts in another range enable said bill-dispensing means to effect dispensation of bills of predetermined denomination and number dependently upon the positioning of said value contactor in engagement with value contacts in one or the other of said ranges.

4,190,067

METHOD AND APPARATUS FOR INSERTION OF WEFT THREADS IN JET WEAVING MACHINES

Vladimir Kuda, Brno; Vladimir Vasicek, Moravsky Krumlov, and Borivoj Suchanek, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

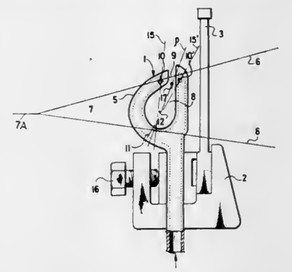
Continuation-in-part of Ser. No. 726,575, Sep. 27, 1976, abandoned. This application Aug. 30, 1977, Ser. No. 829,153
Claims priority, application Czechoslovakia, Sep. 27, 1975, 6543-75
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **6 Claims**

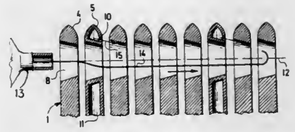
1. In a jet loom having a nozzle adapted to direct a stream of a fluid pressure medium through a horizontally disposed weft inserting comb which is cyclically moved by a slay into the shed formed by the warp threads thereby picking a weft thread therethrough, the improvement comprising,

a comb made up of a plurality of juxtaposed comb members operatively mounted on the slay, each comb member having a pair of shank portions, the comb members each defining a weft inserting opening and the free ends of said shank portions define an unthreading channel having an inlet opening and communicating the weft inserting opening with the exterior of the comb;

the weft inserting openings through the comb members defining a horizontal picking path for the weft threads,

at least one of said plurality of comb members having at least one secondary carrying fluid conduit means having an outlet adjacent to one of the free ends of the shank portions; the axis extending through the weft inserting openings of the plurality of comb members and an imaginary line passing through the midpoints of the inlet openings of the unthreading channels of the comb members define a first plane, a rectangular projection of the axis of said secondary carrying fluid conduit outlet on said first plane forming with the axis extending through the weft inserting





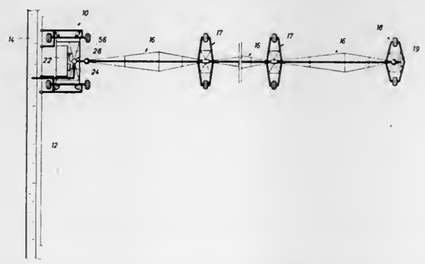
openings an angle ranging from 5°–30°, said secondary carrying fluid conduit having an outlet adjacent to each free end of the pair of shank portions, the axes of said pair of outlets mutually intersecting each other at a point located below the weft thread being inserted and below a second plane, relative to the unthreading channel, said second plane being parallel to said axis extending through the weft inserting openings and passes through the central axes of said pair of outlets.

4,190,068

SELF-CORRECTING LINEARLY MOVABLE IRRIGATION SYSTEM

Glenn A. Beusch, Post Falls, Id.; Harold L. Thompson, Spokane, Wash.; Herbert E. Lindner, Spokane, Wash., and Geoffrey G. Jones, Spokane, Wash., assignors to Gifford-Hill & Company, Inc., Tulsa, Okla.

Filed Sep. 23, 1977, Ser. No. 835,877
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—1 **24 Claims**



17. An irrigation system for irrigating large land areas and being movable in a substantially linear manner across the land area, said irrigation system comprising:

an elongated reference means establishing a travel path across said land area;

an inboard motorized steerable mover unit adjacent said elongated reference means and defining a reference pivot point;
an outboard motorized mover unit displaced from said inboard steerable mover unit;
a plurality of irrigation pipe spans interconnecting said outboard mover unit with said inboard mover unit and rotating about said pivot point;
sensor means mounted on said inboard mover unit and having movement relative to said inboard mover unit to seek distance relating engagement with said reference means;
means sensing the mechanical relationship of said sensor relative to said mover unit and deriving an electrical representation of said mechanical relationship and thus the distance between said elongated reference means and said inboard mover unit;
wheels attached to said inboard mover unit for effecting steering and movement of said inboard mover unit;
steering control means responsive to said mechanical relationship and distance representation for rotating at least one of said wheels to cause movement of said inboard mover unit in a direction to maintain said distance representation within preselected limits;
angle indicator means for deriving a first variable electrical signal functionally related to the angular position of said outboard mover unit about said reference pivot point and relative to said inboard mover unit;
tension and compression means for deriving a second variable electrical signal functionally related to compression and tension forces acting along said plurality of irrigation pipe spans;
means for proportionately energizing said inboard and outboard mover units in response to the compression and tension signals to induce correcting movement of at least one of said outboard mover units to maintain said second electrical signal within preselected values; and
means for thereafter proportionately energizing said inboard and outboard mover units in response to said angular position signal to induce correcting movement of said inboard and outboard mover units to return said first electrical signal within predetermined values.

4,190,069

PROCESS FOR TRANSMITTING A HYDROCARBON FLUID THROUGH A PIPELINE

Karl W. Krantz, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 6, 1975, Ser. No. 584,417
Int. Cl.² F17D *1/17;* B01F *3/20*
U.S. Cl. 137—13 **6 Claims**

1. A process for transmitting a hydrocarbon fluid through a pipeline at a reduced fluid flow friction loss, which comprises:
A. intermixing with said fluid a composition comprising:
(i) a continuous phase of a liquid which is different from but normally miscible with said hydrocarbon fluid, said liquid being selected from the group consisting of a monohydric alcohol of from 1 to 16 carbon atoms; a dihydric alcohol of from 7 to 16 carbon atoms, an ester of a mono or polyhydric alcohol of from 1 to 16 carbon atoms and an acid of from 6 to 30 carbon atoms; and a polyoxyalkylene dialkylether; and, dispersed therein,
(ii) a stable discontinuous phase predominantly comprising fine particles of a high molecular weight polymer which is ultimately miscible with said hydrocarbon fluid, said high molecular weight polymer being a polyhydrocarbon having an average molecular weight of at least 500,000, the amount of said composition being selected to provide from 10 ppm to 1500 ppm of high molecular weight polymer based on said hydrocarbon fluid; and
B. transmitting the resulting mixture through a pipeline at a velocity sufficient to establish turbulent flow conditions.

5. A process for transmitting a hydrocarbon fluid through a pipeline at a reduced fluid flow friction loss, which comprises:
A. intermixing with said fluid a composition comprising:
(i) a continuous phase of a liquid which is different from, but miscible with, said hydrocarbon fluid, said liquid being a hydrocarbon oil of average molecular weight of less than about 2,000, and, dispersed therein,
(ii) a stable discontinuous phase predominantly comprising fine particles of a polydiorganosiloxane having an average molecular weight of at least 500,000, the amount of composition being selected to provide from 10 ppm to 1500 ppm of said polydiorganosiloxane based on said hydrocarbon fluid; and
B. transmitting the resulting mixture through a pipeline at a velocity sufficient to establish turbulent flow conditions.

4,190,070

METHOD AND APPARATUS FOR CONTROLLING FLOW OF LIQUID IN GRAVITY FLOW CONDUITS

William J. Bauer, 422 S. Park Rd., LaGrange, Ill. 60525

Filed Dec. 5, 1977, Ser. No. 857,400
Int. Cl.² F17D *3/00;* F16K *31/22*
U.S. Cl. 137—15 **28 Claims**



1. A process for conducting liquid from a first elevation to a lower elevation through a closed gravity flow conduit comprising:
flowing the liquid from a reservoir at the first elevation past a valve assembly in said reservoir, and into and downward in a closed conduit by gravity, producing by such downward flow in said conduit, at least a partial vacuum subjacent said reservoir;
adjusting said valve assembly in response to the level of liquid in said reservoir to control the flow of liquid from said reservoir into said conduit and to maintain a pool of liquid in said reservoir, thereby precluding entry of air into the upper portion of said conduit; and
applying a continuously variable, upward force on said valve assembly to compensate the downward force thereon due to the vacuum therebeneath in said conduit, said upward force being applied automatically in response to the vacuum in said conduit subjacent said reservoir.

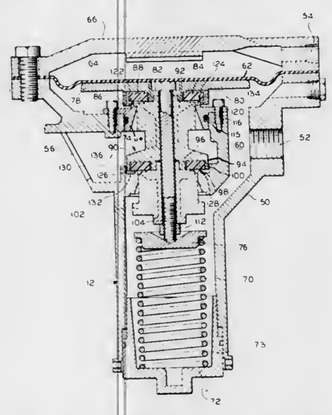
4,190,071

BACKFLOW PREVENTION DEVICES

Robert H. Dean, Evanston, and Oliver Q. Dyer, Hoffman Estates, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,785
Int. Cl.² F16K *31/12*
U.S. Cl. 137—115 **16 Claims**

1. A backflow prevention device comprising first and second shut-off valves, first and second spring operated check valves and a differential pressure relief valve, said first shut-off valve being connected on its upstream end to an inlet pipe and on its downstream end to said first check valve, said first check valve being connected on its downstream end to said second check valve, said second check valve being connected on its downstream end to said second shut-off valve and said second shut-off valve being connected on its downstream end to an outlet pipe, said relief valve being communicatingly interconnected between the upstream end of said first check valve and said downstream end of said first check valve to provide pressure relief on the downstream end of said first check valve when a backflow condition occurs in said device, said differential pressure relief valve comprising a valve body having an inlet communicatingly connected to said downstream end of said first check valve, an outlet port and first and second valve seat areas, a diaphragm mounted in said body and a moveable valve assembly also mounted internally of said body for movement in an axial direction thereof and in position to be operatively engaged by said diaphragm, said moveable valve assembly including:
(a) a retaining member having one surface operatively engageable with said diaphragm and having concentric first radially inner and first radially outer annular collars on its opposed surface with a first annular channel being formed between said first and second collars;



(b) a first sealing ring positioned in said first channel, said first sealing ring having a first portion and a movable portion;
(c) a first guide member having one surface abutting said first portion of said first sealing ring for retaining said ring in said first channel and having concentric second radially inner and second radially outer annular collars on its opposed surface with a second annular channel being formed between said inner and outer collars;
(d) a second sealing ring positioned in said second channel;
(e) a second guide member having a surface abutting said second sealing ring for retaining said ring in said second channel; and
(f) means for fastening the assembly together for cooperative piston motion including a central shaft engagingly fitted through central apertures in said retaining member and said first and second guide member;
said valve body further including first and second annular seat flanges positioned in said first and second valve seat areas, respectively, for engagement with and disengagement from said first and second sealing rings to control fluid flow from said inlet port to said outlet port through said first and second valve seat areas, said moveable assembly being biased by a spring in said valve body to a normally open position wherein said first sealing ring is axially spaced from said first valve seat flange and said second sealing ring is axially spaced from said second valve seat flange, means for introducing differential pressure from said upstream and downstream ends of said first check valve into said valve body on opposing sides of said diaphragm whereby said diaphragm causes said moveable assembly to move into a closed position when said differential pressure is above a first predetermined level wherein said first valve seat flange sealingly abuts said first sealing ring and said second valve seat flange sealingly abuts said second sealing ring, and whereby said diaphragm causes said movable assembly to move into an opened position when said pressure differential is below a second predetermined level, said second valve seat area opening prior to said first valve seat area opening under certain pressure conditions, a projecting annulus included in said valve body, said projecting annulus circumferentially surrounding the outer periphery of said second radially outer collar of said first guide member in close concentric proximity thereto whereby a lift chamber is formed in the second valve seat area which provides an added force on the moveable assembly to cause accelerated opening of the valve to its fully open condition once it has partially opened.

4,190,072

UNDERWATER STORAGE ASSEMBLY

Ramon J. Fernandez, and John S. Kahl, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 718,981, Aug. 30, 1976, Pat. No. 4,141,377.
This application Oct. 12, 1978, Ser. No. 950,734
Int. Cl.² B65G *5/00*
U.S. Cl. 137—236 S **3 Claims**

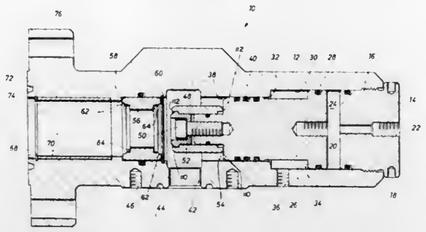
1. An underwater storage assembly comprising
at least one cylindrical storage tank,
a skid assembly for maintaining each tank in position so that a first end of the tank is positioned higher than a second end of the tank,
said skid including pile receiving means for engagement with piles for securing the skid assembly in place at the bottom of the sea,
each tank having
at least one rigid cylindrical wall defining an inner chamber,
a flexible membrane secured to the inside of said one cylindrical wall for dividing the inner chamber into a first and a second compartment,
a passage for allowing water to pass freely into and from said first compartment from the environment,
a filtering apparatus associated with each tank for preventing debris and sea organisms from entering the tank through the respective passage, and
at said first end, means for receiving fluids into and discharging fluids from said second compartment, said second compartment being capable of storing said fluids and said second compartment being fluid-tight, each receiving and discharging means including a feeder pipe extending substantially the entire length of the second compartment parallel to the axis of the tank and said feeder pipe being perforated at a plurality of locations along the portion of its length within the tank.

4,190,073

CHOKE FOR CONTROLLING THE FLOW OF DRILLING MUD

Jack R. Claycomb, 8103 Gnow - #101, Houston, Tex. 77040

Filed Sep. 27, 1976, Ser. No. 727,031
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—238 **9 Claims**



1. A choke for controlling the rate of flow of mud comprising:

a hollow housing;

a movable valve element in said housing;

an encircling valve seat in said housing;

contacting surfaces on said valve element and valve seat which include tapered throttling surfaces which, on separation, define a controllable throttling passage and which contact one another on closure wherein said throttling surfaces include:

(a) a tapered surface on said valve seat cooperative with a surface on said valve element, which, on closing movement of said valve element relative to said valve seat, defines a flow path between said valve element and said valve seat which is narrowed sufficiently to permit flow of mud while preventing entry of particles above a certain size in the mud;

(b) means for directing the flow from said tapered surface in a flushing manner across the surface of said valve element;

downstream transverse shoulders on both said valve element and valve seat which are parallel to one another and which facially close and contact against one another to close the flow through said housing, said shoulders being sheltered from fluid flow through said tapered surfaces by their respective locations on said valve element and valve seat, said shoulders being relatively spaced on said valve element and valve seat to close and contact after said tapered surfaces move to their narrowest spacing therebetween and wherein said tapered surfaces are concentric of one another and wherein one of said tapered surfaces connects immediately to said transverse shoulder.

4,190,074

PRESSURE EQUALIZATION VALVE AND TECHNIQUE FOR SHAFT FURNACE

Pierre H. Mailliet, Howald, and Michel Kirchen, Luxembourg, both of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg

Filed Jul. 8, 1977, Ser. No. 814,105
Claims priority, application Luxembourg, Jul. 13, 1976, 75372
Int. Cl.[2] F16K *43/00, 31/12*
U.S. Cl. 137—315 **12 Claims**

1. A pressure equalization valve comprising:

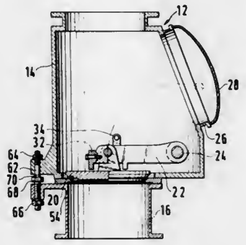
valve body means, said body means being adapted for connection between a pair of spacially displaced conduits, said body means defining a fluid flow path having an axis, said valve body means having end portions circumscribing said flow path, said body means being provided with a lateral opening at one side thereof;

removable cover means for said body means lateral opening;

a conduit section, said conduit section having an axis aligned with the fluid flow path axis of said valve body means, said conduit section having end portions circumscribing said flow path, said conduit section being displaced from said body means along said aligned axes;

valve seat means, said valve seat means being transversely movable with respect to said aligned axes and having a generally annular shape, said valve seat means being positioned between said body means and said conduit section and in contact with facing end portions thereof when in the installed state, said seat means defining a valve seat having an aperture axially aligned with said fluid flow path;

means for clamping said seat means between said body means and said conduit section facing end portions, said clamping means interconnecting said valve body means and said conduit section, said seat means being removable from said valve in a direction transverse to said fluid flow path axis upon loosening of said clamp means without interruption of the connection between and the axial alignment of said body means and said conduit section, said clamp means when in the tightened condition causing establishment of a hermetic seal between each of said body means and said conduit section and said seat means, said



clamp means further including means for urging said body means and conduit section apart in the axial direction upon the loosening of said clamp means;

a rotatable control shaft, said control shaft passing through said body means;

means for imparting rotary motion to said control shaft;

a valve member disposed within said body means, said valve member having a sealing surface which cooperates with the seat defined by said seat means to perform a valving function;

pivot arm means, said pivot arm means being connected adjacent a first end thereof to said rotatable control shaft; and

means coupling said valve member to said pivot arm means adjacent the second end thereof whereby rotation of the control shaft will result in said valve member moving between a closed position wherein said sealing surface is in contact with said valve seat and an open position wherein said valve member is disposed adjacent to said body means lateral opening, said coupling means permitting articulation of said valve member with respect to the second end of said pivot arm means.

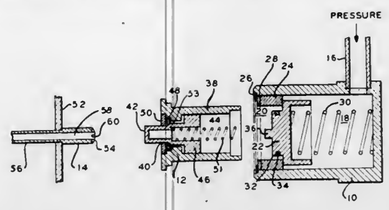
4,190,075

DOUBLE VALVE CONSTRUCTION

John P. Kayser, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Sep. 26, 1977, Ser. No. 836,864
Int. Cl.[2] F16K *15/18*
U.S. Cl. 137—329.1 **5 Claims**

1. A double valve construction comprising a secondary housing including an inlet adapted to be connected to a source of gas or vacuum, said secondary housing having a secondary valve including means biasing said secondary valve toward its closed position, said secondary valve having a movable valve element and a valve seat on said secondary housing, a primary housing having one end thereof adapted to be operably inserted into said secondary housing to axially move said secondary valve against said biasing means, said one end of said primary housing including seal means preventing said secondary valve from opening by the insertion of said primary housing into said secondary housing, a dust cap valve means including bias means biasing said dust cap valve means towards its closed



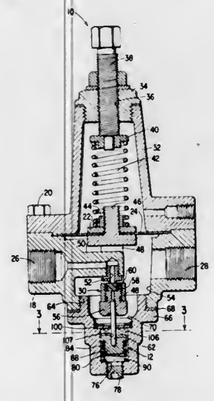
position, said dust cap valve means normally closing the outlet on the other end of said primary housing, a primary valve formed between said one end of said primary housing and said secondary valve when said primary housing is interfitted into said secondary housing, said dust cap valve means adapted to receive an adapter means to first open said dust cap valve means a predetermined linear distance to then open said primary valve to permit communication of gas or vacuum between said primary and secondary housings and said outlet.

4,190,076

DAMPING VALVE FOR PRESSURE REGULATOR

Albert R. Cameron, Huntingdon Beach, and Donald R. Gneiding, Fullerton, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 890,003
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—505.45 **2 Claims**



1. A pressure regulator operative responsive to inlet pressure and outlet pressure comprising:

a. a housing having an inlet, an outlet, a transverse wall separating the inlet and the outlet, and an outlet chamber formed on the outlet side of the transverse wall,

b. a valve diaphragm disposed on the outlet side of the transverse wall and having one side thereof in communication with the outlet chamber,

c. an inlet orifice formed in the transverse wall to communicate the inlet with the outlet,

d. a valve connected to be actuated by the valve diaphragm and to be shifted toward or away from the inlet orifice responsive to the pressure in the outlet chamber,

e. a damping chamber formed in the housing below the valve, said damping chamber having a circular cross section,

f. hydraulic liquid filling the damping chamber,

g. a flexible seal, having a central aperture, to separate the outlet chamber from the damping chamber,

h. a piston, having a head, slidingly received in the damping chamber, said head of the piston being circular and of substantially equal diameter to the cross section of the damping chamber, a lower portion being formed on the piston below the head and of reduced diameter, and a spring is received about the lower portion and to engage the bottom of the chamber to normally urge the piston upwardly in the direction of the seal.

i. a plurality of flats formed on the head in circumferentially spaced relationship to each other to provide passages for the hydraulic liquid to pass from one side of the piston to the other whenever the piston is moved,

j. a connecting rod sealingly passing through the flexible seal, and having one end located in the valve and the other end affixed to the piston, and

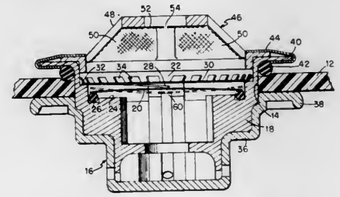
k. said housing having a portion opposite the inlet orifice which is counterbored to define a large upper bore and a small lower bore, with the lower bore forming said damping chamber, the flexible seal being circular and fitted within the upper bore, and a retaining ring clamps the flexible seal to the bottom of the upper bore to enclose the top of the damping chamber.

4,190,077

MICROWAVE APPLIANCE VALVE

Robert F. Bowen, Burlington, and Philip A. Knight, Jr., Concord, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 813,034, Jul. 5, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,352
Int. Cl.[2] G05D *23/02*; A47J *31/00*
U.S. Cl. 137—550 **6 Claims**



1. A valve assembly for use in a microwave environment comprising a valve housing having a circumferential portion shaped to fit within an opening in the bottom of a microwave-transparent liquid-containing reservoir and having a vertical passage therethrough with an inlet portion at its upper end and an outlet portion at its lower end whereby liquid in the reservoir may flow downwardly through the passage, a bimetal valve member positioned in said passage and movable into and out of normally closed relation to the passage to control the flow of liquid downwardly therethrough, said inlet portion of the passage being open above the valve member to permit microwaves to contact liquid therein, and a filter mounted on the housing over said inlet portion of the passage, said filter being a screen of microwave-transparent material having a central portion overlying the valve member and bowed upwardly away from the valve member whereby air bubbles in the liquid within the passage between the valve member and filter may rise away from the vicinity of the valve member.

4,190,078

APPARATUS FOR CONVERTING OF SPIN FLOW ENERGY INTO PRESSURE ENERGY

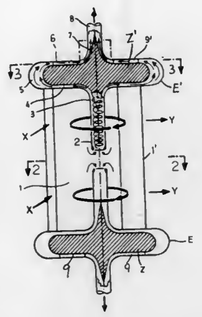
Ernst-August Bielefeldt, Hollenstedt, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,382

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625422

Int. Cl.² F15D *1/04*

U.S. Cl. 137—561 R **11 Claims**



1. An apparatus for recovering spin flow energy wherein a spin flow is converted into a parallel flow, comprising conduit means having inlet port means for said spin flow and outlet port means for said parallel flow, chamber means located in said conduit means intermediate said inlet port means and said outlet port means and having a configuration of rotational symmetry, a central member also having a shape of rotational symmetry operatively supported in said chamber means, said central member and said chamber means being dimensioned and shaped relative to each other so as to include the following flow passage components therebetween, a first flow passage component providing a smooth transition from an axial flow direction into a substantially radially outward flow direction, a second flow passage component operatively connected to said first flow passage component and constituting a plate diffuser, a third flow passage component operatively connected to said second flow passage component and constituting an annular deflection zone, a fourth flow passage component operatively connected to said third flow passage component and forming a guide zone to cause a substantially inward flow direction, and a fifth flow passage component operatively connected to said fourth flow passage component and constituting a smooth transition from said inward flow direction into an axial flow direction toward said outlet port means whereby said flow passage components are arranged in the recited sequence as viewed in the flow direction from said inlet port means to said outlet port means.

4,190,079

HIGH SURFACE AREA PERMEABLE MATERIAL

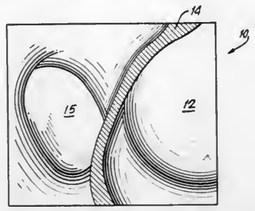
Eugene W. White; William M. Hanusiak, both of State College, Pa., and Rodney A. White, Torrance, Calif., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 713,258, Aug. 10, 1976, Pat. No. 4,075,092. This application Dec. 9, 1977, Ser. No. 859,135

Int. Cl.² B01D *3/00*

U.S. Cl. 137—561 R **2 Claims**

1. Apparatus comprising a chamber, a tubular integral, three-dimensional structure providing two separate interpenetrating, three-dimensional domains or channels, each of said domains or channels being a closed system of connected porosity or permeability with multiple interconnections only with respect to its respective domain or channel, each of said domains or channels being interpenetrating within said structure, said structure being fluid-tightly fixed at both ends within said chamber such that a closed annular space is provided between the exterior of said tubular structure positioned within said chamber and the interior of said chamber, first fluid inlet and outlet means associated with said chamber for the supply of



fluid to one of said channels or flowpaths in said tubular structure and to receive fluid exiting from said one flowpath and second fluid inlet and outlet means associated with said chamber for the supply of fluid to the other one of said channels or flowpaths in said tubular structure and to receive fluid exiting from said other flowpath.

4,190,080

ARTICULATED LOADING ARM CONTROL SYSTEM

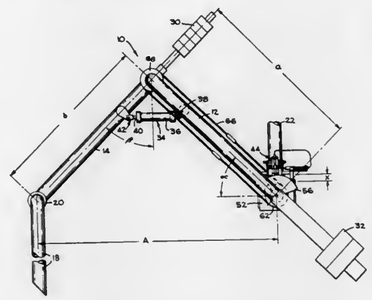
Eugene R. Le Devehat, Saligny, France, assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 17, 1978, Ser. No. 888,608

Claims priority, application France, Mar. 17, 1977, 77 08070

Int. Cl.² B65B *3/04;* **F15B** *9/00*

U.S. Cl. 137—615 **14 Claims**



1. An articulated loading arm for the transfer of fluid from a first site to a second site, comprising:

an inboard arm section pivotally connected to a supply conduit for receiving the fluid to be transferred from the first site;

an outboard arm section pivotally connected to said inboard arm section to receive fluid therefrom;

a drop pipe pivotally connected to the outboard arm section to deliver said fluid to the second site;

a hydraulic jack;

means for connecting said hydraulic jack between said outboard arm section and said inboard arm section to pivotally move said outboard arm section relative to said inboard arm section;

means for sensing the attitude of said inboard arm section, including control means and means for coupling said control means to said inboard arm section to facilitate response of said control means to said attitude of said inboard arm section;

means for sensing the attitude of said outboard arm section, including means for coupling said control means to said outboard arm section to facilitate response of said control means to said attitude of said outward arm section;

said control means providing hydraulic pressure to said hydraulic jack in response to a change in the attitude of said inboard arm section, said outboard arm section, or both of said arm sections to maintain said drop pipe in a predetermined azimuthal position relative to said supply conduit.

4,190,081

ELECTRO-HYDRAULIC SYSTEMS

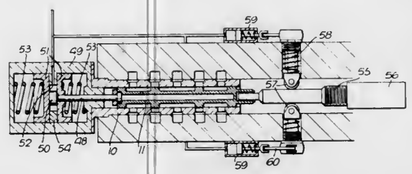
Ernest F. Coles, Welwyn Garden City, England, assignor to Hawker Siddeley Dynamics Engineering, Ltd., Hatfield, England

Filed Oct. 12, 1977, Ser. No. 841,442

Claims priority, application United Kingdom, Oct. 14, 1976, 42695/76

Int. Cl.² F15B *13/044*

U.S. Cl. 137—624.27 **3 Claims**



1. An electro-hydraulic servo valve assembly for regulating the amount or pressure of hydraulic fluid supplied to a hydraulically-operated machine system, comprising a ported valve sleeve, a progressively rectilinearly movable valve spool controlling ports in said valve sleeve, a rotary motive power unit, coupling means including a leadscrew and nut mechanism coupling the drive of the motive power unit to the valve spool, a valve spool position transducer supplying a feedback signal representative of the instantaneous position of the valve spool, electrical control means controlling the energization of the motive power unit in accordance with input command signals and the feedback signal, means for centering the valve spool in the absence of hydraulic pressure, and hydraulically-operated means locking the leadscrew against rotation when hydraulic pressure is present and unlocking to allow the leadscrew to rotate in the absence of hydraulic pressure to permit the valve spool to be centered.

4,190,082

ADJUSTABLE DISTRIBUTION VALVE

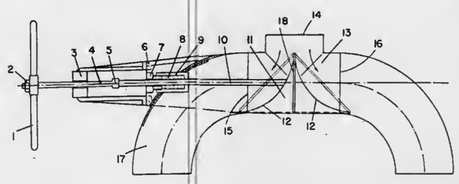
Mariano Hernández Crespo, Madrid, Spain, assignor to Empresa Nacional de Ingenieria y Tecnologia, S.A., Madrid, Spain

Filed May 16, 1978, Ser. No. 906,373

Claims priority, application Spain, May 20, 1977, 228.623[U]

Int. Cl.² F16K *11/07*

U.S. Cl. 137—625.17 **4 Claims**



1. An adjustable distribution valve having an inlet opening and two outlet openings and comprising a generally T-shaped body defining first, second and third branches, the first and second branches being axially aligned, being provided respectively by the horizontal limbs of the T, and defining the two outlet openings respectively and the third branch being provided by the vertical stem of the T and defining the inlet opening, and the valve further comprising a plug element fitted in the passage defined by the axially-aligned first and second branches and movable therewithin, and an actuating rod secured to the plug element and extending therefrom axially within the first branch and through the outlet opening defined thereby, said plug element being bounded by a cylindrical surface of diameter equal to the diameter of said passage, and two opposed concave surfaces which intersect said cylindrical surface at a point substantially halfway along the plug element and at opposite ends of the plug element at positions which are diametrically opposite said point with respect to said cylindrical surface, the plug being movable longitudinally within said passage by means of said actuating rod between a first position, in which said point confronts the inlet opening and the plug element distributes fluid received by way of said inlet opening to both outlet openings, a second position, in which the plug element blocks said first branch and directs fluid received by way of said inlet opening to the outlet opening defined by said second branch, and a third position, in which the plug element blocks said second branch and directs fluid received by way of said inlet opening to the outlet opening defined by said first branch.

4,190,083

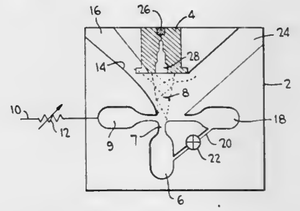
FLUIDIC LOGICAL PYROTECHNIC INITIATOR

Tadeusz M. Drzewiecki, Silver Spring, Md., and John M. Goto, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 7, 1977, Ser. No. 831,320

Int. Cl.² F15C *1/08*

U.S. Cl. 137—838 **8 Claims**



1. A fluidic relay device comprising:

output means for generating an output when impacted by a supersonic jet; and

a monostable fluid amplifier comprising a power nozzle for emitting a supersonic fluid jet, a first vent means having a flow attachment surface to which said supersonic jet attaches when said amplifier is in its stable mode, a control channel for emitting a control fluid to direct said supersonic jet to impact said output means, and a second vent means for venting said fluid jet away from said output means when the pressure of said control fluid exceeds a desired level.

4,190,084

FLOW CONTROL MEANS

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

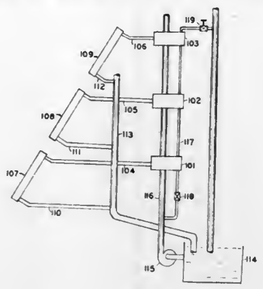
Filed Sep. 28, 1977, Ser. No. 837,548

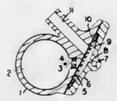
Int. Cl.² G05D *7/01*

U.S. Cl. 137—883 **1 Claim**

1. A fluid manifolding system comprising a main flow line, a plurality of branch flow lines, a flow control valve means connected to each branch point, and a control line operably connected to said control valve means, wherein said control valve means comprises in sequence a fixed constriction in the branch flow path and a flexible diaphragm responsive to the pressure in said control line, positioned for throttling the flow

in said branch flow path, and means for controlling the control line pressure in relation to the main flow line pressure,





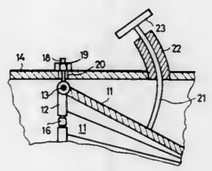
whereby the flow in each of said branch flow lines is maintained at a desired flow rate.

4,190,085

GAS FLOW REGULATING AND MEASURING APPARATUS

Juhani Hasa, and Arvi Tolmunen, both of Kausala, Finland, assignors to Halton Oy, Finland

Continuation-in-part of Ser. No. 766,795, Feb. 8, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,792
Claims priority, application Finland, Jun. 8, 1976, 761622
Int. Cl.[2] F16D *1/02*
U.S. Cl. 138—45 **14 Claims**



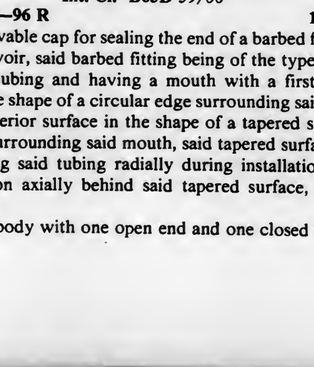
1. Apparatus for controlling the flow of a gas comprising: a collar member having a longitudinal axis and a pair of opposed end regions, said collar member being adapted to be sealingly connected to at least one duct member through which a gas flow stream passes so that said gas stream can flow through said collar member; means provided within said collar member between said end regions thereof for mounting a plurality of throttling blades therein; and a plurality of throttling blades, each of said throttling blades being defined by a substantially rectangular plate member having a pair of opposed long edge regions defining first and second side edge regions and a pair of opposed short edge regions, defining upstream and downstream edge regions, said plate member having a longitudinally warped transversely curved configuration, said throttling blades each being pivotally hinged to said mounting means so that said first side edge region of each throttling blade overlaps and resiliently engages the second side edge region of an adjacent throttling blade with a positive bearing force over the substantial length of said side edge regions resulting in a fluidly sealed engagement between adjacent blades, said blades defining the side surface of a truncated cone which is air tight due to said sealing engagement between the first and second side edge regions of adjacent throttling blades and whose axis coincides with said collar member axis, said blade upstream end regions defining the base of said truncated cone and said downstream end regions defining the apex of said truncated cone, and said mounting means supporting said blades for pivotal movement for adjusting the inclination of said blades and thus the size of said apex to control the size of an aperture defined by said downstream end regions of said blades through which a gas in said collar member is adapted to flow, so that by situating said blades at a predetermined inclination in said collar member the flow of air therethrough can then be regulated.

4,190,086

CONNECTOR DEVICE FOR THE QUICK COUPLING OF FLOATING HOSES

Giorgio Bormioli, Via Galileo Galilei 21, Padova, Italy

Filed Sep. 5, 1978, Ser. No. 939,345
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—89 **2 Claims**



1. A connector device for quickly coupling one end of a buoyant, flexible hose to one end of a pipe, comprising

a pair of buoyant housings having cooperating ends releasably attachable together to form a single floating body with a hydraulic seal between said cooperating ends,

one of said housings containing a first section of piping having one end secured to said one end of said hose,

the other of said housings having thereon a further section of piping closed at one end and releasably and sealingly attachable at its opposite end to the opposite end of said first section of piping to function as a cover therefor, and

means in said one housing and operable from the exterior thereof for releasably securing said opposite end of said first section of piping selectively to said opposite end of said further section of piping, or to said pipe when said housings are detached from each other.

4,190,087

BREATHER CAP

Stephen J. Herman, Evergreen, and Joel F. Giurtino, Littleton, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 26, 1978, Ser. No. 918,725
Int. Cl.[2] B65D *59/06*
U.S. Cl. 138—96 R **16 Claims**

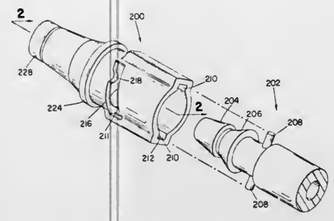
1. A removable cap for sealing the end of a barbed fitting for a fluid reservoir, said barbed fitting being of the type used for connecting tubing and having a mouth with a first exterior surface in the shape of a circular edge surrounding said mouth, a second exterior surface in the shape of a tapered surface of revolution surrounding said mouth, said tapered surface being for stretching said tubing radially during installation, and a raised portion axially behind said tapered surface, said cap comprising:

a tubular body with one open end and one closed end,

said tubular body adapted to slip loosely over the exterior of said tubular fitting,

a first interior surface of revolution in the interior of said tubular body said interior surface being tapered to bear against one of said exterior surfaces on said barbed fitting and thereby provide a fluid-tight annular seal between said interior and exterior surfaces,

first retaining means for preventing said cap from moving axially away from a venting position in which said cap fits loosely over said barbed fitting and said interior and exterior surfaces do not engage, whereby fluids can be vented from said reservoir,



helical means in the wall of said tubular body for cooperating with said raised portion of said barbed fitting, for moving said cap into a sealing position with said fitting wherein said interior and exterior surfaces are tightly engaged,

second retaining means for preventing said cap from rotating relative to said fitting while in said sealing position to thereby maintain tight engagement between said interior and exterior surfaces,

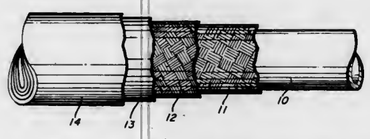
said first and second retaining means each being releasable and said helical means being reversible, for removing said cap from said fitting and for moving said cap back and forth between said sealing and venting positions.

4,190,088

CHAFE OR FIRE SLEEVE FOR HOSE

James M. Lalikos, Springfield; Chester T. Gazda, Chicopee, and Lawrence O'Melia, Easthampton, all of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Mar. 8, 1978, Ser. No. 884,612
Int. Cl.[2] F16L *11/10*
U.S. Cl. 138—126 **16 Claims**



1. A chafe or fire sleeve for an aircraft fuel hose comprising an internal tube with an outer sleeve integrally formed thereon, said sleeve having a pair of coaxial layers, an outer of said coaxial layers being the chafe or fire sleeve made from a mixture of urethane and silicone elastomers, said urethane and silicone in said outer layer being mixed, with their proportions being in the range of 80% to 20% urethane and 20% to 80% silicone, respectively, and an inner of said coaxial layers being silicone.

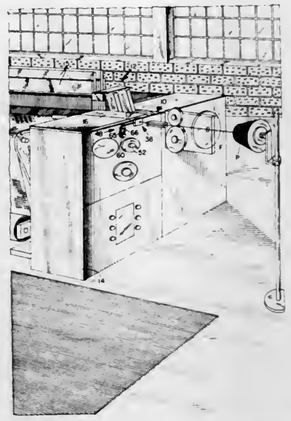
12. A hose comprising an inner tube structure covered by a chafe or fire sleeve coaxially formed thereon, said chafe or fire sleeve being a coaxial member comprising an outer layer of urethane and silicone elastomers mixed in the range of, respectively, 80%/20% to 20%/80%, and the inner member being a layer of silicone formed between said inner tube and said outer layer.

4,190,089

PROJECTILE LAUNCHING APPARATUS

Petras Cyvas, Worcester, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,642
Int. Cl.[2] D03D *47/36*
U.S. Cl. 139—437 **9 Claims**



1. In a pneumatic loom in which filling picks are inserted from an outside supply source by a pneumatically launched projectile, projectile launching and receiving apparatus comprising:

(a) a housing having an inner opening at one end, an outer opening at the opposite end, a projectile receiving bore extending axially from the inner opening, a pressure chamber connected to the bore for launching the projectile and an elongated passageway extending from the outer opening to the bore for guiding filling yarn from the outer opening to the projectile receiving bore,

(b) valve means including a valve element movable from an open position in which the element is clear of the passageway and a closed position in which the element is effective to seal the passageway at a point between the outer opening and pressure chamber, and

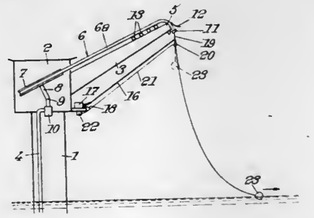
(c) control means for moving the valve element to the closed position during receiving and launching of the projectile.

4,190,090

EQUIPMENT SERVING TO CONNECT OIL-TANKERS TO MARINE TOWERS

Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Filed Oct. 12, 1977, Ser. No. 841,484
Claims priority, application France, Oct. 19, 1976, 76 31431
Int. Cl.[2] B63B *35/44*; B67D *5/04*
U.S. Cl. 141—387 **5 Claims**



1. Apparatus for connecting a petroleum-oil supply line mounted on a marine column to a received conduit mounted on an oil-tanker, comprising: a rotary head mounted on said column and rotatable about the axis thereof; a boom mounted

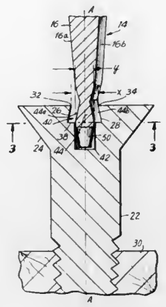
on said head and extending radially therefrom; a hose-pipe connected at its upstream end to said oil-supply line of said column; a connector member provided at the downstream end of said hose-pipe adapted to be coupled to said receiver conduit on said oil tanker; a mooring hawser connected at one end to storage means provided on said head and adapted to be connected at its other end to said oil-tanker to be loaded; and a hose-pipe storage pulley rotatably mounted on said head for receiving and storing a predetermined length of said hose-pipe, said hose-pipe being in its stored condition wound around said pulley and supported by said boom with only substantially said connector member extending from the free end of said boom, said boom including low friction hose-pipe guide means for guiding and supporting said hose-pipe, said pulley having a single circumferential hose receiving groove the width of which corresponds substantially to the diameter of said hose-pipe, and said pulley having a diameter adapted for storing in said single circumferential groove a length of said hose-pipe corresponding to the length of the hose-pipe in its working condition between said free end of said boom and the inlet of said receiver conduit.

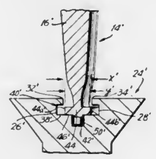
4,190,091

SCREW, SCREWDRIVER AND SCREW-HOLDING ATTACHMENT THEREFOR

Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010, assignor to Sebastian Zuppichin, Cliffside Park and Aldo Colognori, Cliffside, both of, N.J.

Filed Sep. 26, 1978, Ser. No. 945,811
Int. Cl.[2] B25B *15/00, 23/10*
U.S. Cl. 145—52 **3 Claims**





1. A screw-holding screwdriver, comprising:

(a) an elongated driver shank having a longitudinal axis, a handle end region, and an opposite blade end region,

(b) a driver blade of one-piece with the blade end region of the shank;

(c) means for holding a screw to be turned by the driver blade, said holding means including

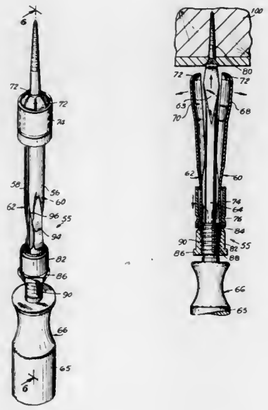
(1) a pair of movable elongated resilient arms at opposite sides of the driver shank, said arms being separated by two slots which extend lengthwise along the arms, each arm including

(A) a screw-gripping end portion having a plurality of curved fingers which extend in smooth, continuous arcuate manner, both longitudinally away from the handle end region and radially inwardly towards the longitudinal axis to thereby form a generally semi-dome-shaped configuration, said fingers of both arms terminating at tips which define a circular periphery which surrounds the stem of the screw to be turned, said fingers of both arms engaging substantially the entire underside of the head of the screw to be turned to thereby hold the screw in a positive locking manner, said fingers of both arms being successively separated by radially-extending slits all of which have generally the same cross-sectional area along their lengths,

(B) a semi-cylindrical body portion adjacent to each screw-gripping end portion, both of the semi-cylindrical portions extending circumferentially about the shank for partially enclosing the latter, each slot extending lengthwise along the semi-cylindrical body portions and having generally the same cross-sectional area along the lengths of the latter,

(C) a generally flattened body portion adjacent to each semi-cylindrical body portion, both flattened body portions being located at opposite sides of the shank and having arcuate side edge regions which extend radially inwardly towards the longitudinal axis such that each slot has an enlarged cross-sectional area in the region of the flattened body portions, and

(D) a semi-cylindrical collar end portion adjacent to each flattened body portion for partially enclosing the shank, and



(2) means for moving the resilient arms between a non-gripping position in which the arms are spaced apart of each other, and a gripping position in which the screw-gripping end portions form a dome-shaped configuration and substantially enclose the screw head of the screw to be turned,

said moving means constituting a cylindrical locking sleeve slidably mounted over the resilient arms for movement lengthwise of the latter, said locking sleeve having an interior passage formed with a leading axial end, a trailing axial end and an annular cam-type projection intermediate said axial ends of the passage, said projection being an annular ridge which extends radially inwardly from the inner circumferential wall of the passage, said ridge being in sliding frictional engagement with the body and end portions of the arms; and

(d) means for finely and continuously adjusting the position of the holding means in longitudinal direction relative to the shank, said fine-adjusting means including

(1) a mounting collar surrounding the arms and being fixedly connected to the collar end region of the arms for longitudinal movement with the same, said collar having a longitudinally-extending internally threaded collar portion adjacent to the handle end region, and a polygonally-shaped flange portion to facilitate manual gripping, and

(2) a longitudinally-extending mating externally threaded shank portion of one-piece with the shank in the near vicinity of the handle end region for turning movement with the shank, said mating shank portion being in constant threaded engagement with the threaded collar portion during the entire turning movement of the driver shank for shifting the shank relative to the holding means with infinitely variable displacement.

4,190,092

WHEEL RIM

James L. Evans, Ypsilanti, and John A. Main, Plymouth, both of Mich., assignors to Kelsey-Hayes Co., Romulus, Mich.

Continuation-in-part of Ser. No. 673,736, Apr. 5, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,048
Int. Cl.[2] B60C *5/00;* **B60B** *21/00*
U.S. Cl. 152—381.1 **5 Claims**



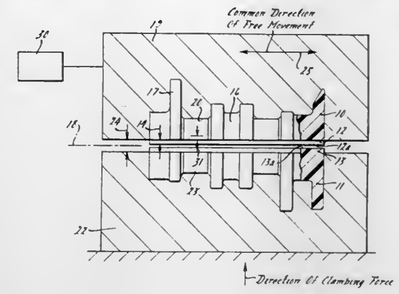
1. In an automotive wheel suitable for mounting a pneumatic tire thereon having an annular rim portion with a pair of axially spaced radially outward extending annular flanges, an annular well portion intermediate said flanges and an annular imperforate bead seat portion adjacent each flange and axially spaced from said well portion, each bead seat portion having a radially outer annular surface for seating the base of each bead portion of said pneumatic tire, the improvement comprising at least one circumferentially continuous radially outward projecting protuberance rising from each annular bead seat surface such that the cross-sectional thickness of said bead set is not diminished, each protuberance comprising a radially outward projecting side, said side having at least a portion thereof normal to the wheel axial centerline and forming a base angle with the annular bead seat surface, a descending surface extending from said radially projecting side sloped radially inward and axially toward said annular well, said descending surface terminating at the intersection of said surface and the annular bead seat surface, said descending surface permitting movement of the tire bead axially thereover away from the wheel well upon inflation of said tire whereby the tire bead portion becomes locked between said radially outward extending flanges and said radially outward projecting side of said protuberance by compression of the bead elastomer therebetween.

4,190,093

VIBRATION WELDING OF EXPANDED BEAD POLYSTYRENE

Dolores C. Kearney, Inkster, and Bruno Matz, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1978, Ser. No. 957,376
Int. Cl.[2] B22C *9/04, 7/02*
U.S. Cl. 164—34 **13 Claims**



1. A method of making a composite consumable pattern for use in the cavityless type of metal casting, comprising:

(a) forming at least two mateable pattern parts, each having at least one mating plane defined by a flat surface except for predetermined melt-down projections on said surfaces, said parts being constituted entirely of a low density expanded closed-cell polymeric material having a density of 3 lbs./ft^3 or less which upon contact with molten metal is ignited and consumed,

(b) bringing said parts together into contact with said mating surfaces parallel and juxtaposed, while urging said contact with a force of 5–10 psi,

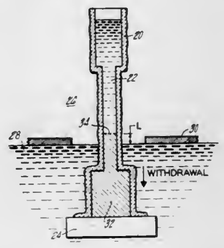
(c) while in said forced contacting relationship, relatively vibrating said parts to promote friction at at least one of the melt-down projections and surfaces thereby promoting a friction weld upon resolidification of the melt-down material, said relative vibration being carried out for a period of time no greater than 2 seconds, with a vibration amplitude of 0.03–0.10" and a frequency of 120–240 cycles/second.

4,190,094

RATE CONTROLLED DIRECTIONAL SOLIDIFICATION METHOD

Anthony F. Giamei, Middletown, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1978, Ser. No. 954,386
Int. Cl.[2] B22D *27/04, 25/00*
U.S. Cl. 164—60 **17 Claims**



1. In the withdrawal method of directional solidification of a metal casting which is characterized by differing perimeter to area ratios along its length,

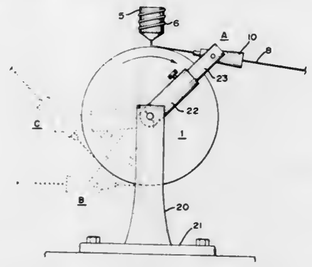
a. maintaining a hot zone at a temperature above the liquidus temperature of the metal of the casting;
b. maintaining a cold zone at a temperature below the solidus temperature of the metal of the casting;
c. withdrawing the casting progressively from the hot zone to the cold zone to effect movement of a nominal solidification interface, which is located between the liquidus isotherm and the solidus isotherm, at a rate which directionally solidifies at least a substantial portion of the casting;
d. effecting movement of the solidification interface through another portion of the casting by withdrawing the casting progressively from the hot zone to the cold zone, at a rate different from that in (c), and;
e. controllably transitioning between the different withdrawal rates according to a closely followed predetermined relationship between rate and time which represents at least one smooth function of withdrawal rate with time, as compared to a step function.

4,190,095

CHILL ROLL CASTING OF CONTINUOUS FILAMENT

John R. Bedell, Sparta, N.J., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Oct. 28, 1976, Ser. No. 736,690
Int. Cl.² B22D *11/06*
U.S. Cl. 164—87 **4 Claims**



1. The improvement in the process of making metal filament by depositing molten metal onto the peripheral surface of a rotating annular chill roll and separating the solid filament from the chill roll, which comprises:
(a) capturing the filament in its normal trajectory from the point at which the filament is separated from the chill roll by action of centrifugal force and, by means of an aspirator, applying tension to the filament in a first direction tangential to the chill roll away from the point at which the filament is separated from the chill roll by centrifugal force; and
(b) maintaining tension on the filament by means of said aspirator while changing the direction of the applied tension to a second direction tangential to the chill roll past the point at which the filament is separated fro the chill roll by centrifugal force, to thereby maintain the filament on the chill roll to prolong contract between the filament and the chill roll, and collecting the filament.

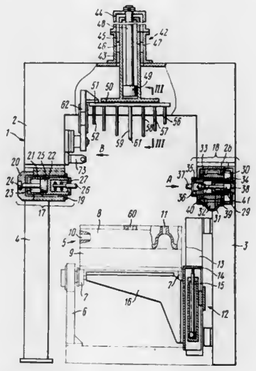
4,190,096

MANIPULATOR FOR SEPARATING COATED PERMANENT MOULDS

Anatoly D. Teplinsky, ulitsa Generala Petrova, 27, korpus 1, kv. 73; Yakov M. Ryvkis, ulitsa Garibaldi, 14, kv. 26; Rostislav L. Snezhnoi, ulitsa B. Khmelnitskogo, 36, kv. 12, and Leonid Y. Netes, ulitsa Akademika Filatova, 82/2, kv. 101, all of Odessa, U.S.S.R.

Filed Apr. 17, 1978, Ser. No. 897,539
Int. Cl.² B22D *29/04, 33/02*
U.S. Cl. 164—158 **8 Claims**

1. A manipulator for use in effecting separation of split coated permanent metal moulds having two parts formed with air injection holes and a parting plane disposed horizontally when in a position for separation, comprising,
a frame;
a hoisting mechanism operable to deliver and place said coated permanent moulds in position for separation mounted on said frames and having:
a guiding plate rigidly fixed on said frame,
a carriage mounted on said guiding plate,
supports adapted to carry said permanent mould being rigidly fixed on said carriage,
a power cylinder rigidly connected with said guiding plate and geared to said carriage for transmitting up and down linear movement to the latter;
two clamping devices mounted on said frame adapted to grip the top part of said mould when in position for separation;
one of said clamping devices being a housing rigidly fixed on said frame,
a power cylinder incorporating a case mounted in said housing for axial movement therealong,
a rod fixed in said housing,
a piston rigidly fixed to said rod,
a bar mounted on the end of said case to move therewith in the course of clamping and releasing of said mould part;
the other clamping device being a housing rigidly fixed on said frame,
a power cylinder incorporating a case rigidly fixed in said housing,



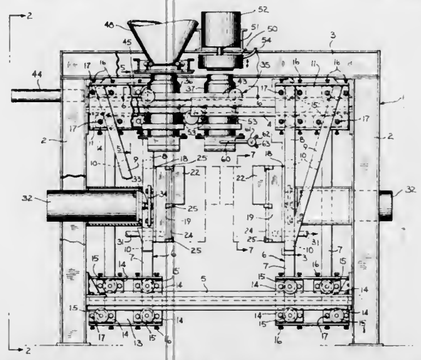
a rod movably mounted with respect to said case,
a piston rigidly fixed to said rod,
a tail spindle kinematically linked with said rod and effecting translatory motion therewith,
a cross-bar fixedly attached to said tail spindle,
at least two bars rigidly fixed on said cross-bar and effecting translatory motion therewith in the course of clamping and releasing said mould part;
a turnover device mounted on said second-mentioned clamping device for handling the mould top part being defined by,
an actuator,
a gear rack mounted in the housing of said second-mentioned clamping device and geared to said actuator operable to transmit translatory motion thereto relative to said housing,
a gear wheel mounted in said housing being brought into engagement with said rack and operable to transmit rotational motion to said gear wheel, said wheel being kinematically linked through a slot connection with said tail spindle and rotating therewith;
a broaching mechanism fixed on said frame above said clamping devices, being operable to push out during separation of the finished casting from said top part of the mould into the bottom part thereof, and concurrently cleaning the air injection holes in said top part of the mould of the used coating.

4,190,097

APPARATUS FOR MAKING FOUNDRY CORES

John J. Allread, Hartland; Thomas A. McManamy, Reedsburg, and Bruno E. Peter, Brookfield, all of Wis., assignors to Grede Foundries Inc., Milwaukee, Wis.

Filed Nov. 23, 1977, Ser. No. 854,420
Int. Cl.² B22C *15/24*
U.S. Cl. 164—343 **4 Claims**



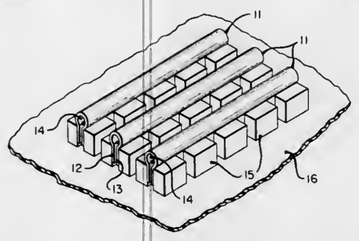
1. An apparatus for producing foundry cores, comprising a frame, a plurality of generally parallel guide rails mounted on the frame, a pair of carriages, a plurality of rollers on each carriage, said rollers mounted for movement on said guide rails, a core box section mounted on each carriage, said guide rails include a pair of upper guide rails located at the front and rear of the apparatus respectively, and a single lower guide rail disposed at the rear of the apparatus, power means connected to each carriage to move the carriages in a direction toward and away from each other, moving said carriages toward each other bringing said core box sections into mating relation to form a core box, means for introducing sand coated with an uncured resin capable of being cured by a catalyst gas into said core box, and means for passing a cayalyst gas through said sand to cure the resin and provide the core.

4,190,098

MULTIPLE COMPONENT CIRCUIT BOARD COOLING DEVICE

Alfred G. Hanlon, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 16, 1978, Ser. No. 878,501
Int. Cl.² H01L *23/40*
U.S. Cl. 165—1 **5 Claims**



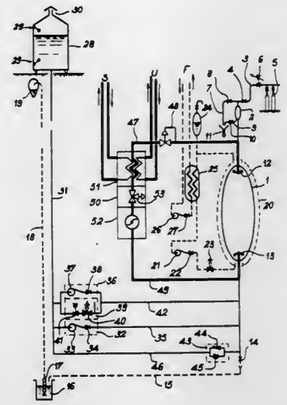
1. A method of cooling a multiplicity of solid state components mounted in parallel rows upon a printed circuit board, comprising:
insertion of a heat exchange means between adjacent pairs of said parallel rows of said solid state components; and
conduction of radiated heat away from said adjacent pairs of said parallel rows of said solid state components.

4,190,099

HEAT TRANSFER SYSTEM FOR THE UTILIZATION OF CAVITIES DUG IN THE SUBSOIL AS HEAT SILOS

Jacques Despois, Viroflay, and Francis Nougarede, La Celle Saint Cloud, both of France, assignors to Commissariat a l'Energie Atomique, Paris and Societe Nationale elf Aquitaine, Courbevoie, both of, France

Filed Feb. 13, 1978, Ser. No. 877,587
Claims priority, application France, Feb. 18, 1977, 77 04657
Int. Cl.² F28D *15/00*
U.S. Cl. 165—45 **35 Claims**



1. A heat transfer system for the utilization of cavities dug in the subsoil as heat silos by circulating a heat-transporting liquid on the one hand for the introduction of heat into one or a number of cavities which have been dug in the subsoil and the available internal capacity of which is normally filled with said heat-transporting liquid during the utilization stages and on the other hand for the extraction of heat from said cavity or cavities, wherein said system comprises in combination:
a circulation and heat exchange circuit comprising suitable pumping means, heat exchange means and flow regulation means which make it possible at the time of heat storage to carry out extraction of the heat-transporting liquid at low temperature at the lower end of the cavity or cavities, heating of said liquid by heat exchange with an external fluid and reinjection of said liquid at the upper end of the cavity or cavities and, at the time of heat recovery, to carry out extraction of the heat-transporting liquid at high temperature at the upper end of the cavity or cavities, cooling by heat exchange with an external fluid and reinjection of said liquid at the lower end of the cavity or cavities, said circulation and heat exchange circuit including at least one pipe line leading to the top of the cavity or cavities having at least one flow-arresting valve therein constituted by a normally-closed valve caused to open by the pressure within the cavity or cavities or constituted by any other equivalent device for isolating the top of the cavity or cavities from the remainder of the system if the internal pressure at the top of the cavity or cavities becomes lower than a minimum operating pressure which is in turn slightly higher than the vapor pressure of the heat-transporting liquid at the maximum storage temperature and appreciably lower than the reference pressure aforesaid;
at the top portion of the cavity, a purge device comprising a small auxiliary chamber containing a predetermined quantity of air or of gas;
within the interior of the cavity or each cavity, two equipment units for injection and recovery of the heat-transporting liquid, one unit being located in the top portion of the cavity and the other unit being located in the bottom portion of said cavity;

expansion means comprising at least one expansion reservoir at atmospheric pressure which is put into communication with the base of the cavity or each cavity by means of a system of pipe lines for transferring the heat-transporting liquid having pressurization and pressure relief means;

a safety unit comprising a filling check-valve or any like device for allowing the heat-transporting liquid to pass freely from the expansion means to the cavity or each cavity while completely preventing flow in the opposite direction.

4,190,100

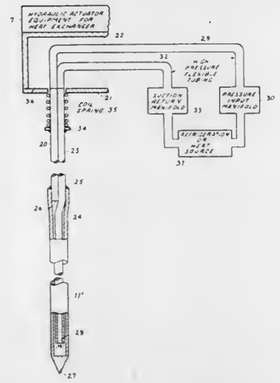
INTERNAL HEAT EXCHANGER FOR MEAT

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,711

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 R **24 Claims**



1. (Amended) An internal heat exchanger for meat comprising: [at least one] *a plurality of* recirculating needles *disposed in a predetermined pattern, each of said plurality of needles* including an outer tube having one end thereof terminated in a closed needle point [;] , and an inner tube disposed within said outer tube having one open end thereof spaced from said needle point and providing a predetermined clearance along its length between the outer wall of said inner tube and the inner wall of said outer tube; *an input manifold common to said predetermined clearance of each of said plurality of needles to supply a pressurized heat transferring medium to each of said plurality of needles; and a return manifold common to said inner tube of each of said plurality of needles to remove said heat transferring medium from each of said plurality of needles.*

4,190,101

HEAT EXCHANGER TUBE BASE

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Swakopmund AG, Diesbach, Switzerland

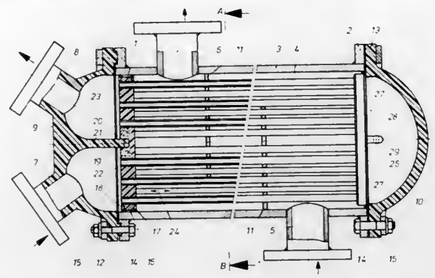
Filed Mar. 22, 1977, Ser. No. 780,067

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612514

Int. Cl.[2] F28F *9/02*

U.S. Cl. 165—82 **4 Claims**

1. An improved tube base (**1**, **2**) for a bundle-type heat exchanger and an inner wall of a casing (**3**) of the exchanger, for cooperation with a tube bundle (**4**) of the exchanger; the tube base consisting of a poly laurin lactam material that has an elastic return capacity up to about 80%, a unit of thermal expansion coefficient of 0.8 to 1.0×10^4 per degree Celsius at $-60°$ to $+30°$ C., and 1.0 to 1.9×10^4 per degree Celsius at $+30°$ to $+100°$ C., which unit is higher than that of the tubes in said bundle and of said casing; said bundle being entirely cast at least at one end into said material in a gapless manner; said material also acting as sealing means (**17**, **18**) between said tubes and the tube base, on the one hand, and the tube base and an inner wall of said casing, on the other hand; wherein a contour of a covering face of the tube base, which face is opposite said inner wall, is profiled to have a peripheral curved



portion (**16**) for the formation of at least one sealing edge (**17**, **18**) that forms part of said sealing means.

4,190,102

AIR COOLED CONDENSER INSTALLATION

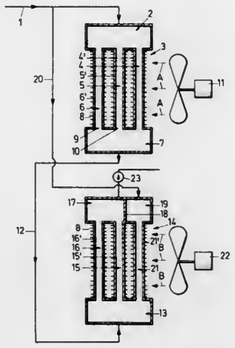
Hans-Bernd Gerz, Bochum, Fed. Rep. of Germany, assignor to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,660

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1978, 2800287

Int. Cl.[2] F28B *7/00*

U.S. Cl. 165—113 **8 Claims**



1. An air cooled condenser installation comprising first heat exchange means comprising a plurality of rows of substantially upright tubes adapted to be impinged by a stream of cooling air in a direction transverse to the longitudinal direction of the tubes, each of the tubes having an upper and a lower open end; an upper manifold communicating with the upper open ends of said tubes; a lower collecting chamber communicating with the lower open ends of said tubes; a steam conduit communicating with said upper manifold so that steam passing therethrough flows downwardly through said tubes to partly condense with the thus-formed condensate flowing likewise downwardly into said lower collecting chamber; second heat exchange means comprising a plurality of second rows of substantially upright tubes adapted to be impinged by a second stream of cooling air flowing transverse to the elongation of said second tubes, each of said tubes in said second rows having an upper and a lower open end; a lower distribution chamber communicating with the lower open ends of the tubes of said second rows; an upper distribution chamber communicating with the upper open ends of the tubes of said second rows; a connecting steam conduit connecting said lower collecting chamber of said first heat exchange means with said lower distribution chamber of said second heat exchange means so

that steam which has not been condensed in said first heat exchange means flows upwardly through said tubes of said second rows of tubes from said lower to said upper distribution chamber to thereby condense with the thus-formed condensate flowing in countercurrent direction to the steam; said second heat exchange means including further a plurality of additional substantially upright tubes having each an upper and a lower open end and being arranged in front of the tubes of said second rows to be first impinged by said second stream of cooling air, said additional tubes communicating at the lower ends thereof with said lower distribution chamber; and a branch conduit branching off from said steam conduit and communicating with the upper open ends of said additional tubes so that steam passing therethrough flows downwardly through said additional tubes and condenses with the thus-formed condensate flowing in the same direction as the steam.

4,190,103

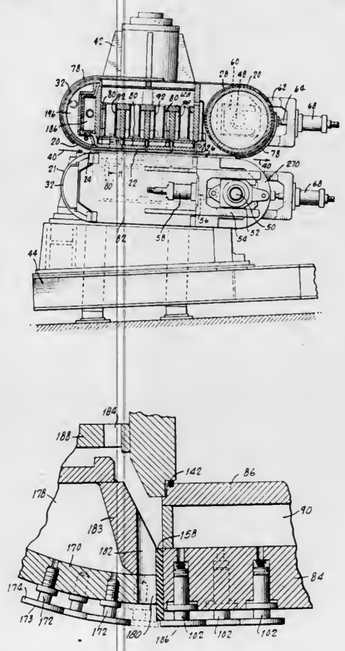
CONTINUOUS CASTING OF METAL STRIP BETWEEN MOVING BELTS

Olivo G. Sivilotti; David E. Steer, and Thomas A. C. Stock, all of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Division of Ser. No. 568,320, Apr. 15, 1975, Pat. No. 4,061,178. This application Sep. 20, 1977, Ser. No. 834,969

Int. Cl.[2] B22D *27/02*; F28F *25/06*

U.S. Cl. 165—120 **2 Claims**



1. An apparatus comprising, in combination with means providing a surface which moves in a desired path and which is to be cooled: a multiplicity of elements having closely spaced faces lying in and distributed throughout a non-traveling surface which substantially conforms with said path over a predetermined area and which is arranged so as to provide a slight spacing between said non-traveling and said moving surfaces, each of said elements having a central jet aperture through its face for directing liquid coolant against the moving surface, and means for supply of liquid coolant under pressure to the jet apertures and for withdrawal of liquid coolant from spaces between the element faces, said elements and said coolant supply and withdrawal means being constructed and arranged so that liquid coolant flows outward from each jet of the elements against and in covering relation to the moving surface, forming a coolant layer filling the slight spacing between the element faces and the moving surface, and is withdrawn through the said spaces between the element faces; said apparatus further including means for mounting each of said elements to be movable individually toward and away from the aforesaid predetermined path, and means loading each element toward said path, said loading means being resiliently yieldable so that each element can be individually moved in the direction away from said path upon displacement of the moving surface in said direction, exerting force through said coolant layer against the face of the element.

4,190,104

HEAT EXCHANGER HAVING HELICALLY WOUND TUBE COILS

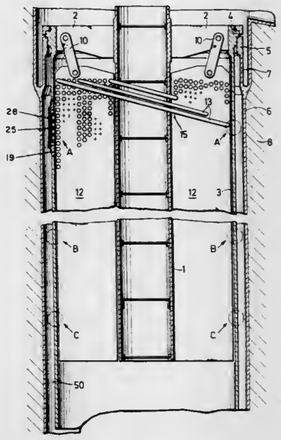
Arno Frei, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,195

Claims priority, application Switzerland, Nov. 17, 1976, 14442/76

Int. Cl.[2] F28D *7/02*; F22B *37/24*

U.S. Cl. 165—162 **14 Claims**



1. A heat exchanger comprising

a plurality of radially oriented and vertically disposed support plates;

a plurality of helically wound tube coils mounted in said support plates in concentric relation to each other;

a vertically disposed cylindrical jacket peripherally disposed about said support plates and said tubes;

at least one slot disposed in said jacket near each of said plates; and

at least one shoe mounted on each of said plates each of said shoes being guided in one of said slots, said slot having an axial length longer than the axial length of said shoe to permit axial movement of said support plates relative to said jacket.

4,190,105

HEAT EXCHANGE TUBE

Gerhard Dankowski, Rte. 2, Box 59A, Royse City, Tex. 75089

Continuation-in-part of Ser. No. 713,352, Aug. 11, 1976, Pat. No. 4,063,431. This application Sep. 9, 1977, Ser. No. 831,735

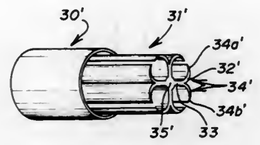
Int. Cl.[2] F28F *3/12*

U.S. Cl. 165—179 **6 Claims**

1. An insert for a heat exchange tube, comprising:

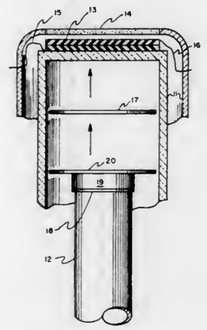
a plurality of fins depending from a common core, said fins

each having curved bifurcated ends remote from said core, said bifurcated ends of said fins being tapered and flexible to be curved in opposite directions upon insertion



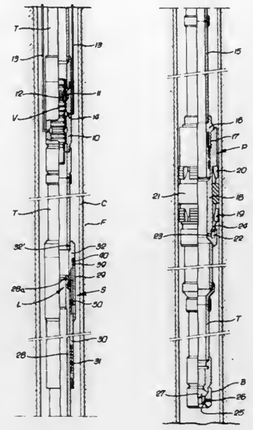
of the insert into the tube such that said ends are in heat exchange contact with the inside surface of the heat exchange tube.

4,190,106
OPTIMIZED COOLER DEWAR
Howard L. Dunmire, Woodbridge, and Stuart B. Horn, Fairfax, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 18, 1976, Ser. No. 668,109
Int. Cl.[2] F28F *13/00*; H01L *23/36*; F25B *19/00*
U.S. Cl. 165—185 **8 Claims**



1. A cryogenic coupling between a cold finger and a low temperature dewar comprising:
- a first planar, solid, highly malleable and highly heat conductive transition member pressed into the surface of said dewar;
- a second highly conductive, thin, rigid, metallic transition member conductively bonded to said cold finger;
- a third transition member comprising a continuous mat of highly heat conductive resilient interwoven fibers filling the major portion of the space between said first and second transition members, said fibers being sufficiently compressed to make firm contact with one another and being bonded to at least one of said transition members; and
- a fourth thin rigid highly conductive metallic interface member is conductively bonded to said third transition member between said first and third transition members.

4,190,107
WELL BORE APPARATUS WITH HYDRAULICALLY RELEASABLE TUBING SEAL UNIT
Jerome H. Oden, Houston; Roy E. Swanson, Jr., Sugar Land, and Ronald J. Vondall, Sulphur Springs, all of Tex., assignors to Baker International Corporation, Orange, Calif.
Filed Aug. 25, 1978, Ser. No. 936,851
Int. Cl.[2] E21B *23/04, 17/02*
U.S. Cl. 166—120 **7 Claims**

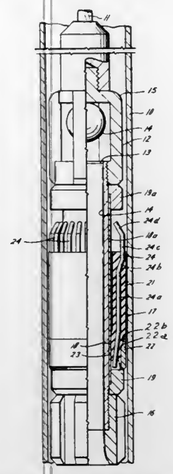


1. Well bore apparatus adapted to be installed in a well casing for conducting produced well fluid to the top of the well, comprising: a tubing string extending into the casing; packer means in said tubing string having normally retracted expansible casing engaging anchor means and resilient packing deformable into sealing engagement with the casing; and a releasable sealing connector in said tubing string above said packer means; said connector including a pair of telescopically interengaged inner and outer tubular sealing bodies; one of said bodies being connected with said packer means and the other of said bodies being connected with the upwardly extended tubing string; releasable latching means retaining said bodies in a telescopically contracted condition; and fluid pressure responsive release means operable to release said latching means enabling telescopic extension of said bodies; said packer means having setting means responsive to a first pressure of fluid in said tubing string for expanding said anchor means and deforming said packing; said release means having means responsive to a second pressure higher than said first pressure of fluid in said tubing string to release said latch means; and means for temporarily closing said tubing string below said packer means to allow increase of pressure in said tubing string from said first to said second pressures.

4,190,108
SWAB
Jack C. Webber, 1721 Blalock, Houston, Tex. 77055
Filed Jul. 19, 1978, Ser. No. 925,987
Int. Cl.[2] E21B *37/00*
U.S. Cl. 166—202 **21 Claims**

1. A swab cup comprising, a sleeve shaped body of resilient material with circumferentially spaced reinforcing wires, all of said wires spaced inwardly from the outer diameter of the body along a major portion of its length to permit the body to have fluid film lubrication with a tubing,

said wires at their upper sections having sled portions at the outer diameter of the cup for engaging the wall of a tubing and bridging couplings in the tubing, and

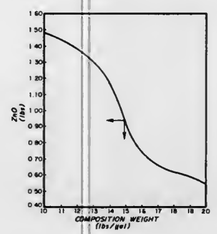


a restraining ring at the lower end of the cup limiting radial movement of the wires within the ring while permitting limited outward movement of the wires above the ring.

4,190,109
INTRODUCTION AND SELECTIVE REMOVAL OF DEBILITATING AGENT FOR PERMEABILITY CORRECTION
Hugh M. Barton, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 11, 1978, Ser. No. 950,752
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—270 **12 Claims**

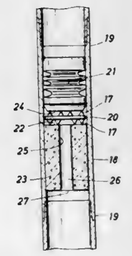
1. A process comprising:
(a) injecting into a subterranean formation having zones of varying permeability a composition which is a debilitating agent for a subsequent injected plug-forming composition;
(b) thereafter introducing a fluid flush material under conditions so as to selectively remove said debilitating agent from the more permeable zones of said formation; and
(c) thereafter introducing a said plug-forming composition which in the absence of said debilitating agent provides a fluid diversion composition.

4,190,110
METHOD OF CEMENTING WELLBORES USING HIGH TEMPERATURE CEMENT MUD SPACER
Robert M. Beirute, Fort Worth, Tex., assignor to The Western Company of North America, Ft. Worth, Tex.
Filed May 19, 1978, Ser. No. 907,568
Int. Cl.[2] E21B *33/16*
U.S. Cl. 166—291 **6 Claims**



1. A method for cementing wellbores which contain a drilling fluid comprising introducing an amount of a spacer composition into said wellbore prior to introduction of the cement composition, said spacer composition being present in an amount effective to prevent contact of said cement with said drilling fluid and said spacer composition comprising an aqueous suspension of attapulgite clay stabilized with an effective amount of zinc oxide and having a pH of at least about 7.

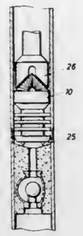
4,190,111
WELL CEMENTING/PLUG DRILLING APPARATUS AND IMPROVED CEMENTING AND DRILLING PROCESS
Carl A. Davis, P.O. Box 12326, Houston, Tex. 77017
Filed Sep. 11, 1978, Ser. No. 941,161
Int. Cl.[2] E21B *17/14, 33/16*
U.S. Cl. 166—291 **15 Claims**



8. A well pipe configuration comprising, moving up the pipe string:
(a) a well shoe or collar pipe attachment having a cement tube adapted to receive a pump down wipe plug;
(b) a cementing/plug drilling apparatus comprising a drillable rigid plate having a top face and a bottom face and having at least one drillable top protrusion upward from the top face and at least one drillable bottom protrusion protruding downward from the bottom face, said bottom protrusion in contact with the top of the cement tube, and
(c) a pump down wipe plug, the bottom of the plug in contact with the top protrusions of the apparatus of b).

11. In the process of cementing within a well and drilling through a pump down wipe plug comprising pumping a desired amount of wet cement into the cementing string, followed by a pump down wipe plug at the interface of the wet cement and the fluid used to force the cement to the desired level, forcing the cement and plug down the string until the plug contacts the cement tube of a well shoe or collar pipe attachment, allowing the cement to harden, then drilling out the plug with a rotating drill bit, the improvement which comprises introducing a cementing/plug drilling apparatus between the cement tube and the pump down wipe plug said apparatus comprising a drillable rigid plate having a bottom face and a top face and at least one drillable protrusion protruding from each face, contacting the top of the plug with a rotating drilling bit, forcing the protrusion on the top face to engage the bottom of the plug and the protrusion on the bottom face to engage the top of the cement tube thereby retarding the tendency of the plug to rotate with the rotating bit and enhancing the drilling action of the bit.

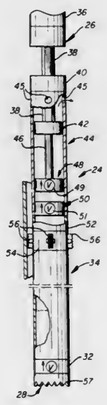
4,190,112
PUMP DOWN WIPE PLUG AND CEMENTING/DRILLING PROCESS
Carl A. Davis, P.O. Box 12326, Houston, Tex. 77017
Filed Sep. 11, 1978, Ser. No. 941,162
Int. Cl.[2] E21B *33/16*
U.S. Cl. 166—291 **16 Claims**



12. An improved down hole well pipe configuration comprising:
(a) a well shoe or collar pipe attachment, and
(b) a pump down wipe plug having at least one drillable bottom tooth made of a material selected from the group consisting of cast iron and aluminum protruding from its bottom surface, said tooth in contact with the top surface of the pipe attachment.

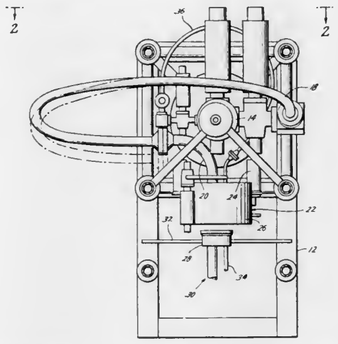
15. An improved drilling process comprises:
(a) inserting a first pump down wipe plug having at least one drillable tooth extending below the bottom surface, into a cementing pipe string;
(b) pumping the first plug down the pipe string until the tooth or teeth on the bottom surface of the first plug contact the top surface of a second plug or shoulder of a collar or shoe;
(c) and drilling out the first plug with a rotating drill bit, the tendency of the first plug to rotate being retarded by the tooth or teeth extending below the bottom of the first plug and engaging the top surface.

4,190,113
WELL CLEANOUT TOOL
Wayne O. Harrison, 218 W. 465th St., Odessa, Tex. 79762
Filed Jul. 27, 1978, Ser. No. 928,532
Int. Cl.[2] E21B *37/00*
U.S. Cl. 166—311 **8 Claims**



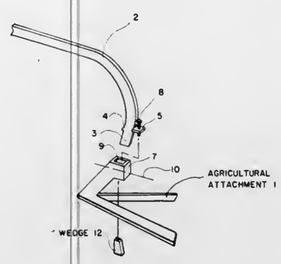
1. A well cleanout tool, comprising; an elongated main body having a lower inlet end into which fluid and debris may flow, and an upper outlet end having means by which fluid may be returned to the wellbore; said inlet end being spaced from said outlet end;
support means connected at said upper outlet end of the main body by which said tool can be supported, the medial body portion of the tool being an elongated, hollow member for containing well fluid and debris;
a pump means located within said main body at a location between said upper outlet end and said lower inlet end for forcing fluid to flow from said lower inlet end, through said medial body portion, and through said upper outlet end;
said pump means includes a pump barrel axially formed within said main body, and a piston reciprocatingly received within said barrel, a piston rod by which said piston is connected to be reciprocated by said support means;
a traveling valve in said piston, a standing valve located between said inlet end and said pump barrel;
a closure member at said upper outlet end; means by which said piston rod extends through said closure member; an abutment means formed on said piston rod at a location between said piston and said closure member so that the abutment means engages the closure member when the piston is reciprocated uphole by said support means to thereby provide a jarring effect;
a trap means located between said lower inlet end and said medial body portion through which fluid and debris may flow while said pump forces fluid to flow through said tool.

4,190,114
SUBSEA WELLHEAD APPARATUS
Edmund A. Fisher, and Frank P. Czerewaty, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.
Filed Aug. 18, 1978, Ser. No. 934,687
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—346 **5 Claims**



1. An apparatus for connecting a subsea christmas tree to a subsea flowline, comprising
a production flowline loop connected to the christmas tree, and
a remotely actuated connector secured to the end of the flowline loop away from said tree,
said connector being movable in a line for engaging and connecting to a subsea flowline,
the movement of said connector moving the end of said loop secured to said connector along said line of movement,
said loop extending from said tree to said connector in a plane at a substantial angle to the line of movement of said connector whereby the movement of the connector end of said loop causes predominantly torsional stresses in said loop.

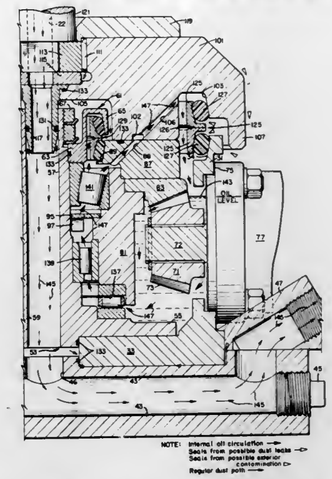
4,190,115
FOR RELEASABLY COUPLING AGRICULTURAL ATTACHMENT TO SHANK
Richard B. Couture, Box 64, Ferland, Sask., Canada (S0H 1MO)
Filed May 15, 1978, Ser. No. 906,040
Int. Cl.[2] A01B *15/00*
U.S. Cl. 172—753 **2 Claims**



1. A coupling for releasably coupling an agricultural attachment to a shank, said coupling comprising
a curved rectangular rod-like shank having a free end, said shank being substantially linear in the area of its free end and having a lip projecting from one side thereof in the area of its free end and a coupling member projecting from the opposite side thereof, said coupling member having an internally threaded bore formed therethrough;
an agricultural attachment for performing an agricultural task, said attachment having a coupling end of rectangular sleeve type configuration accommodatable on said shank with additional space therein at the free end thereof up to said projecting lip and coupling member;
a bolt threadedly coupled in the bore of the coupling member of the shank; and
a wedge having an internally threaded bore formed therein for accommodating said bolt whereby when the coupling end of said attachment is positioned on the free end of said shank in abutment with said lip and said wedge is positioned in the hole of said coupling end next-adjacent said shank and said bolt coupled in said coupling member is threadedly coupled in said wedge, said attachment is removably tightenable on said shank via said bolt and said wedge.

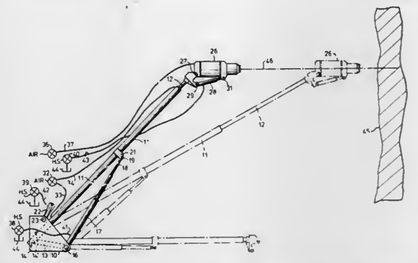
4,190,116
MINE ROOF BOLTER
Winston R. O'Neal, Fayetteville, and Stephen L. Richardson, Oak Hill, both of W. Va., assignors to Black Diamond Service Company, Inc., Fayetteville, W. Va.
Filed May 3, 1978, Ser. No. 902,397
Int. Cl.[2] E21C *5/00*
U.S. Cl. 173—38 **19 Claims**

1. In a rotary drill head apparatus for a mine roof bolter having a central dust suction means, a drill-bit-engaging means, a pinion-and-ring gear driving means, and inner and outer oil cavities within which bearings are rotatively operable, the improvement of a circulatory lubricating means, comprising:
A. an oil lift means for lifting oil upwardly from said inner oil cavity, said oil lift means comprising an oil lift ring having at least one finger which is downwardly inclined toward the direction of rotation, and said oil lift means being rotatively operable within said inner oil cavity for said lifting of said oil upwardly; and
B. an oil movement means for upwardly and radially moving said oil to a position above said outer oil cavity, whereby said oil falls past said pinion-and-ring gear driving means, said oil movement means comprising a plurality of diagonally and radially disposed oil passageways that are formed in a seal plate and in a chuck which are rigidly



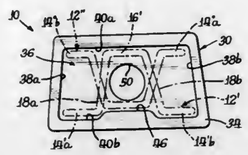
attached to and supported by a cylindrical hub which separates said inner oil cavity from said outer oil cavity.

4,190,117
SUPPORT AND POSITIONER FOR ROCK DRILL
Donald R. MacLean, 60 Duncan St., Thornbury, Ontario, Canada (N0H 2P0)
Filed Sep. 12, 1978, Ser. No. 941,582
Int. Cl.[2] E21C *5/00*
U.S. Cl. 173—43 **9 Claims**



1. Support and positioner apparatus for a rock drill comprising a feed boom pressure cylinder and piston, means for selectively applying fluid pressure at the upper and lower ends of the pressure cylinder whereby the piston can be extended and retracted along its axis, a mounting for a rock drill pivotally connected on the upper end of the feed boom piston, a base plate adapted for connection on a mobile carrier, a boom-elevating extendable and retractable pressure cylinder and piston pivotally connected between the base plate and an intermediate part of the feed boom cylinder, a valve controlling flow of pressure fluid to and from the elevating cylinder whereby the feed boom cylinder can be raised to an elevated angle of inclination and can be lowered, a linkage pivotally connected on a lower end of the feed boom cylinder and extending downwardly from the feed boom cylinder and laterally of the axis of the feed boom piston to a lower pivot point on the base plate located laterally of and below the axis of the feed boom piston and means retaining said linkage at a predetermined angle to said axis, said feed boom piston and cylinder rocking bodily downwardly and forwardly about said lower pivot point.

4,190,118
DRIVE CAP
Lawrence J. Sweeney, Seneca, Pa., assignor to Franklin Steel Company, Franklin, Pa.
Filed Jun. 19, 1978, Ser. No. 916,856
Int. Cl.² B25D *9/00*
U.S. Cl. 173—130 **6 Claims**



1. A drive cap for use in driving structural posts longitudinally into the ground, the posts being of the type having a pair of substantially coplanar lateral flanges interconnected through a web having a wall which is substantially parallel to and offset from the plane of said lateral flanges, said lateral flanges having outer longitudinal edges spaced to define the major transverse dimension of the post, and the plane of said lateral flanges being spaced from the plane of said wall to define the minor transverse dimension of the post,

said drive cap being adapted for use with posts of different transverse size wherein a first size post has major and minor transverse dimensions greater, respectively, than the major and minor transverse dimensions of a second size post,

said drive cap comprising a drive block having a longitudinal axis and upper and lower ends and defining a recess therein intersecting one of said ends,

said recess being defined by nonparallel laterally spaced side walls and mutually facing front and rear walls interconnected to said side walls so that said recess is adapted to receive an end of a post of said first post size therein with said cap in generally closely fitting relation with the outer longitudinal edges of said lateral flanges when said cap is disposed in a first predetermined orientation relative to said first size post and so as to receive an end of a post of said second post size therein with said cap in generally closely fitting relation with the outer longitudinal edges of the lateral flanges of said second size post when said cap is disposed in a second predetermined orientation relative to said second size post rotated substantially one-half revolution about its longitudinal axis from said first predetermined orientation relative to said first size post,

the other end of said drive cap facilitating impacting of said cap by an external force to drive said first or second size posts into the ground when said cap is mounted thereon.

4,190,119
EARTH DRILLING APPARATUS
James B. Loftis, and Norlin O. Lewis, both of Remlap, Ala., assignors to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Dec. 12, 1977, Ser. No. 859,613
Int. Cl.² B23Q *5/00;* **E21C** *5/00*
U.S. Cl. 173—149 **3 Claims**

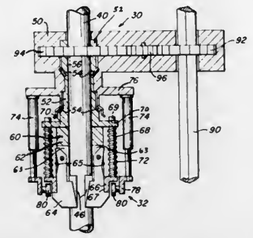
1. An improved drilling machine comprising:

a frame;

an elongated drill mast having one end connected to said frame;

a rotary drive means adapted to reciprocably move on at least a major portion of said mast and having an axis of rotation disposed generally parallel to said mast and including an elongated rotor having a through bore coaxial with said axis of rotation for receiving therewithin a longitudinally extending drill string of a length greater than the height of said mast, said drill string being provided with pairs of rectangular shaped notches longitudinally spaced there along;

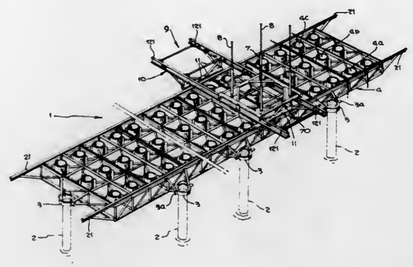
said rotary drive means further including a pair of oppositively disposed pivotable latches mounted on said rotor and an actuator assembly selectively moveable between first and second positions, said latches being adapted to mate with said notches, movement of said assembly to its first position pivots said pair of latches into mating relationship with a corresponding pair of said drill string notches thereby providing positive engagement of said



rotary drive means with said drill string whereby rotational and longitudinal motion are imparted to said drill string under conditions wherein said rotary drive means is reciprocably moved along said mast, movement of said assembly to its second position pivots said latches out of engagement with said notches such that said rotary drive means is free to move along said drill string as it is reciprocated along said mast during the drilling operation; and

means for reciprocating said rotary drive means along said mast.

4,190,120
MOVEABLE GUIDE STRUCTURE FOR A SUB-SEA DRILLING TEMPLATE
A. Michael Regan, Huntington Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.
Filed Nov. 18, 1977, Ser. No. 852,908
Int. Cl.² E21B *7/12*
U.S. Cl. 175—7 **35 Claims**



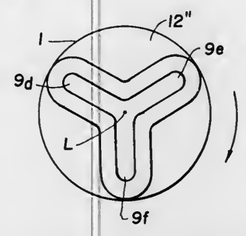
1. A subsea template and movable guide structure assembly for conducting subsea drilling and production operations selectively between a plurality of adjacent subsea wells comprising:

a subsea well template having a plurality of template sections arranged in a longitudinally extending array, each of said sections having a plurality of well bore guide means in laterally spaced series relative to the longitudinal extent of said template;

tool guide means for guiding a subsea well tool into a well bore guide means;

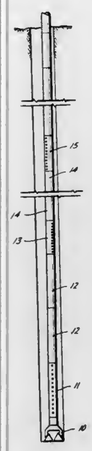
carriage means and means for movably mounting said carriage means to said template, said carriage means movably mounting said tool guide means on said template for movement along the longitudinal extent thereof, whereby, said tool guide means may be positioned with regard to selected ones of said sections.

4,190,121
THERMAL DRILLING DEVICE
Werner Baum, Flein, and German Munding, Bad Friedrichshall, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany
Division of Ser. No. 734,424, Oct. 21, 1976, Pat. No. 4,076,082.
This application Jan. 24, 1978, Ser. No. 871,822
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2607046
Int. Cl.² E21B *7/14*
U.S. Cl. 175—14 **2 Claims**



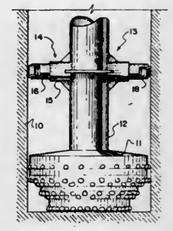
1. A thermal drilling device operating in a rotary motion, particularly for drilling geological formations, comprising a drill body having an interior combustion chamber with a bottom having an outlet defining a discharge nozzle, said drill body being rotatable about an axis of rotation, means for generating hot gaseous products of combustion in said combustion chamber, said discharge nozzle having a plurality of radially extending slots which intersect at the center of said drill axis of rotation and define discharge openings for the hot gases.

4,190,122
SPACED WEIGHT RELIEVED DRILL COLLAR STRING
James F. Arnold, 241 Kilts Dr., Houston, Tex. 77024
Filed Mar. 22, 1978, Ser. No. 888,837
Int. Cl.² E21B *17/00*
U.S. Cl. 175—320 **12 Claims**



1. For use in the drilling of a well, a string of drill collars adapted to be connected in a drill string, said drill collar string having its weight symmetrically disposed about its centerline except for a plurality of straight tubular sections vertically spaced apart along its length with a major portion of said sections being separated by at least one drill collar which has its weight symmetrically disposed about its centerline as aforesaid and each section being weight relieved along one side thereof to produce an eccentric weighting of the section corresponding to 0.5 to 10 percent of the original weight of said section.

4,190,123
ROCK DRILL BIT LOADING DEVICE
John Roddy, 312 Laidlaw Blvd., Winnipeg, Manitoba, Canada
Filed Jul. 14, 1978, Ser. No. 924,625
Claims priority, application United Kingdom, Jul. 20, 1977, 30482/77
Int. Cl.² E21B *17/10*
U.S. Cl. 175—325 **14 Claims**



1. A rock drill bit loading device in which said drill bit is mounted on the lower end of a rotatable drill string within a bore hole and includes a source of hydraulic pressure and a source of drilling fluid within said drill string, comprising in combination at least two bore hole wall engaging assemblies extending radially outwardly from the wall of the drill string and rotating therewith, means to apply outward pressure to said assemblies, to engage same with the wall of the bore hole and means to translate the frictional engagement of said assemblies with the wall of the bore hole, to downward pressure upon the drill bit when said drill string and bit is rotating in one direction and to release said downward pressure when rotating in the opposite direction.

4,190,124
STABILIZER AND BLADE ATTACHMENT MEANS THEREFOR
Robert G. Terry, Odessa, Tex., assignor to Thomas L. Taylor, Odessa, Tex.
Filed Oct. 23, 1978, Ser. No. 954,044
Int. Cl.² E21B *9/22*
U.S. Cl. 175—406 **17 Claims**

1. A stabilizer of generally cylindrical configuration having means at the upper and lower end thereof by which the stabilizer can be connected in series relationship with respect to a drill string; an axial flow passageway formed through said stabilizer through which drilling fluid can flow;

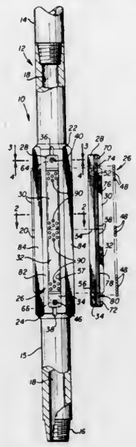
said stabilizer having a central body within which a plurality of elongated, outwardly opening, radially spaced slots are formed; each said slot being spaced circumferentially from the nearest adjacent slot; each said slot having opposed sidewalls and opposed endwalls, and a bottom spaced from said axial flow passageway; said opposed sidewalls extend from said bottom to the outer peripheral surface of said central body;

a cutting blade having opposed ends, opposed sidewalls, and a front and a rear face; means on said front face for reaming the inside peripheral wall surface of a borehole true; one said blade being received within one said slot in close tolerance relationship therewith, the sidewalls of said blade being closely adjacent to the sidewalls of said slot;

an elongated, longitudinally extending, circular groove formed on each said opposed wall surface of said slot and on each said opposed sidewall of said blade; one said

groove, when said blade is received within said slot, registers with another said groove to form a cylindrical passageway, said passageway having an inlet end and an outlet end, a closure means for said inlet end and said outlet end;

and a plurality of holding balls removably received within said cylindrical passageway, said balls have an outside diameter to be admitted within said cylindrical passageway;



one said blade can be received within one said slot, said plurality of holding balls can be forced through said inlet end of said passageway until said passageway is substantially filled with balls, the closure means positioned to isolate the balls within the passageway where each of the balls simultaneously bear against the circular groove of the slot and the circular groove of the blade, thereby holding the blade within the central body.

4,190,125

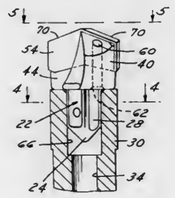
DRILL BIT AND STEEL COMBINATION FOR IMPROVED FLUID FLOW

Kenneth C. Emmerich, and Ralston L. Hamlin, both of Lexington, Ky., assignors to Fansteel Inc., North Chicago, Ill.

Filed Nov. 9, 1977, Ser. No. 849,995

Int. Cl.[2] E21C *13/10, 15/00*

U.S. Cl. 175—410 **4 Claims**



1. In combination, a mining drill bit and driving steel for rotary and rotary percussion drilling of hard materials such as rock, coal, concrete and the like which comprises:

(a) a central metallic, heat conductive body generally round in cross-section and having a central axis,

(b) an acircular driving shank of substantially smaller diameter than said body axially disposed on one end of said body having a cooling passage formed therein extending to said body,

(c) a hard metal cutting insert supported diametrically at the other end of said body comprising a flat elongate member having leading cutting edges on the top of said member on opposite sides of the axis of said body and on opposite sides of the member with a clearance angle surface angled downward from the leading edge toward a trailing edge on each side of the member,

(d) support prongs extending axially of said body in diametrically opposed quadrants having ledge surfaces in contact with the bottom of said insert and back-up, axially extending chordal surfaces in contact with a trailing side of said insert, said insert being brazed to said prongs at said ledge and back-up surfaces,

(e) passages formed in said prongs in communication with a shank passage extending axially to the distal end of said prongs and passing behind and adjacent to said back-up chordal surfaces and terminating adjacent the cutting edges of said insert and to conduct heat away from said ledge and back-up surfaces to prevent destructive heating of said brazed surfaces,

(f) said body having opposed, parallel, chordal sides at the base of the body below the leading cutting edges of said cutting insert, and

(g) a driving steel having a central acircular recess to receive said shank in a driving relation and having opposed, parallel, external chordal sides aligned with the chordal sides on said bit body to provide a passage within a hole being drilled for the flushing away of drilling chips and fines toward the mouth of the hole.

4,190,126

ROTARY ABRASIVE DRILLING BIT

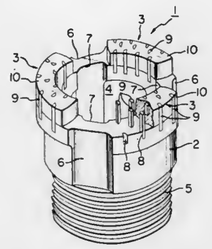
Ryuichi Kabashima, Yokohama, Japan, assignor to Tokiwa Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1977, Ser. No. 862,393

Claims priority, application Japan, Dec. 28, 1976, 51-159141

Int. Cl.[2] E21B *9/16*

U.S. Cl. 175—410 **5 Claims**



1. A rotary abrasive drilling bit comprising a bit body attached to a rotary drill pipe and a plurality of teeth equipped on the fore part of said bit body, wherein each of said teeth is composed of a plurality of tungsten carbide thin sticklike cutting elements and a matrix that is softer than and inferior in abrasion resistance to said elements, all said sticklike tungsten carbide elements extending along the cutting direction of said bit body and orderly arranged in each tooth with a desired space therebetween radially as well as circumferentially of the bit body with the ends located in a zig-zag path transverse to said cutting direction, said matrix surrounding the tungsten carbide thin sticklike elements and maintaining them in the aforesaid arrangement, and the cutting face of said tooth being composed of a compound surface consisting of the end faces of the tungsten carbide thin sticklike elements and the surface of the matrix, whereby when the edges of the tungsten carbide thin sticklike elements are worn down and shortened with the progress of drilling work the surface of the matrix is also worn down to the same extent in concert therewith to maintain the teeth suitable for drilling purposes.

4,190,127

BRAZING INSERTS

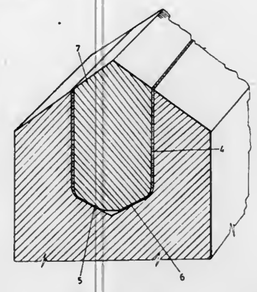
Isaac M. Wolf, 18 Hollinger Ave., Springs, Transvaal, South Africa

Filed Jan. 19, 1978, Ser. No. 870,807

Claims priority, application South Africa, Jan. 20, 1977, 77/0339

Int. Cl.[2] B23K *1/04*

U.S. Cl. 175—410 **11 Claims**



1. A rock working tool having a bit portion having a recess for a cutting insert with the floor of the recess being formed with a downward taper to the center, and a hard metal insert having a base which is complementally tapered to the base of the recess brazed into the recess with a greater thickness of brazing material between at least two opposite sides of the insert and the recess than between the bases of the insert and recess.

11. A method of brazing a parallel-sided insert for a rock working tool into a parallel-sided recess in the tool including the steps of shaping the base of the recess and the base of the insert to complemental gabled shapes so that when the insert is located in the recess, the insert is automatically centrally located in the recess, positioning the insert in the recess with the base of the insert resting on the base of the recess so that the insert is gravitationally centered in the recess, and causing molten brazing medium to flow into the spaces between the insert and recess to hold the insert in the recess.

4,190,128

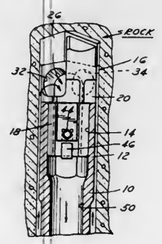
ROOF DRILL BIT WITH HEXAGONAL BODY PORTION

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

Filed Dec. 21, 1978, Ser. No. 971,844

Int. Cl.[2] E21C *13/00*

U.S. Cl. 175—410 **5 Claims**



1. A mining drill bit for rotary and rotary percussion drilling of hard materials such as rock, coal, concrete and the like which comprises:

(a) a generally cylindrical metallic body having a base portion with a polygonal shape in cross-section with flat sides,

(b) an acircular driving shank of substantially smaller diameter than said body axially disposed on one end of said body having a cooling passage formed therein extending to said body,

(c) support prongs extending axially on said base portion in diametrically opposed quadrants having aligned ledge surfaces to support a bottom of a cutting insert and axially extending chordal surfaces in contact with trailing sides of said insert on opposite sides of the center of said body,

(d) an insert secured to surfaces of said prongs,

(e) the remaining quadrants in said body being formed to provide chip slash openings extending into said base portion to form ports connecting the cooling passage of said shank with said slash openings.

4,190,129

AIR CUSHION BUMPER CARS

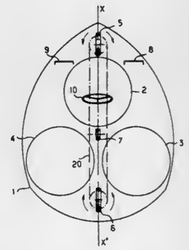
Dominique Mary, lieu dit "La Souche", 76500 Elbeuf, France

Filed May 9, 1978, Ser. No. 904,343

Claims priority, application France, May 18, 1977, 77 16223

Int. Cl.[2] B60V *1/14*

U.S. Cl. 180—119 **5 Claims**



1. A ground effect vehicle comprising: a chassis having a longitudinal axis; front, middle and rear wheels arranged along the said longitudinal axis and each having an axle, the axle of said middle wheel being fixed at right angles to the said axis and the said middle wheel being an idler wheel; means for pivoting the axles of the front and rear wheels to orientate the said axles simultaneously in any same direction in a plane containing the said axis and parallel with the ground; means for driving the front and rear wheels in one direction; air cushion means carried by the chassis for exerting a downward force on the ground and an upward lift force on the chassis; means for lifting the said wheels off the ground and applying them in engagement with the ground without disturbing the attitude of the chassis while the vehicle is in motion, the said lifting means being so arranged that one at least of the two front and rear wheels is capable of being selectively applied in engagement with the ground independently or in combination with any one of the other two wheels.

4,190,130

DUAL STEERING SYSTEM FOR OFF-HIGHWAY VEHICLES

Earl Beck, Springdale, Ark., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

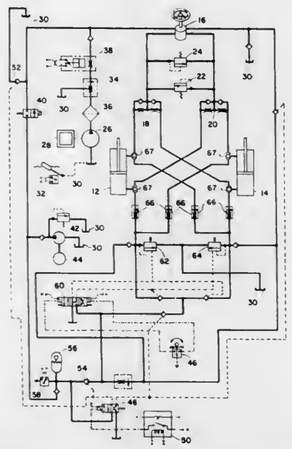
Filed Sep. 11, 1978, Ser. No. 941,023

Int. Cl.[2] B62D *5/06*

U.S. Cl. 180—133 **5 Claims**

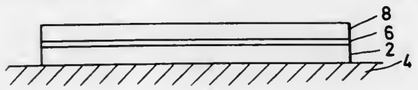
1. Dual vehicular steering apparatus with a primary steering system for normal operation and a secondary system for emergency operation triggered by pressure sensitive switching and valving means wherein both systems have in a common a pair of single rod hydraulic steering cylinders, each cylinder being connected to a steerable wheel of the vehicle and being capable of steering the vehicle despite complete failure of the other steering cylinder; engine means to power said vehicle; hydraulic fluid stored in a tank; cylinder shuttle valve means for each steering cylinder to separate said primary system from said

secondary system; and means for conducting said fluid from said cylinder shuttle valve means to said steering cylinders and wherein said primary system comprises main pump means driven by said vehicle engine to maintain an acceptable level of pressure in said primary system; a high pressure filter; means for conducting fluid from said pump to said filter where said fluid is filtered; a priority flow divider to divert said fluid in excess of an acceptable pressure level; means for conducting said fluid from said filter to said priority flow divider; a control valve to regulate the flow of said fluid; means to conduct fluid from said priority flow divider to said control valve; integrated valving means to proportionately regulate fluid flow between said cylinders; means for conducting said fluid from said control valve to said proportional valve means; and means to conduct said fluid from said proportional valve package to said



cylinder shuttle valve means; and wherein said secondary system comprises secondary steering pump means; electric motor means driven by the vehicular battery to drive said secondary pump; means to conduct said fluid from said secondary pump means through said switching and valving means and to said cylinder shuttle valve means; an accumulator; pressure sensitive switching and valving means to conduct said fluid from said secondary pump to said accumulator; means to conduct said fluid from said accumulator to said cylinder shuttle valve; means to apply equal pressure to both ends of each steering cylinder thereby locking said steering cylinders in a single operating mode; means to selectively drain fluid from selected ends of said steering cylinders to effect steering; and operator controlled secondary steering switch and valve means to operate said fluid drain means.

4,190,131
NOISE ABATEMENT TECHNIQUES AND SYSTEMS
William D. Robinson, Ipswich, England, assignor to Delta Materials Research Limited, Ipswich, England
Filed Feb. 14, 1978, Ser. No. 877,729
Claims priority, application United Kingdom, Feb. 16, 1977, 6574/77
Int. Cl.² F16L *11/00*; B32B *5/14, 7/02*; G10K *11/02*
U.S. Cl. 181—296 **41 Claims**



1. A method of reducing the noise emanating from a noise generating source, such as a machine tool, comprising the steps of:

(a) covering a surface from or through which the noise emanates with a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, said first layer being in contact with and supported by said surface from or through which the noise emanates;

(b) covering the first layer with an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said first layer being in contact with and supporting the intermediate layer and decoupling the intermediate layer from said surface from or through which the noise emanates; and

(c) covering the intermediate layer with an outer flexible surface-protective layer resistant to impact, wear, and abrasion;

whereby a cladding, consisting of a flexible layered structure, is formed for reducing the noise emanating from the noise generating source.

14. A cladding for reducing the noise emanating from a noise-generating source having a surface from or through which the noise emanates, said cladding consisting of a flexible layered structure adapted to cover the surface, said layered structure comprising:

(a) a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, said first layer being adapted to be positioned in contact with and supported by said surface from or through which the noise emanates;

(b) an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said first layer being in contact with and bonded to the intermediate layer and serving to decouple the intermediate layer from said surface from or through which the noise emanates; and

(c) an outer flexible surface-protective layer resistant to impact, wear, and abrasion, bonded to a face of the intermediate layer remote from the first layer.

25. A stock tube provided with a flexible cladding comprising:

(a) a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, and first layer being in contact with and enclosing an outer surface from or through which noise emanates out of the stock tube;

(b) an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said intermediate layer being in contact with and enclosing the first layer, said first layer decoupling the intermediate layer from the outer surface from or through which the noise emanates out of the stock tube; and

(c) an outer flexible surface-protective layer resistant to impact, wear, and abrasion, enclosing the intermediate layer.

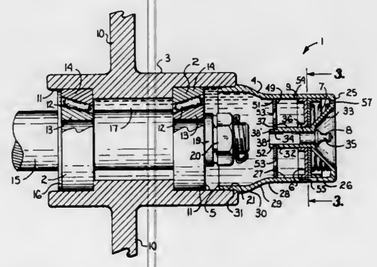
4,190,132
SPIDER THREAD
Jean-Paul Desilets, 7952 NE. 4th Ave., Miami, Fla. 33138
Filed Jun. 7, 1976, Ser. No. 682,750
Int. Cl.² A62B *1/08, 35/00*
U.S. Cl. 182—6 **2 Claims**

1. A device that enables a person to make an emergency descent from outside a building or an elevated place, said device comprising a flexible longitudinal flat band (preferably steel band) one end of which must be fastened at the starting point, said flat band being wound on a reel made of two connected disks by a core having a center hole, two L-shaped plates connected at one end thereof with center holes and having a trapezoidal shape placed one on each side of said reel with friction material between said plates and said reel, said plates forming the body of the device and at the opposite end having two corners extending beyond the circumference of the reel in order to install a roller at one of said corners and a snap hook at the other corner, said hook is adapted to be connected to a harness worn by the user, two convex disks having center holes placed one on each side of said plates, the above mentioned parts, reel, plates and disks being held together by a bolt



through their center holes, said bolt being used as an axle for the reel and as a means to apply a braking effect on the reel by pressing the plates against said reel when a threaded knob or handle at the threaded end of the bolt is being tightened with one hand, thus enabling the user to control the rate of his descent.

4,190,133
WHEEL BEARING PRESSURE LUBRICATOR
Kenneth C. Ploeger, 5th and Dryden, Odessa, Mo. 64076
Filed Oct. 10, 1978, Ser. No. 950,010
Int. Cl.² F16N *11/04*; B60B *27/00*
U.S. Cl. 184—1 D **4 Claims**



1. A wheel bearing pressure lubricator comprising:

(a) a hollow cap having a side wall, a central aperture, an open end and a closed end, said open end being adapted for sealing engagement with a wheel hub, said side wall having an interior surface with a substantially cylindrical shape;

(b) a tubular member having connection with a central portion of said closed end and extending therefrom between and concentrically with said side wall;

(c) a lubricator fitting connected with said closed end and communicating with said tubular member;

(d) a piston structure slidably and sealingly mounted on said tubular member and having a marginal edge thereof sealingly engaging the interior surface of said side wall; said marginal edge having a defined length;

(e) a spring member positioned between said piston structure and said closed end and urging said piston structure toward the open end;

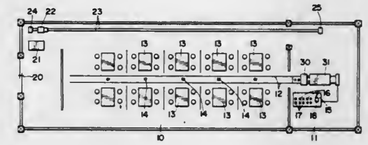
(f) a vent aperture disposed through said cap at a point adjacent to said closed end;

(g) an abutment means in said cap limiting translation movement of said piston structure toward said open end and having openings for communication of wheel hub lubricant pressure to said piston structure;

(h) an overflow opening extending through said side wall in spaced relation to said abutment means and at a point whereby the pressure of lubricant in said wheel hub moves said piston structure away from the abutment means to a filled position exposing said overflow opening to prevent excess lubricant pressure in the wheel hub;

(i) a piston position indicator aperture in said side wall with a location and size relative to the length of the piston marginal edge to be closed thereby when the piston structure is translated to said hub filled position and to be open when the piston structure engages the abutment means and ceases to apply pressure to lubricant in the wheel hub.

4,190,134
DISH CARRYING SYSTEM
Noboru Kato, 1279 banchi Josuihoncho, Kodaira-shi, Tokyo, Japan
Filed Dec. 20, 1977, Ser. No. 862,608
Claims priority, application Japan, Apr. 14, 1977, 52/43291; Apr. 14, 1977, 52/43292
Int. Cl.² A47G *23/08*
U.S. Cl. 186—1 R **11 Claims**



1. Apparatus for carrying a product from a first area to a preselected one of a plurality of second locations, comprising:

rails laid over the distance between said first area and said plurality of second locations, said plurality of second locations being arranged along and on laterally opposite sides of said rails; and

a vehicle adapted to travel on said rails with a product loaded thereon, said vehicle including:

a body mounted on wheels which are engageable with said rails;

openings on laterally opposite sides of said body;

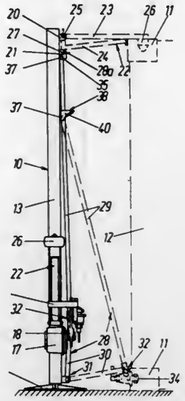
flaps movably mounted on said body for selectively opening and closing respective ones of said openings; and

a tray member in said body and slidable horizontally relative to said body and in interlocked relation with opening and closing actions of each of said flaps, said tray member being slidable outwardly of said body toward one of said openings when the flap corresponding to said one of said openings is opened and being slideable inwardly to its original position in said body upon closing of said corresponding flap.

4,190,135
GEAR RACK HOIST
Joerg Wenzel, and Erich Mai, both of Kirschfurt, Fed. Rep. of Germany, assignors to Josef Haamann, Fed. Rep. of Germany
Filed Mar. 1, 1978, Ser. No. 882,100
Int. Cl.² B66B *9/00*
U.S. Cl. 187—1 R **4 Claims**

1. In a gear rack hoist for lifting, lowering and/or supporting containers, shelters, cabins, temporary construction or the like having corner fittings which operate in concert with conical actuating parts of upper and lower hoist beams mounted in spaced relation on the hoist shaft and respectively associated with upper and lower corner fittings, the beam associated with the lower fittings being provided with two bars of different lengths each articulatedly connected by means of bolts to the hoist shaft and to the conical actuating part, the total length of these two bars not appreciably or at all exceeding the height of the hoist shaft, the improvement wherein the connecting means at the hoist shaft (**13**) for the longer bar (**29**) of the lower beam (**28**), where said longer bar assumes an operational posi-

tion slanting upwards against the hoist shaft, comprises an outwardly closed, generally U-shaped suspension and securing bail surrounding said bar (29) with play and extending gener-



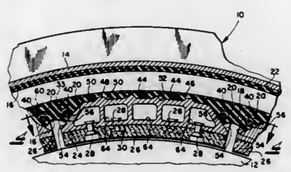
ally transversely to the hoist shaft, said bail being provided with a guide and a support pocket (44), and a support bolt (37) fastened to the upper end of said longer bar and being receivable in said support pocket.

4,190,136

COUPLING APPARATUS

Marcus H. Collins, Akron, and Kiritkumar R. Patel, North Royalton, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 13, 1978, Ser. No. 959,972
Int. Cl.[2] F16D *49/14*
U.S. Cl. 188—367 **24 Claims**



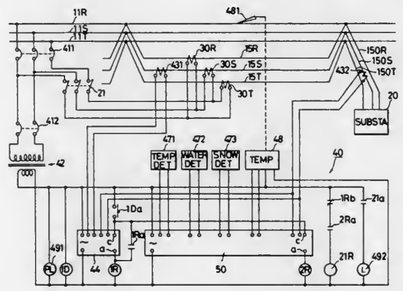
23. A coupling comprising a rim assembly, a drum assembly rotatable relative to said rim assembly about an axis of rotation, a fluid expandable tube element having an exterior surface connected to said rim assembly for rotation therewith relative to said drum assembly, said tube element including a plurality of plies and a plurality of spaced apart lugs disposed on said exterior surface, a plurality of shoe members, each of which includes a first surface and a second surface disposed substantially parallel to said first surface, each of said shoe members including means disposed on said first surface connectable with one of said lugs on said tube element to support said first surface of said shoe member contiguous to said exterior surface of said tube member, said tube having a shape factor at least as large as 3.125 per square inch of interface between said first surface of said shoe member and said exterior surface of said tube member, a plurality of friction pads, one of which is secured to said second surface of each of said shoe members, said shoe members being movable in a radial direction between a first position in which said plurality of friction pads are engaged with said drum assembly to couple said input and output members upon expansion of said tube element and a second position in which said plurality of friction pads are spaced apart from said drum assembly to permit relative rotation between said input and output members upon contraction of said tube element, a plurality of projections disposed on said first surface of each of said shoe members substantially parallel to said axis of rotation, a plurality of parallel corresponding indentations disposed on said exterior surface of said tube member having a length at least as long as the length of each of said corresponding projections, each of said indentations being adapted to receive said corresponding projection therein to provide for the transfer of torque from said shoe member, through said tube element to said rim assembly.

4,190,137

APPARATUS FOR DEICING OF TROLLEY WIRES

Akira Shimada, Ibaraki; Kouichi Watanabe, Kobe, and Katsuji Nakajima, Kashihara, all of Japan, assignors to Dainichi-Nippon Cables, Ltd. and Kawasaki Jukogyo Kabushiki Kaisha, both of Kobe, Japan

Filed Jun. 22, 1978, Ser. No. 918,168
Int. Cl.[2] B60M *1/34*
U.S. Cl. 191—27 **10 Claims**



1. An apparatus for deicing of trolley wire in a power transmission system comprising:

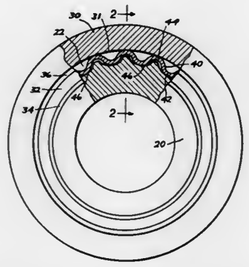
at least two trolley wires for supplying an alternating current power to an electric vehicle, each of which has a feeder line, said feeder line being connected to said trolley wires at a plurality of points to form a plurality of closed loops, and each feeder line in said closed loops passing through the through aperture of a through-type current transformer having a primary winding to which a voltage between said two trolley wires is applied in order to cause a Joule heat along said trolley wires.

4,190,138

AUTOMATIC CLUTCH

Wilfrid H. Bendall, 48-18 432rd St., Woodside, N.Y. 11377

Filed Jan. 3, 1978, Ser. No. 866,276
Int. Cl.[2] F16D *41/06, 41/10*
U.S. Cl. 192—43 **10 Claims**



1. An automatic clutch for connecting a driving and a driven member, said clutch comprising an externally toothed gear for connection to one of said members, a concentric annular member for connection to the other of said members, said annular

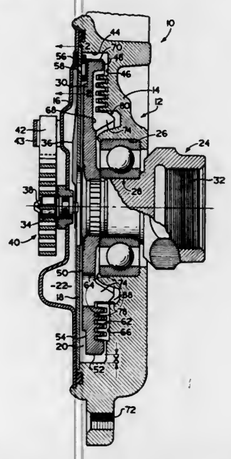
member having an internal diameter substantially larger than the external diameter of the gear to provide a radial clearance space therebetween, a corrugated resilient element having internal and external portions fitted in said space and in sprung retention on the gear with internal corrugation portions initially in centered contact with the root portions of the gear teeth alternating with external corrugation portions in contact with the internal periphery of the annular member.

4,190,139

CENTERING ABUTMENT FOR VISCOUS FLUID DRIVE

Thomas H. Tinholt, Marshall, and Phillip E. Konkle, Albion, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 5, 1978, Ser. No. 912,283
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **12 Claims**



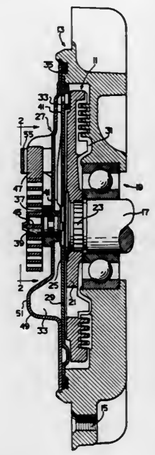
1. In a viscous fluid drive having a housing with an annular generally radially extending side member adapted to be rotated about an axis, a centrally located input shaft opening defined in said side member, a working chamber in said housing defined in part by an annular peripheral surface on said housing and an annular generally radially extending surface on said side member, a clutch member located within said working chamber and defined in part by an annular peripheral surface spaced radially from said peripheral surface on said housing by a distance of X units and an annular generally radially extending surface axially spaced from said radially extending surface on said side member, and a plurality of spaced interdigitated generally axially extending lands and grooves defined on said generally radially extending surfaces of said members intermediate said input shaft opening and said peripheral surface on said clutch member, the improvement comprising: a generally axially extending annular trough in one of said members on the radially extending surface of said one member defined in part by a generally cylindrically shaped surface, the axial depth of said trough being greater than the axial depth of said grooves on said one member; and a centering abutment located on said generally radially extending surface of said other member and being defined in part by a generally cylindrically shaped surface having an axial length of B units which is greater than the axial length of A units of said lands on said other member and radially spaced from said generally cylindrically shaped surface on said one member by a distance of Y units which is substantially less than said distance of X units to readily locate said clutch member relative to said side member for interdigitation of said lands and grooves.

4,190,140

FLUID COUPLING DEVICE, BIMETAL CLIP AND METHOD OF ASSEMBLY THEREFOR

Phillip E. Konkle, Albion, and Thomas H. Tinholt, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 26, 1978, Ser. No. 909,755
Int. Cl.[2] F16D *43/25, 35/00*
U.S. Cl. 192—82 T **8 Claims**



1. In a fluid coupling device of the type including a first rotatable member defining an axis of rotation, cover means associated with the first member to define a fluid chamber therebetween, a valve plate disposed to separate the fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in the fluid operating chamber and rotatable relative to the first member, valve means operable to control fluid communication between the operating chamber and the reservoir chamber and including a valve shaft disposed generally axially and extending outwardly through the cover means and being rotatable relative thereto, a bimetal element having a first end portion operatively connected to the valve shaft and a second end portion, the improvement comprising:

(a) a clip member including a portion receiving the second end portion of the bimetal element and first and second wing portions oppositely disposed about said receiving portion and oriented generally parallel to the adjacent surface portion of the cover means;

(b) means for attaching each of said first and second wing portions to said adjacent portion of the cover means;

(c) said receiving portion of the clip member being configured to substantially prevent circumferential movement of said second end portion relative to the axis of rotation; and

(d) one of said clip member and the second end portion of the bimetal coil including means for restraining radial movement of the second end portion of the bimetal coil relative to said clip member.

4,190,141

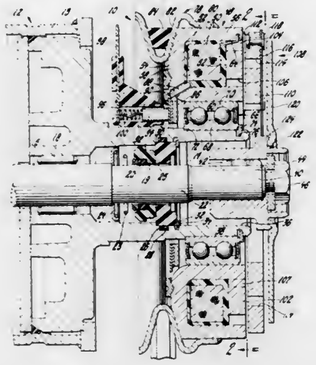
ELECTROMAGNETIC CLUTCH

George T. Bennett, Kettering, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 5, 1978, Ser. No. 912,427
Int. Cl.[2] F16D *27/10*
U.S. Cl. 192—84 C **2 Claims**

1. For use with an air-conditioning compressor including a casing having a fixed tubular extension extending from an end surface thereof and a drive shaft extending centrally through

said tubular extension, with a drive hub secured to said drive shaft, an electromagnetic clutch comprising a rotatable coil housing having inner and outer walls, an energizable electromagnetic coil mounted in said coil housing, a bearing mounted around said tubular extension adjacent said inner wall for rotatably supporting said coil housing, a slip ring secured to said coil housing, a lead connected between said slip ring and said coil, a brush holder secured to said tubular extension, a spring-loaded brush mounted in said brush holder for sliding engagement with said slip ring, drive means secured to said drive hub, an armature plate positioned adjacent said drive means on the coil side thereof, spring means secured at one end thereof to said armature plate and at the other end thereof to said drive means for movably supporting said armature plate and driveably connecting said armature plate to said drive



means, driven means on said coil housing, a clutch rotor secured to the end of said inner wall of said coil housing adjacent said armature plate and extending radially outwardly from said inner wall so as to provide a radially outer uninterrupted annular gap with respect to the adjacent inner surface of said outer wall of said coil housing, first slot means formed with spaced bridging in a radially inner portion of said clutch rotor providing an interrupted inner annular gap adjacent said inner wall, and second slot means formed with spaced bridging in said armature plate providing an interrupted annular gap intermediate said uninterrupted annular gap and said inner annular gap, the arrangement providing a magnetic flux path having the characteristic that no shorting can occur across said uninterrupted outer annular gap so that said armature plate is attracted more quickly with stronger magnetic force when said electromagnetic coil is energized.

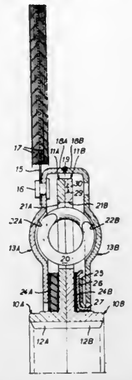
4,190,142

TORSION-DAMPING ASSEMBLIES WITH TWO-PART HUBS E.G. FOR FRICTION CLUTCHES

Jacques Berlioux, Sucy-en-Brie, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 23, 1978, Ser. No. 880,578
Claims priority, application France, Feb. 25, 1977, 77 05529
Int. Cl.² F16D *3/14*
U.S. Cl. 192—106.2 **15 Claims**

1. A torsion damping assembly comprising two coaxial members rotatably mounted relative to each other, and circumferentially disposed resilient means interposed between said members, a first of said members comprising two one-piece hub parts, each hub part being formed of one integral piece of metal with each hub part comprising an annular radially extending elemental web and a cylindrical inner flange integrally joined to said elemental web, said cylindrical flange having integrally formed on the inside surface thereof spline means for coupling said hub part to an axial shaft, said elemental webs having openings or cutouts facing one another, opposed edges of said elemental webs defining in part said openings or cutouts serving as bearing surfaces for said resilient means; a second of said members comprising at least one annular plate member disposed annularly around said hub parts



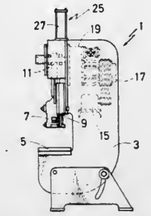
parallel to said webs, said annular plate member having recesses formed therein and cooperating with said openings or cutouts for accommodating said resilient means.

4,190,143

METHOD AND DEVICES FOR SAFETY FOR MECHANICAL PRESSES

Naoki Orita, Machida, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Dec. 28, 1977, Ser. No. 865,191
Claims priority, application Japan, Dec. 28, 1976, 51-157441; Mar. 29, 1977, 52-34024
Int. Cl.² F16D *21/08, 67/02;* **F16P** *3/00*
U.S. Cl. 192—145 **8 Claims**



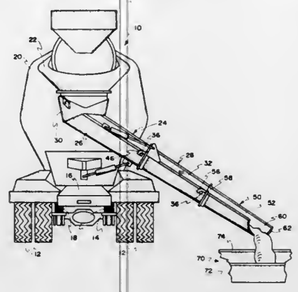
1. A mechanical press comprising a press ram mounted on a crank shaft adapted for reciprocatory movement along a vertical path between uppermost and lowermost points on said path, motor means operatively coupled to said crank shaft for turning said crank shaft through 360° rotation including an upper dead center position, main clutch and brake means for disconnecting said crank shaft from said motor means and stopping said ram at said uppermost point after completion of a stroking cycle when said crank shaft is at said upper dead center position, auxiliary clutch means operatively connected in series with said main clutch means and which is normally engaged for transmitting power from said motor means to said crank shaft, and means for automatically disengaging said auxiliary clutch means if said crank shaft unintentionally rotates past said upper dead center position upon completion of a stroking cycle of said ram.

4,190,144

CONCRETE DISCHARGE CHUTES

Evart K. Lybbert, 79 Laurel St., Salt Lake City, Utah 84103

Filed Jun. 9, 1978, Ser. No. 913,986
Int. Cl.² B65G *11/00*
U.S. Cl. 193—10 **8 Claims**



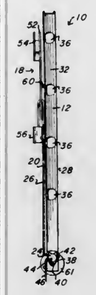
1. A concrete discharge chute section comprising:
a substantially rigid trough having an open top defined by spaced top edges;
connector means at the proximal end of the chute section sized, shaped and located to match and releasably connect to chute means of a concrete ready mix truck;
generally U-shaped substantially rigid discharge means at the distal end of the chute section comprising distal trough means to accommodate, during use, displacement of concrete along a path having a substantial horizontal component and a substantial vertical component and a discharge edge at the end of the distal trough means causing concrete leaving the chute section to fall generally vertically as a stream over said discharge edge in substantial alignment with a concrete form independent of the orientation of the truck in relation to the concrete form, the longitudinal axis of the chute section being at an angle other then 90 degrees to the form when viewed in plan from above the truck.

4,190,145

CIGARETTE DISPENSING APPARATUS

Dana C. Paret, East Shore Dr., Silver Lake, N.H. 03875

Filed Sep. 22, 1978, Ser. No. 944,789
Int. Cl.² G07F *11/04*
U.S. Cl. 194—1 P **9 Claims**



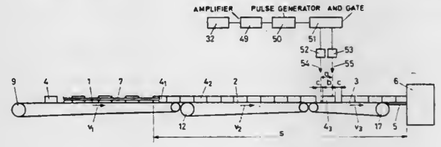
1. Vending apparatus for dispensing cylindrical items one at a time comprising:
an elongated storage magazine for storing a plurality of cylindrical items to be dispensed and having an inlet opening for receiving the items and an outlet opening below the inlet for discharging the items;
a generally L-shaped dispensing gate rotatably mounted to the storage magazine across the outlet opening thereof and shiftable from a first blocking position in which the cylindrical items are retained in the storage magazine to a second dispensing position in which a single item is allowed to drop through the outlet opening; and
a balance beam rotatably mounted to the storage magazine and having a counterweight attached to one end and a generally u-shaped coin receptacle at the opposite end open on a top side for receiving a coin and on an end side for allowing a coin to roll out of the receptacle with said balance beam coupled through a linkage to the dispensing gate such that the counterweight normally positions the balance beam for maintaining the gate in a blocking position but deposit of a coin into the coin receptacle tilts the balance beam and shifts the dispensing gate to the discharge position.

4,190,146

APPARATUS FOR CONVEYING FRAGILE ITEMS

Max Knuchel, Gächlingen, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 6, 1978, Ser. No. 922,302
Claims priority, application Switzerland, Jul. 13, 1977, 8690/77
Int. Cl.² B65G *47/31*
U.S. Cl. 198—460 **10 Claims**



7. Apparatus for reducing the accumulation pressure between succeeding items being conveyed in succession along an accumulation path to a receiving device, comprising: first and second transport means disposed in succession in a conveying path, and constituting the accumulation path; means connected to control the advance of items along the accumulation path in a manner to produce gaps between successive items in the conveying direction along the accumulation path; and sensing means disposed for monitoring the length of each gap and connected to said control means for causing the rate of supply of items to the outlet end of the accumulation path to be higher than the rate at which items are being conveyed from the accumulation path to the receiving device for a selected time period following each occurrence of a gap length exceeding a selected value, and to be lower than the rate at which items are being conveyed from the accumulation path to the receiving device at all other times, whereby a cyclic variation in gap length is produced between successive gaps; and wherein said first transporting means is connected to be controlled by said control means to advance at a first speed during each selected time period and at a second speed lower than the first speed at all other times, and said second transporting means is disposed downstream of said first transporting means and is driven to advance at a speed proportional to, but higher than, the current advance speed of said first transporting means.

4,190,147

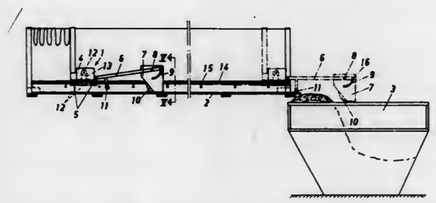
DEVICE FOR TRANSPORT OF BULK MATERIAL OR THE LIKE

Hans M. Hansson, Mölneby, Basgärden, Överlida, Sweden (510 60)

Filed Aug. 15, 1977, Ser. No. 824,820
Int. Cl.² B65G *25/10*
U.S. Cl. 198—746 **2 Claims**

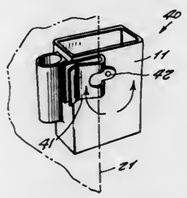
1. A transfer device for moving bulk material along a path to a collecting receptacle comprising an elongated chute having a surface defining said path, said surface including an inner end

and a material discharge end, a trolley mounted for longitudinal reciprocating movement along said chute, elongated arm means pivoted to said trolley and extending longitudinally of said chute, a scraper assembly including scraping means pivoted to said arm means at a distance from said trolley, guide means depending from said arm means for engagement with said surface and drive means for moving said trolley along said chute between a first end position adjacent said inner end of said surface in which first position said scraping means engages said surface and said guide means is clear of said surface and a second end position in which said guide means engages said surface adjacent said discharge end and said scraping means projects beyond said discharge end below the level of said surface, movement of said trolley from said first to said second



end position causing the scraping means to scrape said surface, move off the discharge end of said surface and drop below the level of said surface until said guide means engages said surface, and movement of the trolley from said second to said first end position causing said scraper assembly to engage the chute at said discharge end of said surface and pivot said assembly relative to said arm means into a position in which said scraping means is clear of said surface, said scraper assembly further including projecting means engaging said surface during subsequent return movement of the trolley to said first end position for retaining the scraping means clear of said surface wherein said trolley includes guide wheels with peripheral grooves and said chute includes track means having upper and lower sections received in said grooves.

4,190,148
CIGARETTE AND CIGARETTE LIGHTER CASE AND COVER
Palmer W. Schade, II, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Oct. 19, 1976, Ser. No. 733,846
Int. Cl.² A24F *15/00*; B65D *85/10*; A45C *15/00, 1/04*
U.S. Cl. 206—89 **2 Claims**



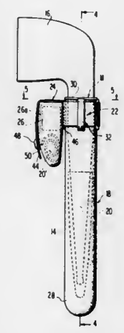
1. A cigarette and cigarette lighter case assembly, comprising a case with an open end and a removable cover, said case having a cavity for receiving a pack of cigarettes and a separable cavity for receiving a cigarette lighter, said cover being adapted to fit over said open end and close simultaneously said openings to both said cavities, in combination with a two pronged U-shaped clip pivotally secured to a rear side of said case by pivot means whereby both said pivot and said clip are spaced from said open end and rear side respectively to permit closure of said case by said cover, said clip being pivotable to a position whereby the cigarette pack and lighter will be vertical when said case is mounted on a vertical edge of users garment with both said prongs engaging said garment, said clip being aligned parallel to a plane passing through the centers of said cavities.

4,190,149
ARTICLE CARRIER AND BLANK THEREFOR
James R. Oliff, Austell, and Richard K. Watkins, Lithonia, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Feb. 12, 1979, Ser. No. 11,481
Int. Cl.² B65D *85/62*
U.S. Cl. 206—145 **6 Claims**



1. A top gripping article carrier blank comprising a top wall (1), a pair of side walls (2,3) foldably joined respectively to the side edges of said top wall, a pair of end walls (6,7) foldably joined respectively to the end edges of said top wall, multiple neck receiving apertures (16–21) formed in said top wall, and characterized by a web panel (22,23,26,27) foldably joined to each end edge of each wall of one pair of walls along a fold line disposed at an acute angle to the fold line between the associated wall and said top wall, an anchoring tab (30,31,34,35) joined to each end edge of each wall of the other pair of walls along a fold line disposed at an acute angle to the fold line between the associated wall and said top wall, the outer edge of each of said anchoring tabs disposed at an obtuse angle with respect to the fold line between the associated wall of said other pair of walls and said top wall, and said anchoring tabs being spaced respectively from the associated web panel.

4,190,150
SANITARY PROTECTIVE SHEATH WITH DISPOSABLE ABSORBENT LINER FOR TOBACCO PIPE STEM
Raymond J. Bresell, 18 Moody Ave., Claremont, N.H. 03743
Filed Nov. 8, 1978, Ser. No. 958,914
Int. Cl.² A24F *3/00, 9/00*; B65D *65/02*
U.S. Cl. 206—244 **6 Claims**



1. A sanitary protective sheath assembly for sheathing a smoking pipe stem, cigarette or cigar holder mouthpiece or the like, said sheath assembly comprising:

an elongated tubular sheath, said sheath being closed at one end and open at the other to form a mouth for reception of the pipe stem,

a tubular absorbent material being transversely sized to fit within said sheath, being closed at one end and open at the other end and insertably carried within the closed end of said sheath,

means carried by said liner and projecting upwardly from said liner to the mouth of said sheath for effecting retrieval of said liner,

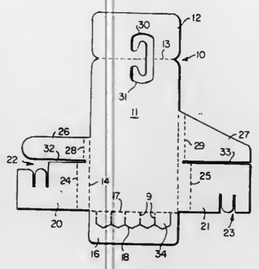
an adjustable closure strap surrounding said sheath adjacent said mouth for adjustably closing off said sheath at said mouth about the upper end of said pipe stem to frictional lock the sheath to a given variable diameter pipe stem, cigarette holder mouthpiece, etc,

a pouch carried by said strap exterior of said sheath, said pouch including a lockable cover permitting access to the pouch interior, and

said assembly including a cylindrical plug having a diameter less than the diameter of said sheath at the open end thereof;

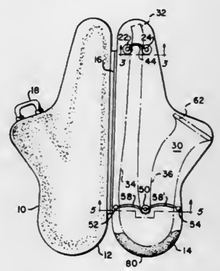
whereby replacement of the pipe stem with the plug permits the strap to close off the upper end of said sheath about said plug and to prevent contamination of the sheath interior or the disposable lining when the sheath is not employed in sheathing the pipe stem or the like.

4,190,151
DISPLAY HANGER
Frederick S. Russell, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.
Filed Nov. 20, 1978, Ser. No. 962,181
Int. Cl.² B65D *85/18*
U.S. Cl. 206—281 **1 Claim**



1. A display hanger for garments or the like formed from a single blank of relatively stiff material such as paperboard comprising, a main body panel having front and rear surfaces, said front surface being adapted to have printing matter applied thereon, a reinforcing flap foldably attached to the upper end of said main body panel and adhered to the unprinted rear surface thereof so that cut outs formed in both said reinforcing flap and main body panel coincide to form a means for suspending the hanger from a companion support member, a first pair of interlocking flaps foldably attached to the side edges of said main body panel for retaining one or more garments on said hanger, and a second pair of flaps foldably attached to the side edges of said main body panel for supporting the garments displayed, the improvement comprising an extension flap attached to the lower end of said main body panel that is normally folded out of view and adhered to the rear surface of said main body panel, said extension flap further comprising a plurality of separate tab elements that are printed with indicia to indicate incremental pricing information for the garments so displayed and that are adapted to be selectively folded into view, said tab elements being of substantially the same width and length but having an overall length that is less than the length of said extension flap so that the end of said extension flap remote from said tab elements can be adhered to the unprinted rear surface of said main body panel, said tab elements being separated from one another and from the extension flap by perforated lines so that when price changes occur, the previously exposed price tab elements may be removed and others folded into view.

4,190,152
MUSICAL INSTRUMENT CARRYING CASE
Richard L. Reiter, 36 Catherine Ct., Cedar Grove, N.J. 07009
Filed Feb. 27, 1979, Ser. No. 15,846
Int. Cl.² A45C *11/00*
U.S. Cl. 206—314 **9 Claims**



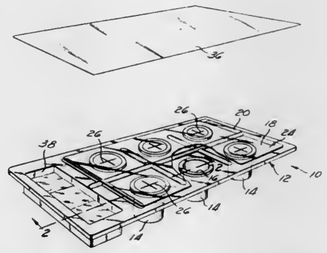
1. In a carrying case for storing and carrying a saxophone or similarly shaped musical instrument, said case including a floor and a cover portion; improved means for preventing said instrument from moving while in said case and for holding said instrument firmly in engagement with the floor of said case comprising:

a post extending upwardly from the floor of said case and located in the crook of said saxophone between the main body and the bell thereof;

resilient means secured to said post and to said floor and extending over said main body and holding the same firmly to the floor preventing movement thereof; and

further resilient means secured to said post and to said floor and extending over said bell and holding the same firmly to the floor preventing movement thereof.

4,190,153
SPONGE DISPOSAL TRAY
C. Eric Olsen, Ventura, Calif., assignor to California Medical Developments, Inc., Ventura, Calif.
Filed Oct. 23, 1978, Ser. No. 953,697
Int. Cl.² B65D *1/36, 81/36*
U.S. Cl. 206—362 **4 Claims**



1. A medicinal sponge disposal tray comprising:

a transparent frame;

a plurality of initially empty containers, each said container being integral with said frame, each said container having an open upper end;

a thin sheet material transparent access cover located over each of said open upper ends and fixedly secured to said

frame, said access cover including a plurality of slitted access openings with there being a single access opening connecting with each said open upper end of a said container, each said access opening being normally closed to enclose said empty container but being openable to permit insertion and deposit of a sponge into a said container and being automatically reclosable thereafter, entry into each container being only through its respective said slitted access opening; and

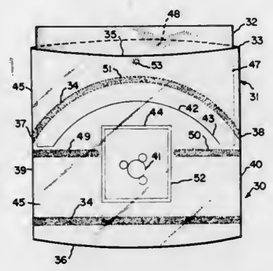
a thin sheet material sealing cover covering said access cover, said sealing cover preventing entry of foreign material through said access openings into said containers, said sealing cover being discardable to expose said access cover.

4,190,154

STERILE PACKAGE

James A. Clark, Honeoye Falls, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,063
Int. Cl.[2] A61B *19/02*
U.S. Cl. 206—438 **16 Claims**



1. An improved sterilizable, sterility maintaining, peelable package for sterile products which comprises:

envelope means;

peeling film means inserted in and extending from one end of said envelope means for opening a portion of said package and removal of said sterile product without contamination;

said peeling film means extending for only a portion of the length of said envelope means in order to facilitate the opening of said envelope means while at the same time minimizing the quantity of material required;

said peeling film means comprising an untreated sheet of sterilizable plastic film having a density appreciably dissimilar from the density of said envelope means; and

closure means for hermetically sealing said envelope means and for hermetically sealing said peeling film means to said envelope means.

4,190,155

COVERED, PORTABLE INSULATED PLATE

Faith Higley, 2003-29 Bay View Heights Dr., San Diego, Calif. 92105

Filed Nov. 13, 1978, Ser. No. 959,763
Int. Cl.[2] B65D *1/24, 25/14, 25/28*
U.S. Cl. 206—445 **1 Claim**

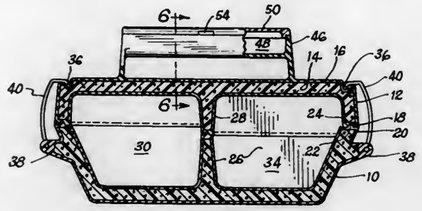
1. An insulative carrying case comprising:

(a) a lower insulative plate-defining member having impervious inner and outer wall surfaces with an insulation material therebetween, said member defining a first continuous peripheral edge and a first continuous vertical partition compartmentalizing said lower member;

(b) an insulative upper cover member having a second continuous edge metable with said first edge and a second continuous vertical partition matable with the first partition; said upper cover member having impervious inner and outer wall surfaces with an insulation material therebetween;

(c) fastening means to releasibly fasten said upper and lower members together in compressed relation with the edges and partitions sealingly mated to define a plurality of generally horizontally aligned and extended, sealed and mutually separate compartments;

(d) a carrying handle comprising a horizontally extended bar defining a hollow interior cavity having a hinged integral



cover lid for the containment of utensils and food condiments, said handle being supported by leg members integrally, unitarily connected to said bar and integrally, unitarily connected to the outer wall surface of said upper member substantially above the combined centers of gravity of said upper and lower member whereby a typical multi-course meal may be transported and stored for a number of hours while maintaining substantial temperature integrity and spacial fidelity to a conventionally served meal.

4,190,156

METHOD OF PACKAGING UNVULCANIZED NEOPRENE

Alain C. Adam, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 28, 1978, Ser. No. 946,713
Int. Cl.[2] B65D *85/70*
U.S. Cl. 206—447 **6 Claims**

1. A method of packaging unvulcanized, talc-treated, solid neoprene pieces for delivery to blending equipment, said method comprising placing the neoprene pieces in a bag made of a thermoplastic material and closing the bag by stitching with a synthetic polymer thread, the polymeric materials of which the bag and the thread are made being readily dispersible in the neoprene at the blending temperature to give a homogeneous dispersion at the weight levels at which they are used, the plastic bag having on a portion of one of its large surfaces a coating of a hot melt adhesive.

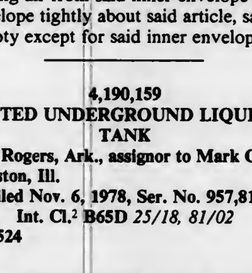
4,190,157

PHONOGRAPH COVER HOLDER (COVER-UP)

Mark S. Chatham, P.O. Box 14153, Milwaukee, Wis. 53214

Filed Nov. 6, 1978, Ser. No. 958,047
Int. Cl.[2] A47G *1/16*
U.S. Cl. 206—477 **3 Claims**

1. A phonograph record cover holder, comprising, in combination, a base and a disc molded of rigid plastic; said base comprising a circular member having a hole therethrough and pressure-sensitive adhesive on its rear side, and a rib means on its front side, said disc comprising a circular member having a rearward stem at the center of its rear side, said stem rotatably fitting in said hole through the center of said base, a rear side of said disc abutting against said rib means, said rib means forming spaces between said base and disc, for receiving phonograph cover corners, and said disc having a one-quarter



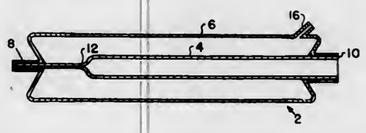
notch on its periphery for said cover corner to pass therethrough.

4,190,158

CONTAINER FOR DELICATE ARTICLES

Charles J. Ambrose, 2230 Benton St, Richland, Wash. 99352

Filed Sep. 15, 1975, Ser. No. 613,402
Int. Cl.[2] B65D *85/30, 81/02*
U.S. Cl. 206—522 **8 Claims**



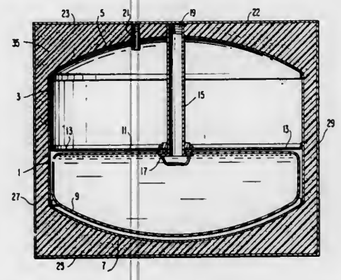
1. A container for fragile articles comprising an outer envelope of flexible sheet material, an elongated inner envelope of flexible sheet material for receiving an article, extending across said outer envelope, said outer envelope having normal dimensions in all directions greater than said inner envelope, the walls of said outer envelope being sealed to said inner envelope only adjacent each end of the latter, the interior of said inner envelope being vented to the atmosphere outside said outer envelope, and means for inflating said entire outer envelope, thereby expelling air from said inner envelope and collapsing said inner envelope tightly about said article, said outer envelope being empty except for said inner envelope.

4,190,159

ENCAPSULATED UNDERGROUND LIQUID STORAGE TANK

Jerry L. Hoyt, Rogers, Ark., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Nov. 6, 1978, Ser. No. 957,819
Int. Cl.[2] B65D *25/18, 81/02*
U.S. Cl. 206—524 **4 Claims**



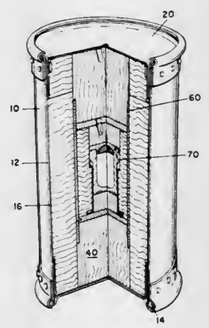
1. A liquid storage tank in a carton, the tank being spaced from the side walls of the carton on all sides, hardened plastic foam filling the space between the exterior of the tank and the interior of the carton, and at least one pipe fitting communicating with the interior of the tank and extending beyond the tank through the foam and endwise abutting the inner side of at least one wall of the carton.

4,190,160

ACCIDENT RESISTANT TRANSPORT CONTAINER

John A. Andersen, and James K. Cole, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1979, Ser. No. 18,098
Int. Cl.[2] B65D *81/04, 81/06, 85/30*
U.S. Cl. 206—591 **5 Claims**



1. An accident resistant container for shipping materials such as plutonium comprising a tubular steel housing, a metal load spreading tube of shorter length than said housing concentrically disposed within the housing and spaced therefrom having upper and lower end portions inset with respect to corresponding end portions of said housing, a first metal disk inset with respect to the lower end of said tube to provide a projecting skirt portion and secured to the tube forming a bottom support, a metal heat conductor member within said load spreading tube and spaced therefrom with a lower end portion secured to said first disk and projecting upwardly therefrom having an open upper end terminating within said metal tube for positioning and retaining therein a vessel with material such as plutonium therein, a second metal disk inset with respect to the upper end of said tube forming a tube closure and providing a projecting skirt portion, an annular wood filler intermediate said housing and load spreading tube, lower and upper wood fillers having end portions projecting into and abutting against respective of said metal disks and filling respective lower and upper end portions of said load spreading tube and central portions of said annular wood filler, an additional annular wood filler intermediate said load spreading tube and heat conducting member, and lower and upper wood fillers having end portions abutting respective of said metal disks to position said vessel and filling central portions of said additional annular wood filler.

4,190,161

COMPARTMENTED ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

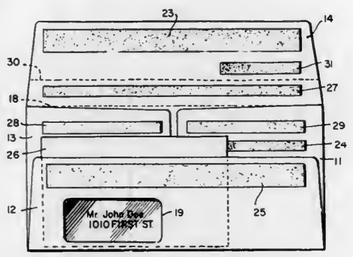
Continuation-in-part of Ser. No. 868,875, Jan. 12, 1978, abandoned. This application Nov. 29, 1978, Ser. No. 964,709
Int. Cl.[2] B65D *27/34, 27/04, 27/08, 27/16*
U.S. Cl. 206—620 **4 Claims**

1. A compartmented envelope formed from a single blank of envelope material and including at least one integral panel for

dividing the envelope into compartments consisting of a window compartment that is smaller in length and width than the exterior dimensions of the envelope and a second full sized compartment in front-to-back relation comprising, an elongated rear panel having two long edges and two shorter edges, a front window panel foldably attached to one of the long edges of said rear panel, a sealing flap foldably attached to the other long edge of said rear panel and a first end closue flap foldably attached to one of the shorter edges of said rear panel, the improvement comprising:

(a) a second end closure flap foldably attached to the opposed shorter edge of said rear panel, said second end closure flap being of a length sufficient to divide the envelope into its two compartments but not long enough to overlap the opposite end closure flap;

(b) a first area of pressure sensitive adhesive applied to said front panel;



(c) at least one additional area of pressure sensitive adhesive applied to said sealing flap for mating with said first area to seal both compartments

(d) separate adhesive areas applied to said sealing flap and to said second end closure flap which, when mated together, additionally seal the only compartment full-sized;

(e) a perforated line in said sealing flap between the adhesive areas applied thereto for permitting independent access to said window compartment; and,

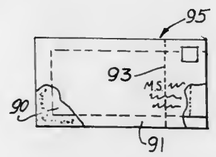
(f) a third area of pressure sensitive adhesive applied to said second end closure flap, all of said pressure sensitive adhesive being of the type that will only adhere to itself whereby when said sealing flap is folded to close the envelope, the third area of adhesive mates with an area of adhesive on said sealing flap flap to retain an item that is smaller in length than said envelope in position in the window compartment of said envelope.

4,190,162

STATIONERY HAVING SNAP-OPEN ENVELOPE WITH REMAILABLE PORTION

Eugene J. Buescher, St. Charles County, Mo., assignor to William R. O'Meara, Florissant, Mo.

Continuation of Ser. No. 480,621, Jun. 19, 1974, abandoned.
This application Jan. 26, 1978, Ser. No. 872,467
Int. Cl.[2] B65D *27/06*
U.S. Cl. 206—625 **14 Claims**



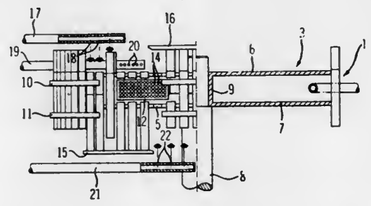
1. A mailing envelope capable of containing an element to be mailed comprising front and back sides connected in facing relation, and upper, lower, left and right edges when viewing said front side, said front and back sides including front and back panels, respectively, mailing address means on the exterior of said front panel for mailing the envelope, return address means on the exterior of one of said panels, first and second tear lines of perforations extending substantially between the upper and lower eges of the envelope respectively on said front and back sides dividing the envelope into separable left and right envelope portions each including a part of said back side and a part of said front side, one of said lines of perforations being disposed closer to the left edge of the envelope than the other of said lines of perforations so that upon separation of said left and right envelope portions the back side part of one of said envelope portions has a greater left-to-right dimension than that of the front side part of said one envelope portion to provide a closure end flap foldable over said front side part for closing said one envelope portion whereby said one envelope portion is usable to mail an element therein, said left and right envelope portions remaining together when the envelope is mailed, said one envelope portion includes said return address means for mailing said one envelope portion, said mailing address means and said lines of perforations being so relativey disposed on the envelope that said closure end flap is capable of covering at least a portion of said mailing address means when folded over said front side part of said one envelope portion to close said one envelope portion, said front and back panels being discrete sheets secured together by adhesive means between facing marginal portions of said panels but with sections of said facing marginal portions laterally between said tear lines of perforations being substantially free of said adhesive means so that said sections of said front panel are capable of movement relative to said sections of said back panel during the opening of the envelope to allow the opening of the envelope along said tear lines of perforations.

4,190,163

DEVICE FOR CHECKING THAT THE BANDS JOINING FILTERS TO CIGARETTES HAVE BEEN SEALED DOWN

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Jun. 27, 1978, Ser. No. 919,691
Claims priority, application Italy, Sep. 26, 1977, 3558 A/77
Int. Cl.[2] B07C *5/00*
U.S. Cl. 209—535 **8 Claims**



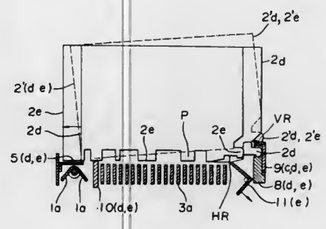
1. A device for checking that the bands joining filters to cigarettes have been sealed down, the device comprising transfer means for transferring the cigarettes, one next to the other, in a movement direction crosswise to their longitudinal axes, said transfer means being provided with a succession of housings into which the individual cigarettes fit, the longitudinal dimensions of which are less than the length of one filter cigarette, means for retaining the cigarettes in said housings, the device additionally including first pneumatic means placed laterally with respect to said transfer means, said first pneumatic means generating jets of air, directed axially with respect to the cigarettes, towards and in the direction of openings in axial alignment with said housings into which the cigarettes fit, the width of which being slightly greater than the section of one cigarette; first halting means for halting, inside said housings, the movement of the cigarettes passing through said openings with just that part around which the cigarette-filter jointing band has been placed, under the action of the said first pneumatic means, said first halting means being placed laterally with respect to said transfer means, on the opposite side thereof to where said first pneumatic means are positioned; cigarette interception and ejecting means for intercepting and ejecting the cigarettes from their respective housings in the transfer means, these being placed downstream of said first pneumatic means in the movement direction of said transfer means and laterally thereto on the same side as said first pneumatic means; second pneumatic means placed downstream of said cigarette interception and ejection means, in the movement direction of said transfer means and laterally thereto on the same side as said first halting means, said second pneumatic means generating jets of air directed towards and axially to the cigarettes; second halting means for halting the cigarettes moving inside their respective said housings in said transfer means under the action of said second pneumatic means, said second halting means being placed laterally with respect to said transfer means, on the side thereof where said first pneumatic means and said interception and ejection means are located downstream of the latter with respect to the movement direction of said transfer means.

4,190,164

RANDOM AUTOMATIC SELECTOR

Chiaki Matsuda, Tokyo, Japan, assignor to Mazda Cartex Company, Limited, Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,117
Int. Cl.[2] B07C *3/20*
U.S. Cl. 209—610 **5 Claims**



1. A random automatic selector comprising a plurality of code bars which are aligned in parallel and selectively descend corresponding to a designated code number; a plurality of file cases each having projections at the bottom corresponding to its own predetermined code number and further having a vertical separation recess at the rear edge and a horizontal separation recess also at the bottom edge; an elongated spiral rotor for sequentially lifting and dropping the file cases to drop a designated file cases away from the other file cases; means for engaging the vertical recess for separating the designated file case at the rear edge; means for holding a front edge of the designated file case; and means for engaging the horizontal recess for horizontally pushing out only the designated file case.

4,190,165

PIPE CHOCK STICK

Edward H. Collins, Medford, Oreg., assignor to The Mt. Pitt Company, Medford, Oreg.

Filed Dec. 27, 1977, Ser. No. 864,216
Int. Cl.[2] B65G *1/14*
U.S. Cl. 211—60 R **2 Claims**

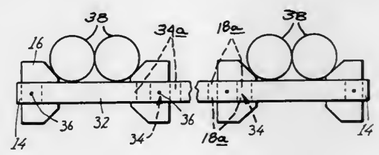
1. A pipe chock stick used in bracing pipes or the like comprising

an elongate board having a pair of opposed end regions and a pair of spaced-apart, substantially parallel faces,

brace means securable to one of said end regions for bracing pipes stacked against said faces,

means defining, intermediate said end regions, a longitudinally extending slot communicating with said faces,

a block having a pair of opposed arms, portions of which define opposed, longitudinally extending edges of a gullet formed centrally in said block, said block being dimensioned to be received within said slot, by insertion of one of said arms therethrough, wherein said arms extend beyond associated ones of said faces, and said gullet being



dimensioned to receive slidably therein, portions of said board adjacent and extending longitudinally of said slot, wherein the longitudinal position of said block within said slot may be selectively varied, and

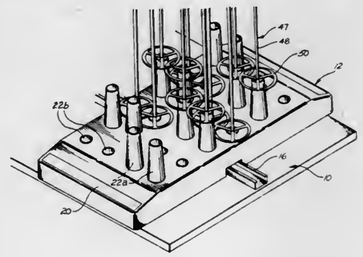
means for securing said block in said slot at a selected longitudinal position, wherein said block and said brace means, when the latter is secured to said board, are spaced apart a selected distance for bracing therebetween pipes stacked against said faces.

4,190,166

SKI POLE MOUNTING ASSEMBLY AND METHOD

James D. Allsop, 2144 Dellesta Dr., Bellingham, Wash. 98225

Filed Mar. 17, 1978, Ser. No. 887,806
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—60 R **39 Claims**



1. A mounting assembly for pairs of ski poles, each of which has a main pole portion, a basket at the lower end of the pole portion, and a tip portion extending downwardly from the basket, the baskets of each pole having a predetermined radius and diameter, and the tip portions each having a predetermined length, said display assembly comprising:

a. a base member having a longitudinal axis,

b. a plurality of platform members mounted to said base for limited movement thereon along said longitudinal axis, each platform member having its own longitudinal axis parallel to the base member longitudinal axis, and a lateral axis generally transverse to its longitudinal axis,

c. each platform having thereon pairs of mounting members, each of which has an upper end with an upwardly facing mounting socket of a predetermined depth dimension to receive therein a tip portion of a pole, the pairs of mounting members being arranged in first and second transverse rows, each row being made up of alternate pairs of mounting members and intermediate pairs of mounting members positioned intermittently with the alternate pairs of that row, the alternate pairs of mounting members of the first row being arranged in a staggered relationship with the alternate pairs

of the first row being in staggered relationship with the intermediate pairs of the second row,

d. said mounting members being arranged in generally longitudinal and transverse alignment, each of said mounting members being spaced from adjacent aligned mounting members by a distance greater than the radius of the baskets and less than the diameter of the baskets,

e. the alternate pairs of mounting members having their upper ends at a first upper level above their related platform, and the intermediate pairs of mounting members having their upper ends at a second lower level, said upper and lower levels being spaced from one another a vertical distance such that a vertical dimension from a basket of a pole mounted in one of said upper mounting members to an upper end of an adjacent lower mounting member is at least as great as a distance from an upper surface of a basket to a lower tip end of its related tip portion,

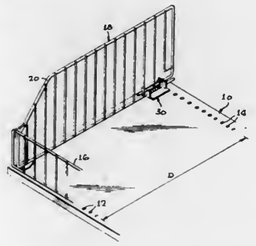
whereby ski poles in aligned adjacent mounting members have their baskets in overlapping relationship, with poles in alternate mounting members being able to be moved upwardly free of their mounting members without interference from baskets of adjacent poles, and with poles in intermediate mounting members being able to be moved upwardly free of their related lower mounting members, without interference from baskets in adjacent aligned mounting members of alternate pairs, and then moved longitudinally relative to their related platform to be free of the mounting assembly.

4,190,167

ADJUSTABLE WIRE DIVIDER

Richard E. Wells, 151 Avenida, La Habra, Calif. 91631, and Frank L. Kinda, 1511 5th St., Manhattan Beach, Calif. 90266

Filed May 25, 1978, Ser. No. 909,218
Int. Cl.² A47F *5/01*
U.S. Cl. 211—184 **6 Claims**



1. A wire divider useful for installation on shelves with front and rear holes spaced by a moderately variable distance, comprising:

a plurality of wires forming a largely rectangular divider with first and second end portions and upper and lower edges, including an outer wire that extends substantially along a closed path and that has wire end portions that overlap along the second end portion of the lower edge to provide a pair of spaced parallel wire portions extending parallel to the lower edge of the divider;

means mounted at said first end portion of the divider to fit into a shelf hole;

a foot having at least one hook for reception in a shelf hole, said foot having wire-engaging portions slideably engaged with both of said parallel wire portions to slide parallel to said wire portions and prevent rotation of the foot about its axis of sliding; and

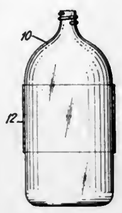
a spring biasing said foot to slide in a predetermined direction along said wire portions.

4,190,168

LABEL FOR RETURNABLE AND REFILLABLE BOTTLE AND ASSOCIATED METHOD

Pierre Jacques, 10 Captor Ct., Huntington, N.Y. 11743

Filed Dec. 22, 1978, Ser. No. 972,396
Int. Cl.² B65D *23/08*
U.S. Cl. 215—12 R **30 Claims**



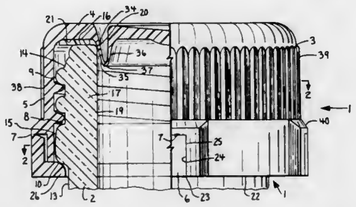
16. An article of manufacture comprising a bottle and a stretched sleeve encircling and compressively engaging said bottle, said sleeve having inner and outer portions, said outer portion including a fatty acid and having a greater degree of slip than said inner portion.

4,190,169

TAMPERPROOF PACKAGE

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Filed Jan. 15, 1979, Ser. No. 3,499
Int. Cl.² B65D *41/34*
U.S. Cl. 215—252 **11 Claims**



9. A tamperproof package comprising:

(a) a container having a circumferential sealing finish with a sealing rim at the upper end of said circumferential finish;

(b) inclined cam surfaces with a locking shoulder therebelow on said circumferential finish;

(c) a closure cap adapted to be received over said sealing finish; said closure cap comprising:

(1) a top wall of a size to cover said upper end of said sealing finish;

(2) a depending skirt integrally connected to the marginal edge of said top wall;

(3) inclined camming surfaces on said skirt adapted to engage said sealing finish inclined cam surfaces whereby said surfaces urge said cap upwardly when said cap is rotated for removal;

(4) one or more detent means flexibly connected to said skirt for relative flexing in radial planes toward and away from an axis concentric with and perpendicular to said top wall, said detent means and skirt being integrally connected parts of a unitary cap structure of plastic material; said detent means having circumferentially opposed side edges;

(5) said peripheral skirt and detent means having portions adapted to extend below said locking shoulder with said skirt portions and said detent means having fastener means for interlocking engagement with each other incident to said radial inward movement of said detent means to secure said detent means; and

(6) said detent means respectively including inwardly projecting lugs adjacent their lower extremities for holding

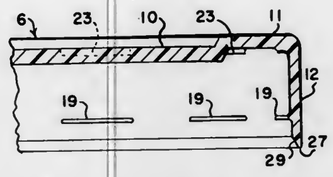
engagement beneath the said locking shoulder whereby rotating the cap for removing same from a container will effect the breaking of the fastener means and outward movement of the detent means.

4,190,170

SNUFF CAN AND THE LIKE

Eugene J. Boyd, Addison, Ill., assignor to United States Tobacco Company, Greenwich, Conn.

Filed Jan. 15, 1979, Ser. No. 3,748
Int. Cl.² B65D *51/16*
U.S. Cl. 215—307 **6 Claims**



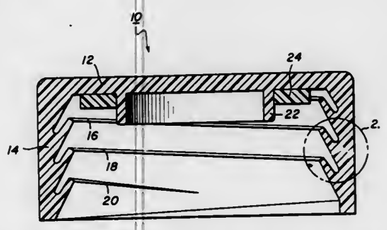
1. A can construction comprising, the combination of, a can formed by a bottom wall and an upwardly extending cylindrical side wall, and a lid comprising a top wall and a downwardly extending peripheral flange having an inside diameter and configuration such as to be snugly received upon the top of said cylindrical side wall, said flange having a circumferential rib structure upon its inner surface projecting radially inwardly from adjacent its bottom edge, said side wall having a circumferential rib structure projecting radially outwardly from said side wall and positioned so that its bottom edge mates with the top edge of the first-named rib structure so as to hold said lid onto the top of said can, said can and said lid being of plastic and being sufficiently deformable so that said flange can be flexed outwardly to remove the lid from the can and to flex when the lid is being installed onto the can, said can having a plurality of vertical vent passageways from the top of said can and past the said rib structure on said side wall, said rib structure on said flange having a plurality of vent gaps which are so positioned that one or more of said vent passageways is in alignment with one or more of said vent gaps.

4,190,171

CLOSURE WITH COMPENSATING THREADS

Lee K. Kulle, Mundelein, and William L. Rudzena, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 2, 1979, Ser. No. 9,388
Int. Cl.² B65D *41/04*
U.S. Cl. 215—329 **7 Claims**



1. A container closure for threadedly engaging the externally threaded neck of a container, the closure being internally threaded along its side wall, the improvement comprising:

said closure thread extending inwardly toward the central axis of the closure and defining an angle of less than 45 degrees with respect to said central axis;

said closure thread tapering inwardly as it extends toward said central axis and being generally flexible but being sufficiently rigid to prevent a lower thread from contacting an immediately higher thread during flexing of the threads;

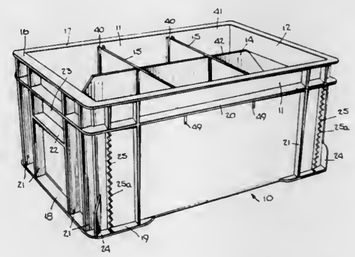
whereby said container closure may be threaded onto an externally threaded container and it will compensate for the variations in the mating thread geometry.

4,190,172

BEVERAGE BOTTLE CASE

Theodor M. Box, 1108 Aileen Rd., Brielle, N.J. 08730

Filed Jun. 1, 1976, Ser. No. 691,627
Int. Cl.² B65D *1/24, 21/00*
U.S. Cl. 220—21 **2 Claims**



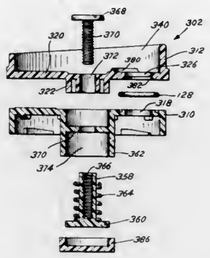
1. In a beverage transport case of the type adapted for stacking with other similar cases and having side, end and bottom walls and upper and lower stacking flanges, and further including inner beverage container-receiving compartmentation, and bottom stacking recesses adapted for engagement with the tops of beverage containers in a case below such case in a stack, said case being of the type wherein the top portions of stored beverage containers extend upwardly beyond the top edge of said case, the improvement comprising inner compartmentation partitions releasably engaged with and disposed within said case and being removable therefrom to provide an open interior of said case for the storage of other goods, vertical slotted portions on the inner surfaces of said side and end walls adapted to slideably receive and mount associated portions of said partitions to provide subcompartmentation within said case, said partitions being capable of disassembly from one another and stowable within said case against the inner bottom thereof, said slotted portions including locking apertures extending through said side and end walls and complementary shaped projections on said partitions releasably engaging said apertures in assembled condition within said case, a raised rectangular reinforcing rib network disposed on the inner bottom of said case having a plurality of spaced parallel longitudinal ribs extending from end to end of the case and a plurality of spaced parallel transverse ribs extending from side to side of the case and intersecting said longitudinal ribs, said network including a plurality of diagonal ribs extending through the corners of said rectangular network to divide said inner bottom into a plurality of congruent right isosceles triangular areas and provide raised bottom support means for containers disposed within said case, said partitions having a plurality of bottom tabs releasably engaging said ribs to lock them in position in assembled condition, and a plurality of exterior vertical flanges on said case having outer sawtoothed edge configurations to provide enhanced frictional contact of said case with handling equipment.

4,190,173

BEVERAGE CONTAINER

LeRoy W. Mason, Baraboo, and Frederick J. Furrer, Wisconsin Dells, both of Wis., assignors to Flambeau Products Corporation, Baraboo, Wis.

Continuation of Ser. No. 877,678, Feb. 14, 1978, abandoned. This application Aug. 4, 1978, Ser. No. 930,919
Int. Cl.² A47G *19/22*; B65D *51/18*
U.S. Cl. 220—203 **6 Claims**



1. An improved beverage container comprising, in combination:
- a beverage receptacle having an open top and a rim about said open top; and
- a dispensing assembly including,
- a first dispensing member having a generally planar portion with a first opening defined therein and a first sleeve portion with a passageway defined therein interrupted by a radially, inwardly extending ledge,
- a second dispensing member having a generally planar portion defining a second opening and a second sleeve portion defining a second passageway;
- said first dispensing member and said rim cooperatively defining means for releasably securing said dispensing assembly atop said receptacle so that said dispensing assembly is sealed thereto against beverage leakage and so that said beverage may be placed in said beverage receptacle through said open top;
- said first dispensing member and said second dispensing member cooperatively defining means for (1) rotatably pivotly mounting said second dispensing member atop said first dispensing member, said second dispensing member thereby rotatably pivotable to and from a pivotal position wherein said second opening is in registry with said first opening so that the beverage may be dispensed from said beverage receptacle through the openings, and (2) automatically venting said receptacle through the first and second openings when the pressure within said receptacle exceeds a pre-selected maximum pressure when said first and second openings are not in registry,
- said mounting and venting means including,
- a post member slidably mounted within said first passageway of said first sleeve portion and having an end;
- spring means mounted on said post member compressible between said end and said ledge; and
- a fastener member fastened to said post member through said second passageway of said second sleeve portion for compressing said spring means to a pre-selected biasing force,
- whereby said second dispensing member is maintained in relation to said first dispensing member whenever said pre-selected biasing force is not less than the force of said pressure and is moved to permit said venting through said first opening whenever the force of said pressure acting on said second dispensing member exceeds said preselected biasing force.

4,190,174

DRINKING RECEPTACLE COVER WITH A LIP OPERATED VALVE

Irwin Haimowitz, Los Angeles, Calif., assignor to Thermo-Seal, Inc., Los Angeles, Calif.

Filed Jan. 29, 1979, Ser. No. 7,396
Int. Cl.² A47G *19/22*
U.S. Cl. 220—254 **5 Claims**



1. In a cover for a drinking receptacle having a lip operated valve, with the receptacle having an open top defined by a circular rim portion of the receptacle:
- a. two thin layers of a rigid resilient material of circular formation presenting a circular periphery and snugly assembled in a nested relation;
- b. a downwardly opening channel formed immediately adjacent to said periphery for receiving the rim portion of said receptacle;
- c. both of said layers being formed with an opening defined by a straight edge margin proximate the center of the cover diverging side edges extending radially outwardly from the ends of said straight edge margin towards the periphery of the cover and a curved end edge between the side edges and located closely adjacent to the periphery of the cover;
- d. the inner layer of said cover having a straight end wall upstanding integrally from the straight edge margin of the opening of said inner layer, side walls upstanding from adjacent the diverging side edges of said opening of said inner layer and a curved end wall upstanding from adjacent said curved end edge of said opening of said inner layer;
- e. said side and curved walls being formed with a flange that is integral therewith and outstanding therefrom;
- f. the top layer of said cover having a straight end wall upstanding integrally from the straight edge margin of the opening of the top layer, diverging side walls having ends integrally joined to the straight end wall of said top layer and a curved end wall integrally joined to the ends of said side walls more closely adjacent to the periphery of the cover; and
- g. said lower and upper layers of that portion of the cover in which the opening is formed constituting a two ply valve with the flange on the lower ply engaging the underside of the top layer of the cover when the valve is in closed position and said straight walls on the upper layer of said cover constituting a hinge which permits a downward movement of the valve when pressure is applied thereto by the lips of a drinker and the resiliency of the hinge returns the valve to closed position when the pressure of the drinkers lips is removed therefrom, with the return movement being limited by the engagement of said flange with the underside of said top layer.

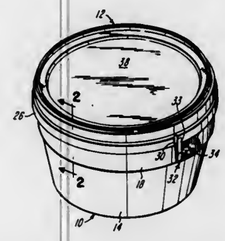
4,190,175

CONTAINER AND CLOSURE CONSTRUCTION FOR RESISTING TAMPERING

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Filed Mar. 25, 1976, Ser. No. 670,235
Int. Cl.² B65D *41/30*
U.S. Cl. 220—270 **22 Claims**

1. An assembly comprising:
- a molded one-piece plastic container having a generally upright wall portion bounding an opening thereto,
- a molded one-piece plastic closure having an integrally molded panel for covering said opening and a skirt surrounding said wall portion,
- said container and said closure having interfitting means to provide a snap fit therebetween so that a prying force must be applied to the distal edge of said closure skirt to remove said closure from said container, and
- closure shield means molded as part of said container projecting outwardly from and substantially surrounding said wall portion to shield said distal edge of said closure skirt sufficiently that it would be difficult to pry said closure from said container by manual manipulation without the aid of a mechanical device.
- said closure shield means including a tearable section immediately adjacent said wall portion for severably attaching



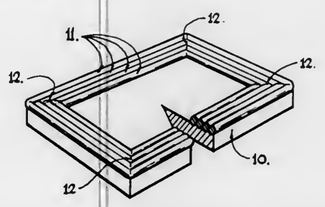
said shield means to said wall portion constructed so that said shield means may be sufficiently detached from said wall portion to expose said distal edge for manual manipulation so that said closure may be pried from said container without the aid of a mechanical device,
- said shield means comprising a first wall projecting outwardly from said wall portion, said tearable section comprising a reduced thickness portion of said first wall engaging said wall portion, said shield means further comprising a second wall projecting upwardly from the outer end of said first wall and generally parallel to said wall portion, said first and second walls cooperating with said wall portion to form a channel for receipt of the lower portion of said closure skirt.

4,190,176

SEALING COVER UNIT FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Jan. 23, 1979, Ser. No. 5,790
Int. Cl.² B65D *41/00*
U.S. Cl. 220—359 **5 Claims**



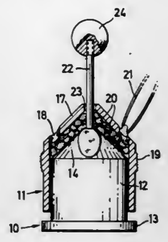
1. A cover unit for hermetically sealing a container for a semiconductor device comprising:
- a metallic cover element;
- and a plurality of turns of wire of a heat-fusible material formed and disposed on said cover element with the outermost turn substantially in registry with the periphery thereof and said turns being fused thereto at a plurality of spaced points.

4,190,177

PELLET DISPENSER FOR DENTAL PURPOSE

Hans M. Bausch, Monheimer Str. 16, 5000 Koln 60, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,651
Int. Cl.² B65D *83/00*
U.S. Cl. 221—56 **8 Claims**



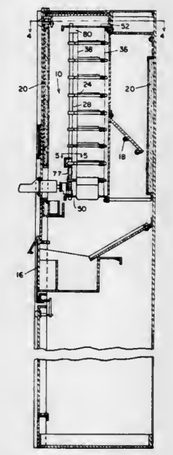
8. A pellet dispenser for dental purposes comprising:
- a substantially cylindrical vertical body having an inclined upper surface,
- a weighted hood covering said body and being movable relative thereto, said hood having a cylindrical skirt overhanging said cylindrical body and having an inclined lid facing said body upper surface, there being at least one dispensing aperture in said lid, pellets contained between said body inclined upper surface and said hood lid being dispensable individually through said at least one aperture, and
- wherein a rod projects upwardly from the top of said vertical body, wherein said hood has an opening for the free passage of the rod, and wherein a knob having a diameter greater than that of said opening is provided on the rod above said hood.

4,190,178

DROP SHELF VENDING MECHANISM

Roderick R. LeBron, III, 6120 N. 30th St., Omaha, Nebr. 68111

Filed May 30, 1978, Ser. No. 910,227
Int. Cl.² G07F *11/06*
U.S. Cl. 221—90 **14 Claims**



1. A drop shelf vending mechanism comprising a rack, a plurality of vertically spaced drop shelves provided with shafts rotatably journalled in said rack and movable from a lock position to a freely rotatable unlocked position, trigger means

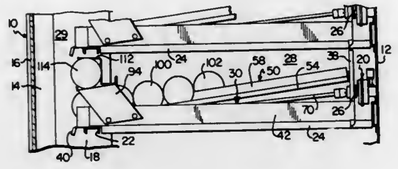
for moving said shafts from a lock position to a freely rotatable position to drop a vending article supported on the shelf for distribution to a customer, an operating shaft supporting said trigger means in sliding relation thereon for movement of said trigger to an operative position for each of said drop shelves and a trip lever means connected to said operating shaft responsive to the operation of a coin selector means to rotate said operating shaft and operate said trigger, said drop shelf shaft having a squared shaft portion adjacent a rounded portion and said trigger being operable to move said shaft from a shelf locking position wherein said square shaft portion is slidably fitted within a mating square hole of said rack to the freely rotatable position wherein said rounded portion is journalled within said mating square hole.

4,190,179

APPARATUS FOR STORING AND DISPENSING GENERALLY CYLINDRICAL PRODUCTS

Charles A. Moss, Lee's Summit, Mo., and Boley A. Andrews, Shawnee Mission, Kans., assignors to The Vendo Company, Overland Park, Kans.

Filed Oct. 4, 1978, Ser. No. 948,376
Int. Cl.² G07F *11/30*
U.S. Cl. 221—299 **17 Claims**



1. In a machine for dispensing articles of type adapted to roll upon a surface or revolution thereof:

article storage means for receiving and rollably supporting a plurality of said articles in a row aligned with the direction of rollability of said articles and for urging said articles into successively interengaging relationship with each other and toward one extremity of said storage means from which said articles are to be individually and successively dispensed upon movement thereof beyond said one extremity of said storage means;

shaft means rotatable through a plurality of rotational positions thereof including an article advancement and restraining position, an auxiliary restraint effecting position, a primary restraint removing and article releasing position, and a primary restraint restoring position;

a circumferentially asymmetric, primary restraining element disposed adjacent said one extremity of said storage means, operably coupled with said shaft means for rotation by the latter about an axis offset from but extending in substantially the same general direction as said row of articles, and configured and arranged for engaging and restraining a next to be dispensed article disposed at a location next adjacent said one extremity of said storage means against movement beyond the latter when said shaft means is in said article advancement and restraining, auxiliary restraint effecting, and primary restraint restoring positions thereof and for clearing said next to be dispensed article for movement beyond said one extremity of said storage means when said shaft means is in said primary restraint removing and article releasing position thereof; and

a circumferentially asymmetric, auxiliary restraining member spaced from said element in a direction generally toward the opposite extremity of said storage means, operably coupled with said shaft means for rotation by the latter about an axis offset from but extending in substantially the same general direction as said row of articles, and configured and arranged for engaging and restraining an article disposed in said row next adjacent said location for said next to be dispensed article against movement into said location when said shaft means is in said auxiliary restraint effecting, primary restraint removing and article releasing, and primary restraint restoring positions thereof and for clearing said next adjacent article for movement into said location for said next to be dispensed article adjacent said one extremity of said storage means when said shaft means is in said article advancement and restraining position thereof,

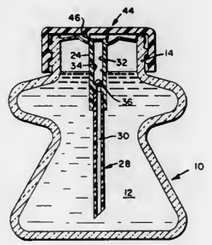
whereby said member will be disposed in a disposition out of engagement and restraining relationship to any of said articles, all of said articles will roll toward said one extremity of said storage means and a next to be dispensed article will occupy said location next adjacent said one extremity of said storage means and be engaged and restrained by said element against movement beyond said one extremity of said storage means when said shaft means is in said article advancement and restraining position thereof, said member will engage and restrain an article disposed in said row next adjacent said location when said shaft means is in said auxiliary restraint effecting position thereof, said element will be cleared out of restraining engagement with said next to be dispensed article to release the latter for movement beyond said one extremity of said storage means while said member continues to engage and restrain an article in said row next adjacent said location when said shaft means is in said primary restraint removing and article releasing position thereof, and said element will be moved when said shaft means is in said primary restraint restoring position thereof into a disposition for engaging and restraining said article disposed in said row next adjacent said location upon movement of same into said location when said shaft means is next in its article advancement and restraining position.

4,190,180

LIQUID DISPENSER

Robert A. Bennet, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Dec. 20, 1978, Ser. No. 971,384
Int. Cl.² B65D *37/00*
U.S. Cl. 222—207 **6 Claims**



1. A dispenser for use with a container of liquid having a vertical neck open at the top, said dispenser comprising:

a horizontal flexible diaphragm having a downwardly extending peripheral lip adapted for detachable sealing engagement with the periphery of the open neck whereby the diaphragm covers the top of the neck, said diaphragm having a top disposed concave cup-like recess centrally disposed therein and inwardly spaced from said lip, said recess having a central hole at the bottom thereof;

a vertically elongated tubular element extending through said hole and sealed thereto, said element having an open top end disposed above said hole in the recess, an open bottom end adapted to extend into said container below the level of said liquid, and a vertical bore interconnecting said top and bottom open ends, said bore having a vertically elongated enlarged region with a top and a bottom, said region being disposed intermediate the top and bottom ends of the element, the top end of the element having a plurality of horizontal spaced conduits interconnecting the bore with the interior of the recess;

a member disposed in said region and slidable up and down therein, said member being moved by gravity to the bottom of the region when the element is upright and being moved by gravity to the top of the region when the element is inverted; and

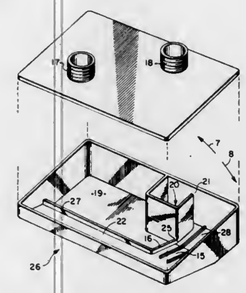
first and second sealing means cooperating with said member and disposed in the region adjacent the top and bottom thereof respectively, said member when disposed in the top of the region engaging the first means and when disposed in the bottom of the region engaging the second means, each means when engaged by said member forming a closed check valve through which said liquid cannot pass.

4,190,181

DISPENSING DEVICE

Gerard Arnaud, Beausoleil, France, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1978, Ser. No. 876,796
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705804; Feb. 11, 1977, 7704108[U]
Int. Cl.² G01F *11/26*
U.S. Cl. 222—456 **8 Claims**



1. A dispenser device for dispensing liquid medium, particularly adapted for being mounted in the door of a dishwasher, the door of which is pivotably mounted on a horizontal pivot axis and is pivotable between a lower position and an upper position, said dispensing device being provided with a reservoir and a dosing chamber for placing in readiness for dispensing a measured quantity of liquid, characterized by the fact that a scooping chamber and an inclined wall are provided, that the bottom of the scooping chamber is on a higher level than the bottom of the reservoir when the door is in its upper position and that the medium stored in the reservoir will flow into the scooping chamber and from there over the inclined wall into the dosing chamber when the door is pivoted into its lower position.

4,190,182

SKI CARRIER

Dana Hickey, Merrimack, N.H., assignor to Ski Tree, Inc., Nashua, N.H.

Filed Feb. 17, 1978, Ser. No. 878,798
Int. Cl.² A45F *5/10*
U.S. Cl. 224—45 S **7 Claims**

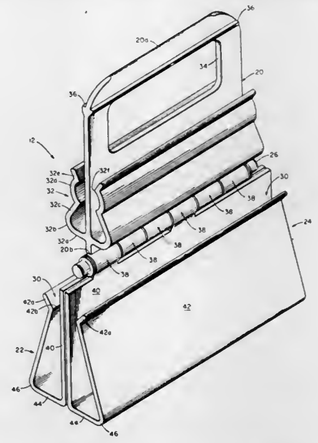
1. A hand held carrier for a pair of skis and a pair of ski poles comprising,

handle means having a hand opening and having first hinge means formed on one edge that extends generally in said first direction,

first and second panel means having second and third hinge means, respectively, formed on their upper edges that extend generally in said first direction, said first, second and third hinge means being mutually intermeshed and axially aligned along said first direction,

a hinge pin pivotally engaging said first, second and third hinge means,

said first and second panel means each including an inner wall, an outer wall and a bottom wall spanning said inner and outer walls that together define a ski-receiving channel, said walls being formed integrally of a resilient material having an inherent tendency to assume a relaxed position, said outer wall being deflected laterally away from a relaxed position proximate said inner wall when one of said skis is received in said channel to develop a gripping force on said one ski, and



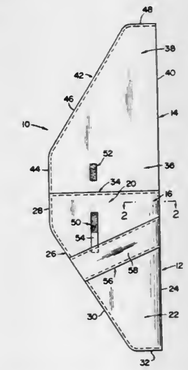
clip means formed integrally with said handle means of a resilient material for releasably engaging a pair of ski poles each extending generally in said first direction.

4,190,183

HAND GUN CASE

Donald Yates, 4538 W. Knox, Tampa, Fla. 33614

Filed Oct. 10, 1978, Ser. No. 950,136
Int. Cl.² F41C *33/02*
U.S. Cl. 224—238 **4 Claims**



1. A hand gun case for storage of a pistol comprising a main body having an opening formed in the upper portion thereof to form a pocket or enclosure to receive and house the pistol and a closure flap movable between an open and closed position extending outwardly from said main body adjacent said opening to enclose the pistol within the hand gun case when in said closed position, a first closure element including a first and

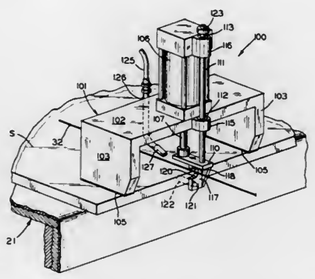
second member formed on said main body and said closure flap respectively to secure said closure flap in said closed position when said first and second members are operatively engaged to each other, said first closure element further includes a secondary flap movable between a first and second position to selectively render said first closure element inoperative when in said second position, and a second closure element formed on said main body to selectively secure said closure flap in said closed position, said secondary flap being secured to said main body adjacent said first member such that a portion of said secondary flap normally unlies said second closure element to retain said secondary flap in said first position and disposed between said first and second members when in said second position.

4,190,184

METHOD OF AND APPARATUS FOR THERMALLY CUTTING GLASS

Waldemar W. Oelke, Rossford, and Ralph C. Poplawsky, Sylvania, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 23, 1978, Ser. No. 936,140
Int. Cl.² C03B *33/02*; B26F *3/12*
U.S. Cl. 225—2 **12 Claims**



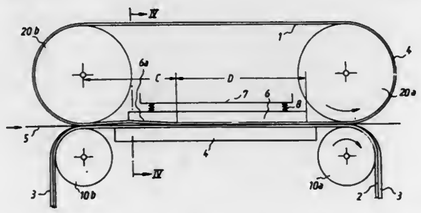
1. A method of cutting glass along a desired line of cut comprising: scoring one edge of a glass sheet, applying concentrated heat against one surface of the glass sheet along a narrow line coincident with a desired line of cut causing said sheet to split progressively from said scored edge in a running cut along said line towards the opposite edge of said sheet, and flexing said sheet along said desired line of cut adjacent said opposite edge of said sheet to assist in the severance of said sheet and confine said running cut to said intended line of cut.

4,190,185

ARRANGEMENT FOR TRANSPORTING PHOTOGRAPHIC FILM, AND THE LIKE

Kurt Thate, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,138
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2503954
Int. Cl.² B65H *17/24, 5/02*
U.S. Cl. 226—172 **7 Claims**



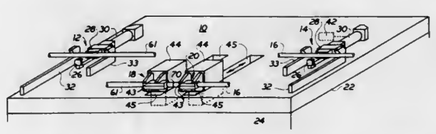
1. An arrangement for transporting flexible sheet material, particularly photographic film, X-ray film, or the like, of the type which should not be physically contacted at its major surfaces, the arrangement comprising in combination, transport-force-applying means for engaging the sheet material at only the lateral edge portions of the sheet material and effecting transport of the sheet material along a predetermined transport path by directly exerting transport force upon only the lateral edge portions of the sheet material, without physically contacting the major central portion of the sheet material in order to prevent damage to such central portion, and including tensioning means operative during sheet material transport for tensioning the sheet material in direction transverse to its transport direction to an extent sufficient to prevent sagging or bulging of the sheet material during such transport, wherein the transport-force-applying means comprises guides and a pair of first conveyor belts trained about the guides to define the transport path, each first belt frictionally engaging a respective one of the lateral edge portions from one of the two sides of the material for exerting frictional transport force upon such lateral edge portion in the direction of elongation of the belt, and wherein the tensioning means comprises frictional engaging elements arranged to frictionally engage the lateral edge portions from the other of the two sides of the material, the frictional engaging elements of the tensioning means being movable in direction away from the longitudinal centerline of the travelling sheet material for effecting the transverse tensioning of the sheet material, wherein the friction coefficient of the frictional engaging elements, relative to the sheet material, is greater than the friction coefficient of the first conveyor belts, wherein the transport-force-applying means further comprises a pair of second conveyor belts cooperating with the first belts to frictionally engage the lateral edge portions of the sheet material between the first and second belts, and wherein the frictional engaging elements are provided on the second belts and have the form of elastically resilient elements extending along the whole length of the second belts and pointing towards the sheet material and inclined in direction away from the longitudinal centerline of the travelling sheet material, the transport path for the sheet material having at least three sections, the transport-force-applying means and the tensioning means comprising means for lightly pressing the conveyor belts against each other during travel thereof along the first and third sections but not the second section to effect outward displacement of the frictional engaging elements along the first and third sections but not the second section, whereby to permit the frictional engaging elements to reassume a non-displaced regenerated condition during travel along the second section so as to make possible renewed outward displacement during travel along the third section.

4,190,186

PREPARATION OF TUBE FOR WELDING

Leonard J. Flowers, Oakmont, Pa.; Melvin R. Fahnestock, Parkersburg, W. Va., and James L. MacIntosh, Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 15, 1978, Ser. No. 942,542
Int. Cl.² B23K *31/06*
U.S. Cl. 228—15.1 **7 Claims**



1. Apparatus for preparing two tubes to be welded together at their ends, and for placing the tube ends in opposed, abutting relationship for welding, the apparatus comprising
means for annealing a length of each tube before the ends of the tubes are placed in abutting relationship for welding,

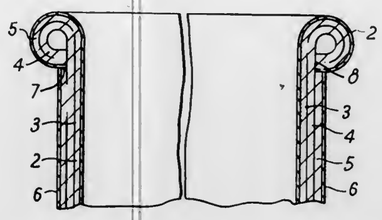
means for stretching the length of each tube after it is annealed and while the tube is in a heated condition to insure that the length is straight for welding,
means for severing an end portion from the length of each tube after it is annealed to provide two annealed tube ends for welding,
means for placing and holding the annealed ends of the two tubes in abutting position to be welded together, and
means for forcing the abutting ends together for welding and in a manner that will upset the material of the tube ends during welding.

4,190,187

TUBULAR CONTAINERS

Thomas G. Nelms, London, England, assignor to Rolex Paper Company Ltd., Slough, England

Filed Jul. 12, 1978, Ser. No. 923,904
Claims priority, application United Kingdom, Jul. 20, 1977, 30536/77
Int. Cl.² B65D *3/04, 5/04*
U.S. Cl. 229—5.5 **11 Claims**



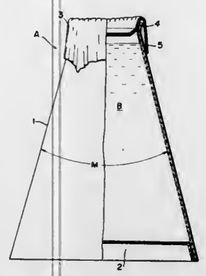
1. A tubular container whose wall at at least one end is of thinner gauge than, and radially offset relative to, the adjacent wall portion, said thinner gauge wall portion being curled over through more than 270 degrees to constitute a bead occupying the area of said radial offset and projecting radially therefrom for sliding engagement with a closure.

4,190,188

CONTAINER AND CONE FOR SAME

Koichiro Ohmori, Tokyo, Japan, assignor to Honshuseishi Kabushiki Kaisha, Japan

Filed May 5, 1978, Ser. No. 903,065
Int. Cl.² B65D *13/04, 41/48, 41/44*
U.S. Cl. 229—5.6 **16 Claims**



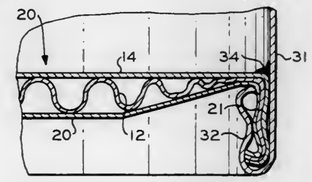
1. A sealed container comprising:
a hollow truncated cone shaped body made of paper sheet material having air tightness, the top end of said body being smaller in size than the bottom and thereof, said smaller top end having an opening defined by the upper marginal edge portion of said sheet material which extends upwardly and outwardly;
means for closing said bottom end of said body; and
a cover means made of sheet material being adhered to the inner surface of said marginal edge portion so as to make said container air-tight.

4,190,189

CLOSURE MEMBER FOR A CONTAINER

Laurence R. DeForest, Kansas City, Mo., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Apr. 17, 1978, Ser. No. 897,082
Int. Cl.² B65D *3/10*
U.S. Cl. 229—5.6 **10 Claims**



1. A container structure comprising:
a corrugated closure member having a corrugated center layer bounded on opposite sides by inner and outer layer members, said corrugated closure member having a flattened peripheral marginal portion, said corrugated center layer being at least substantially crushed in said flattened peripheral marginal portion in such a manner that the crushed center layer is substantially in contact with said inner and said outer layer members, said flattened peripheral marginal portion being bent at an angle to the central portion of said corrugated closure member to form a depending skirt, the three plies formed by the crushed center layer substantially in contact with said inner and outer layer members extending at least from substantially the outer edge of said depending skirt to the angle formed between said flattened peripheral marginal portion and said central portion, said depending skirt extending completely around the periphery of said central portion;
a single-ply container sidewall formed so as to have a geometrical cross section, transverse to the longitudinal axis of said container structure, at least generally corresponding to the surface area of the portion of said inner layer member in said central portion of said corrugated closure member, said single-ply container sidewall forming an opening on the longitudinal axis of said container structure, said corrugated closure member being positioned within the opening formed by said single-ply container sidewall so as to generally fill the opening formed by said single-ply container sidewall, said single-ply container sidewall having a marginal end portion, said marginal end portion projecting beyond the edge of said depending skirt which is opposite said central portion of said closure member, said marginal end portion extending inwardly to form a rolled rim around said depending skirt with the edge of said marginal end portion extending at least generally to the bend between said depending skirt and said central portion of said closure member.

4,190,190

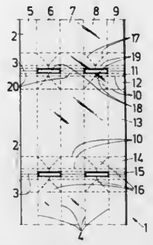
STRIP MADE UP OF CONSECUTIVE PACKAGE BLANKS

Tuomo Halonen, Toijala, Finland, assignor to Okuli Oy, Toijala, Finland

Filed May 9, 1978, Ser. No. 905,035
Int. Cl.² B65D *5/72*
U.S. Cl. 229—17 R **4 Claims**

1. A web of package blanks made of cardboard being shaped to form individual packages, in which each blank includes: a plurality of longitudinal folding lines dividing each of the blanks into longitudinal zones; four transverse folding lines formed on each of the blanks dividing the respective blanks into five transverse zones; and oblique folding lines formed at

intersections between the two transverse zones adjacent to a middlemost transverse zone and two longitudinal zones adjacent to an intermediate longitudinal zone permitting the blank to be folded to a package; said middlemost transverse zone being adapted to form rectangular sides of the package; said two transverse zones adjacent to said middlemost zone provides end portions of the package and outermost transverse zones provide seams which seal the package at both of said ends; cutout areas provided in intersections between said outermost transverse zones and said longitudinal zones adjacent to



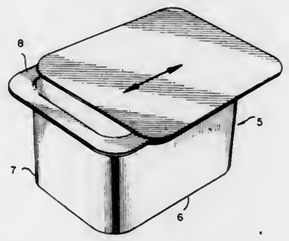
said intermediate longitudinal zone, said cutout areas being covered with plastic material adapted to fold between opposed cardboard layers, as the blank is folded so as to provide sealing material at said seams, said web having a continuous strip of consecutive non-parallel blanks in which said longitudinal folding lines travel in the direction of the web, said transverse folding lines being perpendicular to said direction and said cutout areas being situated at the borderlines between adjacent blanks to thereby permit the web to be folded to the shape of a tube and to form a plurality of packages without the need of cutting the blanks apart.

4,190,191

SLIDING LID FOR FLANGED TRAY

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,232
Int. Cl.² B65D *43/00, 77/00, 5/64*
U.S. Cl. 229—43 **5 Claims**



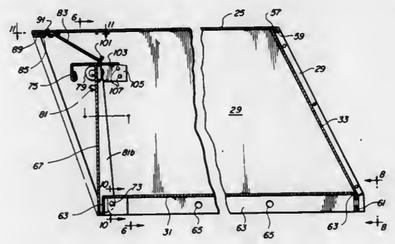
1. A sliding lid for a flanged, open top tray comprising, a rectangularly shaped central panel including side panels foldably attached at two opposed sides thereof wherein the width of the side panels is sufficient to provide, when folded adjacent to said central panel, first portions which are fixedly attached to said central panel in the region adjacent to the foldable connections thereto and second unattached portions which form with said central panel a pair of slide channels for accepting the tray flange at two sides of said tray, the improvement wherein said side panels comprise first and second pairs of foldably attached panels, said first pair of side panels having a length that is substantially equal to the length of the central panel sides to which they are attached and said second pair of side panels having a length less than that of the first pair of side panels and a width substantially equal to that of the first pair of side panels, said second pair of side panels being divided into two portions by embossed lines which extend along the length of said panels and bisect the panels into two substantially equally sized portions, so that when said second pair of side panels are folded over upon themselves adjacent to said central panel, and portions thereof adjacent to the foldable connection between said first side panels and said central panel are adhered together, the unattached portions remain free to form said pair of slide channels for accepting the tray flange at two sides of said tray.

4,190,192

THEFT PREVENTING OUTDOOR MAILBOX

Alexander M. Cornwell, Jr., St. Louis, and Joseph N. Miller, Overland, both of Mo., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Nov. 14, 1977, Ser. No. 851,138
Int. Cl.² B65D *91/00*
U.S. Cl. 232—17 **5 Claims**



1. A theft preventing outdoor mailbox comprising:
a body portion for holding and enclosing mail, said body portion including a top and two sides with the front ends of said sides being inclined so that acute angles are formed between said top and the front ends of said sides;
an access aperture through which mail located in said body portion may be removed formed in the front of said body portion;
a door for selectively closing to prevent, and opening to permit, withdrawal of mail from said body portion through said access aperture, said door pivotably mounted adjacent the bottom of the front ends of said sides and fitting within the inclined front ends of said sides upon being closed;
locking mounting means to provide for the locking of said door to prevent access to the interior of said body portion by unauthorized parties;
a mail slot opening to the interior of said body portion when said door is closed, said mail slot being sufficiently large to permit the insertion of mail into said body portion and small enough to prevent access to the interior of said body portion for the removal of mail therein;
a tab located on each side of said door; and
a pair of dimples formed in said sides of said body portion, said tabs engaging said dimples with an interference fit when said door is in the closed position, thereby maintaining said door in its closed position.

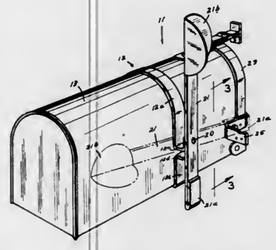
4,190,193

SELF-CONTAINED CLAMP-MOUNTED PIVOTAL ARM MAILBOX SIGNAL DEVICE ASSEMBLY

George T. Smith, 7401 N. Williams Rd., Lansing, Mich. 48910

Filed Sep. 27, 1978, Ser. No. 946,135
Int. Cl.² A47G *29/12*
U.S. Cl. 232—35 **3 Claims**

1. A self-contained clamp-mounted mailbox signal device assembly comprising:
a first flexible band support member having a mailbox-engaging hooked portion at one end thereof and vertically-oriented signal arm support flange at the opposite end thereof, said first flexible band support member configured to provide a first horizontal adjustment flange proximate to said vertically-oriented signal arm support flange;
a second flexible band support member having a mailbox-engaging hooked portion at one end thereof and a second horizontal adjustment flange at the opposite end thereof, said second horizontal adjustment flange parallel to and spaced apart from said first horizontal adjustment flange;
connector tightening means in association with said first and second horizontal adjustment flanges so as to tighten said first and second flexible band support members into clamping engagement against the outer surface of a mailbox;
a signal arm pivotally mounted on said vertically-oriented signal arm support flange so as to pivot within a vertical



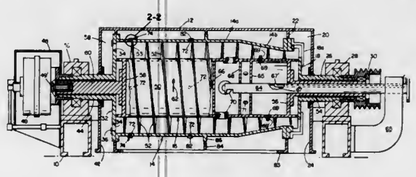
plane along one side of a mailbox upon which said band support members are mounted, said pivotal signal arm having a weighted portion at one end thereof and having a flag indicator signal portion at the other end thereof; and
an angular support arm extension with a bolted clamping plate clampingly securing said arm on the door flange of the mailbox proximate to said band support members, said support arm extension extending outwardly so as to supportably engage said weighted portion of said signal arm so as to maintain said signal arm in a substantially horizontal position when the mailbox door is closed, said support arm extension disengaging from said weighted portion when the mailbox door is opened so as to permit said signal arm to automatically pivot to an upright vertical signal position.

4,190,194

SOLIDS LIQUID SEPARATING CENTRIFUGE WITH SOLIDS CLASSIFICATION

Clifford L. Amero, East Walpole, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Jul. 28, 1978, Ser. No. 928,995
Int. Cl.² B04B *1/20*
U.S. Cl. 233—7 **9 Claims**



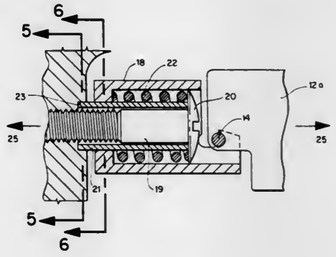
1. In a solids-liquid separating centrifuge of the type having a bowl with a reduced diameter end outlet for solids, a helically bladed conveyor within the bowl extending substantially from end to end of the bowl and arranged to move solids settling in said bowl toward said end outlet, means for rotating said bowl and conveyor about a common axis to convey a first portion of the solids settling in said bowl to said end outlet, and feed means for discharging slurry into said bowl at a feed point spaced from said end outlet, the improvement comprising:
classifying means for segregating and separately discharging from the bowl a second portion of the slurry solids having mainly characteristics different from the solids principally contained in said first portion such that they are relatively slower in settling and more difficult for said conveyor to convey;
said classifying means including at least one nozzle outlet through the peripheral wall of the bowl having an outlet passage with its inlet exposed to the path of movement of solids by the conveyor, intermediate the ends of the conveyor;
said conveyor having a unidirectional pitch directed toward said bowl end outlet at opposite sides of said nozzle inlet, so that solids settling in said bowl at the side of said nozzle outlet remote from said bowl end outlet are conveyed thereby to said nozzle inlet, solids of said first portion are conveyed thereby across said nozzle inlet and on toward said bowl end outlet, and slurry containing solids of said second solids portion is ejected through said nozzle passage by centrifugal force;
and means for collecting the outputs from said end outlet and said classifying means.

4,190,195

HANGER DESIGN FOR A SWINGING CENTRIFUGE ROTOR

Steven J. Chulay, Los Altos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

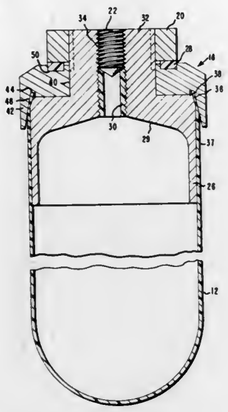
Filed Mar. 14, 1979, Ser. No. 20,388
Int. Cl.² B04B *5/02*
U.S. Cl. 233—26 **4 Claims**



1. In a swinging bucket centrifuge rotor of the type having a plurality of peripheral cavities equally spaced about the axis of rotation of the rotor, each of the cavities having a hanger member mounted therein for pivotally supporting a bucket, the bucket adapted to pivot from a vertical position when the rotor is at rest to a horizontal position when the rotor is rotating, the hanger member being radially movable with respect to the axis of rotation, for each hanger member and cavity the improvement comprising:
a non-circular recess formed in an inner wall of the cavity;
an elongated guide sleeve having a non-circular cross section, one end of the guide sleeve being disposed in the non-circular recess and confined therein against rotational movement by the cooperating non-circular shape of the guide sleeve and the recess, the guide sleeve extending radially outward into the cavity;
fastening means extending through the guide sleeve, having one end fastened to the rotor within the recess;
the bucket hanger member being mounted on the guide sleeve, the hanger member including a portion thereof conforming to and closely abutting the exterior surface of the non-circular guide sleeve, thereby permitting the hanger member to slide radially on the guide sleeve but preventing rotation thereof; and
spring means confined in an area defined by the interior of the hanger member and the exterior to the guide sleeve

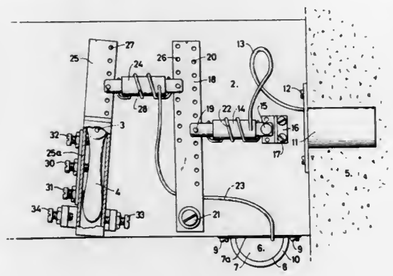
exerting a radial force on the hanger member in a direction toward the axis of rotation of the rotor.

4,190,196
CENTRIFUGE TUBE CAP
Max J. Larsen, Woodbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 29, 1975, Ser. No. 572,711
Int. Cl.[2] B04B *15/00*; B65D *45/00*
U.S. Cl. 233—26 **9 Claims**



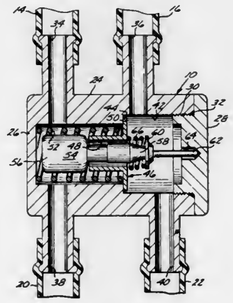
1. A closure assembly for a centrifuge tube that is open at one end and closed at the other comprising:
- a plug adapted to be removably insertable into the open end of said tube, said plug defining a beveled shoulder,
- a cap adapted to be detachably mounted on said plug with a depending annular portion extending over said beveled shoulder and at least partially over the outer surface of the wall of said tube,
- the interior of said annular portion of said cap being flared with at least a part of the interior diameter of said annular portion being less than the outside diameter of said tube, and
- means including said cap for wedging the wall of said tube between the beveled shoulder of said plug and the flared portion said cap, thereby to form a seal for the open end of said tube.

4,190,197
DEVICE FOR DRAFT CONTROL
Stig Werne, Hermelinsv 13, S-43300 Partille, Sweden
Filed Dec. 22, 1977, Ser. No. 863,244
Claims priority, application Sweden, Dec. 27, 1976, 7614555
Int. Cl.[2] F23N *3/00*
U.S. Cl. 236—1 G **7 Claims**



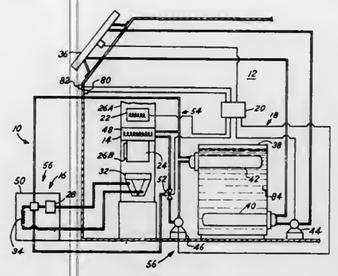
1. Device for automatic draft control of a furnace having an oil burner, a smoke flue, and an exhaust valve located in the smoke flue, part of the smoke flue located nearest after the exhaust valve as counted in the direction of the exhaust comprising a metal tube which is connected with the wall of a chimney, said device comprising a first sensoring device provided on said metal tube and subjected to the influence of the temperature prevailing in said tube, means for the transmission of the registration of the first sensoring device to the exhaust valve, a second sensoring device provided in said chimney wall, and means for the transmission of the registration of the second sensoring device to the exhaust valve, said first and second sensoring devices being connected with the exhaust valve in such a manner that the combined registration of said sensoring devices is transmitted to the exhaust valve so that said valve can be moved in a shutting-off direction upon an increased temperature in the smoke flue and in a reverse direction when the temperature is decreasing.

4,190,198
OIL COOLER BYPASS VALVE ACTUATING MEANS
Dennis W. Casuga, Pico Rivera, and William C. Hauser, Hacienda Heights, both of Calif., assignors to Lockhart Industries, Inc., Paramount, Calif.
Filed Apr. 12, 1978, Ser. No. 895,792
Int. Cl.[2] F01P *7/02*
U.S. Cl. 236—34.5 **7 Claims**



1. In an oil cooler bypass valve including a valve housing having an elongated valve chamber communicating with oil supply, oil return, cooler supply and cooler return lines; and a valve member having a cooling position for directing oil from the oil supply line to the cooler supply line for circulation through a cooler and from the cooler return line to the oil return line, and further having a warm-up position for directing oil from the oil supply line back to the oil return line, an improved valve actuating means for moving the valve member between the warm-up and cooling positions, said valve actuating means comprising:
- a main spring engaged between said valve housing and said valve member and operative to urge said valve member toward said warm-up position;
- a thermostat having a main portion and a pin extensible from said main portion in response to an increase in the temperature of oil in said valve chamber, said pin being engaged upon said valve housing;
- a relief spring engaged between said valve member and said main portion for moving said valve member toward said cooling position upon extension of said pin relative to said main portion, said main spring being compressible to enable movement of said valve member in one direction under the influence of relatively high pressure acting on one side of said valve member, said relief spring being compressible to enable movement of said valve member in the opposite direction under the influence of relatively high pressures acting on the other side of said valve member.

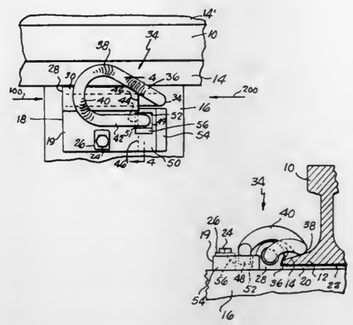
4,190,199
COMBINATION HEATING SYSTEM INCLUDING A CONVENTIONAL FURNACE, HEAT PUMP AND SOLAR ENERGY SUBSYSTEM
Richard E. Cawley, Hurst, and Paul K. Buckley, Ft. Worth, both of Tex., assignors to Lennox Industries Inc., Dallas, Tex.
Filed Jan. 6, 1978, Ser. No. 867,469
Int. Cl.[2] F27J *3/02*
U.S. Cl. 126—419 **10 Claims**



1. A system for heating an air stream to condition an enclosure comprising, in combination:
- a heat pump having an inside coil in communication with said air stream and an outside coil;
- a solar energy subsystem operable in a direct heating state to heat said air stream, said solar energy subsystem including storage means for storing heat derived from solar energy, a solar energy collector thermally coupled to said storage means, and coil means in communication with said air stream and in heat transfer relationship with said storage means for transferring heat from said storage means to said air stream;
- enclosure thermostatic means for producing a first enclosure signal, a second enclosure signal and a third enclosure signal whenever the temperature in said enclosure drops below a first predetermined enclosure threshold, a second predetermined enclosure threshold and a third predetermined enclosure threshold, respectively;
- storage thermostatic means for producing a first storage signal whenever the temperature in said storage means drops below a first predetermined storage threshold;
- furnace means for heating said air stream; and
- control means responsive to said enclosure thermostatic means and said storage thermostatic means for coordinating operation of said heat pump, said furnace and said solar energy subsystem, said control means activating said solar energy subsystem in response to said first enclosure signal, activating said heat pump in response to said first enclosure signal and said first storage signal, activating said heat pump in response to said second enclosure signal, and activating said furnace means in response to said third enclosure signal.

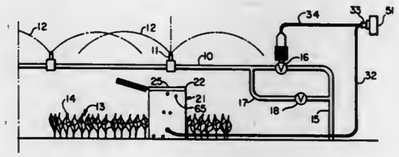
4,190,200
RAIL CLIP ASSEMBLY
Warren P. Morrow, Silver Spring, Md., assignor to Scotco, Inc., Silver Spring, Md.
Filed Mar. 17, 1978, Ser. No. 887,781
Int. Cl.[2] E01B *9/48*
U.S. Cl. 238—349 **12 Claims**

1. A rail clip for fastening a longitudinally extending railway rail to an underlying support, which comprises:
- a single rod having a first end portion, a second end portion and a bent portion intermediate said first and second end portions adapted to contact and thereby retain said rail against said support, said first end portion comprising a first elongated end portion positioned in use substantially parallel to said longitudinally extending rail, said second end portion comprising a second elongated end portion parallel to said first elongated end portion and means extending integrally from said second elongated end portion for locking said rod against longitudinal movement



wherein said locking means comprises a unitarily formed terminal portion extending downwardly from said second elongated end portion, wherein said terminal portion is formed at a substantially right angle to and has substantially the same diameter as said second elongated end portion, and wherein said terminal portion defines the terminating end of said second end portion of said rod.

4,190,201
MISTING CONTROL
Edward C. Geiger, 500 E. 7th St., Lansdale, Pa. 19446
Filed Sep. 22, 1978, Ser. No. 944,965
Int. Cl.[2] A01G *25/16*
U.S. Cl. 239—65 **1 Claim**



1. In an automatic misting system for cutting beds or the like having at least one misting nozzle operable upon a supply of liquid thereto to direct a mist of spray over said bed, and a valve to control the supply of spray liquid to said nozzle; an automatic control means to operate said valve comprising a housing having a pair of spaced-apart sidewalls and a peaked roof, corrosion-resistant bushings mounted on said sidewalls opposite one another, said bushings having a portion extending through said sidewalls and caps engaging said extending portion, a non-absorbent collector positioned in the atmosphere above the bed and in the path of the mist from the spray nozzle to collect thereon a film of water of a thickness determined by the surface tension thereof, a collecting-and-sensing element comprising a balance rod underlying said roof, a support for said balance rod, said balance rod being integrally attached to said support, said support having pointed ends which are pivotally mounted in said bushings and which cooperate with said caps to minimize friction in the pivotal movement of said support, said collector being mounted at one end of said balance rod, and a counterweight mounted on the opposite end of said balance rod to overcome the weight of said collector when it is dry, but of insufficient weight to overcome the weight of said collector when it is provided with a film of liquid thereon, said counterweight being positioned within said

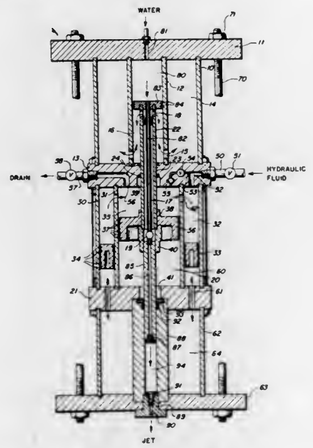
housing and operable upon overbalance thereof by said collector with its film of water to cause the collecting-and-sensing element to assume a first limit position wherein the counterweight is engaged against said roof to limit the pivotal movement thereof in one direction, opposed stopping means positioned within said housing to limit pivotal movement of said collecting-and-sensing element in the other direction, said stopping means being a rod laterally disposed within said housing and disposed substantially horizontally parallel with said balance rod support, whereby said balance rod, when said counterweight overcomers the weight of said dry collector, contacts said stopping means causing said collecting-and-sensing element to assume a second limit position, wherein said housing and said balance rod are out of contact and remain so while said film of water accumulates on said collector, and a switch means responsive to the position of said collecting-and-sensing element and connected to said valve to supply water to said nozzle in the second position of said collecting-and-sensing element and to interrupt said supply in the first position of said collecting-and-sensing element.

4,190,202

HIGH PRESSURE PULSED WATER JET

Gene G. Yie, Chicago, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Jul. 3, 1978, Ser. No. 921,216
Int. Cl.² B05B *1/08*
U.S. Cl. 239—101 **26 Claims**



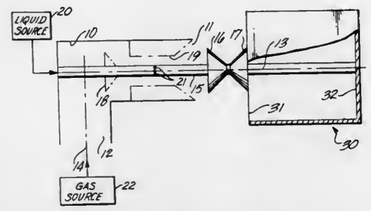
1. A thrust generator comprising:
a single substantially gas-tight combination working-cocking cylinder, a power piston adapted for substantially gas-tight reciprocating motion within said cylinder and dividing said cylinder into a substantially gas-tight working cylinder containing working fluid on one side of the power piston and a substantially gas-tight cocking cylinder containing cocking fluid on the other side of said power piston;
a closed driving gas chamber in pressure transmission communication with said working cylinder and containing driving gas providing driving force to said power piston for the power stroke, said driving gas being pressurized in said driving gas chamber by movement of said power piston reducing the volume of said working cylinder;
a cocking fluid chamber in fluid transfer communication with said cocking cylinder and containing cocking fluid providing force to said power piston for the cocking stroke of said power piston;
means for cyclic supplying pressurized hydraulic fluid to and draining hydraulic fluid through a hydraulic fluid outlet valve from said working-cocking cylinder;
a cocking fluid communication cylinder extending from the working chamber side of said power piston through the central portion of said working chamber into said cocking fluid chamber providing passage of said cocking fluid and centered movement of said power piston in said working-cocking cylinder;
a floating piston separating said hydraulic fluid from gas;
trigger valve means providing initial flow of working fluid into said working cylinder to initiate the power stroke of power piston; and
control means for control of said hydraulic fluid outlet valve and trigger valve.

4,190,203

VORTEX GENERATING DEVICE WITH RESONATOR

Nathaniel Hughes, Palm Springs, Calif., assignor to Hughes Sciences Group, Inc., Palm Springs, Calif.

Filed Mar. 13, 1978, Ser. No. 886,287
The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.
Int. Cl.² B05B *17/06*; F15C *1/16*
U.S. Cl. 239—102 **90 Claims**



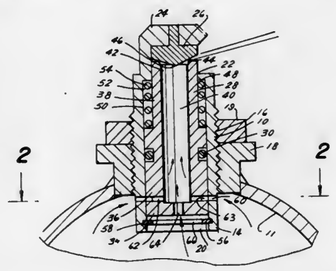
1. A vortex generating device comprising:
a flow passage having a fluid inlet and a fluid outlet;
a source of gas under pressure larger than the ambient pressure into which the outlet opens connected to the inlet to cause gas to pass through the flow passage;
means for generating in the gas a plurality of tornado-like vortices arranged in a ring about the flow axis, the vortices rotating about the flow axis;
a resonator disposed at the outlet external to the passage to intercept fluid flowing vortically through the passage; and
an external bluff body lying between the outlet and the resonator.

4,190,204

SHOWER NOZZLE FOR FABRIC CONDITIONER

Charles B. Nicholson, Glens Falls, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,051
Int. Cl.² B05B *15/02*
U.S. Cl. 239—109 **8 Claims**



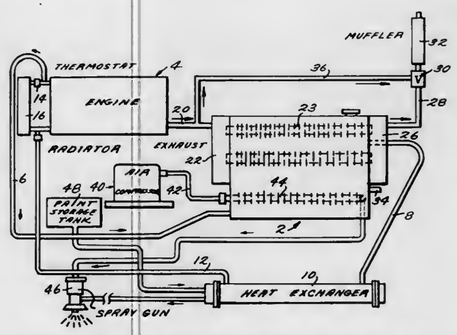
1. In combination with a spray pipe, a spray nozzle, said nozzle comprising; a generally tubular body in alignment with the spray hole through the wall of said pipe, a bore of said tubular body, a piston slidably fitted in said tubular body within said bore, a central passage formed in said piston and communicating the interior of said spray pipe to the outside thereof, a first seal means cooperating with said tubular body and said piston and confining the contents of said spray pipe to said central passage, a valving member of said tubular body and disposed on the centerline of said central passage, a spray position of said piston with the upper end thereof abutting said valving member, said piston maintained in said spray position by the force of the content of said spray pipe pressing thereagainst, a blocking surface of said valving member overlying a first portion of said central passage and blocking a portion thereof in said spray position, a spray surface of said valving member spaced from and overlying a second portion of said central passage in said spray position whereby liquid exiting said cenral passage in said spray position will impinge thereon to be formed into and directed as a spray, a purging position of said piston with the upper end thereof spaced from said valving member, means for shifting the piston between the spray and purged positions, and flow volume control responsive to shifting of the piston between the spray and purge positions to vary the volume of liquids being directed from the spray pipe into the central passage of the piston.

4,190,205

ROAD MARKING APPARATUS AND METHOD

Wayne R. Mitchell, Muncy, Pa., assignor to Prismo Universal Corporation, Montgomery, Pa.

Filed Oct. 3, 1978, Ser. No. 949,420
Int. Cl.² B05B *1/24*
U.S. Cl. 239—129 **7 Claims**



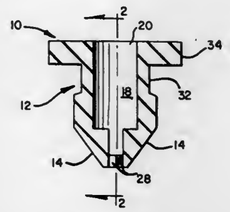
1. Apparatus for spraying and heating a quick-drying traffic paint composition onto a road surface to a temperature of at least 120° F., said apparatus comprising:
a vehicle driven by an internal combustion engine,
an air compressor powered by said engine,
a paint storage tank,
a paint sprayer,
heat collection means having an internal space for holding engine liquid including means for providing heated engine liquid to said internal space, a first set of tubes within and passing through said internal space in communication with and for passing hot engine exhaust gases through said internal space, said first set of tubes being in thermal contact with the liquid contained in said collection means, and a second set of tubes within and passing heated compressed air from said compressor in thermal contact with the liquid contained in said internal space; and
a heat exchanger in fluid communication with said collection means and supplied with said heated liquid for heating traffic paint passed therethrough, traffic paint inlet means connected to said storage tank and paint outlet means connected to said paint sprayer, and inlet means for receiving the heated liquid from said collection means and outlet means for exhausting the liquid to said engine.

4,190,206

DRIP IRRIGATION SYSTEM

Gordon E. Atkinson, and Kenneth C. Tregillus, both of Yellow Springs, Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Jun. 30, 1978, Ser. No. 920,804
Int. Cl.² B05B *1/02, 1/30*
U.S. Cl. 239—271 **9 Claims**



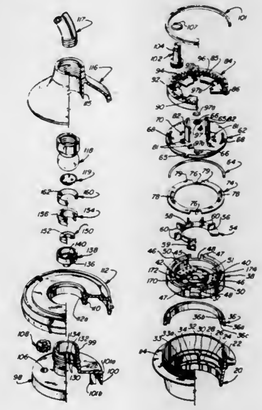
1. In a one-piece elastomeric flow control valve including a body portion having a flow port extending therethrough and terminating in an inlet opening at one end and an outlet at the opposite end, the improvement comprising:
said inlet opening is defined by a central section and a pair of end sections positioned at opposite ends of said central section,
said elastomeric material possesses an elasticity such that external pressure applied to said inlet end of said valve causes said central section substantially to close while the open cross sectional area of said end sections varies inversely in response to variations in said external pressure to regulate flow through said flow control valve at a substantially constant flow rate, and
said end sections of said inlet opening extend inwardly of said valve a relatively short distance to provide precise control over flow through said inlet opening.

4,190,207

PULSATING SPRAY APPARATUS

Stephen C. Fienhold, and Michael A. Cammack, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jun. 7, 1978, Ser. No. 913,284
Int. Cl.² B05B *1/08, 1/18*
U.S. Cl. 239—381 **16 Claims**



1. In a pulsating spray apparatus that includes:
a housing having a fluid inlet and a fluid discharge outlet;
means in said housing defining a flow path from said inlet to said outlet;

pulsating means in said flow path for cyclically interrupting the flow of fluid from said inlet to said outlet and causing a pulsating spray to be discharged therefrom, said pulsating means including a forced vortex driven turbine rotatable within a cavity defined with said housing;

control means for adjusting the fluid flow from said inlet to said outlet;

nozzle means for tangentially imparting driving force to said vortex and creating a predetermined static fluid pressure within said cavity;

means defining a first fluid flow passage from said control means to said nozzle means with said control means including means for regulating the fluid flow through said first fluid flow passage to said nozzle means;

the improvement comprising:

means defining an orifice leading laterally inward toward the outer edge margin of the forced vortex created by flow through said nozzle means and action of said turbine;

means defining a second fluid flow passage from said control means to said orifice;

said control means further including means for selectively regulating fluid flow through said second fluid flow passage to said orifice;

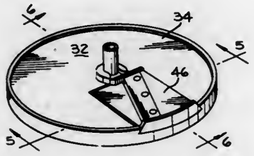
and said orifice being oriented relative to said turbine to deliver its fluid flow in a direction which reduces the effect of said forced vortex in driving said turbine.

4,190,208

PROCESSOR AND CUTTER DISC

Robert L. Schaeffer, LeRoy, and Bhim S. Madan, Brockport, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,348
Int. Cl.[2] B02C *18/18*
U.S. Cl. 241—92 **6 Claims**



1. In a food processor having a power base and lid-covered bowl with an inner surface, a feed chute through the lid to a cutting disc rotated by a shaft extending into and terminating in the bowl, an improvement in said disc comprising,

a peripheral flange thereon extending upwardly adjacent the bowl inner surface,

a single substantially rectangular locking-edged opening through the disc and flange on one side only of the disc center and terminating short of and adjacent the center,

a narrow slot centrally of the opening and extending across the disc center,

a depending hub at the disc center and crossing said slot to receive the shaft therethrough,

a removable locking-edged cutter insert having a tab matching said slot and radially slidable into said opening and slot to contact the hub,

a stepped sleeve on said tab disposed on and vertically locating the insert on the shaft,

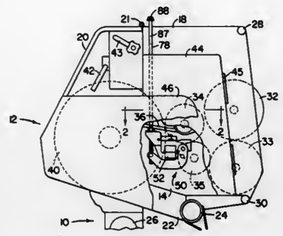
whereby the disc is totally carried by the insert and vertically and radially restrained by the locked edges and shaft respectively, and fixedly spaced from the lid by said step for single disc multiple capability with different inserts.

4,190,209

ADJUSTABLE SHEAR BAR FOR A HARVESTER CUTTERHEAD

Harold E. deBuhr; Merlyn D. Bass; Jerry L. Krafka, all of Ottumwa; David L. Wolf, and Kenneth R. Christopher, both of Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 3, 1978, Ser. No. 921,282
Int. Cl.[2] B02C *18/16*
U.S. Cl. 241—101.7 **14 Claims**



1. In a forage harvester having a mobile frame, a cutterhead housing mounted on the frame and having opposite side walls and an inlet opening, a rotary cutterhead mounted in the housing and having a plurality of knives with cutting edges at the cutterhead periphery generating a cylinder as the cutterhead rotates and a generally horizontal transverse shear bar extending between the opposite side walls adjacent the cutterhead periphery parallel to the cutterhead axis so that crop material moving through the inlet opening moves past the shear bar into the cutterhead, the combination therewith of improved means for adjustably mounting the shear bar on the housing to adjust the clearance between the shear bar and the cutterhead and comprising:

a support structure including a pair of support members respectively rigidly connected to the opposite side walls and including a pivot means;

a pair of lever elements respectively pivotally mounted on the pivot means and having first portion swingable in a generally fore and aft arc in response to rocking of the lever elements on their pivots;

a pair of generally fore and aft link members respectively connecting the first portions of the lever elements to the opposite ends of the shear bar so that rocking of the lever elements shifts the opposite ends of the shear bar in a generally fore and aft direction toward or away from the cutterhead periphery;

a pair of clamping means respectively operatively associated with the opposite ends of the shear bar for generally vertically clamping the opposite ends of the shear bar against the support structure so that the shear bar is shiftable in said fore and aft direction only upon exertion of a sufficient force through the link members to overcome the generally vertical clamping force exerted by the clamping means; and

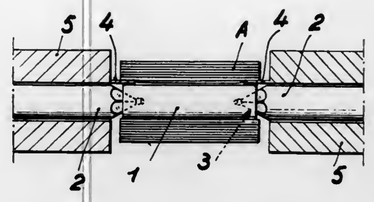
a pair of force multiplying means respectively connected to the respective lever elements and including input elements, each force multiplying means being operative to rock the lever member about its pivots upon exertion of an input force on the input elements sufficient to overcome the clamping force exerted by the clamping means, said clamping force being substantially greater than the input force, whereby exertion of said input force on an input element in one direction shifts the end of a shear bar toward the cutterhead periphery and exertion of said input force in the opposite direction shifts the end of the shear bar away from the cutterhead periphery.

4,190,210

METHOD AND ARRANGEMENT FOR WINDING CAPACITORS

Cataldo C. Chirico, 107 Passage Emile Boutrais, 94120 Fontenay-sous-Bois, France

Filed Nov. 16, 1977, Ser. No. 852,038
Claims priority, application France, Dec. 3, 1976, 76 36456
Int. Cl.[2] H01G *13/02, 7/00*
U.S. Cl. 242—56.1 **12 Claims**



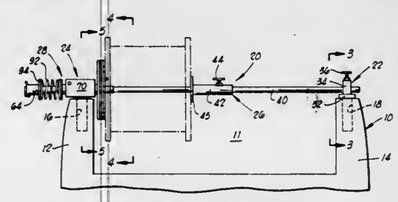
1. An arrangement for winding a film onto a mandrel so as to form a capacitor thereon, comprising means for rotatably supporting a mandrel onto which a film is to be wound; means for rotating the mandrel so as to wind the film onto the latter including two centers at least one of which is rotatable, said centers being movable between an operative position in which they engage the mandrel so as to rotate the latter, and an inoperative position in which they are withdrawn from the mandrel; and retaining means displaceable between a first position in which it is superposed over an initial portion of the film wound onto the mandrel so as to retain the initial portion of the film on the mandrel, during subsequent winding of additional portions of the film onto the latter, and a second position in which said retaining means is withdrawn from the film wound on the mandrel.

4,190,211

REEL MOUNTING APPARATUS

Harlo W. Janzen, Rte. 2, Box 74, Balko, Okla. 73931

Filed Oct. 10, 1978, Ser. No. 949,815
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—86.7 **13 Claims**



1. A reel mounting apparatus comprising:

a pair of bracket subassemblies adapted for securement to the vertically extending sides of a truck;

an elongated, two-part shaft assembly including

a shaft detachably mounted in one of said bracket subassemblies; and

a shaft extension detachably coupled to said shaft and projecting coaxially therefrom;

a sleeve slidably surrounding said shaft extension, and movably mounted on said other bracket subassembly to facilitate axial movement along the shaft extension;

a friction element adjacent an end of said sleeve disposed between said brackets and movable therewith on the shaft extension; and

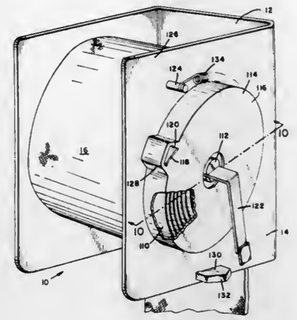
spring means biasing said sleeve along said shaft extension toward said one bracket subassembly.

4,190,212

COMFORT MECHANISM FOR SEAT BELT RETRACTOR

Joseph M. Cachia, New Haven, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 27, 1977, Ser. No. 791,618
Int. Cl.[2] A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107 **5 Claims**



1. A safety belt retractor comprising a frame, a shaft mounted for rotation on said frame, a spool mounted on said shaft and having seat belt webbing wound thereon, first means biasing said spool in a rewind direction and having an inner end attached to said shaft and an outer end, and means for reducing the tension of the webbing against the wearer due to the bias force of the first biasing means, said tension reducing means comprising a second biasing means biasing said spool in the rewind direction and having a lower biasing force than said first biasing means, blocking means having an operable position at which it prevents said first biasing means from rotating said spool and an inoperable position at which it does not prevent such rotation, and means for moving said blocking means between said operable and inoperable positions, said blocking means being moved into said operable position after extension of the seat belt webbing to a position of use, said second biasing means operable to rewind said webbing when said blocking means is in its operable position, wherein said blocking means comprises a stop member provided on a rotary member mounted for rotation on said shaft, said stop member being fixed with respect to said rotary member, and a blade member having a thin, elongated shape, one end of said blade member being connected to said shaft so as to fix said blade member for rotation with said shaft, the other end of said blade member being operable to engage said stop member upon rewind from said extended position to prevent rotation of said rotary member with respect to said shaft, said rotary member being connected to said outer end of said first biasing means.

4,190,213

SAFETY BELT TAKE-UP DEVICE

Takeo Ueda, Fujisawa, Japan, assignor to NSK-Warner K. K., Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,364
Claims priority, application Japan, Nov. 2, 1977, 52-147631[U]
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **8 Claims**

1. A safety belt take-up device provided with a double sensing type emergency-lock mechanism comprising:

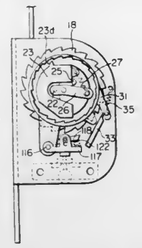
webbing draw acceleration sensing means connected to a take-up spindle for the webbing and adapted to shift from a first position to a second position when webbing is drawn out at an acceleration greater than a predetermined value;

vehicle acceleration sensing means adapted to shift from a

first position to a second position in response to a predetermined vehicle acceleration;

first transmission means connectible to said take-up spindle in accordance with the shift from said first position to said second position of said webbing draw acceleration sensing means and/or said vehicle acceleration sensing means and adapted to shift from a first position to a second position due to the webbing draw-out force;

second transmission means provided on said first transmission means and adapted to shift from a first position to a second position with the shift of said vehicle acceleration sensing means to its second position, said second transmission means when in its second position being connectible



to said take-up spindle to move said first transmission means from its first position to its second position, said second transmission means comprising two opposed levers pivotally supported on said first transmission means, a limiting member for limiting the angle formed by and between said two levers, and bias means for biasing said levers toward a maximum angle direction, one of said levers being mesh-engageable with a ratchet gear formed on said take-up spindle when said second transmission means is in its second position; and

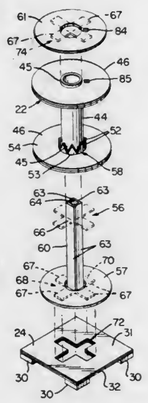
lock means for preventing the draw-out of the webbing when said first transmission means has shifted to its second position.

4,190,214

PACKAGE CONSTRUCTION FOR COILABLE MATERIAL AND METHOD OF PACKAGING AND DISPENSING SAME

Jerome S. Bond, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 2, 1978, Ser. No. 957,278
Int. Cl.² B65H *49/18*
U.S. Cl. 242—138 **23 Claims**



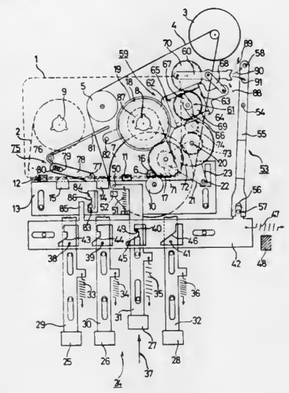
1. In a package construction for coilable material comprising a reel for coiling said coilable material thereon and a container for containing said reel, said container comprising a plurality of walls; the improvement wherein said reel is made as a part of one of said walls, said one wall having an inner surface and an outer surface, a plurality of feet attached against said outer surface, said one wall with its feet defining a pallet for said container and its reel; said reel disposed substantially centrally on said one wall, said container comprising tubular construction having an open end, said tubular construction being disposed around said reel with the terminal edge of said open end above said outer surface.

4,190,215

TAPE RECORDER STOPPING MECHANISM

Istvan Hochbaum; Mandred Ketzer; Friedrich Laa, and Johann Veigl, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1978, Ser. No. 941,546
Claims priority, application Austria, Sep. 14, 1977, 6607/77
Int. Cl.² B65H *59/38*
U.S. Cl. 242—186 **7 Claims**



1. A mechanism for performing a control function in an apparatus in response to stopping of a component in the apparatus, comprising

an actuating device for performing a control function,

a component mounted in the apparatus, and means for rotating the component,

a pivotally mounted lever,

means for pivotally oscillating said lever in response to rotation of said component, and for moving said lever to a given position in response to stopping of said component,

a connecting rod,

means for reciprocating the connecting rod, and

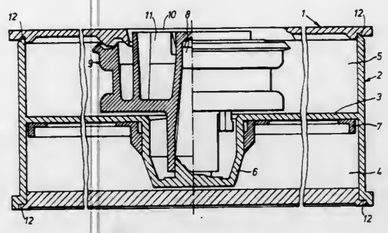
a coupling rod linking said lever and said connecting rod, the rods being arranged so that while the lever is in the given position the connecting rod reciprocates along a path which engages the actuating device, and that during oscillation of the lever away from the given position the connecting rod is diverted to move past the actuating device.

4,190,216

NARROW GAUGE FILM CASSETTE

Achim Kluczynski, Immekeppel, and Johannes Tabel, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,276
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623942
Int. Cl.² G03B *1/04*
U.S. Cl. 242—194 **9 Claims**



1. A cassette containing a spool for carrying and feeding a film from one position to another within the cassette and having a plurality of parts being adapted to be repeatedly disassembled and reassembled to form a light-tight container comprising

a first casing having an open end, a film aperture in a casing wall diametric to the open end, and a first and second major casing walls each normal to the apertured wall, said major walls spaced apart and diametric to each other and forming with the apertured wall a chamber accessible through said open end,

the first major wall having a first opening centrally positioned for receiving a film spool and the second major wall having a second opening centrally positioned and diametric to said first opening,

a frusto-conical surface around said second opening in said second major wall extending into said chamber,

a second casing having wall members engageable with the walls of the first casing and means formed in the walls of the first and second casings to provide light-tight junctions between the first and second casings,

a film feed spool having a fixed core and a take-up core positioned within the second casing, said take-up core being rotatably positioned with respect to the fixed core and provided with means for providing rotation,

a fastening member positionable within the cassette comprised of

a center post positionable on said frusto-conical surface, said center post having a central passage extending axially through the post; and

a pin capable of being fastened in the central passage and adapted to both engage the outer surface of the second major wall of the first casing,

said pin extending through the central passage and engaging the film spool,

whereby the film spool is engaged into a light-tight relationship with the inner surface of the first major wall of the first casing.

4,190,217

FILTER SYSTEM FOR AGRICULTURAL AIRCRAFT

William M. O'Connor, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Dec. 5, 1977, Ser. No. 857,218
Int. Cl.² B64B *1/24*
U.S. Cl. 244—53 B **1 Claim**

1. Apparatus for filtering the inlet airflow of a gas turbine engine said engine being mounted in the aerodynamically shaped nose portion of an agricultural aircraft comprising:

a housing constructed in the nose portion and formed to enclose and support the gas turbine engine;

a duct constructed in the housing;

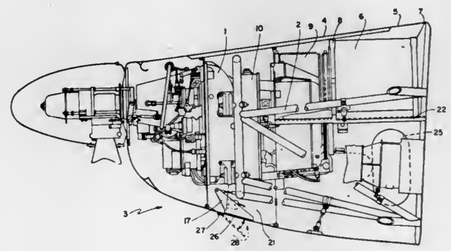
a first inlet opening constructed in the upper portion of the nose portion and having a low aerodynamic impedance to air flowing over the nose portion said inlet connected to the duct to allow the flow of air thereto;

a cylindrical automotive type barrier filter assembly mounted in the duct with its longitudinal axis transverse to the airflow, said airflow flowing through the filter in a radial manner; said filter assembly comprising:

a perforated cylindrical member which is closed at one end to form a receptacle;

a perforated shroud mounted within and spaced radially from the cylindrical member to form an annular space within the receptacle, said shroud having an axially extending inner passage formed concentric with the axis of the cylindrical member to collect the radially flowing filtered air;

an annular barrier filter element removably secured within



the annular space in the receptacle and constructed to allow the radial flow of air;

a closure adapted to removably fit over the open end of the receptacle to retain the filter element, said closure having a concentric opening communicating with the inner passage;

a connecting duct connected to the filter passage and communicating directly with the inlet of the engine to form a sealed passage from the filter to the gas turbine engine;

a bulkhead mounted in the housing to substantially surround the filter assembly and thermally insulate said assembly from the gas turbine engine;

a bypass duct connected to the inlet of the gas turbine engine and constructed to allow the flow of air directly to the engine; and

a second inlet constructed in the nose portion and connected to the bypass duct, said second inlet having means to open said inlet and allow the flow of air into the bypass duct in the event that the filter becomes clogged.

4,190,218

BIKE KITE

Michael Cousens, Jr., 1350 NW. 45th St., Miami, Fla. 33142

Filed Nov. 13, 1978, Ser. No. 960,231
Int. Cl.² A63H *27/08*; B64C *31/06*
U.S. Cl. 244—155 R **1 Claim**

1. A bike kite flown from a bicycle during movement of said bicycle, said bicycle having a frame with a seat-supporting part and a rear wheel supporting part, a seat mounted on the seat-supporting part and a rear wheel rotatably mounted in the rear wheel supporting part, said bike kite comprising

a kite having a harness;

a ball joint affixed to the harness of the kite;

a kite string having spaced opposite first and second ends, said kite string being tied at its first end to the ball joint on the harness of the kite; and

kite tethering means affixed to the frame of the bicycle for affixing the second end of the string to the bicycle, said kite tethering means comprising an elastic cord having a first end affixed to the second end of the kite string and a spaced opposite second end, a tubular member having spaced opposite first and second ends with a ball joint seat formed in the first end thereof for accommodating the ball



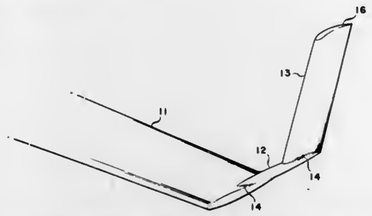
joint, said elastic cord passing through said tubular member and out of said tubular member at the second end thereof and clamping means affixed to the second end of the elastic cord and clamped to the frame of the bicycle between the seat and the rear wheel thereof whereby when the kite is not borne aloft, the elastic cord maintains the ball joint seated in the ball joint seat of the tubular member.

4,190,219

VORTEX DIFFUSER

James E. Hackett, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 17, 1977, Ser. No. 797,788
Int. Cl.[2] B64C *5/08*
U.S. Cl. 244—199 **5 Claims**



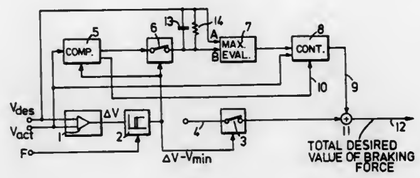
1. A vortex diffuser to attenuate vortex flow after its formation and emanation from an airplane wing, such diffuser consisting of an aerodynamically configured boom secured to and extending aftwardly from said wing adjacent the outer tip thereof, and a single asymmetric vane secured to one side of said boom adjacent the aft end thereof and located entirely aft of said wing, said vane extending upward from said one side of said boom in a generally vertical direction and disposed in the path of said vortex flow, being cambered toward its leading edge so as to intercept said vortex flow smoothly and prevent the separation thereof.

4,190,220

METHOD AND APPARATUS FOR BRAKING RAIL-GUIDED VEHICLES AUTOMATICALLY AND ACCURATELY WITH RESPECT TO A DECELERATION DISTANCE

Karl Hahn; Herbert Bohms, both of Berlin; Johannes Strecker, Feldafing, and Wilhelm Landes, Neusass-Westheim, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,457
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2708361
Int. Cl.[2] B61L *3/00*
U.S. Cl. 246—182 B **7 Claims**



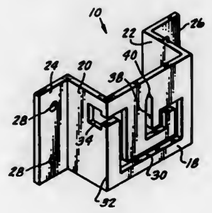
1. A method of braking a rail vehicle from a first speed to a target speed in a predetermined distance, said method comprising the steps of: generating a predetermined, fixed braking force upon actuation of a vehicle brake, generating a first, fixed braking force signal that has an amplitude corresponding to said braking force; generating a second signal corresponding to the actual speed of said vehicle; delaying said second signal for a first delay time; generating a third signal corresponding to reference speed values, said third signal having an initial maximum value corresponding to the delayed value of the signal corresponding to the actual speed of said vehicle at the time the brake is applied; generating, after a predetermined second delay time, a correcting braking force to modify the rate of change of speed of said vehicle to reach said target speed within said distance; combining said correcting braking force with said predetermined, fixed braking forces after said second delay time; removing said predetermined, fixed braking force when said vehicle slows down to a speed that differs from said target speed by a predetermined amount; thereupon generating a new correcting braking force based on the target speed; and applying said new braking force to brake said vehicle to said target speed.

4,190,221

SECURITY MOUNTING

Peter E. Updike, 3949 Olive Ave., Long Beach, Calif. 90807

Filed May 18, 1978, Ser. No. 906,959
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—551 **6 Claims**



1. A security mounting of the type for reversibly attaching a movable component to a stationary component which comprises:

a pin means having an enlarged head;

said pin means attached to one of said movable or stationary components;

a bracket member;

said bracket member including attaching means;

said attaching means attaching said bracket member to the other of said movable or stationary component;

said bracket member including a face plate;

said face plate having a tortuous channel winding through said face plate;

said tortuous channel having a dimension across its width intermediate the diameter of said pin means and the dimension of said enlarged head;

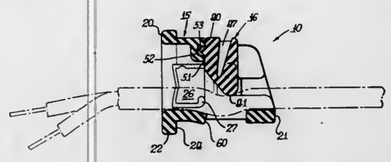
said tortuous channel including a first branch having an opening allowing said pin means to be inserted into said tortuous channel, a terminus branch at the opposite end of said tortuous channel from said first branch and a plurality of other branches located between said first branch and said terminus branch, the configuration of which forms a maze such that said pin means is inserted in said opening, and said pin means is slid along said tortuous channel until said pin means rests in said terminus branch attaching said movable component to said stationary component.

4,190,222

ELECTRICAL CABLE CONNECTOR WITH CAM LOCK

Arthur I. Appleton, Indian Creek Village, Fla.; Jon L. Liljequist, Mount Prospect, and Carlos J. Ylagan, Glendale Heights, both of Ill., assignors to Appleton Electric Company, Chicago, Ill.

Filed Feb. 21, 1978, Ser. No. 879,347
Int. Cl.[2] F16L *5/00*
U.S. Cl. 248—56 **4 Claims**



1. An electrical cable connector for fixedly securing at least one electrical conductor to an electrical box and for providing a protected pathway into the inside of the box through an opening therein, comprising:

a tubular main body having an inner end and an outer end, said tubular body being of lesser diameter than said opening over most of its length including its outer end to permit most of said main body from outer end to inner end to pass through said opening from the interior to the exterior of the box,

a passageway extending axially through said body for protectively channeling said conductor into said box,

flange means on said body proximate its inner end extending sufficiently radially outwardly from said tubular body to engage the inside of said box around said opening for preventing said tubular body from freely passing entirely through said opening from the interior of the box to the exterior of the box,

locking means between said flange means and said outer end for holding said flange adjacent said opening,

and separate and movable compression means interfitting with said tubular body between said locking means and said outer end for fixedly clamping said conductor to said connector, said compression means being contained entirely within said lesser diameter to permit passage thereof through said box opening during installation of said connector into said box said compression means including a cam having an axis extending transversely of said passageway and journalled in said tubular body, said cam being rotatable between a first position, wherein said passageway is unobstructed to passage of said conductor therethrough, and a second position at least partially blocking said passageway, whereupon movement of the cam from its first position to its second position when the conductor is in the passageway effects a clamping of the conductor to the connector,

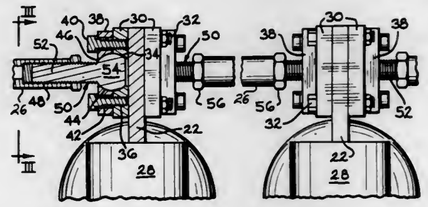
said compression means also including slot means therein for receiving the slender end of an elongate implement to facilitate moving it from its first position to its second position, said slot extending into said cam in a direction transverse of said axis so that the length of said implement can be utilized to exert a considerable turning effort thereon.

4,190,223

BRACING STRUT FOR FLEXIBLE CONDUITS

Kenneth R. Swanson, Lawrence, and Richard J. Beilfuss, Baldwin City, both of Kans., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 27, 1978, Ser. No. 881,594
Int. Cl.[2] E04G *25/06*; F16M *13/00*
U.S. Cl. 248—68 R **1 Claim**



1. A bracing strut assembly for flexible conduit systems comprising, in combination, a flange support bracket having opposite sides and fixed to the conduit to be braced, a pair of spaced planar flange supports, first threaded fasteners mounting a flange support on each side of said bracket, a pair of planar flanges, second threaded fasteners mounting each flange upon a flange support, a ball socket defined by a semi-spherical recess formed in each of said associated flange supports and flanges, an opening defined in each flange communicating with the associated socket, a rigid bar having opposite ends, a bore defined on each end of said bar, threads defined in each bore, the thread pitch within said bores being of opposite hand, and a ball having a threaded stem rotatably mounted in each bar end bore extending through a flange opening and a spherical head received within a socket, the transverse dimension of said openings being greater than the transverse dimension of said stems permitting oscillation of said heads within the associated socket.

4,190,224

INTRAVENOUS POLE HOLDER

Gerald J. LeBlanc, and Edgar J. LeBlanc, both of 73 Pond St. (R), Natick, Mass. 01760

Continuation of Ser. No. 790,595, Apr. 25, 1977. This application Jun. 14, 1978, Ser. No. 915,468
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—229 **3 Claims**

1. An improved clamping device for a substrate which comprises:

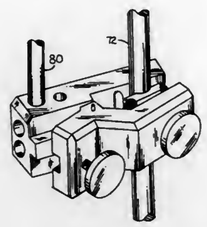
(a) a pair of substantially parallel first and second plate elements adapted to conform to said substrate, arranged in a substantially parallel arrangement to permit the plate elements to move between an expanded open position whereby the substrate to be clamped may be placed between first and second plate elements, and a contractable closed position whereby the substrate is secured and compressed between the closed plate elements;

(b) the said first plate element defining a channel running from one end thereof part way along the direction thereof;

(c) said second plate element defining a longitudinal raised

section running from an end thereof part way along the longitudinal direction, adapting to said longitudinal groove of said first plate element when said clamping device is in said open expandable open position;

(d) pin means joining said first plate element to said second plate element;



(e) screw means threadingly engaging said first plate element and impinging on said longitudinal raised section of said second plate element, adjustable over a range of positions to engagingly move said first and second plate elements between said open expandable position and said contractable closed position.

4,190,225

DEVICE FOR ADJUSTING VERTICAL AND INCLINED POSITIONS OF A VEHICLE SEAT

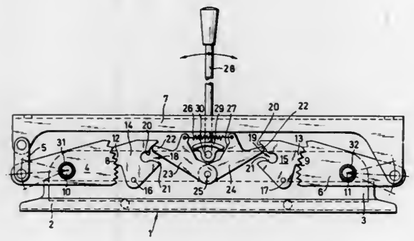
Heinz Bauer; Burckhard Becker, and Alfred Gedig, all of Solingen, Fed. Rep. of Germany, assignors to C Rob Hammerstein GmbH, Solingen-Merscheid, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,632

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811582

Int. Cl.² F16M *11/24, 13/00*

U.S. Cl. 248—394 **9 Claims**



1. In a device for adjusting vertical and inclined positions of a vehicle seat, including at each lateral side of the seat a five-bar linkage assembled of an underframe, a seat carrier bar, a pair of support levers pivotably connected to the underframe, a coupling bar linked between one of the support levers and an end portion of the carrier bar, the other end portion of the carrier bar being linked to the other support lever, a combination comprising a gear segment formed on each of said support levers; a pair of arresting levers linked to the underframe and each being provided with arresting teeth engageable with said gear segments; switching levers linked to said underframe between said arresting levers; spring means coupled to said switching levers for urging the same against said arresting levers to bring the arresting teeth thereof into engagement with said gear segments; a control lever pivotably connected to said underframe between said switching levers; and a cam rigidly connected to said control lever and operable to rotate a selected switching lever against the force of said spring means and out of contact with said arresting levers, thus disengaging the arresting teeth from the corresponding gear segment.

4,190,226

VEHICLE SEAT SLIDES

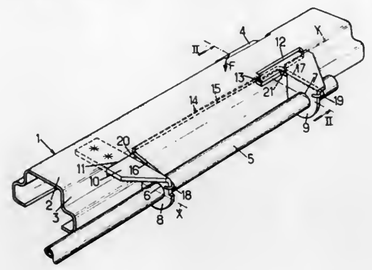
Alain Letournoux, St. Jean de Blanc, and René Droual, Ris Orangis, both of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France

Filed Oct. 3, 1978, Ser. No. 948,303

Claims priority, application France, Oct. 19, 1977, 77 31474

Int. Cl.² F16M *13/00*

U.S. Cl. 248—429 **6 Claims**



1. A vehicle seat slide comprising a lower shaped-section intended to be fixed to the floor of the vehicle, an upper shaped-section intended to be fixed to the seat and adapted to slide along the lower shaped-section, a bolt mounted on the upper shaped-section and adapted to coact with a rack integral with the lower shaped-section, and a rigid rod for controlling the movements of the bolt against the return force of a spring, said rod extending along the slide and being itself pivotably mounted on a transverse axis connected to the upper shaped section, characterized in that, the bolt being mounted in a way known per se so as to pivot about a longitudinal axis connected to the upper shaped-section, the control rod is housed in two holes provided respectively in two transverse vertical lugs, the front one of which is integral with the upper shaped-section and the rear one of which is integral with the bolt.

4,190,227

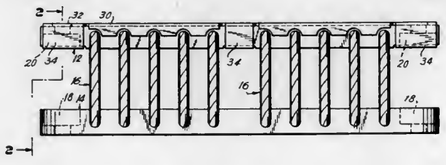
VIBRATION ISOLATOR AND METHOD FOR MANUFACTURING SAME

Robert E. Belfield, Sayville; Chester L. Gilbert, Forest Hills, and Euland M. Bickham, North Babylon, all of N.Y., assignors to Aeroflex Laboratories, Inc., Plainview, N.Y.

Filed Jul. 22, 1976, Ser. No. 707,589

Int. Cl.² F16L *15/04*

U.S. Cl. 248—636 **19 Claims**



1. In an isolator for supporting a load on a part, such as a vehicle part, which is subject to vibrations, in a manner insulating the load from the vibrations, a pair of elongated substantially coextensive bar means of substantially the same size and configuration respectively situated in alignment with each other and respectively being spaced from each other while being situated in substantial parallel planes, one of said bar means being adapted to be connected with the load while the other of said bar means is adapted to be connected with the part which is subject to vibrations, and a plurality of elongated spring means portions distributed longitudinally along each side of said pair of bar means and being fixed thereto, said plurality of spring means portions respectively being situated substantially in parallel planes which are substantially normal

to the parallel planes in which said pair of bar means are located, each said spring means portion extending between said bar means along a path at least a portion of which is curved, one spring means portion on each side of said bar means being aligned in the same plane, each pair of spring means portions aligned in a single plane being integral with each other and formed from a single spring member, each of said spring members having an intermediate portion fixed to one of said bar means and a pair of ends fixed to the other of said bar means, said plurality of spring members interconnecting said pair of bar means for yieldable springy movement of one bar means with respect to the other, said intermediate portion of each spring member being situated substantially midway along the length thereof so that both of said spring means portions formed therefrom are substantially identical, both of said bar means being made of a molded material, said intermediate portions of said spring members being embedded in said one bar means during molding while said ends of each spring member are embedded in the other of said bar means during molding, said other bar means including a pair of separate elongated molded bodies in which said ends of each spring member are respectively embedded, said plastic bodies being situated in side-by-side relation and extending longitudinally of each other, and said other bar means including a retainer means operatively connected with said pair of molded bodies for retaining them connected to each other in side-by-side relation.

4,190,228

MOULD FOR THE METALLOTHERMIC WELDING OF METAL ITEMS

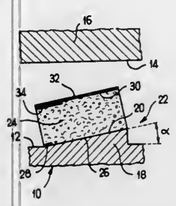
Patrick Bommart, Rueil Malmaison, France, assignor to C. Delachaux, Gennevilliers, France

Filed Jul. 5, 1978, Ser. No. 922,035

Claims priority, application France, Jun. 7, 1978, 77 21158

Int. Cl.² B22D *19/04;* **B23K** *23/00*

U.S. Cl. 249—86 **11 Claims**



1. A mould comprising at least two parts for the metallothermic welding of at least two metal items together by arrangement around butts of each of the metal items to define a pouring cavity adapted in use to receive hot welding-fluid, a face of the mould which in use will contact a part of one of the items to be welded or another portion of the mould, said face having a projection limiting the mould cavity and which in use presents a sloping side towards the exterior of the pouring cavity, and a strip of a compressible material which is little affected by heat being fixedly attached to the sloping side of the projection in order to abut said part of one of the items or the other portion of the mould and thereby automatically ensuring staunching of the mould after positioning the parts thereof around butts of the metal items.

4,190,229

HOT DOG BUN PAN

David R. Bradshaw, P.O. Box 1364, Selma, Ala. 36701

Filed Jan. 26, 1978, Ser. No. 872,623

Int. Cl.² A21C *11/00*

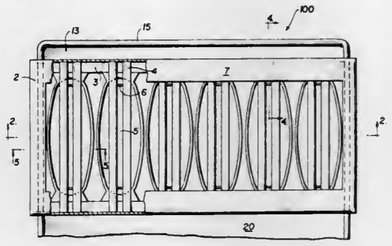
U.S. Cl. 249—124 **3 Claims**

1. A pan assembly for fabricating hot dog buns having a recess to accommodate a complimentally formed hot dog comprising:

a rectangular tray having a flat bottom panel, vertically upstanding walls contiguous therewith extending around said bottom panel,

a holding rack having a first pair of opposed parallel edges with a length longer than a one dimension of said bottom panel whereby said first pair of edges extend over two of the upstanding walls of said tray to form two lips for removing said rack from said tray,

said rack having a second pair of opposed parallel edges thereby forming a substantially rectangular frame with said first pair of edges, said second pair of edges defined by a lower portion and a longer upper portion parallel thereto and spaced therefrom, pl plural molds disposed



within and constrained by said rack, and recess forming means disposed one within each mold and supported by said rack,

whereby when said rack is removed from said tray said recess forming means is carried therewith and said mold is left behind,

in which said molds are defined by a generally ovaloid configuration having open top and bottom faces and are provided with plural tab members extending horizontally outwardly from the longitudinal extent of said oval mold at the top face thereof and said tab members abut against said lower portion of said second pair of edges of said rack so as to constrain said mold in said tray.

4,190,230

SCAVENGING AIR VALVE FOR CLEANING TUBULAR AIR FILTER BODIES

Hans Geissbühler, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Continuation of Ser. No. 682,844, May 4, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,166

Claims priority, application Switzerland, May 5, 1975, 5783/75

Int. Cl.² F16K *31/122*

U.S. Cl. 251—36 **7 Claims**

1. A high speed low pressure scavenging air valve for cleaning at least one tubular filter body by selectively introducing pulses of scavenging air from a scavenging air chamber to said tubular body comprising:

(a) a housing having stationary inner side walls, a stationary end wall connected to said side walls, and an exhaust port through said end wall, a maintaining chamber being defined between said inner walls and said end wall;

(b) a scavenging air line having an inlet end disposed within said maintaining chamber, said inlet end having a first transverse dimension;

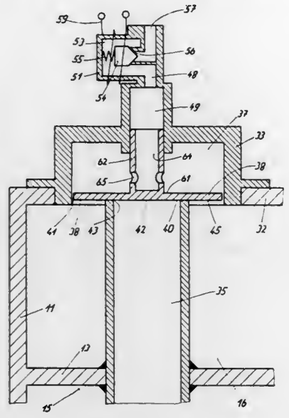
(c) a valve disc formed of rigid material having first and second sides, and a central portion, said first side being exposed to said scavenging air chamber, said second side being exposed to said maintaining chamber, said central portion being disposed to selectively open and close said inlet end of said scavenging air line, said first and second sides extending substantially beyond the first transverse dimension of said inlet end of said air line to provide a pressure surface on the first side of said disc for said scav-

enging air to move said disc away from said inlet end, said disc being mounted for reciprocating movement within said maintaining chamber in a direction normal to said disc, said second side forming a second pressure surface opposite said stationary end wall for scavenging air in said maintaining chamber to move said disc toward said inlet end, said first and second sides having outer edge portions, said outer edge portions and said inner side wall of said maintaining chamber defining a narrow throttling passageway which provides fluid communication between said scavenging air chamber and said maintaining chamber;

(d) means for guiding said disc in said maintaining chamber;

(e) an exhaust air line in fluid communication with said exhaust port;

(f) a control valve positioned within said exhaust line to regulate the flow of air therethrough, said valve normally



blocking the flow of air whereby said disc is normally biased to close said inlet end by the pressure of scavenging air within said maintaining chamber on the second pressure surface of said second side, and whereby when said control valve is open, said pressure in said maintaining chamber is released and said scavenging air pressure acting against said first side of said disc rapidly opens said inlet end of said scavenging air line introducing a scavenging air pulse into said air line; and

(g) means for pneumatically damping said disc in its movement toward said end wall to open said inlet end whereby said disc rapidly closes said inlet end to terminate said scavenging air pulse, said pneumatic damping means being inoperative to dampen said disc movement upon initial rapid opening of said air inlet end and operative to dampen said disc movement only as said disc approaches said end wall of said maintaining chamber.

4,190,231

BILATERALLY BALANCED FLUID CONTROL VALVE

Ettore Vimercati, 42 Via F. Carridoni, Bergamo, Italy

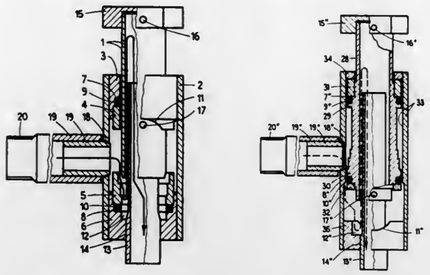
Continuation-in-part of Ser. No. 811,858, Jun. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 566,071, Apr. 8, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,229

Claims priority, application Italy, May 21, 1974, 22998 A/74

Int. Cl.[2] F16K *47/00*

U.S. Cl. 251—118 **2 Claims**

1. A valve for controlling and shutting off the flow of fluid from a pipe, in which the shutting and control elements are two separate components, one of said components being tubular in shape and positioned inside the other hollow component, the said hollow component being the body of the valve carried by a pipe inserted into the fluid-supply pipe, and the said tubular component being the plunger of the valve, elastic sealing rings being disposed in recesses provided in the cylindrical surfaces of coaxially permanently fitted sleeves disposed inside the valve body, the said sealing rings rubbing and pressing lightly against the smooth cylindrical surface of the plunger facing them, small closed circular areas being the contact regions of the elastic sealing rings on the smooth cylindrical surface within the confines of which the fluid inlet in the valve body is constantly disposed, the cylindrical surface of the top sleeve serving to guide the plunger, the cylindrical surface portion of the bottom sleeve located above the elastic sealing ring having a number of adjacent stepped portions whose diameters are only slightly different from that of the opposite smooth cylindrical surface serving as a fluid control, a cavity being part of the valve body and located beneath the bottom sealing ring serving as a chamber for the dissipation of such kinetic energy as is generated by the fast-flowing fluid colliding with the slow-flowing fluid where the fluid discharge is located, the said fluid discharge means being tubular in shape and aligned with the valve body, and being fitted into a bore provided in the bottom wall of the cavity, and serving to remove turbulence from the outflowing stream of fluid, the said plunger of the valve being slidable through the said sealing rings along their common longitudinal axis, and being furthermore rotatable around the said longitudinal axis, the fluid flow being gradually controllable from fully shut to fully open as a function of the longitudinal position of the plunger relative to the valve body, the plunger being in a state of static balance with respect to any existing pressure and friction as well as with respect to its own weight, whatever its position within the limits of its predetermined traverse, the said plunger being displaceable from its position of rest under guided conditions and solely under the direct control of an operator.



4,190,232

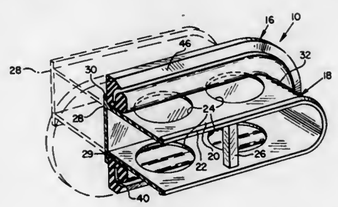
IRRIGATION PIPE GATE VALVE

Lloyd W. Clements, 49 W Lincoln Ave. (C), Woodland, Calif. 95695

Continuation-in-part of Ser. No. 918,492, Jun. 23, 1978, abandoned, which is a continuation of Ser. No. 775,244, Mar. 7, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 964,264

Int. Cl.[2] F16K *31/58*

U.S. Cl. 251—145 **8 Claims**



5. In an irrigation structure including a generally horizontal irrigation pipe having a generally elliptical opening disposed so

that the major axis of the ellipse extends lengthwise of the pipe, the improvement comprising a gate valve including:

a substantially rigid, generally elliptical tubular slide having shorter side portions and longer side portions, an open outer end and a closed inner end and a plurality of generally circular openings in each of the longer side portions thereof,

the openings in one of the longer side portions being substantially directly opposed to the openings in the other of the longer side portions,

the shorter side portions being imperforate,

and a generally elliptical sealing frame of elastomeric material mounted in the opening in the pipe and fitting closely on the slide and having an exterior circumferential groove

the slide being adjustable axially relative to the frame and the slide and the frame being provided with detent portions to hold the slide in adjusted position relative to the frame.

4,190,233

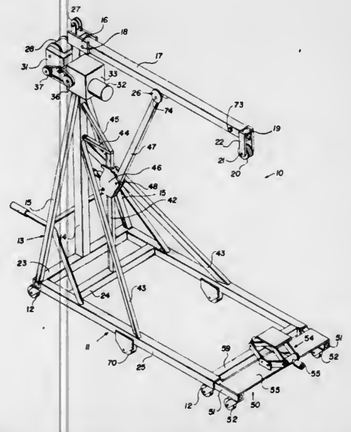
JACK

Charles J. B. Godfrey, 334 Reid St., Forest City, N.C. 28043

Filed Jun. 30, 1978, Ser. No. 921,054

Int. Cl.[2] B66F *3/46*

U.S. Cl. 254—4 B **8 Claims**



1. A jack comprising a base frame defined by a first pair of horizontally disposed spaced parallel hollow beams interconnected at one end by a pair of cross pieces, and at another end by a further cross piece, a second pair of horizontally disposed spaced parallel beams telescopingly inserted within said first pair of beams at said further cross piece, said second pair of beams interconnected by a platform upon which first jack means are affixed, wheel underlying and supporting said beams, a vertical frame carried by said base at the extremity thereof remote from said first jack means, said vertical frame comprising a vertical post joined to a central portion of one cross piece having plural angled braces extending from said first pair of spaced hollow beams to said vertical post, an overhead boom hinged at one extremity thereof to a top portion of said vertical post, said boom extending over said first pair of hollow beams, and means for pivoting said boom about said vertical post.

4,190,234

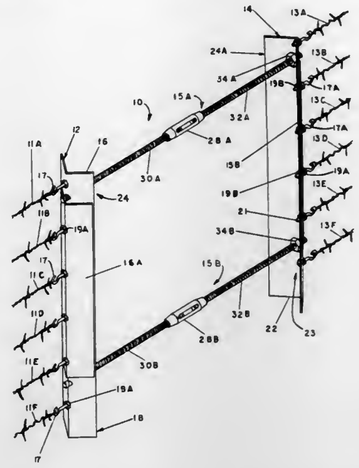
MULTIPLE WIRE FENCE TIGHTENER

Cecil L. Coleman, Rte. 1, Box 246, Dardanelle, Ark. 72834

Filed Oct. 24, 1978, Ser. No. 911,899

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—83 **1 Claim**



1. A multiple wire stretcher for tightening fences, said stretcher comprising:

first and second elongated, rigid pulling angle members adapted to be disposed in parallel, spaced apart relation said pulling angle members each having top and bottom portions; said angle members comprising angled elongated reinforcement members rigidly coupled thereto and extending between said pulling angle member top and bottom portions for preventing deformation of said pulling angle members during operation of said wire stretcher;

a first adjusting rod adapted to extend between said pulling angle member top portions, said first adjusting rod threadably coupled to each said pulling angle members whereby rotation of said rod draws said pulling angle members together;

a second adjusting rod adapted to extend between said pulling angle member bottom portions, said second adjusting rod threadably coupled to said pulling angle members whereby rotation of said second adjusting rod draws said pulling angle members together;

said first and second adjusting rods each comprising:

a centrally disposed turnbuckle portion adapted to be manually rotated to operate said wire stretcher;

an elongated, lefthand threaded segment weldably secured to said turnbuckle portion and threadably received within one of said first and second pulling angle members; and

an elongated, righthand threaded segment weldably secured to an opposite side of said turnbuckle portion and threadably received within the other of said first and second pulling angle members;

said pulling angle members additionally comprising apex portions thereof comprising nut means weldably secured thereto at a central, symmetrical position for threadably receiving said lefthanded and right-handed threaded adjusting rod segments, thereby preventing twisting of said elongated pulling angle members in response to rotation of said adjusting rods; and

a plurality of eye bolts adapted to be coupled to individual wire elements of said fence and secured to said pulling angle members in spaced apart relationship thereon.

4,190,235

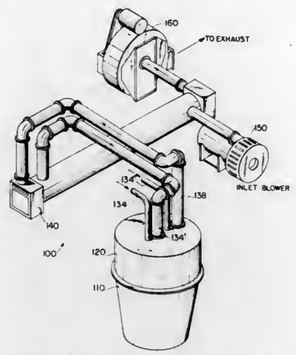
FLUIDIZED BED LADLE HEATING METHOD AND APPARATUS

William C. Dell, 1211 Connecticut Ave., NW., Washington, D.C. 20036

Continuation-in-part of Ser. No. 933,834, Aug. 15, 1978, abandoned. This application Sep. 14, 1978, Ser. No. 942,366

Int. Cl.[2] C21D *1/00*

U.S. Cl. 266—44 **36 Claims**



1. The method of high temperature heat treatment of foundry and/or mill ladles, comprising the steps of:

(A) pneumatically forming within a given ladle, a fluidized bed of refractory particles, capable of containing and sustaining high temperatures up to at least 2000° F.;

(B) heating the fluidized bed internally by injecting combustion gases therein to raise the temperature of the ladle to a range of not less than 800° F.;

(C) simultaneously with step (B) exhausting heating gases from the fluidized bed while;

(D) controlling the input of (B) with the exhaust of (C) to form a controlled zone of negative pressure above the fluidized bed.

4,190,236

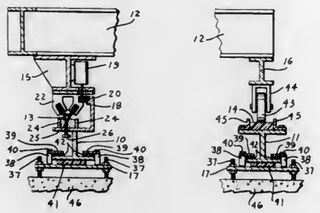
APPARATUS FOR GUIDING A TOOL IN A LINEAR PATH RELATIVE TO A WORK PIECE, AND METHOD OF MANUFACTURE THEREOF

John R. McKibbin, and Frederick B. Tyler, Jr., both of P. O. Box 58002, Birmingham, Ala. 35209

Filed Mar. 23, 1979, Ser. No. 23,242

Int. Cl.[2] B23K *7/10*

U.S. Cl. 266—69 **20 Claims**



1. An improvement in an apparatus for guiding a tool in a linear path relative to a work piece, including a means for supporting said work piece, a first linear track member, a second collinear track member laterally displaced from said first linear track member, a transverse member movably supported by said first linear track member and said second collinear track member, and a tool carried by said movable transverse member, wherein the improvement comprises:

(a) A means for maintaining perpendicularity between said first linear track member and said transverse member;

(b) A means for providing rolling support for said transverse member by said second collinear track member; and

(c) A second collinear track member having a horizontal epoxy supportive surface made from a liquid epoxy material hardened into a horizontal supportive surface, said horizontal epoxy supportive surface being in communication with said means for providing rolling support for said transverse member by said second collinear track member.

4,190,237

APPARATUS FOR TREATING REFINERY WASTE GASES

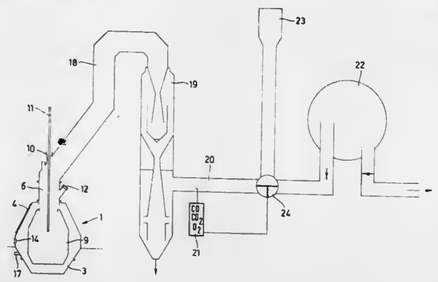
Jörg P. Baum, Essen, Fed. Rep. of Germany, assignor to Verfahrenstechnik Dr. Ing. Kurt Baum, Essen, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,896

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714825

Int. Cl.[2] C21C *5/40*

U.S. Cl. 266—80 **11 Claims**



1. An apparatus for treating waste gases emitted from metallurgic refining wherein metals are treated in a vessel comprising a closed pressure vessel having a removable bottom, a metallurgical treatment vessel within said pressure vessel, said pressure vessel being connected to a waste gas cooler and a dust separator.

4,190,238

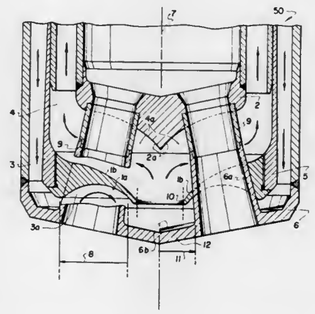
LANCE HEAD FOR A FINING LANCE

Josef Schoop, Peine; Werner Resch, Dortmund, and Heinz Damme, Peine, all of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 905,007

Int. Cl.[2] C21C *5/48*

U.S. Cl. 266—270 **9 Claims**



1. A lance head for a refining lance, comprising, a lance head bottom member, a plurality of nozzles connected to said bottom member, a supply line connected to said bottom member for supplying coolant toward an inner surface thereof, a return line connected to said supply line for channeling coolant away from the interior surface of said bottom member, said supply and return lines disposed concentrically of a major axis of said lance head, a flow guide member connected between said supply line and said return line extending inwardly toward the major axis of said lance head and closely around said nozzles for directing coolant toward and across said bottom member interior surface, said flow guide member having a bottom surface facing said bottom member interior surface and defining a first coolant passage therewith, said flow guide member bottom surface being concave toward said interior surface in the area adjacent said nozzles and the cross-sectional area of said first coolant passage being substantially constant past said nozzles due to said concavity, whereby, coolant is uniformly directed past said bottom member interior surface.

4,190,239

SHOCK ABSORBER ASSEMBLY AND INSTALLATION

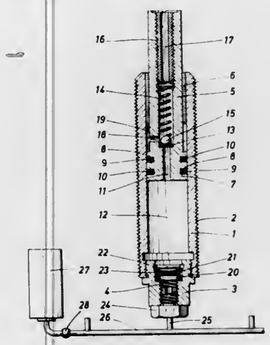
Gerhard Schwankhart, Attnang-Puchheim, Austria, assignor to Walter Sticht, Attnang-Puchheim, Austria

Filed Jun. 8, 1978, Ser. No. 914,617

Claims priority, application Austria, Jun. 17, 1977, 4283/77

Int. Cl.[2] F16F *9/19*

U.S. Cl. 267—65 R **7 Claims**



1. A pneumatic shock absorber comprising

(a) a source of compressed air,

(b) a cylinder having two ends,

(c) a piston mounted reciprocably in the cylinder for assuming different axial positions therein, the piston defining

(1) a pressure chamber in the cylinder adjacent one of the cylinder ends,

(d) inlet passage means communicating with the pressure chamber,

(e) conduit means premanently connecting the compressed air source to the inlet passage means for delivering compressed air to the pressure chamber for reciprocation of the piston,

(f) a check valve in the inlet passage means and responsive to an air pressure in the pressure chamber exceeding the pressure of the compressed air for preventing the escape of compressed air from the pressure chamber,

(g) an outlet passage means connected to the atmosphere and communicating with the pressure chamber in any of the axial positions of the piston, and

(h) an adjustable relief valve in the outlet passage and responsive to a pressure in the pressure chamber to which the relief valve is adjusted for venting the said pressure to the atmosphere.

4,190,240

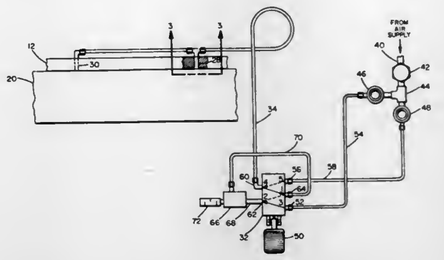
CYLINDER HEAD SUPPORT WITH AIR CUSHION AND VACUUM HOLD DOWN

Bertil G. Peterson, Bloomington, Minn., assignor to Tobin-Arp Manufacturing Company, Eden Prairie, Minn.

Filed Apr. 17, 1978, Ser. No. 896,889

Int. Cl.[2] B25B *11/00*

U.S. Cl. 269—21 **5 Claims**



1. In a machine for performing work on a work piece, the improvement comprising:

a support member for supporting a work piece;

a table for supporting the support member;

orifice means for supplying air to or removing air from between the support member and the table;

an air source;

a vacuum force transducer having an air supply inlet, a vacuum inlet, and an exhaust outlet; and

operator-controlled valve means for selectively connecting the air source to the orifice means to provide an air cushion which permits positioning of the support member with respect to the table, or connecting the air source to the air supply inlet of the vacuum force transducer and the vacuum inlet to the orifice means to provide a vacuum which holds the support member in a fixed position with respect to the table.

4,190,241

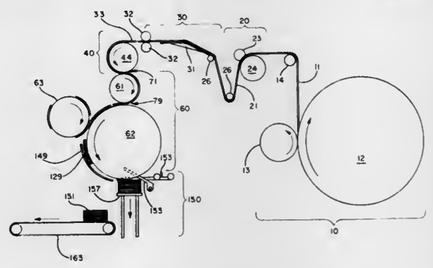
APPARATUS FOR CONVERTING PAPER ROLLS INTO STACKS OF INDIVIDUAL FOLDED PAPER SHEETS

Gary A. Krueger, Neehah, Wis., assignor to Kimberly-Clark Corporation, Neehah, Wis.

Filed May 1, 1978, Ser. No. 901,436

Int. Cl.[2] B42C *1/04*

U.S. Cl. 270—47 **4 Claims**



1. In apparatus for converting a continuous paper web into stacks of individual web segments, the combination comprising:

a cutting station including a cutter for transversely segmenting said web into a continuous stream of adjacent sheets of regular length as said web is carried through said cutting station;

means including a rotary transfer cylinder for receiving said

stream of adjacent sheets and transferring said sheets from said cutting station to a final stacking station;

a rotary pre-stacker cylinder positioned parallel and tangent to said transfer cylinder for pre-stacking sets of sheets on said transfer cylinder before said sheets are delivered to said final stacking station, including means for removing certain sheets from said transfer cylinder, carrying them through 360° of rotation, and placing them upon remaining sheets on said transfer cylinder, whereby sets of pre-stacked sheets, spaced by the gaps vacated by the removed sheets, are delivered by said transfer cylinder to said final stacking station; and

means at said final stacking station for stacking said sets of pre-stacked sheets as they are delivered to said stacking station, said gaps providing an interval for stacking of one set of pre-stacked sheets onto the top of said stack, before the next set is delivered.

4,190,242

GEAR FOLDER

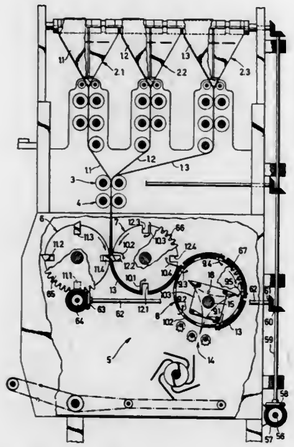
Hans B. Bolza-Schunemann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,081

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652159

Int. Cl.² B42C *1/04*

U.S. Cl. 270—50 **4 Claims**



1. A gear folder for collecting sheets of paper and for folding said sheets, said gear folder including a rotatable, hollow, collecting cylinder, and a folding blade carrier rotating eccentrically within said collecting cylinder, said rotating folding blade carrier carrying four selectively projectable rotating folding blades, said folding blades of said folding blade carrier tracing a three-point hypocycloid, said hollow collecting cylinder having five fields, each of said five fields being equipped with a retractable pin set;

control means for selectively retracting each of said pin sets, said control means including a fixed cam disk having a first camming recess and a rotatable cam disk having a second camming recess, each of said pin sets being retracted only when said first and second camming recesses coincide, one revolution of said folding blade carrier coinciding with one 4/5 revolution of said collecting cylinder.

4,190,243

FOLDER ASSEMBLY FOR BOOK FOLDING

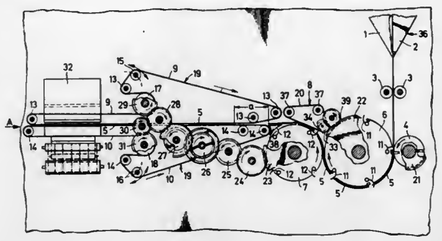
Horst B. Michalik, Hochberg, and Otto T. Weschenfelder, Wurzburg, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,637

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723358

Int. Cl.² B65H *45/22*

U.S. Cl. 270—66 **5 Claims**



1. A folder assembly for book folding in a web-fed rotary printing machine, said folding assembly folding signatures which have been severed from associated printed webs, said folder assembly comprising:

a rotatable cuttng knife cylinder and a rotatable take-over cylinder, said cutting knife cylinder severing the webs into a series of signatures;

means for selectively operating said take-over cylinder in either a straight run production mode or a collect run production mode;

a rotatable conveyor cylinder and a first signature conveyor system, said conveyor cylinder and said first signature conveyor system cooperating to receive the signatures from said take-over cylinder;

a signature acceleration section for receiving the signatures from said conveyor cylinder and said first signature conveyor system and operating to regulate the spacing between signatures;

a longitudinal folding device for receiving the signatures from said signature acceleration section and for longitudinally folding the signatures; and

means for operating said signature acceleration section at a first speed when said take-over cylinder is in the straight run production mode and at a second, different speed when said take-over cylinder is in the collect run production mode whereby said signature acceleration section delivers the signatures to said longitudinal folding device in a spaced array.

4,190,244

DEVICE FOR PICKING UP SHEETS FROM A MAGAZINE IN A PACKAGING MACHINE

Roberto Risi, Via Zampieri 11, Casalecchio di Reno (Province di Bologna), Italy

Filed Feb. 15, 1978, Ser. No. 878,129

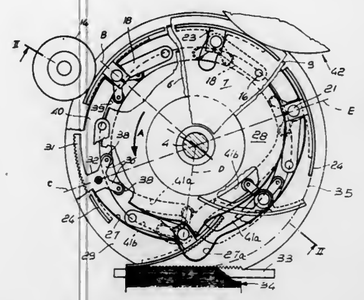
Claims priority, application Italy, Feb. 18, 1977, 3356 A/77

Int. Cl.² B65H *3/20*

U.S. Cl. 271—33 **2 Claims**

1. A device for picking up sheets from a sheet magazine comprising a base, a shaft journalled in said base at a given distance from the leading sheet in said magazine and driven with continuous motion, a plate member fixed to said shaft, a plurality of withdrawal sectors oscillating supported on said plate member and each comprising a cylindrical sheet holding segment having a radius of curvature equal to said given distance and a gear segment extending in the same plane of said cylindrical segment, a stationary rack fixed in the same plane as the leading sheet and so as to intermesh with said gear segment, cam control means formed in the base and extending around

said shaft and operatively associated with said sectors to pivot the latter, wherein according to the improvement the device further comprises a plurality of levers pivotally supported on said plate member and extending substantially circumferentially with respect to said shaft, each lever rotatably supporting



a respective sector and the axes of rotation of said sectors and levers being parallel to said shaft, stationary cam means being further provided controlling pivoting movement of said levers to produce, in cooperation with said cam control means, rolling of said cylindrical segments onto the leading sheet with said gear segment in intermeshing relationship with said rack.

4,190,245

DE-CURLING DEVICE FOR PRINTING PRESSES

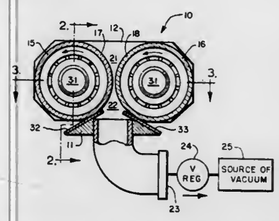
Harry Brandes, Hainburg, Fed. Rep. of Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 843,260

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648986

Int. Cl.² B65H *29/70*

U.S. Cl. 271—278 **2 Claims**



1. A sheet flattener for a sheet-fed printing press or the like in which printed sheets having a tendency to curl in the direction of a freshly printed surface thereof are conveyed seriatim edgewise from a source to a receiver along a path of flow comprising, in combination, a pair of elongated smoothly cylindrical rollers closely spaced parallel to one another to form a narrow gap between them and presenting opposed cylindrical surfaces defining an upper receiving space and a lower plenum space of cusp-shaped cross section, means including a supporting bar having end brackets for rotatively supporting the rollers crosswise with respect to the direction of sheet flow and for defining a receiving space closely spaced parallel to the sheet path, means including the supporting bar and end brackets for enclosing and sealing the plenum space, means for applying vacuum in the plenum space, means for conveying the sheets along the path of movement to the surface of said pair of closely spaced rollers with a freshly printed surface of each sheet in contact with the surface of said rollers, the surface of the rollers being continuous and imperforate so that the effect of the vacuum is concentrated in the gap at a sufficiently high level as to draw a conveyed sheet downwardly into the upper receiving space and deeply into the narrow portion of the gap and against the cylindrical surfaces in a cusped profile with the sheet undergoing an abrupt bend at the point of the cusp in a direction opposite to the direction of curling tendency thereby to remove the curl, both of the rollers being mounted for rotational movement at the speed of conveyance of the sheet to preclude any drag and relative slippage of the sheet against the surfaces thereby to insure against smearing of ink on the presented faces of the sheets.

4,190,246

PAPER FEEDING SYSTEM

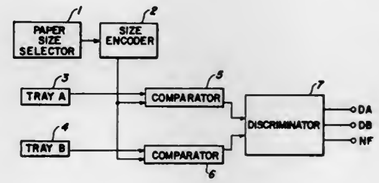
Kazuyasu Sasuga, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,301

Claims priority, application Japan, Jan. 27, 1977, 52/7913[U]

Int. Cl.² B65H *1/00*

U.S. Cl. 271—145 **1 Claim**



1. In a paper feeder for use in a copying machine equipped with a plurality of trays for storing paper of various sizes; the improvement comprising:

a circuit for encoding a selected paper size from a number of available paper sizes;

circuit means for detecting and encoding the sizes of paper stored in the plurality of trays;

a comparator circuit for comparing said selected paper size with one of the plurality of trays that contains paper corresponding to the selected paper size; and

a dual discriminator circuit for generating signals in response to the output of said comparator circuit, said discriminator circuit in a first mode enables paper feeding from a selected tray if paper is available for feeding and in a second mode generates a signal to indicate necessity of adding paper to the selected tray if the tray is empty.

4,190,247

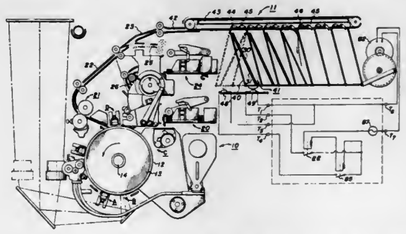
SHEET RECEIVING APPARATUS

Joachim Guenther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1974, Ser. No. 455,467

Int. Cl.² B65H *29/60*

U.S. Cl. 271—291 **2 Claims**



1. A multiple bin sheet receiving apparatus, for a reproducing machine conditionable to image on either one or both sides of a sheet, comprising:

a plurality of generally parallel bin side wall members each mounted to said apparatus independently pivotally suspended generally vertically from their upper ends at fixed,

spaced apart, positions to forms upper openings into said bins, and bin bottom members pivotally interconnecting the lower ends of all of said bin side wall members to define an integrally pivotable multiple sheet receiving bin apparatus with each bin side wall member being common to two adjacent bins,

means for transporting said sheets generally in a plane past said upper openings of said bins, including deflector means for deflecting sheets into said openings of said bins between said spaced fixed mounting positions of said bin side wall members, wherein said deflector means comprises two alternatively operated deflector members at each said bin opening, each adjacent to an opposite said bin side wall member,

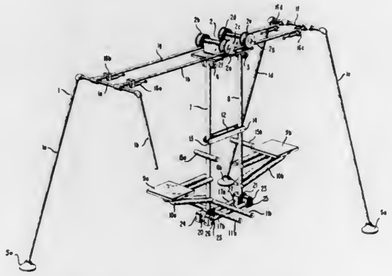
and means for automatically pivoting all of said bin side wall members in parallel as an integrally connected unit about said fixed upper end pivotal mountings thereof between first and second bin orientations, wherein in said first orientation said sheets lie against one said bin side wall member of each said bin with one sheet face exposed, and wherein in said second orientation said sheets lie against the opposite adjacent said bin side wall member of said bins with the opposite sheet face exposed, to provide proper collation for simplexed or duplexed copies, respectively.

4,190,248

TROLLEY-SWING

George J. Philippi, 1209 Stillman Ave., Plainfield, N.J. 07060

Filed Apr. 18, 1978, Ser. No. 897,332
Int. Cl.[2] A63F *7/06*
U.S. Cl. 272—87 **4 Claims**



1. A trolley-swing comprising in combination:

a rigid frame constructed to support an elongated track at a height above and in substantially parallel relation to ground level;

a trolley, including a carriage, mounted for extended to and fro motion along said track;

a swing comprising at least one forward and one rear supporting hanger strut mounted with the upper ends of each said hanger strut respectively disposed in rotatable relation to forward and rear upper pivot means;

said forward and rear upper pivot means supported in spaced-apart relation along said carriage in the principal direction of said track so that in their vertical rest positions said hanger struts depend from said carriage in parallel vertical relation, forming two sides of a parallelogram;

the horizontal component of the rotation of said hanger struts being substantially aligned with the principal direction of said track;

interconnecting means being connected between the lower ends of said hanger struts through forward and rear lower pivot means, said interconnecting means forming a third side of said parallelogram which is substantially parallel to the carriage of said trolley;

at least one seat for a rider of said swing rigidly connected intermediate the end of at least one said hanger strut exclusive of said interconnecting means;

and means respectively responsive to manual pull and foot-thrust by a rider seated on said at least one seat for applying a torque to distort the angles of said parallelogram comprising said hanger struts, to cause rotation thereof in a vertical plane about said upper and lower pivot means, from said vertical rest position to a position of rotational displacement and to convert a component of the rotational motion of said hanger struts to translational motion of said trolley carriage along said track as said hanger struts pass through their vertical rest position in returning from a position of rotational displacement;

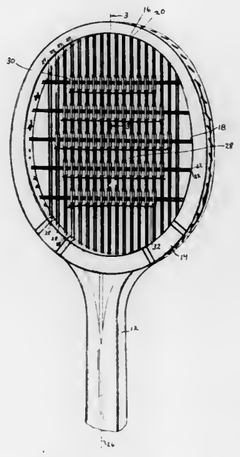
said means responsive to manual pull and foot-thrust comprising a hand-hold rigidly connected at an intermediate position on said one hanger strut, and a footrest disposed on said interconnecting means adjacent said one hanger strut.

4,190,249

TENNIS RACKET AND METHOD OF MAKING SAME

Werner Fischer, Lichtenburgerstrasse 13, 8113 Vilsbiburg, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,211
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634599; Jul. 31, 1976, 7624107[U]
Int. Cl.[2] A63B *51/06*
U.S. Cl. 273—73 D **17 Claims**



1. A tennis racket or the like which is particularly adapted for angular momentum transfer comprising,

a racket body comprising a racket handle and a racket head frame,

a central stratum in said frame of paired, tensioned cross strings,

a first stratum of regularly spaced main strings in said frame adjacent one side of said cross string stratum, and a second stratum of regularly spaced main strings in said frame adjacent the other side of said cross string stratum, the spacing of said main strings being not more than about half of the spacing of said cross strings,

a plurality of sheaths positioned on strings of said main string strata at points of contact between said main strata strings and said cross stratum strings in at least the central zone of said racket head frame, said sheaths having a diameter of at least about one and one half times the diameter of the cross strings and a length at least about three fourths of the center-to-center spacing of the main strings, and

a set of holding strings for each of said main string strata for unifying the respective lateral movement of said main string strata, and means positioned on said main strings for preventing the displacement of said holding strings on said main strings.

11. A method for manufacturing a tennis racket which is particularly adapted for angular momentum transfer, comprising the steps of

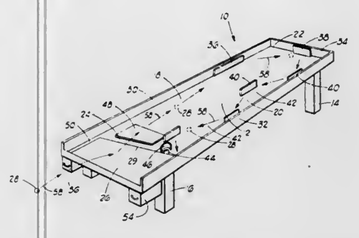
providing a tennis racket frame, stringing a strata of paired cross strings having a predetermined pair-wise separation, stringing a stratum of main strings at each side of said central cross stratum to provide two independent main string strata having main strings which are regularly spaced apart with a separation distance not more than half the pair-wise separation of said cross string pairs while concommitantly applying cylindrical sheaths having a diameter of at least one and one half times the cross string diameter and a length at least three fourths of the main string separation distance for intended points of contact between said main and cross strings, applying holding strings to each of said main string strata for connecting strings of said respective strata together for lateral movement as a unit, such that displacement of said holding strings along said main strings is restrained.

4,190,250

GAME APPARATUS

Norman J. Grifhorst, 131 N. Hillside, Wichita, Kans. 67214

Filed May 15, 1978, Ser. No. 906,100
Int. Cl.[2] A63B *71/04*; A63F *9/00*
U.S. Cl. 273—342 **5 Claims**



2. A game apparatus for receiving a rubber rolling ball thereon, the apparatus comprising:

a game table mounted on legs and having a first side portion, a second side portion, a front portion and a rear portion, said table sloped downwardly from the front portion to the rear portion of said table;

a flat launch board mounted on top of the rear portion of said table for bouncing the ball onto said table, said launch board having an angled front wall for receiving the rolling ball when the ball rolls downwardly from the top portion to the rear portion of said table;

a portion of carpet, the carpet being disposed in front of said launch board and attached to said table, said carpet acting to reduce the velocity of the ball when the ball is bounced off said launch board and onto said table;

a first sideboard extending along the length of the first side portion of said table and attached thereto;

a second sideboard extending along the length of the second side portion of said table and attached thereto;

a front board extending along the length of the front portion of said table and attached thereto;

a first sideboard bumper attached to said table and adjacent to and parallel said first sideboard;

a front board bumper attached to said table and adjacent to and parallel said front board;

a plurality of second sideboard bumpers attached to said table and adjacent to and parallel said second sideboard, said second sideboard bumpers disposed in a staggered spaced relationship to each other and extending along the length of the second side portion of said table, said second sideboard bumpers forming a scoring lane therebetween;

a score hole in the second side portion of said table and adjacent said launch board; and

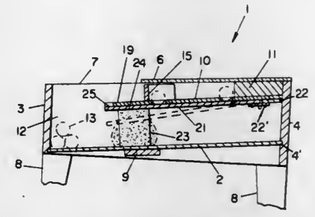
a return hole in the first side portion of said table and adjacent said launch board.

4,190,251

BUMP BOARD MARBLE GAME

Raymond M. Hall, 2339 E. 5th St., Dayton, Ohio 45403

Filed Mar. 27, 1978, Ser. No. 890,452
Int. Cl.[2] A63F *7/00, 7/10*
U.S. Cl. 273—124 R **9 Claims**



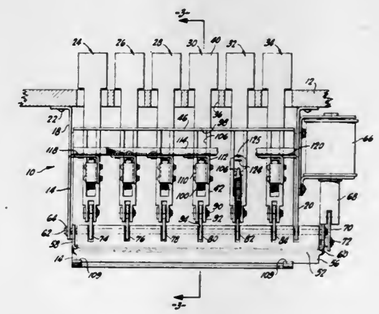
1. A bump board game for finger propelled marbles including a walled enclosure having a bottom, a flat forwardly sloping playing surface, spaced marble receiving scoring holes in said surface, dump board panel means arranged parallel beneath and engaging with said surface for retaining marbles lodged in said holes, means for pivotally connecting the rear of said panel means to the rear of said surface, and resilient compressible spring-like pad means arranged on the bottom of said enclosure beneath and to the rear of and for supporting the front of said panel means whereby manual downward pressure on the front upper surface of said panel means pivotally depresses said panel means relative to said playing surface to uncover said holes and release the marbles therein for rolling return over said panel means to the front of said enclosure.

4,190,252

MULTIPLE DROP TARGET ASSEMBLY FOR AMUSEMENT GAME

Cleon V. Kindig, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 18, 1978, Ser. No. 870,277
Int. Cl.[2] A63F *7/00*
U.S. Cl. 273—127 R **12 Claims**



1. A mechanism for resetting a plurality of ball actuated drop targets positioned for movement relative to the ball rolling playing surface of a pin-ball game apparatus, each of said targets extending through a slot in said playing surface for

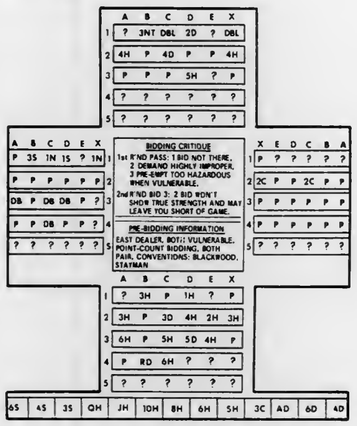
substantially vertical reciprocation therein and positioned for actuation by a ball rolling on said playing surface, said playing surface further including an exposed lower surface, said mechanism further including the combination of a frame having means for mounting the same on said lower surface, an elongated reset bar, means coupled with said reset bar for mounting the same on the frame in spaced relationship to and below said lower surface for pivotal movement about an axis extending transversely of the direction of movement of the targets, said reset bar having a cross-sectional shape providing substantial torsional rigidity, means for applying a force to one end of the reset bar to produce a movement about its longitudinal axis for pivoting said reset bar in one direction to a target reset position, means coupling said reset bar to the targets for raising the targets to said reset position as a function of the pivotal movement of the reset bar in said one direction, and latch means for releasably holding the targets in raised positions after the reset bar has reached said reset position.

4,190,253

CONTRACT BRIDGE DEVICE

Herbert H. Andrae, 88 Setauket Trail, Medford Lakes, N.J. 08055

Filed May 11, 1978, Ser. No. 904,972
Int. Cl.[2] G09B *19/22*
U.S. Cl. 273—148 **3 Claims**



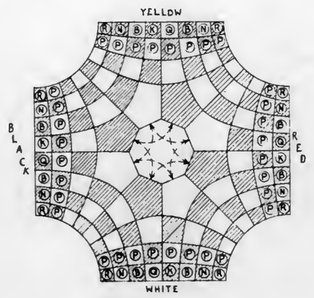
1. A device that permits a solitary user to bid a multiplicity of simulated hands of contract bridge in the same technical manner as he would be able to do as a member of a conventional foursome and which is composed of three major components; one being an orienting tray of dimensions determined by the other components; another being a template having groupings of apertures, fitted with slides or covers designed and arranged to make possible the timely exposure and/or conceal ment of lines and columns, and a center box of data; imprinted upon a sheet of paper, one for each hand to be bid, each of which constitutes a third component of the device which in detail is; a printed geometric figure in the form of an even armed cross of practical with and heighth with each of the four arms divided into a suitable number of intersecting lines and columns forming square spaces that can be and are cross indexed by letter and numerical indices so that each square in each arm bears the same indices as the corresponding squares in all other arms and this permits the presentation of a plurality of rounds, each of four possible contract bridge bids in the form of playing card indicia and numerals to be printed in said squares using the top line of the arms for the first four bids and progressing downward through the arms of the cross for succeeding sequences of bids until the required number of bidding sequences for the hand being bid according to the rules of contract bridge has been executed and a contract established; and at the bottom leg of the cross is the hand being bid in a line of playing card indicia while in the center of the cross in the box formed by the interior dimensions of the cross there is printed the minimum information that must be known before proper bidding can be initiated.

4,190,254

"DOUBLE-CHESS" GAME BOARD

Winthrop M. Leeds, 212 Overdale Rd., Pittsburgh, Pa. 15221

Filed Jul. 29, 1976, Ser. No. 709,919
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—261 **1 Claim**



1. A chess game board having an 8-sided peripheral configuration consisting of four straight sides alternated with four concave curved sides, the playing area on said game board comprising 128 playing spaces arranged in 16 curved lanes of 8 spaces each, a group of four lanes following approximately the contour of each of said four curved sides of said game board in advancing from one straight side of said game board to the adjacent straight side, and said game board having an octagonal play-directing area at the center of said board, said area changing the 8 central playing spaces into pentagonal shapes, with said octagonal play-directing area containing 8 dotted lines bridging alternate sides of said octagonal play-directing area so as to indicate optional routes taking either a 90 degree turn to the right or a 90 degree turn to the left for those chess pieces permitted to move along a diagonal route that could take them directly toward the center of said game board.

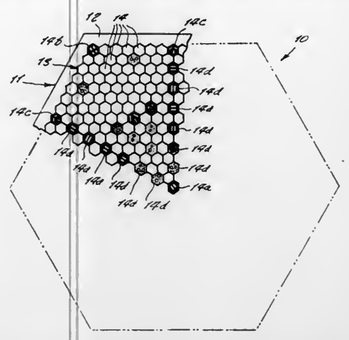
4,190,255

WORD GAME APPARATUS

Charles F. M. Hughes, P. O. Box 142, Bakerstown, Pa. 15007

Continuation of Ser. No. 708,588, Jul. 26, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,679
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—272 **5 Claims**

1. A word game apparatus, comprising a game board and a plurality of playing pieces for placement on said game board, said game board having a hexagonal playing field imprinted on the upper surface thereof in the form of a regular honeycomb pattern of smaller hexagonal spaces providing three different intersecting directions of play from left to right, the smaller hexagonal spaces at each corner carrying an indicia thereon representing a score multiplier, three connecting lines of hexagonal spaces extending from substantially the midpoint of each side of the hexagonal playing field to a like point on the opposite side dividing the playing field into six substantially equal generally pie-shaped areas each embracing 60° of the playing field between the midpoints of adjacent sides and including the corners of said hexagonal playing field, said lines intersecting at the center of the playing field, each of the hexagonal areas of each said line carrying an indicia indicating a score multiplier, a plurality of spaced score multiplier hexagonal areas arranged in each generally pie-shaped area, each having a fixed multiplier value, and word forming characters on each of said playing pieces, said playing pieces being hexagonal in shape and adapted to fit on any hexagonal space on the playing field, whereby words may be formed in three directions and letters of a word in one direction may serve as letters of a word in the other two directions.

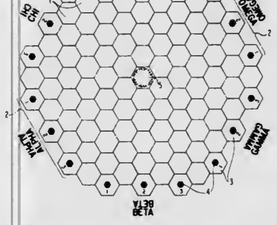


4,190,256

PATH FORMING GAME

Thomas J. Rudden, Jr., 6201 Hardy Dr., McLean, Va. 22101

Filed Mar. 31, 1978, Ser. No. 892,130
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—275 **10 Claims**



1. A game apparatus for two or more players comprising a game board, a variety of different types of offensive playing pieces and defensive playing pieces all in the shape of equilateral hexagons in which:

A. said game board is provided with a matrix of contiguous hexagonally-shaped spaces of about the same size and shape as said offensive and said defensive playing pieces;

B. said offensive pieces are provided for each player in a set including a variety of different types of pieces for each player, each offensive piece being characterized by the presence of at least one path therethrough defined by a distinctively identified interior segment and two or more distinctively identified peripheral segments which adjoin the edge of the piece and the interior segment; and

C. said defensive pieces are of about the same exterior dimensions as said offensive pieces but are further characterized by the absence of any path-defining, distinctively identified interior segments, although said defensive pieces may include one or more distinctively identified peripheral segments which adjoin the edges of the piece and said interior segment.

4,190,257

PACKING RING CONTAINING FLEXIBLE GRAPHITE

Danny L. Schnitzler, Port Clinton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 1, 1978, Ser. No. 874,368
Int. Cl.[2] F16J *15/20, 15/30*
U.S. Cl. 277—102 **15 Claims**

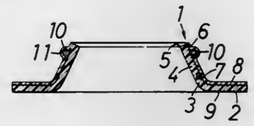
1. A packing ring comprised of small randomly oriented particles of flexible graphite compressed together, said packing ring having a density of from 70 lbs./ft.[3] to 120 lbs./ft.[3], and said particles being capable of undergoing flow with respect to each other when pressure is applied to the ring so as to cause said ring to reform its shape to the dimensions of a stuffing box.

4,190,258

FLUOROCARBON RESIN SEAL AND METHOD OF MAKING SAME

Yoshio Arai, 1400, Kamihongo, Matsudo-shi, Chiba-ken, Japan, and Kikuei Mukasa, Urawa, Japan, assignors to Yoshio Arai, Matsudo, Japan

Filed Jan. 4, 1978, Ser. No. 866,944
Claims priority, application Japan, Mar. 3, 1977, 52-23134
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—164 **4 Claims**



1. In a radial seal for sealing between two relatively movable members, including an integral sealing element formed of fluorocarbon resin and having a radially extending annular flange portion and a lip portion extending from said flange portion at an angle thereto through the intermediary of a flex section defined between said flange and lip portions, the improvement in which said sealing element is divided into a pair of first and second sections by a radial slit extending from the peripheral edge of said flange portion to a vicinity of the peripheral edge of said lip portion in parallel to the opposite surfaces of said sealing element, one of said first and second sections being bulged to form an annular pocket of substantially semi-circular cross section at a location adjacent to the peripheral edge of said lip portion; and an annular elastic member is received in said annular pocket; and the flange ends of said first and second sections are completely enclosed and fixedly secured by case means to one of said two relatively movable members so as to seal said elastic member received in said pocket from fluid flowing through said two relatively movable members.

4,190,259

SINGLE APEX TWO ELEMENT FLUID PRESSURE SEAL ASSEMBLY

Gordon T. Zitting, Sandy, Utah, assignor to Microdot Mfg., Inc., Salt Lake City, Utah

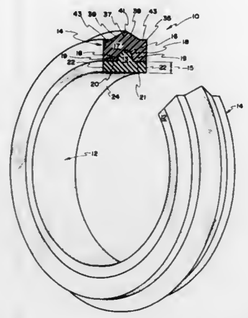
Filed Sep. 8, 1978, Ser. No. 940,534
Int. Cl.[2] F16J *9/00, 15/24*
U.S. Cl. 277—165 **7 Claims**

1. A two element compression seal assembly comprising:

an endless relatively soft annular spring element of yieldable material with memory and having a solid generally rectangular cross-sectional configuration with an annular projection extending toward the other element, an annular shoulder being disposed on each side of the projection;

an endless annular sealing element comprising a body of relatively hard wear resistant synthetic resinous material having a generally U-shaped cross-sectional configuration with the base comprising the U thereof contiguously receiving said annular projection;

said sealing element further comprising spaced radially directed anti-extrusion legs, the length of said legs being substantially the same as the distance the annular projection extends into the U of the sealing element in mating fully contiguous relation, the sealing element further comprising annular shoulders on each side of the U each shoulder being fully contiguously engaged by the adjacent spring element shoulder, the interface between the two elements being fully contiguous and comprising a force resistant flex site across which fluid is prevented from flowing, the spring element extending a short distance radially beyond the legs to compressively engage and



accommodate creation of a static seal against substantially the entire surface area of the base of a groove in a first machine part;

said sealing element further comprising a delta-shaped projection having a central apex extending radially away from said anti-extrusion legs and adapted to extend beyond said machine groove and compressively engage the surface of a second machine part causing said apex to be slightly flattened and to create a dynamic annular line seal along the entirety of the 360 degrees of said slightly flattened apex, the width of the line seal being substantially less than the width of either of the two elements.

4,190,260

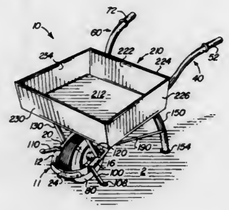
WHEELBARROW APPARATUS

Junior B. Pearce, 670 S. 14th Ave., Yuma, Ariz. 85364

Filed Aug. 24, 1978, Ser. No. 936,530

Int. Cl.[2] B62B *1/18*

U.S. Cl. 280—47.31 **8 Claims**



1. Wheelbarrow apparatus, comprising, in combination:

frame means, including

a generally u-shaped frame member,

a first and a second side arm connected to the u-shaped frame member and extending rearwardly from the u-shaped member;

handle means connected to the side arms for lifting and maneuvering the apparatus, including

a first handle secured to the first side arm, and

a second handle secured to the second side arm, both first and second handles extending rearwardly and upwardly from the frame means;

a wheel secured to the frame means;

stabilizer means including a first stabilizer and a second stabilizer secured to the frame means forwardly of the wheel, and each stabilizer extends outwardly and downwardly for contacting the surface on which the wheelbarrow apparatus is disposed for preventing the wheelbarrow from tipping completely over;

box means for receiving a load secured to the frame means and disposed over the wheel, including

a generally retangular bottom, a substantial portion of which is disposed forwardly of the wheel, and

first, second, third, and fourth side walls secured to the bottom and extending upwardly therefrom;

bracket means for securing the box means to the frame means, including

forward bracket means secured to the frame means and extending upwardly from the frame means to the box, and

rear bracket means secured to the frame means and extending upwardly to the box; and

leg means secured to the frame means adjacent the rear bracket means for supporting the wheelbarrow apparatus at the rear thereof when the wheelbarrow apparatus is in a static position, including

a first leg disposed adjacent the first side arm and the first handle and extending downwardly,

a second leg disposed adjacent the second side arm and the second handle and extending downwardly and spaced apart from the first leg.

4,190,261

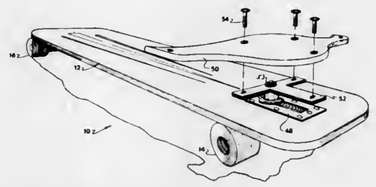
COASTER-SLED BOARD

John A. Moutz, 2884 Eileen Dr., Akron, Ohio 44319

Filed Feb. 17, 1978, Ser. No. 878,715

Int. Cl.[2] B62K *9/00*

U.S. Cl. 280—87.01 **5 Claims**



1. A land vehicle comprising:

a flat support frame having a longitudinally extending slot therein,

support means for said frame and including a front member, pivotally positioned brake means for the vehicle, and a steering and brake control assembly operatively engaging said front member, said steering and brake control assembly having a steering apparatus and a braking apparatus, said braking apparatus having a finger guide, and

flexible connecting means operably extending between said pivotally positioned brake means and said braking apparatus to actuate said pivotally positioned brake means upon forward movement of said steering and brake control assembly;

said steering apparatus rotatable within said braking apparatus, said finger guide of said braking apparatus slidable within said slot.

4,190,262

DEVICE FOR SECURING A LOAD ON A VEHICLE

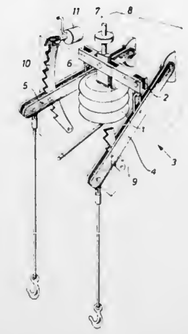
Kurt E. Johansson, Timmermansgatan 12, S-981 00 Kiruna, Sweden

Filed May 3, 1978, Ser. No. 902,425

Claims priority, application Sweden, May 10, 1977, 7705404

Int. Cl.[2] B60R *11/00*

U.S. Cl. 410—37 **9 Claims**



1. A device for securing a load on a load-carrying vehicle comprising:

a frame (3) attached to said load-carrying vehicle;

expansion means (1) mounted to said frame (3), said expansion means (1) having at least one expansion member which is movable relative to said frame (3);

a plurality of tensioning arms (4, 5), said tensioning arms each having first and second ends, each of said plurality of tensioning arms being hingedly mounted to said frame (3) substantially near said first ends of said plurality of tensioning arms (4,5);

a plurality of elongated connecting means, each of said elongated connecting means having a terminal end and a free end, each of said terminal ends of said plurality of elongated connecting means being attached to a respective one of said plurality of tensioning arms (4, 5) substantially near said second ends of said plurality of tensioning arms;

at least one balance arm (2) having a central portion and first and second end portions, said central portion being pivotally connected to said at least one expansion member of said expansion means (1), said first and second end portions of said balance arm each being coupled to a respective one of said plurality of tensioning arms (4,5);

whereby after passing said plurality of elongated connecting means over a load on said load-carrying vehicle and securing said free ends of said elongated connecting means to said load carrying vehicle, said expansion means (1) is expanded, thereby displacing said at least one balance arm (2) and said plurality of tensioning arms (4, 5) relative to said frame (3) to draw said plurality of elongated connecting means taut and to secure said load to said load-carrying vehicle.

4,190,263

WHEELCHAIR WITH SHOCK ABSORBER

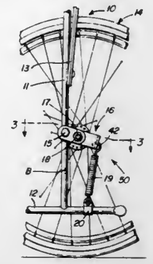
Samuel T. Powers, Albuquerque, N. Mex., assignor to Albuquerque Patents, Ltd., Albuquerque, N. Mex.

Filed May 22, 1978, Ser. No. 908,245

Int. Cl.[2] B62M *1/14*

U.S. Cl. 280—242 WC **7 Claims**

1. In combination, a wheelchair and shock absorber, comprising: a rigid frame having a vertical frame member with an axle mounted thereon, a horizontal frame member attached to the lower portion of said vertical frame member; and wherein said shock absorber includes a lever member with one end of said lever member pivotally mounted on said axle, and wherein said wheel is rotatably mounted on said lever member at a point which is longitudinally spaced from the end of said lever member which is mounted on said axle, and a shock absorbing means which has one end attached to said lever member at a point which is longitudinally spaced from the end of said lever member which is mounted on said axle, the other end of said shock absorbing means being attached to one of said frame members; and further wherein said lever member comprises a first segment which extends for the entire length of said lever member, a second segment laterally spaced from and parallel



to said first segment and extending from the center of said lever member to the end of said lever member which is longitudinally opposed to the point of attachment to said axle, and a third segment extending from the point of connection of said lever member to said axle to the middle of said lever member, said first and second segments of said lever member being connected by laterally extending connecting segment, said second and third segments being connected by a hollow tubular segment; and further wherein said lever member is attached to said axle by a bolt which passes laterally through said first segment and said thid segment.

4,190,264

SAFETY SKI BINDING

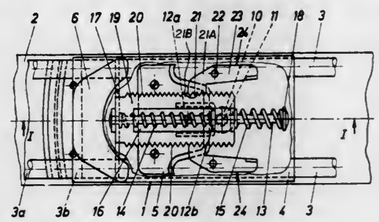
Alois Himmetsberger, and Heinz Wittmann, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Apr. 13, 1978, Ser. No. 896,234

Claims priority, application Austria, Apr. 15, 1977, 2635/77

Int. Cl.[2] A63C *9/08*

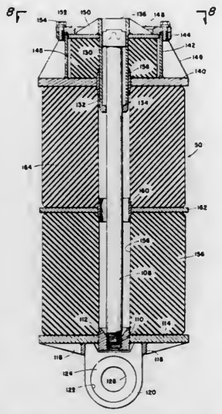
U.S. Cl. 280—618 **10 Claims**



1. A safety ski binding comprising a pivotally supported sole plate provided adjacent a front end thereof with a jaw plate having a holding jaw pivotally supported for movement about an axis which is perpendicular with respect to an upper surface of a ski, said sole plate being maintained in a centered position at said front end by means of a locking mechanism which is released upon exceeding a predetermined torque, the improvement comprising wherein said locking mechanism has a mounting plate secured to said ski, said mounting plate having control surface means thereon which extends symmetrically with the central longitudinal axis of said ski over a two-part acute angle ($\alpha+\beta$), said mounting plate and said control surface means lying in a plane which is substantially parallel to said upper surface of said ski, a control piece mounted on said jaw

plate and engaging said control surface means, wherein one part of said acute angle (α) is predetermined by an angle the longitudinal axis of said sole plate makes with said longitudinal axis of said ski to effect a release and the size of the other part of said acute angle (β) is determined by the relationship tangent $\beta \cong \mu$, wherein μ is the coefficient of friction between said control surface means on said mounting plate and said control piece, and wherein said control surface extending over the other part of said acute angle (β) is oriented at the angle ($\alpha+\beta$) to the longitudinal axis, and resilient means for biassing said control piece, following a release, rearwardly when in contact with said control surface means within said other part of said acute angle (β).

4,190,265
OFF-HIGHWAY VEHICLE
Edgar R. Goodbary, and Francis A. Bartley, both of Cardin, Okla., assignors to Goodbary Engineering Co., Cardin, Okla.
Division of Ser. No. 744,429, Nov. 23, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,193
Int. Cl.² B60G *11/24*
U.S. Cl. 280—716 **4 Claims**

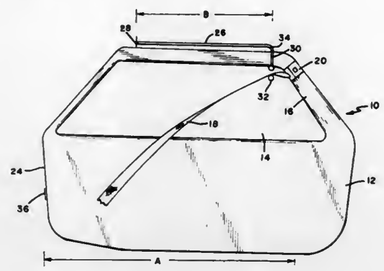


4. In an off-highway vehicle, universal mounting means operably connected between the vehicle and vehicle wheels and comprising a substantially upright spindle means operably secured to said wheels, connector means secured to the opposite ends of said spindle means, at least one of said connector means comprising a non-rotatable outer housing secured to said spindle means, inner housing means concentrically disposed within said outer housing and rotatable about the longitudinal axis thereof independently with respect to the outer housing, apertured plate means carried by the inner housing and extending axially outwardly from the outer housing, and bearing means disposed in said apertured plate means for connection with the vehicle and pivotal about an axis substantially perpendicular to the axis of the rotatable housing.

4,190,266
PASSIVE SEAT BELT SYSTEM
Joseph M. Cachia, Knoxville, Tenn., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.
Filed Sep. 28, 1977, Ser. No. 839,158
Int. Cl.² B60R *21/02*
U.S. Cl. 280—802 **7 Claims**

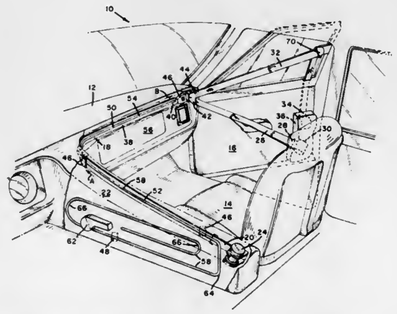
1. In a vehicle passive seat belt restraint system including a seat belt having one end attached at a point of attachment to a door of said vehicle and the opposite end attached in the interior of said vehicle such that when the said door is closed, said belt is automatically moved to a first position at which it restrains an occupant when seated in his seat and when said door is opened, said belt is moved to a second position located forward of said vehicle with respect to said first position, to permit free ingress to and egress from said vehicle, said door having a pivot point upon which said door pivots during opening and closing, the improvement for moving said belt to said second position upon only partial opening of said door, said improvement comprising:

rod means having one end pivotally connected to the frame



of the vehicle at a point located adjacent to and above the height of said door and having an opposite end communicating with said seat belt, the distance between said one end and said opposite end of said rod means being less than the distance between said pivot point of said door and said point of attachment of said seat belt to said door, whereby partial opening of said door causes said rod means to move said belt to its second position.

4,190,267
PASSIVE SEAT BELT SYSTEM
Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.
Filed Jul. 12, 1978, Ser. No. 923,854
Int. Cl.² B60R *21/10*
U.S. Cl. 280—803 **10 Claims**



1. A passive seat belt restraint system comprising:

a seat belt adapted for restraining an occupant positioned in a seat in said vehicle;

said seat belt having a first end connected to a door of said vehicle adjacent to said seat and a second end connected to said vehicle at the side of said seat opposite said door;

at least one of said first and second ends being connected to said vehicle through a seat belt retractor;

track means comprising a first portion mounted in said vehicle at a location adjacent to said side of said seat, said first portion extending from a point adjacent to the rear of said seat to the dashboard of said vehicle located in front of said seat, and a second portion provided in said dashboard and extending from said first portion towards said door,

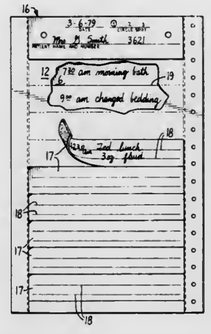
said first and second portions being in communication with each other;

seat belt support means movable in at least said first portion of said track means, said means supporting said seat belt at a first location at least when said seat belt is in a non-restraining position;

connecting means connecting said seat belt to said track means and located in said track means at a second location which is closer to said door than said first location when said seat belt is in a non-restraining position, said connecting means being movable along said first and second portions of said track means; and

means for moving said seat belt support means and said connecting means from a first position at which said seat belt is in position to restrain the occupant, to a second position at which said seat belt is in a non-restraining position, thereby permitting easy ingress to and egress from the seat.

4,190,268
MEANS FOR RECORDING PATIENT CARE
David F. Webster, 1325A Edwards Ave., Santa Rosa, Calif. 95401
Continuation-in-part of Ser. No. 961,759, Nov. 17, 1978, abandoned. This application May 11, 1979, Ser. No. 38,340
Int. Cl.² B42D *12/02*
U.S. Cl. 282—3 R **2 Claims**



1. Means for recording the care given a patient comprising:

(a) a base sheet having opposite marginal edges extending longitudinally of the base sheet;

(b) a strip of carbon paper extending over the base sheet between the opposite marginal edges;

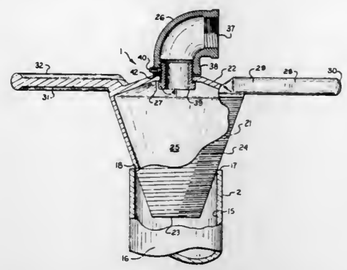
(c) an opaque cover sheet overlying the carbon strip and the base sheet and having opposite marginal edges extending longitudinally of said top sheet in a matching relationship to the marginal edges of the base sheet and being readily separable from the base sheet;

(d) and a top sheet composed of a plurality of separable strips each extending between the longitudinal marginal edges of the cover sheet and each being lightly secured adhesively to the cover sheet for removal from the cover sheet one at a time.

4,190,269
ADAPTER FOR EXHAUST ACTUATED DEVICES
John W. Purdy, Vancouver, Canada, assignor to Wesgar Industries Ltd., Vancouver, Canada
Filed Mar. 29, 1978, Ser. No. 891,448
Int. Cl.² F16L *35/00*
U.S. Cl. 285—38 **12 Claims**

1. An adapter for detachably interconnecting an exhaust stack with an exhaust actuated device, said adapter comprising:

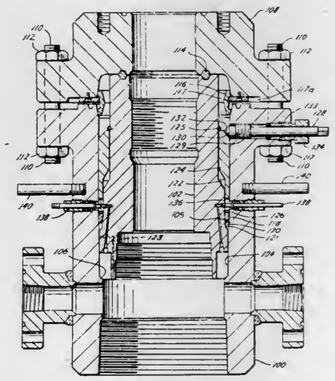
(a) a hollow, frustroconically shaped body having first and second ends, and an inclined side wall extending therebetween; said first end being open for receiving exhaust gases from the stack therethrough, and said second end communicating with said first end and having means for operably connecting said exhaust actuated device therewith; said body side wall including spiral threads on an exterior surface thereof which are adapted for engaging



an interior, free edge of said stack, and rotatively locking said adapter therein; and wherein

(b) said adapter side wall is constructed of a material having a coefficient of thermal expansion which is greater than that of said stack, whereby during operation, said adapter expands with respect to and within said stack to form a secure and substantially airtight seal therebetween.

4,190,270
TUBING HANGER FOR TEMPERATURE VARIATIONS AND EXTREMES
Delbert E. Vanderford, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Dec. 30, 1977, Ser. No. 865,837
Int. Cl.² F16L *21/00*
U.S. Cl. 285—142 **9 Claims**



1. A hanger comprising

a body having a central bore with an upwardly facing seat therein,

a tubular hanger positioned within said central bore on said seat,

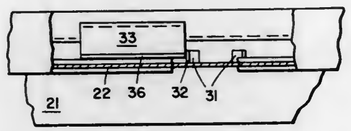
an annular converging space free of obstructions and located between the interior of said body and the exterior of said hanger,

a metal seal ring in said converging annular space and freely movable therein in the direction of convergence until said seal ring engages the interior of said body and the exterior of said hanger,

a sleeve around a portion of the exterior of said hanger, engaging said seal ring and slidable axially on said hanger, and

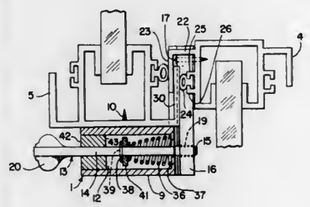
means extending through the wall of said body engaging and exerting a force on said sleeve whereby said sleeve is driven in the direction of convergence of said space until said seal ring is forced into sealing engagement between said hanger and said body, said sealing ring moving axially to sealing engagement with its inner and outer surfaces being maintained substantially parallel to the sides of said converging annular space and when in sealing engagement at least a portion of said converging annular space extending beyond the end of said sealing ring.

4,190,271
SLIDING WINDOW CHANNEL LOCK
Donald Hawkins, P.O. Box 1203, Tracy, Calif. 95376
Filed Nov. 6, 1978, Ser. No. 957,738
Int. Cl.[2] E05C *19/06*
U.S. Cl. 292—145 **10 Claims**



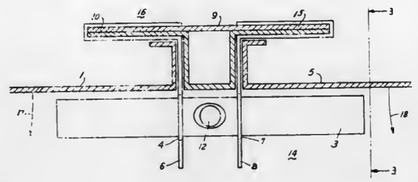
1. In a channel-like track construction for receiving a sliding member and including a plurality of protrusions extending into the track channel, a locking device shaped to permit movement past said protrusions and abut a selected protrusion and for preventing translation of said sliding member, including means for releasably engaging any one of said protrusions in immobilizing fashion, and means for permanently securing said locking device in said track channel.

4,190,272
SCREW LOCK FOR INTERLOCKING SLIDING DOOR AND WINDOWS
Eugene R. Beard, 3186 Reva Dr., Concord, Calif. 94519
Filed Jul. 20, 1978, Ser. No. 926,538
Int. Cl.[2] E05C *5/04*
U.S. Cl. 292—251 **3 Claims**



1. A lock in combination with a pair of closure panels each having a frame member formed with flanges which interlock upon closure and at least one of said panels is slidably mounted in a track; said lock comprising:
a. a lock housing affixed to said flange of one of said interlocking frame members and formed with a chamber having first and second axially spaced end walls;
b. a lock bolt mounted in said housing for rotatable and axial reciprocating movement having a threaded portion at one end and a manually engageable member at the other end;
c. a spring retainer connected to a mid portion of said lock bolt;
d. a spring mounted within said chamber between said first wall of said chamber and said spring retainer and mounted to bias said spring retainer toward said second wall;
e. a keeper mounted in a notch formed in said flange of the other of said interlocking frame members and formed with a threaded opening for threaded registration with said movable bolt; and
f. said flange holding said lock housing is formed with a notch for registration with said keeper when said panels are in the closed position to prevent relative vertical movement of said panels.

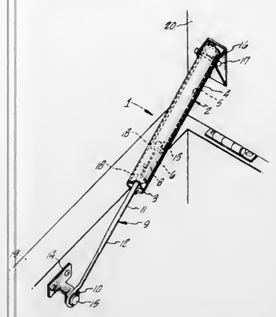
4,190,273
CABINET LOCK ASSEMBLY
Carl E. Schaffrin, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 6, 1978, Ser. No. 913,188
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—288 **1 Claim**



1. An apparatus for locking a pair of doors which open outward and abut when closed onto two lateral extensions of a common jamb, comprising:
a. a first bracket, folded back against itself at its interior edge so as to be slidably mounted on the first of the lateral extensions of the jamb, said bracket including a laterally extending segment which when the bracket is mounted in the manner described extends outwardly from the space between one of the doors and the jamb beyond the door, said bracket having passage therethrough in the segment extending beyond the door;
b. a second bracket, substantially identical to said first bracket, mounted on the second lateral extension of the door jamb in mirrored relationship to said first bracket so as to align the passages in the outwardly extending segments in confronting relationship to each other;
c. a rod-like member capable of being inserted through both bracket passages, and when so inserted extends laterally either side of said jamb distances sufficient to obstruct the opening of both doors;
d. a passage through said rod-like member, substantially transverse to its longitudinal axis, said transverse passage being medial of the brackets when said member is inserted therethrough; and
e. a retention means for limiting the lateral travel of the rod to prevent removal thereof, said means capable of being inserted through the transverse passage in said rod-like member when the passage is medial of said brackets.

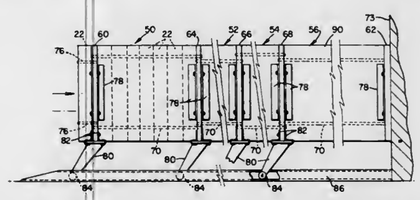
4,190,274
FRICTION SUPPORT DEVICE
David Gross, Laguna Niguel, Calif. 92677, and Hugh V. Jorgensen, San Marino, Calif. 91108
Filed Jan. 23, 1978, Ser. No. 871,607
Int. Cl.[2] E05C *17/44*
U.S. Cl. 292—338 **12 Claims**

1. A friction support device for supporting two members in variable positions relative to one another comprising:
a tube assembly to provide an outer protective covering having an aperture extending lengthwise through its central portion;
a slide holder of a resilient polymeric material having an aperture extending lengthwise through its central portion, the slide holder being inserted into one end of the tube assembly;
a slide rod having a tapered shaft which is inserted through the aperture in the slide holder and extends into the tube assembly, and which frictionally engages the slide holder;
means for fastening the tube assembly to the first member;



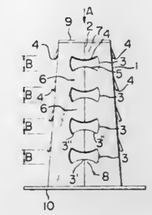
means for fastening the proximal end of the slide rod to the second member.

4,190,275
IMPACT ATTENUATOR
Robert A. Mileti, Marblehead, Mass., assignor to Fibco Inc., Tewksbury, Mass.
Filed Mar. 16, 1978, Ser. No. 887,127
Int. Cl.[2] B60R *19/04, 19/08*
U.S. Cl. 293—102 **1 Claim**



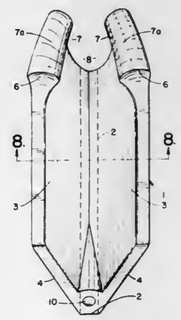
1. An impact attentuator for decelerating a vehicle as it approaches a fixed hazard adjacent to a roadway comprising a plurality of expanded plastic sheets, each sheet having opposed essentially flat faces extending essentially normal to the path of the vehicle, a plurality of cells extending between said faces, the longitudinally axes of said cells being essentially parallel and normal to the planes of said faces, said sheets being from 2.5 inches to 4 inches thick and formed by drawing a solid plastic sheet having an initial thickness of from 0.125 inches to 2.50 inches, said sheets being adapted to be compressed upon impact to substantially less than half their normal thickness without structural damage and thereafter resume their normal thickness, means securing a plurality of said sheets together in face to face contact to form a columnar structure, stiffening panels interposed between certain of said sheets at intervals along the length of said structure, and means for supporting said columnar structure to dispose the central portion thereof above ground level substantially at the height of the center of gravity of the vehicle in position to intercept said vehicle as it approaches said hazard, said last-mentioned means comprising a pair of rails extending away from said hazard at ground level, and rail engaging means carried by said stiffening panels and effective to prevent lateral and vertical displacement of said columnar structure upon impact by a vehicle, said columnar structure being effective to exert a resisting force upon impact which increases as a direct function of the distance to which said impacting vehicle penetrates said structure.

4,190,276
DEFORMABLE IMPACT ABSORBING DEVICE FOR VEHICLES
Tomoyuki Hirano, Tokyo; Akira Yamanaka, and Koichi Tonai, both of Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 14, 1977, Ser. No. 860,626
Claims priority, application Japan, Dec. 22, 1976, 51-155333; Feb. 3, 1977, 52-11265; Jun. 8, 1977, 52-68270
Int. Cl.[2] B60R *19/06*
U.S. Cl. 293—133 **15 Claims**



1. An impact absorbing device comprising a hollow polyhedral body having planar side walls and a longitudinal axis, a plurality of elongated cutouts formed in each of the side walls of said polyhedral body and extending in parallel relation in a direction substantially orthogonal with respect to the longitudinal axis of said polyhedral body, said cutouts each having a pair of opposed longer edges extending substantially orthogonal of said longitudinal axis, and means for guiding continuous deformation of said polyhedral body on its longitudinal axis including each said cutout having one of its longer edges protruding outwardly relative to the other longitudinal edge of the same cutout whereby the energy of impact imparted in an axial direction of said polyhedral body can be absorbed by the deformation of the side walls of said polyhedral body.

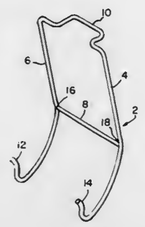
4,190,277
DEVICE FOR INSERTION, MANIPULATION AND REMOVAL OF SOFT CONTACT LENSES
Robert C. England, P.O. Box 2829, 1024 Military Rd., Zanesville, Ohio 43701
Filed Aug. 30, 1978, Ser. No. 938,216
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA **10 Claims**



1. A device for inserting and removing a soft contact lens from the eye of a wearer, and comprising
a body adapted to be held in the hand and moved thereby universally relative to the eye;
a pair of lens engaging elongated pads carried by the body in spaced relation to each other transversely of their lengths;
said pads having elongated lens engaging faces, respectively;
said faces being curvilinear and concave toward each other

in longitudinal section and being curvilinear and convex toward each other in cross section, and, in the normal spaced position of the pads being engageable with the anterior face of a soft contact lens in the form of a spheroidal segment at locations thereon inwardly from the edges of the lens and spaced apart transversely of the lens, while the lens is installed on the eye, said pads being movable toward each other by portions of the hand, while said faces are so engaged with the installed lens, to cause said faces to flex the lens out of its normal spheroidal contour in a manner to admit air between the rear face of the lens and the eye on which it is installed, and to hold the lens in flexed condition while it is on the eye and during its removal from the eye by movement of the body away from the eye.

4,190,278
PANEL CARRYING DEVICE
Frank Jancik, Jr., 5510 Newton St. #6, Hyattsville, Md. 20784
Continuation of Ser. No. 596,819, Jul. 17, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,920
Int. Cl.[2] B65G *7/12*
U.S. Cl. 294—26 **5 Claims**



1. A panel carrying device comprising a pair of support members, each having a first panel support portion and a second portion, said second portion of each of said support members including a point of connection to said first panel support portion and an end, each of said second portions of said pair of support members being curved from its point of connection to its end about a single locus disposed on one side thereof, a first bar disposed between and interconnecting said support members at substantially the respective apogees of their second curved portions, said first panel support portions disposed at an angle with respect to said second portions and extending toward said loci, whereby upon placing a panel on said first panel support portions, said panel carrying device rocks upwardly to a sufficient degree to permit said panel carrying device to be readily grasped.

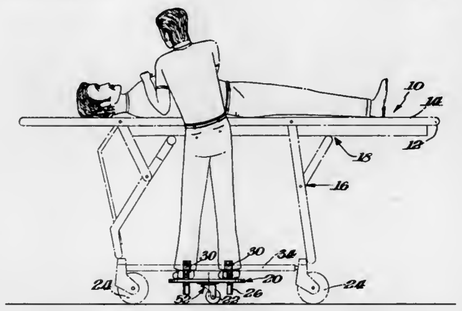
4,190,279
CLAM RAKE
Aldo Sguazzin, 115 Aspen Rd., Mastic Beach, N.Y. 11951
Filed Oct. 23, 1978, Ser. No. 953,418
Int. Cl.[2] E02F *5/00*
U.S. Cl. 294—49 **3 Claims**

1. A clam rake comprising a handle, a rectangular basket framed of heavy gauge wire affixed to said handle at one of the longer edges of said rectangular frame, a plurality of raking teeth affixed to the other longer edge of said rectangular frame, side skids being affixed to the shorter edges of said rectangular frame and a plurality of fingers affixed to said skids, the length of said fingers being the same as the raking teeth at the end of sid shorter edge in proximity to said raking teeth and said



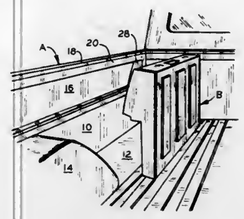
fingers diminishing in length as said shorter edge approaches the end of the shorter edge in proximity to the handle.

4,190,280
WHEELED PATIENT SUPPORT
Stephen C. Donohoe, 714 S. DuPont St., Wilmington, Del. 19805
Filed Sep. 14, 1978, Ser. No. 942,338
Int. Cl.[2] A61G *1/02*
U.S. Cl. 296—20 **9 Claims**



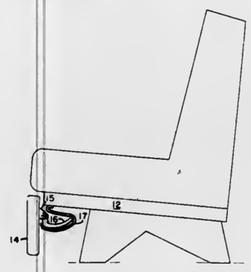
1. In a wheeled patient support having spaced rails with a patient supporting surface mounted therebetween and a wheeled structure mounted thereunder to comprise a mobile patient supporting unit whereby a patient may be placed on the supporting surface and wheeled to an area of treatment during conditions of emergency or the like, the patient supporting surface being substantially longer than it is wide, the patient supporting surface including a head supporting area and a feet supporting area with a body supporting area therebetween and the areas all being generally coplanar in a horizontal plane, the improvement being a platform secured to said unit laterally beyond the periphery of said unit and substantially below said patient supporting surface for supporting a standing attendant thereon, said platform being substantially shorter in length than the length of said patient supporting surface, said platform being located in the general area of said body supporting area, and a rolling surface mounted to and beneath said platform in the same plane as the rolling surfaces of said wheeled structure whereby the attendant may stand on the platform and treat the patient while the patient is being moved to the area of treatment.

4,190,281
BALLAST FOR PICK-UP TRUCKS AND THE LIKE
Steven G. Chandler, 1010 E. Warren, Bucyrus, Ohio 44820
Filed Oct. 30, 1978, Ser. No. 955,803
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—37.6 **7 Claims**



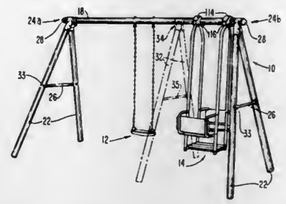
1. Ballast for a pick-up truck and the like having a cargo bed with a floor, side panels each having a horizontal top portion, spaced apart vertical members along the side panels, and a turned down angular member projecting inwardly from the top portion of said side panel, said ballast comprising: a container having inner and outer major container sides, end sides and a top and bottom for the container; said inner and outer container sides generally conforming in length to the space between the spaced apart vertical members; said inner side conforming in shape to the shape of the side panel with which it is to abut, and said ends and top having a width conforming to the width of said top portion between said panel and said inward projection of said turned down angular member, and whereby said container can be inclined outwardly to slip the top inwardly of said turned down angular member between said vertical members, and said bottom then slipped inwardly to bring the container into a vertical position locked against the side panel.

4,190,282
OTTOMAN PROTECTING DEVICE
Allan H. Crawford, Amsterdam, N.Y., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,219
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—68 **3 Claims**



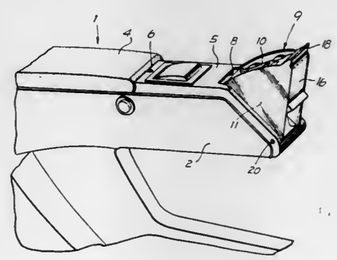
1. A guard member for protecting a fabric or other covering on a portion of the surface on an ottoman against wear, said guard member rotatably carried on an ottoman, said ottoman being carried on and cooperative with a chair, actuating means connected to said guard member, said guard member movable from a first position wherein the distal end of said guard member is positioned beneath said chair and spaced from said ottoman, to a second position wherein the distal end of said guard member is positioned in overlying relationship to a facing edge portion of said ottoman.

4,190,283
FOLDABLE PLAY GYM
Raymond W. Boucher, Dotham, Ala., assignor to Hedstrom Co., Bedford, Pa.
Continuation of Ser. No. 811,176, Jun. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 665,539, Mar. 10, 1976, abandoned. This application May 22, 1978, Ser. No. 908,332
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—77 **12 Claims**



12. A play gym comprising:
A. a horizontal bar,
B. a leg assembly supporting at least one end of the bar, said assembly including
   1. a pair of relatively long tubular legs,
   2. a pivot joint engaged over one end of the horizontal bar said pivot joint having a pair of diverging arms extending perpendicular to the axis of the horizontal bar,
   3. means for connecting the pivot joint to said one end of the horizontal bar,
   4. means for pivotally connecting one end of each of said legs to a different one of said arms, said pivotal connecting means being parallel to each other and also perpendicular to the axis of the horizontal bar so that said legs can be swung from a first position wherein they diverge and extend perpendicular to the horizontal bar to a second position wherein they lie substantially parallel to the axis of the horizontal bar, and
   5. means for releasably maintaining the legs in their first position so that they support said end of the bar above the ground,
C. means for supporting the opposite ends of the bar above the ground.

4,190,284
VEHICLE SEATS
Karl Schmidhuber, NT-Rossdorf, and Hans D. Lehmann, Dettingen-Guckenrain, both of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany
Filed May 19, 1978, Ser. No. 907,506
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 7717085[U]
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—194 **5 Claims**



1. In a vehicle seat, especially for airplanes and omnibusses,

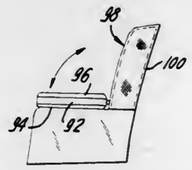
having at least one arm rest formed generally as a box beam support, said arm rest having opposing side walls and a front terminal section, a closure member covering at least the front terminal section of the arm rest, said closure member having an opening therethrough, a control device arranged in said front terminal section, means for rotatably mounting said control device about an axis transverse to the longitudinal axis of the arm rest from a non-use position wherein the control device lies inside the arm rest and closes the opening of said closure member, through said opening and into a use position and back, the improvement comprising a guide affixed to the inside of each side wall of the arm rest adjacent the front terminal section thereof, said means for rotatably mounting the control device including aligned mounting bores in each guide and side wall and resiliently biased pins mounted on said control device for rotatably engaging in said mounting bores, further comprising at least one resiliently biased detent pin provided on said control device, at least one of said guides having detention point means for engaging said detent pin and arresting said control device into its use position, said opening in the closure member being of a size to permit the control device to pass completely therethrough.

4,190,285

SUPPORT FRAMES ADAPTED FOR USE WITH CAR SEATS AND BEDS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 758,846, Jan. 12, 1977, Pat. No. 4,075,720.
This application Dec. 14, 1977, Ser. No. 860,621
Int. Cl.[2] A47D *1/10*
U.S. Cl. 297—254 **2 Claims**



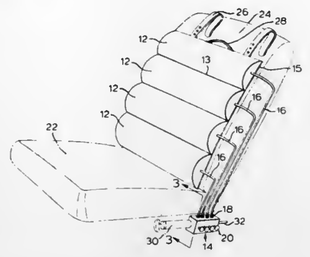
1. A support frame for use in securing a car bed or car seat deployed on the seat of an automobile, comprising, in combination, a base portion having a top surface and a bottom surface, cushioning means disposed on each of said top and bottom surfaces of said base portion, the bottom surface of said base portion and cushioning means therefor being adapted to rest on the bench or seat portion of an automobile when said base portion is in use as a seat cushion or as a car bed or seat base, and securing means removeably attached to an automobile backrest to pivotally secure said base portion to an automobile seat, so that said base portion may be pivoted upwardly and positioned against the back rest of an automobile seat when said base portion is not being used and thereby function as a cushioned back rest, and fastening means including at least one recessed portion or groove disposed in said top surface of said base portion including said cushioning means therefor, for securing a car bed or car seat to said base portion, said fastening means being adapted to receive a corresponding fastening member mounted on a car bed or car seat to be secured to said top surface of said base portion through said cushioning means.

4,190,286

INFLATABLE SEAT CUSHION AND BODY SUPPORT ASSEMBLY

John P. Bentley, 100 Dixie Plaza, 1250 S. Service Rd., Mississauga, Ontario, Canada

Filed Dec. 20, 1977, Ser. No. 862,542
Int. Cl.[2] A47C *7/42*
U.S. Cl. 297—284 **7 Claims**



1. For use as a seat cushion and body support, an inflatable seat cushion assembly, comprising:

A plurality of independent and individually inflatable chambers, each of said plurality of chambers being secured to at least one other chamber; and

means for controlling each of the chambers, including, for each chamber;

first valve means for connecting a chamber to a pressure source of fluid for inflating a chamber, said check valve means permitting fluid flow from said pressure source of fluid, when pressurized, to the respective chamber, said first check valve means being closable for maintaining said fluid in a respective chamber at a desired amount of inflation thereof;

conduit means for said fluid between said first check valve means and a chamber;

second seatable valve means provided in a control block and in fluid communication with said conduit means and operable to release fluid from a respective chamber, said seatable valve means being biased to a closed position and including means for unseating said valve means to permit fluid flow past the valve to a lower pressure sink while the valve is unseated by said means therefor; and

wherein all of said first check valve means are also located in said control block and communicate with a common pressure manifold and are biased to a closed position to preclude fluid flow from any chamber past its respective valve to said manifold, said manifold also being in said control block, and said first check valve means are operable upon pressurization of said manifold above a predetermined minimum pressure to allow fluid flow past said valves to the respective chambers.

4,190,287

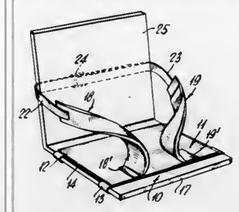
KNEE ABDUCTOR AND RESTRAINER

Ellen Lemisch, 711 West End Ave., New York, N.Y. 10025, and Fredrik Rostock, 18 W. 70 St., Penthouse B, New York, N.Y. 10000

Filed Jun. 28, 1978, Ser. No. 919,814
Int. Cl.[2] A47C *31/00*; A62B *35/00*
U.S. Cl. 297—466 **6 Claims**

1. A knee abductor and restrainer for use on chairs having seats and backs such as wheel chairs and the like comprising a pair of flexible restraining straps, means for securing said straps to the forward portion of the chair seat and in spaced relationship one to the other, said straps extending upwardly about the inner portions of the legs of the user, diagonally across the legs and rearwardly about the body of the user and embracing the abdomen to maintain the legs of the user in a separated position

and means on the ends of the straps for attaching them to the chair back whereby said straps extend about the legs and body



of the user to maintain the user in an upright position while permitting use of the legs.

4,190,288

BACK-HOLDING DEVICE FOR AUXILIARY SEATS, PARTICULARLY CHILDREN'S SEATS, TO BE PLACED ON CONVENTIONAL VEHICLE SEATS

Heinz Korger, Niederstotzingen, Fed. Rep. of Germany, assignor to Carl Stahl GmbH & Co. KG, Herbrechtingen, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,914
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725577
Int. Cl.[2] B60R *21/10*; A62B *35/00*
U.S. Cl. 297—488 **14 Claims**



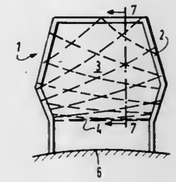
1. A safety restraining device for use with a conventional vehicle seat, such as for a child, comprising a pair of rigid side members spaced laterally apart in the direction transverse to the normal direction of movement of a vehicle, said side members extending in the normal direction of movement of a vehicle and having a front end facing in the normal forward direction of movement and an oppositely directed rear end with an upper surface and a lower surface extending between said front end and rear end, means for securing said side members to a vehicle body, a first restraining body located between said side members and pivotally mounted about an axis extending between said side members and transversely of the normal direction of movement of a vehicle, said first restraining body being pivotally displaceable between a first position where a child seated in the device has freedom of movement and a second position where forward movement in the normal direction of movement is restrained, in the first position said restraining body having a front end facing in the normal forward direction of movement of a vehicle and a rear end facing in the opposite direction with an upwardly facing surface extending between the front and rear ends thereof and forming a horizontal table surface and a downwardly facing surface spaced below said upwardly facing surface, the rear end of said first restraining body being located between the front and rear ends of said side members and the downwardly facing surface of said first restraining body being spaced upwardly from the lower surface of said side members so that a space is provided between the rear end of said first restraining body and the rear ends of said side members and between the downwardly facing surface of said first restraining body and the lower surface of said side members for seating a child with his legs located below the downwardly facing surface and projecting toward the front ends of said side members, said first restraining body being pivotally displaceable into the second position with said upwardly facing surface and downwardly facing surface extending upwardly when a sudden strong deceleration of the vehicle takes place, such as occurs in the case of an accident, wherein the improvement comprises a stationary second restraining body positioned between said side members and below said first restraining body, a horizontal first shaft pivotally mounting said first restraining body and extending between said side members adjacent the front ends thereof, said first restraining body being pivotally movable about said first shaft between the first and second positions thereof, said first shaft being positioned so that impact forces directed against said first restraining body in the second position thereof pass through said first shaft and a flywheel mass located in one of said first restraining body and said side members and arranged for automatically pivotally displacing said first restraining body from the first position into the second position upon a sudden strong deceleration of the vehicle.

4,190,289

NET HEADREST

Matthias M. Brünig, Parchimer Strasse 23, 2000 Hamburg 73, and Herbert D. Stolle, Ruebenkamp 148, 2000 Hamburg 60, both of Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,109
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714796; Jan. 23, 1978, 2802850
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—391 **9 Claims**



1. A net headrest for a seat of a motor vehicle, with a frame attached to the seat and a net fastened to the frame, characterized by the fact that the frame is closed at least at the top and open on at least one side or the bottom and the net in the marginal area of the open side or the bottom of the frame is kept under high tensile stress, in comparison to the remaining net surface.

4,190,290

HEADREST FOR VEHICLE SEATS

Werner Strien, Stuttgart, Fed. Rep. of Germany, assignor to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,831
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801168
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—408 **12 Claims**

1. Device for setting elements which are pivotable relative to each other, especially for setting the pivotable upholstery support of a headrest for vehicle seats, comprising:

a first element formed as a pipe-like hollow tube;

a second element engaged with said first element and formed as at least one rod-like support bar;

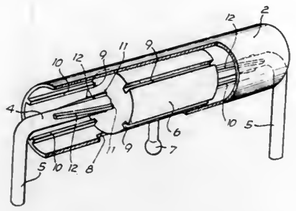
a setting member arranged in said first element so as to be longitudinally movable therein;

an activator device associated with said setting member to form an adjusting device; and

guide means for engaging said second element with said first element;

whereby a forced pivotal motion of at least one of the first

and second elements relative to the other is produced when the setting member is moved by the activator device



in the longitudinal direction of the first element relative thereto.

4,190,291

ADJUSTABLE HEADREST ASSEMBLY FOR AUTOMOTIVE VEHICLES

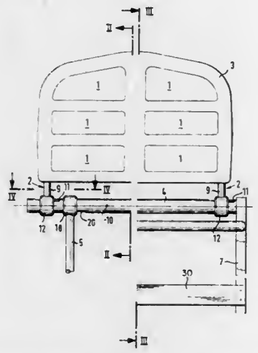
Heinz K. Korger, Niederstotzingen, Fed. Rep. of Germany, assignor to Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei, Herbrechtingen, Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,829

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641470

Int. Cl.² A47C *1/10*

U.S. Cl. 297—408 **16 Claims**



1. A mounting assembly for the headrest of an automotive vehicle including at least one seat with a seat back comprising: a padded body; arm means in fixed engagement with said padded body; a horizontal support member having a generally horizontally extending longitudinal axis; attachment means mounting said horizontal support member on said seat back to prevent pivotal movement thereof about said longitudinal axis; and connecting means mounting said padded body upon said horizontal support member to enable adjustable pivotal movement thereof about said longitudinal axis to a plurality of inclined positions; said connecting means including slot means defined in said horizontal support member and receiving said arm means therein for guided engagement therewith; said slot means comprising at least one longitudinal slot oriented to extend obliquely relative to said longitudinal axis, said at least one obliquely oriented slot engaging said arm means to guide said padded body for movement pivotally about said longitudinal axis when said padded body is moved longitudinally relative thereto thereby to enable said padded body to be adjustably pivotally moved to said plurality of said inclined positions.

4,190,292

PROCESS FOR SUPPRESSING DUST IN MINES

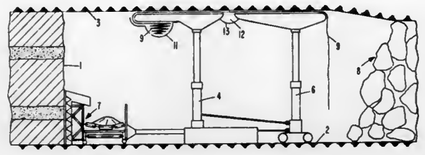
Harald Johannes, Duesseldorf; Günther Seifert, Cologne; Hans Lewer, Witten-Annen, and Dieter Poller, Dortmund, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,449

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650675; Apr. 1, 1977, 2714569; Sep. 8, 1977, 2740447; Oct. 13, 1977, 2746005

Int. Cl.² E21D *23/00*

U.S. Cl. 299—12 **24 Claims**



1. A process for suppressing dust in a longwall mining operation, wherein advanceable support units are used to support the hanging walls of the mine while mining operations are being carried out on the face of the mine, which comprises:

advancing a leading edge of a sheet of dust impervious material, folded in a zigzag fashion, from a package of said sheet material mounted on an advanceable support unit positioned adjacent the mine face;

feeding said leading edge of said sheet between the support unit and a first portion of the hanging wall of the mine such that said sheet is unfolded and withdrawn from said package and temporarily pinned against the first portion of the hanging wall by the support unit;

advancing the support unit toward the mine face while maintaining said sheet material pinned against the first portion of the hanging wall, whereby an additional length of said sheet material is unfolded and withdrawn from said package and is temporarily pinned against a second portion of the hanging wall; and

repeating the foregoing steps, thereby pinning a further length of said sheet material to a third portion of the hanging wall, and releasing the portion of the sheet material pinned against said first portion of the hanging wall.

4,190,293

ROCK SPLITTING ATTACHMENT FOR A BREAKING HAMMER

Charles E. Nieder, 134 N. Lyons Valley Rd., Jamul, Calif. 92035

Filed Apr. 27, 1978, Ser. No. 900,708

Int. Cl.² E21C *37/02, 37/04*

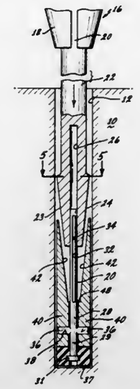
U.S. Cl. 299—23 **9 Claims**

1. A rock splitting attachment for a breaking hammer comprising:

a primary shaft having first wedge means adjacent one of its ends, said first wedge means having a plurality of principal wedge surfaces on the outer surfaces of said primary shaft,

an elongated primary wedge assembly having second wedge means formed adjacent one of its ends, said second wedge means having a plurality of principal wedge surfaces on the interior surfaces of said elongated primary wedge assembly,

means for telescopically attaching said primary shaft to said elongated primary wedge assembly whereby when said primary shaft is driven axially toward said elongated primary wedge assembly while the elongated primary wedge assembly's axial movement has been restrained, said principal wedge surfaces of said primary shaft will contact and travel along said principal wedge surfaces of said elongated primary wedge assembly to be driven radially outwardly thus increasing the width of said elongated primary wedge assembly with the result that the internal concussion and driving force exerted on said primary shaft by a breaking hammer is directed against the walls of a bore hole into which said rock splitting attachment has been inserted causing internal fractures in the rock, said means for telescopically attaching said primary shaft to said elongated primary wedge assembly comprises:



a bore in said primary shaft extending axially inwardly from that end of the primary shaft which has the first wedge means adjacent thereto, and a secondary shaft that forms a part of said elongated primary wedge assembly, the width of said secondary shaft being smaller than the width of said bore so that it may be telescopically received therein.

4,190,294

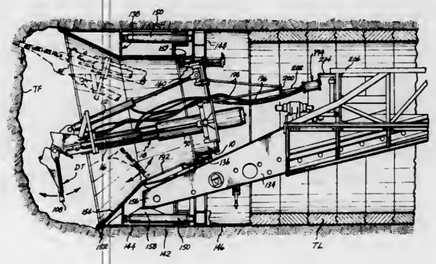
EXCAVATOR FOR USE IN A TUNNELING SHIELD

Tyman H. Fikse, Seattle, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed Aug. 17, 1978, Ser. No. 934,511

Int. Cl.² E21D *9/08*

U.S. Cl. 299—33 **9 Claims**



1. An excavating mechanism for a tunneling machine that is advanced through the ground as excavating proceeds, of a type comprising a combination digging and dragging tool and a multipod support for said tool comprising a tool mounting head and at least three double-acting hydraulic cylinders forming three variable length support and drive legs, which are operable to extend and retract the tool and move it up and down and sideways over the tunnel face, and the improvement comprising:

a rotor which in use is supported within the tunneling machine for rotation about an axis which extends longitudinally of the tunnel;

means connecting the rear ends of the hydraulic cylinder support and drive legs to the rotor, said connecting means permitting only axial and thrust loads to be transmitted between said hydraulic cylinder support and drive legs and said rotor;

means for transmitting bending moments and torque loads from the tool support head back to the rotor; and

means for rotating said rotor to change the sideways attitude of the tool.

4,190,295

MINING MACHINES WITH CUTTER CHAIN TENSIONING MEANS

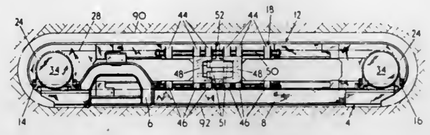
Gordon E. Boast, Burton-on-Trent, England, assignor to Coal Industry (patents) Limited, London, England

Filed Dec. 5, 1977, Ser. No. 857,455

Claims priority, application United Kingdom, Dec. 21, 1976, 53244/76

Int. Cl.² E21C *25/56*

U.S. Cl. 299—43 **7 Claims**



1. A mineral mining machine comprising a conveying track for cut mineral extending transversely to the direction of advance of the machine and disposed adjacent to a floor on which the machine is supported for advance over, a cutter member supported for vertical movement as a whole, the member including a guideway, the guideway having upper and lower runs extending generally parallel to the conveying track, an endless cutter chain supported by the upper and lower runs of the guideway, and a drive motor for the drive chain mounted on the member, wherein the invention comprises the guideway of the cutter member being divided centrally into two halves movable relatively with respect to one another, guide means on which the two halves are relatively movable, and fluid operable means interconnecting the halves of the guideway and actuable to effect the relative movement.

4,190,296

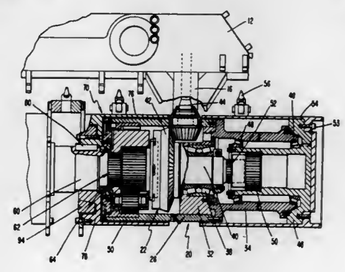
APPARATUS FOR INTERCONNECTING SEGMENTED CUTTER DRUMS OF A ROTARY CUTTER MECHANISM

Larry A. O'Dell, Columbus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 13, 1978, Ser. No. 915,285

Int. Cl.² E21C *25/10*

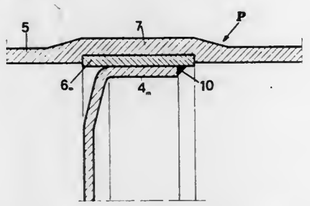
U.S. Cl. 299—89 **10 Claims**



1. In a machine for cutting earth formations, of the type comprising a vehicle body, a cutter drum mounted on said vehicle body, and means for rotating said cutter drum, said cutter drum including a plurality of segments of a cylinder, and connector means connecting said drum segments together, the improvement wherein:

(a) said drum segments each include at one end thereof a reaction surface inclined in a direction extending longitudinally outwardly and radially inwardly; and
(b) said connector means comprising:
(i) a connector ring including an inner peripheral surface inclined in a direction complimentary to that of said reaction surfaces such that said connector ring is able to fit over said reaction surfaces,
(ii) fastener means for imposing generally longitudinally inward forces on said connector ring to urge said inner peripheral surface of said ring into wedging engagement with said reaction surfaces to urge said drum segments together,
(iii) a plurality of clamping means located adjacent an end of said drum opposite the end containing said reaction surfaces, each clamping means comprising a pair of side-by-side wedge members secured to respective ones of adjacently disposed drum segments, each wedge member including a wedge surface, said wedge surfaces being mutually inclined, and
(iv) a separate clamp member including a pair of clamp surfaces which are mutually inclined in complimentary relation to said wedge surfaces, said clamp member being positioned such that said clamp surfaces engage respective ones of said wedge surfaces, and means for urging said clamp member and said wedge members together to bring said clamp surfaces into clamping relationship with associated ones of said wedge surfaces to secure said drum segments together.

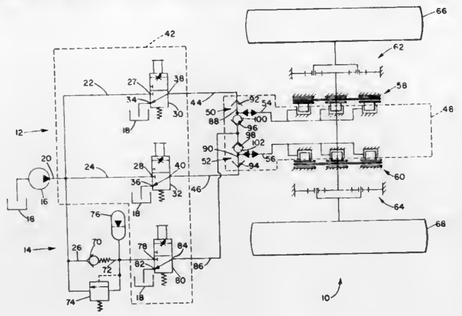
4,190,297
WHEEL FOR AIR OR GAS FILLED TIRES FOR MOTOR VEHICLES
Walter Schmidt, Eigeltingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Sep. 25, 1978, Ser. No. 945,224
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745163
Int. Cl.[2] B60B *3/04, 23/00*
U.S. Cl. 301—63 R **9 Claims**



1. A wheel for air or gas filled tires to be used on motor vehicles and having a ring-shaped rim around a central wheel disc, wherein at least the rim is made out of a composite section having a light metal body section and a central insert of higher strength metal which forms part of the surface of the body section, is at least partly embedded in the surface of the composite section facing the wheel disc, and which strengthens the highly stressed central region of the rim, wherein the insert forms a ring surrounded by the body section with said insert ring of the rim enclosing the wheel disc.

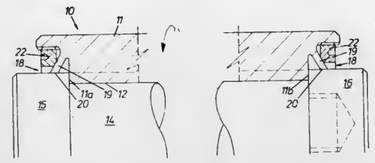
4,190,298
FLUID CONTROL SYSTEM
Lawrence R. Klope, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Oct. 17, 1978, Ser. No. 952,173
Int. Cl.[2] B60T *13/14*
U.S. Cl. 303—2 **14 Claims**

1. A fluid control system comprising: fluid function means; a primary source of pressurized fluid for said fluid function means; a fluid reservoir; a primary fluid control valve connected to said primary source and said fluid reservoir and operatively connected to said fluid function means selectively connecting said primary source to said fluid function means or said fluid function means to said fluid reservoir; a secondary source of pressurized fluid for said fluid function means; a secondary fluid control valve connected to said secondary source and to said fluid reservoir and operatively connected to said fluid function means selectively connecting said secondary source to said fluid function means or said fluid function means to said fluid reservoir; and valve means connected to and disposed between said primary and secondary fluid control



valves and said fluid function means responsive to a greater pressure of said pressurized fluid from said primary fluid control valve than from said secondary fluid control valve to block said fluid function means from said secondary fluid control valve and to connect said primary fluid control valve to said fluid function means, and responsive to a greater pressure of said pressurized fluid from said secondary fluid control valve than from said primary fluid control valve to block said fluid function means from said primary fluid control valve and to connect said secondary fluid control valve to said fluid function means.

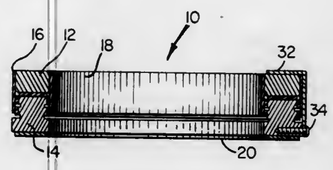
4,190,299
BUSHES
John E. Brown, Mansfield Woodhouse, England, assignor to West & Son (Engineers) Limited, Nottinghamshire, England
Filed May 26, 1978, Ser. No. 910,146
Claims priority, application United Kingdom, May 27, 1977, 22617/77
Int. Cl.[2] F16C *33/72*
U.S. Cl. 308—3.5 **13 Claims**



1. A bush for reception on a shaft, the bush having a body portion having an axially extending bore for rotatably receiving the shaft, an annular sealing formation located at at least one axial end of the body portion for sealingly engaging the shaft, the sealing formation including an annular wall inclined relative to the axis of the body portion so as to project in opposite axial directions, one axial end of the wall defining an annular sealing surface for sealingly engaging the shaft and the opposite axial end of the sealing formation being sealingly attached to the end of the body portion from which the sealing formation projects, the body portion and the or each sealing formation being formed from a rigid material so that on axial

compression of the bush the wall of the or each sealing formation is deflected to urge its annular sealing surface into contact with the shaft.

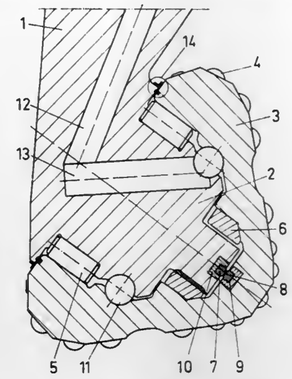
4,190,300
BEARING FOR LINER-HANGER ASSEMBLY
Louis M. Scalzi, Laconia, N.H., assignor to New Hampshire Ball Bearings, Inc., Laconia, N.H.
Filed Nov. 13, 1978, Ser. No. 959,487
Int. Cl.[2] F16C *17/08*
U.S. Cl. 308—4 A **11 Claims**



1. An improved bearing assembly adapted for use in a liner-hanger assembly, which bearing assembly comprises:
(a) an upper cylindrical race element having a lower cylindrical surface;
(b) a lower cylindrical race element having an upper cylindrical surface and having adjoining inside and outside side surfaces;
(c) a load-bearing, low coefficient-of-friction bearing-liner material secured between the lower cylindrical surface of the upper race element and the upper cylindrical surface of the lower race element;
(d) inside and outside sealing-liner material secured to the inside and outside side surfaces of the lower race element; and
(e) inside and outside sleeve elements secured to and extending from the upper race element and extending parallel with the inside and outside liner material and into a close slidable and sealing relationship thereto, thereby providing an improved bearing assembly which prevents drilling mud or other debris from contacting the load-bearing bearing-liner material between the upper and lower race elements.

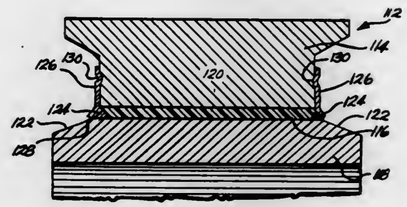
4,190,301
AXIAL BEARING FOR A ROLLER DRILL BIT
Leif Lachonius, Surte, and Dieter Becker, Hisings Backa, both of Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden
Filed Feb. 2, 1978, Ser. No. 874,324
Claims priority, application Sweden, Feb. 16, 1977, 7701680
Int. Cl.[2] E21B *9/10*
U.S. Cl. 308—8.2 **1 Claim**

1. A roller drill bit comprising a journal, a cutting roller rotatably supported on said journal by bearing means including an axial bearing comprising a cup-shaped metallic casing of a material softer than the cutting roller and shaft journal mounted in the axial end face of the shaft journal and a cup-shaped metallic casing of a material softer than the cutting roller and shaft journal mounted in the interior of the tip of the cutting roller, a diamond supported in each casing having



bearing surfaces in confronting engaging relation, each of said bearing surfaces being spherical.

4,190,302
SEALED LINED BEARINGS
William F. Lynn, and Gordon M. Walker, both of Renton, Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.
Continuation of Ser. No. 725,808, Sep. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,491, May 12, 1975, Pat. No. 4,055,369. This application Apr. 11, 1978, Ser. No. 895,331
Int. Cl.[2] F16C *33/74*
U.S. Cl. 308—36.1 **5 Claims**

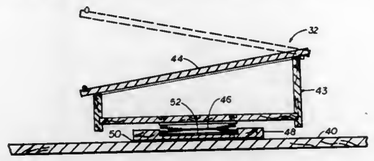


1. A seal for a lined bearing comprising: a bearing having a cylindrical surface on the inner and on the outer races with the inner race having a tapered outer surface near each end; a bearing liner material tightly adhered to the cylindrical shaped surface on the outer race; a resilient seal material is located at a juncture between the outer race, the liner material, and the inner race; a ring fastened to a side of the outer race, said ring deflected outward to extend with ring inside diameter contacting one of the tapered outer surfaces of the inner race and the ring exerting pressure against the resilient seal material thereby holding the resilient seal material against the ring, the side of the liner material, and the outer surface of the inner race.

4,190,303
TABLE FOR USE IN RELIGIOUS SERVICES
Juanita W. Ellis, Rte. 1, Box 399-A, Henderson, Ky. 42420
Filed Jul. 5, 1978, Ser. No. 921,898
Int. Cl.[2] A47B *19/00*
U.S. Cl. 312—33 **6 Claims**

1. A table for use in religious services and otherwise comprising
a multi-sided table top, and

a rotatable lectern removably mounted on said table top for rotation into alignment with each of the sides of said top, said lectern comprising, wall structure defining a chamber therein, a book supporting lid hingably attached to said wall structure adapted for lifting to provide external ac-



cess to said chamber, a plate removably mounted on said table top and forming a base defining a recess therein, swivel means disposed at least partially within said recess and attached to said base, said swivel means also being connected to said lectern.

4,190,304

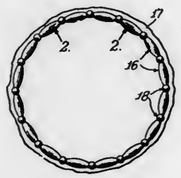
APPARATUS FOR USE IN THE CONSTRUCTION AND DECORATION OF UPHOLSTERED FURNITURE AND THE LIKE

Robert J. Schneider, 479 Geneva Rd., Glen Ellyn, Ill. 60137

Continuation of Ser. No. 728,429, Sep. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,757, May 29, 1975, abandoned. This application May 10, 1978, Ser. No. 904,551

Int. Cl.[2] A47B *95/04*

U.S. Cl. 312—204 **20 Claims**



1. A decorative modular furniture trim unit adapted to be combined with a plurality of other trim units to form a composite decorative design of a size for attachment to a surface of an article such as upholstered furniture, cabinets and wall panels and attachable with nails having decorative heads to such an article said trim unit comprising two joining portions and a decorative portion extending between and connecting said joining portions, each of said joining portions being shaped to mate with and be substantially complementary to the other of said joining portions of said unit and to joining portions of other units, said joining portions and said decorative portion having a normally hidden underside which engages the article when in use, said decorative portion further including a normally viewed top side having a decorative design and being optionally variable relative to said other units in respect to size and design, said trim units being adapted to be joined with said plurality of other trim units and with the mating and complementary joining portions in engagement, and said decorative portions cooperating with said decorative heads of said nails to form said composite decorative design.

4,190,305

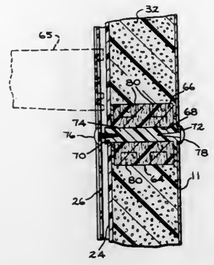
STRUCTURAL SUPPORT FOR A REFRIGERATOR

J. Nelson Knight, Louisville, Ky., and Roger C. Turner, Milwaukee, Wis., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 749,087, Dec. 9, 1976, Pat. No. 4,107,833. This application May 22, 1978, Ser. No. 908,471

Int. Cl.[2] F25D *11/00;* **B65D** *25/14;* **F16B** *37/04*

U.S. Cl. 312—214 **5 Claims**



1. In a refrigerator cabinet of the type employing insitu foamed polyurethane insulation within the wall space between the panel members forming the inner liner and the outer case, a strong, rigid, structural support which comprises:

a body formed by fibrous material with pre-formed holes in the body which facilitates thorough impregnation of the foam material and bonded to one of the panel members to lend support thereot, and

a screw anchor embedded in the body of the impregnated fibrous material and extending through an aperature in the panel member.

4,190,306

DRAWER WITH STOP DEVICE

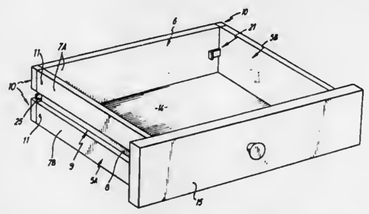
Leon G. Litchfield, and Terence Hardy, both of Derby, England, assignors to L. B. (Plastics) Limited, Derby, England

Filed Apr. 3, 1978, Ser. No. 892,741

Claims priority, application United Kingdom, Apr. 6, 1977, 14495/77; Jul. 23, 1977, 31040/77

Int. Cl.[2] A47B *88/00*

U.S. Cl. 312—330 R **18 Claims**



1. A drawer comprising back and side panels, the side panels incorporating runner grooves and the back and side panels being of hollow construction interconnected by corner pieces having projections engaged in the hollow portions of the associated panels, and a fitment removably mounted at one end of said back panel and retained against removal when the back panel an the associated side panel are assembled, said fitment including a portion which extends across the runner groove in the side panel.

4,190,307

ADAPTER

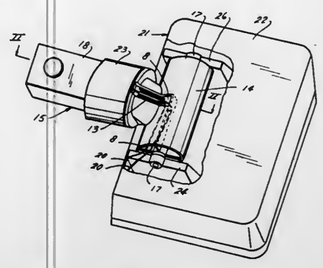
Manfred Eckart, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,917

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737013

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—6 R **19 Claims**



1. An adapter, particularly for detachably connecting an electrical floor-treating device to an operating appliance, comprising a first housing having a first longitudinal axis, a first throughgoing passage and a second throughgoing passage separated from said first passage, a first end portion adapted to be connected to the operating appliance, and a second end portion longitudinally spaced from said first end portion; a second housing having a second longitudinal axis extending substantially transverse to said first axis of said first housing and a third portion adapted to be mounted on said second end portion of said first housing for rotation relative thereto and about said first axis, said second housing being further provided with one through-going passage corresponding to and adapted to communicate with said first passage of said first housing when the latter is connected to said second housing to thereby define an uninterrupted first channel through the adapter, and another throughgoing passage having an open end communicating with said second passage of said first housing when the latter is connected to said second housing and another end open outwardly of said second housing so as to define a second uninterrupted channel through the adapter; and means for mounting said second housing on the treating device for pivotal movement relative thereto about said second axis and for rotational movement with the treating device about said first axis.

4,190,308

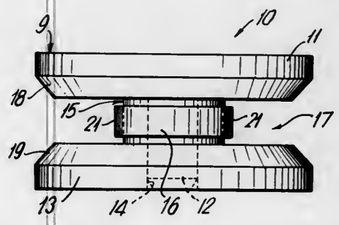
FEMALE ELECTRICAL CONNECTOR

James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,407

Int. Cl.[2] H01R *31/08*

U.S. Cl. 339—19 **18 Claims**



1. An electrical connector for electrically connecting a pair of spaced apart, substantially parallel, electrically conductive pin members comprising:

a housing formed of an electrically nonconductive material and having a pair of opposed, spaced apart cover members and a central hub portion disposed between the cover members; and

a continuous, electrically conductive contact member which is resilient and is disposed around said hub portion in a loose fit relationship, said contact member having a pair of opposed edges disposed parallel to the mounting direction of the connector, said opposed edges being spaced apart a distance greater than the distance between said spaced apart pin members such that when the connector is pushed over said pin members, the pin members resist said pushing action, and the hub portion of the connector housing exerts a force on the lead portion of said contact member to effect an elongation of said contact member thus reducing the pushing force required to overcome the resistance of said pin member and such that when said pushing action is stopped, said hub portion of the connector housing ceases to exert said force on the contact, and the contact tends to revert to its original configuration to effect a secure interference fit and electrical connection between the pins and contact member.

4,190,309

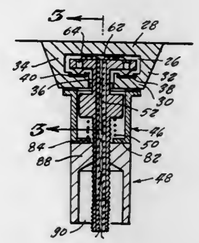
TRACK LIGHT

Irving J. Glass, 64-85 Wetherole St., Forest Hills, N.Y. 11374

Filed Jul. 27, 1978, Ser. No. 928,443

Int. Cl.[2] H01R *9/00, 13/60*

U.S. Cl. 339—21 R **8 Claims**



1. A track light comprising, in combination:

(a) a track including:

(1) an elongated housing for mounting onto a support surface;

(2) a T-shaped channel formed in said housing and having a transverse slot with a lower wall and an open groove formed in said lower wall;

(3) a pair of laterally spaced, parallel conductor strips, partially embedded into said lower wall on opposite sides of said groove; and

(4) inwardly turned shoulders formed in said lower wall and overhanging the edges of said conductor strips; and

(b) an adjustable lighting fixture, including:

(1) a contacting member having a hollow post externally threaded on at least a portion thereof, a cross bar connected across one end of the post having a length less than the width of said channel and a width less than the width of said groove, a pair of mutually insulated conical contacts depending from said cross bar and laterally spaced on either side of said post for separably engaging a respective conductor strip, and an axial collar coupled to said post in spaced relationship from said cross bar with an axial keyway formed in said collar;

(2) a T-shaped cover member having a transverse plate with a cylindrical body depending therefrom, an inwardly turned radial flange at the lower end of said cylindrical body defining a central opening through which said shaft can extend, an axial key inwardly

extending from said cylindrical body and mating with said keyway for non-rotative engagement with said contacting member, locking pads upwardly extending from said transverse plate and laterally positioned with respect to said cylindrical body for extending into said groove to prevent rotation of said T-shaped cover member with respect to said track;

(3) a threaded cap member threading onto said post axially outward of said cover member for axially moving said cover member along said post, and

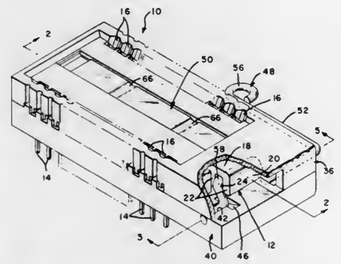
(4) a spring spacedly positioned around said post within said cylindrical body and extending between said collar and said flange for biasing said cover member away from said cross bar to permit insertion of said cross bar through said groove and then upon rotation, into said channel, whereupon said cap member can tighten said lighting fixture onto said track with said locking pads in said groove and said conical contact firmly contacting said conductor strips.

4,190,310

EJECTION DEVICE FOR A ELECTRONIC PACKAGE CONNECTOR

Edward J. Bright, Elizabethtown; Gabriel B. Cherian, York, and William S. Scheingold, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1978, Ser. No. 892,522
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 R **22 Claims**



18. An ejector device for use on a connector into which an electronic package may be removably inserted, the device comprising;

a. an elongated, resilient member positioned on the connector with a first end fixed to the connector, with at least part of the mid-portion positioned to underlie an electronic package which may be removably inserted in the connector and with the second end free to move towards the first end; and

b. means for causing the resilient member to bow upwardly so that the mid-portion pushes against the electronic package in a direction away from the connector.

4,190,311

LOW-PROFILE TEST CLIP ADAPTER

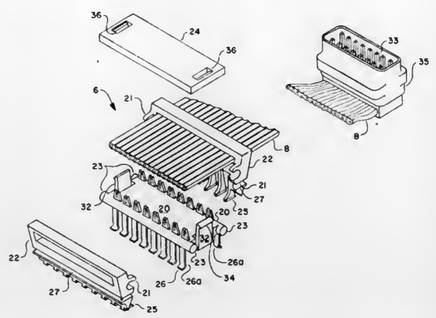
Thomas P. Basta, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 883,983, Mar. 6, 1978, abandoned. This application Feb. 26, 1979, Ser. No. 14,794
Int. Cl.[2] H05K *1/04*; H01R *13/54*
U.S. Cl. 339—75 MP **6 Claims**

1. A low-profile clip for making electrical connection to the terminals of a multi-terminal electronic component while the component is operating in an instrument having closely spaced circuit boards, the device comprising:

a cable comprising a plurality of insulated electrical conductors for carrying electrical signals from a test instrument to the electronic component being tested;

a body having spaced electrical contact means rigidly mounted therein, said electrical contact means including inwardly-directed, arcuate-shaped terminal-contact sections for providing electrical connection with the terminals of the electronic component and conductor-connecting sections for making electrical contact with said plurality of electrical conductors of said cable; and



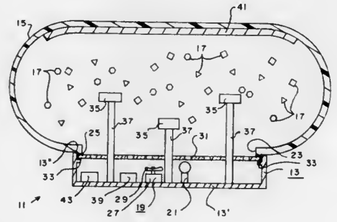
a pair of arms pivotally mounted on said body and comprising finger-like projections for gripping the electronic component between each pair of adjacent terminals thereof, the top portion of each of said arms including a slot for passing said cable therethrough.

4,190,312

LIGHT DISPLAY MEANS

Lonnie E. Bailey, 335 Marianna, Memphis, Tenn. 38111

Filed Sep. 1, 1978, Ser. No. 938,805
Int. Cl.[2] G02B *27/08*
U.S. Cl. 350—4.2 **2 Claims**



1. Light display means comprising:

(a) base means;

(b) hollow translucent body means for being mounted on said base means, said body means having an opening for communicating with said base means;

(c) a plurality of magnetically attractable, light reflective particles for being positioned within said body means;

(d) fan means for blowing air into said body means to cause said light reflective particles to move;

(e) light means for directing light into said body means to cause said light reflective particles to reflect light as they are moved by said fan means;

(f) grill means for being positioned between said opening of said body means and said base means to prevent said light reflective particles from passing out of said body means through said opening of said body means; and

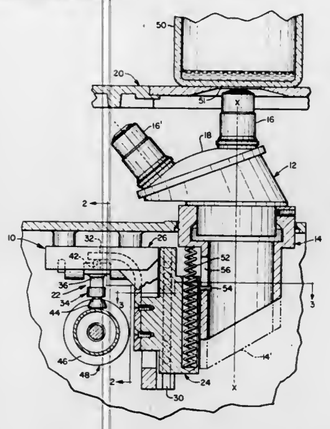
(g) electromagnet means for selectively attracting said light reflective particles, said electromagnet means including a plurality of electromagnet members for being positioned within said body means and for selectively attracting said light reflect particles, said electromagnet means including control means for selectively activating each of said electromagnet members.

4,190,313

SUPPORT FOR A MICROSCOPE OBJECTIVE

Richard P. Schultz, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 17, 1978, Ser. No. 906,544
Int. Cl.[2] G02B *21/00*
U.S. Cl. 350—84 **8 Claims**



1. A support for an objective of a microscope having a focusing mechanism with objective attachment means thereon for moving said objective toward and away from a stage of the microscope to adjust said objective relative to a specimen to be observed on said stage, said support comprising:

a carrier for said objective;

means for slideably mounting said carrier on said attachment means, said mounting means permitting sliding movement of said carrier on said attachment means toward and away from said stage of said microscope independently of movement of said attachment means, said separate movements of said carrier and attachment means being in substantially parallel directions;

a stop limiting the extent of said independent movement of said carrier on said attachment means;

means for yieldingly biasing said carrier against said stop;

whereby said objective with said attachment means may be moved toward and away from said stage by operation of said focusing mechanism while said objective is afforded protection against damaged by yielding of said biasing means to forces unduly resisting such movement and sliding of said carrier on said attachment means in a direction parallel to the direction of movement of said attachment means.

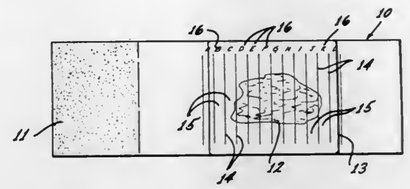
4,190,314

MICROSCOPE AND MICROSCOPE SLIDE FOR CYTOLOGICAL ANALYSIS

Stephen Goldsmith, 104 Lee Ave., Babylon, N.Y. 11702

Continuation of Ser. No. 657,096, Feb. 11, 1976, which is a continuation of Ser. No. 378,984, Jul. 13, 1973, abandoned. This application Jan. 11, 1978, Ser. No. 868,535
Int. Cl.[2] G02B *21/34*
U.S. Cl. 350—94 **11 Claims**

1. In combination with a microscope having a field of view of a predetermined diameter, a microscope slide comprising a thin elongated flat generally transparent strip having means for accurately designating adjacent fields of view and comprising a plurality of visible adjacent spaced-apart parallel lines formed on and extending over almost all of a flat surface of said strip, each of two adjacent equidistantly spaced-apart lines of said plurality of lines defining one of a plurality of uninterrupted scanning spaces having a width substantially equal to the diameter of the field of view of the microscope viewing device for viewing a cytological smear on the slide wherein said means enables a viewer by visually making reference to adjacent lines defining each of said plurality of said scanning



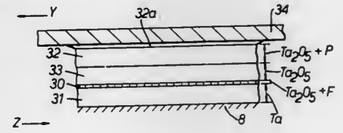
spaces to view the entire area of a smear by successive contiguous viewing scans of said scanning spaces, the spacing between each of two adjacent spaced-apart lines being approximately 1 mm, whereby a viewer making a viewing pass along all of said plurality of scanning spaces overlying a smear is ensured of detecting even a single malignant cell in a smear.

4,190,315

LIGHT TRANSMISSION GUIDES

Jack Brettle, Nether Heyford, and Norman F. Jackson, Duston, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Continuation-in-part of Ser. No. 675,561, Apr. 9, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,789
Claims priority, application United Kingdom, Apr. 10, 1975, 14697/75
Int. Cl.[2] G02B *5/14*; C25D *5/00*
U.S. Cl. 350—96.12 **35 Claims**



1. A light transmission guide comprising an anodic film of light transmitting material having a first anodised portion with a relatively high refractive index and at least a second portion with a relatively low refractive index, in which anodic film the increase in refractive index from said relatively high to said relatively low value is smooth and continuous in the vicinity of an interface between said first and second anodised portions, and in which the outer surface of said anodic film possesses a minimum amount of structural discontinuity on an atomic scale.

4,190,316

LENS CONNECTOR FOR OPTICAL FIBERS

Marc W. Malsby, Lake Arrowhead; John S. Doty, Yucaipa, and Jayantilal N. Patel, Beaumont, all of Calif., assignors to The Deutsch Company, Banning, Calif.

Filed Feb. 2, 1978, Ser. No. 874,558
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.18 **44 Claims**

16. An optical fiber connector comprising

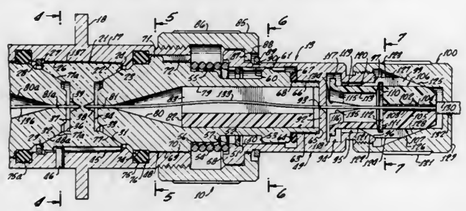
a lens member having first and second opposite ends,

said first and second ends including first and second cavities, respectively,

said cavities being opposite from each other,

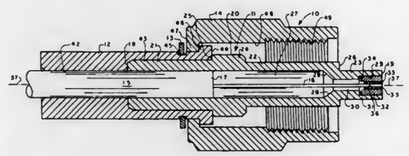
said first and second ends having first and second tapered surface means, respectively,

a first member adjacent said first end of said lens member,
a second member adjacent said second end of said lens member,
said first member including a first portion and a second portion,
said first portion of said first member being movable relative to said second portion of said first member and having tapered surface means engaging said first tapered surface means of said lens member,
said second member including a first portion and a second portion,
said first portion of said second member being movable relative to said second portion of said second member and having tapered surface means engaging said second tapered surface means of said lens member,
a first optical fiber carried by said first member and having an end portion projecting therefrom into said first cavity,



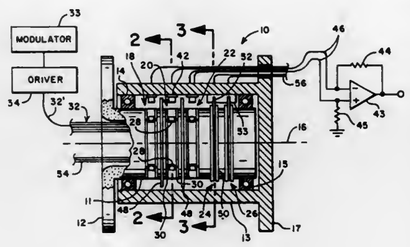
a second optical fiber carried by said second member and having an end portion projecting therefrom into said second cavity,
said first and second members including means for gripping said first and second fibers, respectively, only at locations remote from the ends thereof and so that the ends of said fibers are pressed axially into said cavities,
and means for connecting said first and second members to said lens member, said connecting means including resilient means for biasing said first portions of said first and second members toward said lens member so that said tapered surface means of said first and second members are pressed against said first and second tapered surface means of said lens member for aligning said first and second members with said lens member.

4,190,317
FIBER OPTIC CABLE CONNECTOR PIN ASSEMBLY
John A. Makuch, Danbury, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Dec. 30, 1977, Ser. No. 866,198
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.20 **14 Claims**



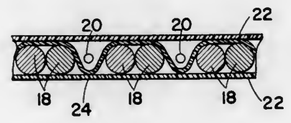
1. An assembly for aligning and terminating at least one optical fiber of a fiber optic cable along a predetermined axis comprising:
a rigid body having a uniformly cylindrical bore dimensioned for receiving said optical fiber and having a center axis in common with said predetermined axis; and
a compressible insert member having a greater outer dimension than the diameter of said bore and having a central aperture dimensioned for receiving said optical fiber, said compressible insert member being tapered along at least a portion of its length and being adapted for forced insertion into said bore and being substantially uniformly compressed by said bore for substantially uniformly reducing the dimension of said central aperture about said optical fiber to thereby firmly grip said optical fiber in aligned and terminated position along said predetermined axis.

4,190,318
OPTICAL SLIP RING APPARATUS UTILIZING RADIAL LIGHT SIGNALS
Robert W. Upton, Jr., Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 19, 1978, Ser. No. 870,908
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.20 **20 Claims**



1. Optical slip ring apparatus for transmitting light signals between two bodies, one of which is rotatable relative to the other about an axis of rotation, comprising:
a first light source for emitting a first radial light signal throughout a continous ring in a first plane;
a first member adapted to be fixed to one of the relatively rotatable bodies, and adapted to carry said first light source so that said ring is centered on the axis of rotation and the first plane is perpendicular to the axis of rotation;
a first light detector; and
a second member adapted to be fixed to the other of the relatively rotatable bodies, and adapted to carry said first light detector so that it is positioned to receive radial light signals emitted by said first light source.

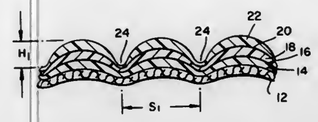
4,190,319
FIBER OPTIC RIBBON AND CABLE MADE THEREFROM
Frederick C. Eggleston, Decatur, Ill., assignor to Essex Group, Inc., Fort Wayne, Ind.
Filed Feb. 13, 1978, Ser. No. 877,047
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.23 **9 Claims**



1. An optical ribbon, comprising:
pair of parallel, elongated, substantially co-planar strength members extending parallel to the axis of said ribbon;
an optical channel situated in the void between said strength members, said optical channel being located in the same plane as said strength members and extending parallel to the axis of said ribbon;
a pair of parallel, elongated polymeric tapes bonded to one another only at their edges so as to form a sheath surrounding said sstrength members,and optical channel, said sheath being bonded to said strength members; and

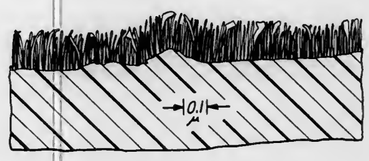
the relative size of said strength members and said optical channel being such that bonding between said sheath and optical channel is substantially prevented, and the spacing between said strength members being such that said channel is substantially free to move relative to said strength members and sheath.

4,190,320
PROJECTION SCREEN
Jesus Ferro, 425 Demody St., Roselle, N.J. 07203
Filed Oct. 24, 1978, Ser. No. 954,214
Int. Cl.² G03B 21/60
U.S. Cl. 350—129 **15 Claims**



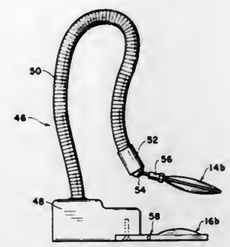
1. A front projection screen comprising a rear backing layer, a filler layer of flexible deformable material having its rear surface bonded to said backing layer, first and second metallic reflecting layers separated from each other by a light transmissive film layer, the first reflecting layer being maintained against the front surface of the filler layer, and a light-diffusing surface layer coated on the front surface of the second metallic reflecting layer to define a viewing surface, said viewing surface having a crosshatched pattern comprising a plurality of intersecting sets of parallel grooves formed therein so that images reflected from said screen can be viewed over a given range of viewing angles.

4,190,321
MICROSTRUCTURED TRANSMISSION AND REFLECTANCE MODIFYING COATING
Gary L. Dorer, Taunton, Mass., and Valdis Mikelsons, Mendota Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Feb. 18, 1977, Ser. No. 770,043
Int. Cl.² G02B 1/10
U.S. Cl. 350—165 **14 Claims**



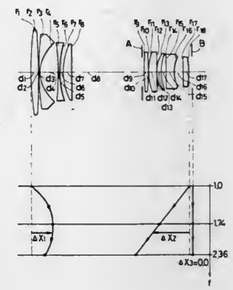
1. An article having a substantially antireflecting surface such that the specular reflection of visible light directed thereat is appreciably reduced, said article comprising
a substrate having a surface coating of an oxide of a metal selected from the group consisting of aluminum, magnesium and zinc or alloys thereof, which coating is a substantially complete conversion of a thin-film of said metal, the thickness of said thin-film prior to conversion being at least 5 nanometers and exhibiting a surface after said conversion characterized by a plurality of randomly positioned discrete leaflets of varying heights and shapes, which leaflets extend from said surface a distance of not less than 20 nanometers nor more than the wavelength of light, and the bases of which contact the bases of substantially all adjacent leaflets.

4,190,322
MAGNIFYING MEANS
Stewart W. Wortley, 1814 S. Cheyenne, Tulsa, Okla. 74119
Filed Sep. 1, 1977, Ser. No. 823,932
Int. Cl.² G02B 13/12
U.S. Cl. 350—181 **4 Claims**



1. Magnifying means comprising a first magnifying element constructed of a plastic material which magnifies in one direction only and having one flat surface and one arcuate surface oppositely disposed with respect thereto, a second magnifying element having at least one arcuate surface and which magnifies in all directions for cooperating with the first magnifying element and means for infinitely varying both of said elements with respect to spacing and angular orientation therebetween for facilitating focusing and to produce relatively high power magnification.

4,190,323
WIDE ANGLE ZOOM LENS WITH HIGH ZOOM RATIO
Ryota Ogawa, Kawagoe, and Takayuki Itoh, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1978, Ser. No. 894,275
Claims priority, application Japan, May 13, 1977, 52-55046
Int. Cl.² G02B 15/16
U.S. Cl. 350—184 **4 Claims**



1. In a photographic zoom lens system including relatively movable first divergent and second convergent lens groups on the object and image side, respectively, the improvements characterized by:
(a) the first lens group including at least two positive and two negative lenses, with the image side lens being positive,
(b) the second lens group including at least two positive lens facing the object,
(c) a fixed aperture diaphragm positioned on the image side of the second lens group, and
(d) the overall lens system satisfying the following conditions:

$$Z = 2.36, \quad \text{(I)}$$

$$\frac{|f_1|}{\sqrt{f_W f_T}} = 1.135, \quad \text{(II)}$$

$$\frac{f_2}{f_T} 0.604, \quad \text{(III)}$$

$$r_I = 1.4414, \quad \text{(IV)}$$

wherein:

Z is the zoom ratio ($Z = f_T/f_W$),

f_1 is the focal length of the first lens group,

f_2 is the focal length of the second lens group,

f_W is the focal length in the wide angle position,

f_T is the focal length in the telescopic or narrow angle position, and r_I is the radius of curvature of the lens surface facing the object of the positive lens nearest to the image in the first lens group, and (V)

	1 : 3.5–4.5 Surface No.	f = 1.0–2.36 r	ω = 38.4°–17.6° d	N	ν
	1	5.0189	0.1563	1.58913	61.1
	2	−30.5650	0.0035		
first	3	4.7923	0.0590	1.80610	40.9
lens	4	0.8060	0.3439		
group	5	−9.3508	0.0521	1.78650	50.2
	6	2.1211	0.0778		
	7	1.4414	0.1580	1.76180	27.1
	8	25.5287	1.5274		
	9	3.3349	0.0858	1.77250	49.6
	10	−6.2150	0.0035		
	11	1.1636	0.1691	1.52630	51.1
second	12	7.3634	0.0035		
lens	13	0.6434	0.0973	1.51823	59.0
group	14	1.1888	0.0913		
	15	4.9821	0.1744	1.84666	23.9
	16	0.6116	0.1688		
	17	3.4938	0.1320	1.54072	47.2
	18	−1.2504			

wherein:

r_i is the radius of curvature of the ith lens surface,

d_i is the thickness of the ith lens or the distance between adjacent lenses,

N is the refractive index at the d-line,

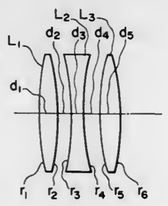
ν is the Abbe' number, and

ω is the half viewing angle.

4,190,324
ACHROMATIC OBJECTIVE LENS

Yasunori Arai, Asaka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1978, Ser. No. 954,032
Claims priority, application Japan, Oct. 21, 1977, 52-126578
Int. Cl.² G02B 9/16
U.S. Cl. 350—226 **1 Claim**



1. An achromatic objective lens comprising: positive, negative and positive lenses, a first positive lens L_1, a negative lens L_2 and a second positive lens L_3, satisfying the following conditions:

(1) $40 < \nu_2 < 45$
(2) $P_2^* < 0.5700$, $P_2^{**} > 0.3300$
(3) $\nu_1 > \nu_2 + 15$
(4) $|\nu_3 - \nu_2| < 5$
(5) $P_3^* - P_2^* > 0.005$, $P_2^{**} - P_3^{**} > 0$
(6) $0.15\ f < -f_2 < 0.5\ f$
(7) $0.5 < f_1/f_3 < 2.0$

where:

ν_i is the Abbe's number of the lens L_i,

P_i^* is the partial dispersion ratio of short wavelength part of the lens L_i, where:

$$P^* = \frac{n_g - n_F}{n_F - n_C}$$

and n_g, n_C and n_F are the refractive indexes corresponding to g-line (436 nm), C-line (656 nm) and F-line (486 nm) of the optical glass material, respectively,

P_i^{**} is the partial dispersion ratio of long wavelength part of the L_i, where:

$$P^{**} = \frac{n_C - n_{A'}}{n_F - n_C}$$

and $n_{A'}$, n_C and n_F are the refractive indexes corresponding to A'line (768 nm), C-line and F-line of the optical glass material, respectively,

f is the overall focal length, and

f_i is the focal length of the lens L_i, and the lens system further defined as follows:

Lens	f = 100.0 Surface	F No. 1 : 12 Distance along optical axis
L_1	$R_1 = 55.2096$	$d_1 = 1.000$
	$R_2 = -28.8000$	$d_2 = 0.049$
L_2	$R_3 = -28.5730$	$d_3 = 0.417$
	$R_4 = 23.5163$	$d_4 = 0.097$
L_3	$R_5 = 22.6201$	$d_5 = 1.000$
	$R_6 = -79.7936$	

	n_d	ν	P^*	P^{**}
L_1	1.51633	64.15	0.5350	0.3582
L_2	1.61340	43.84	0.5623	0.3373
L_3	1.53256	45.91	0.5747	0.3312

$P_3^* - P_2^* = 0.0124$
$P_2^{**} - P_3^{**} = 0.0061$
$-f_2 = 20.966$
$f_1/f_3 = 1.108$, and
n_d is the refractive index on the d-line.

4,190,325
THERMAL COMPENSATOR ASSEMBLY

Isabel L. Moreno, Oceanside, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 856,699, Dec. 2, 1977. This application Nov. 13, 1978, Ser. No. 960,155
Int. Cl.² G02B 7/02
U.S. Cl. 350—253 **7 Claims**

1. In an optical system comprising:

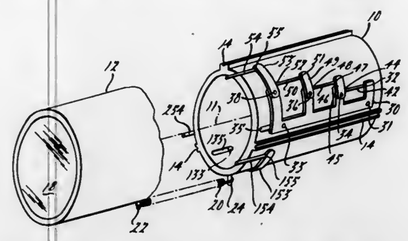
a first lens barrel supporting at least one lens element along an optical axis;

a second lens barrel supporting a second lens element, wherein said second lens barrel is float mounted on said first lens barrel for adjustable movement along said optic axis with respect to said first lens barrel;

an improved optical compensator assembly comprising:

an elongated support member, having a relatively low linear coefficient of expansion, connected to said first lens barrel at a single point so as not to restrict thermal expansion and contraction of said first lens barrel in response to ambient temperature changes;

a first lever having a relatively low linear coefficient of expansion, one end pivotally mounted on said support



member and a second end located for movement along an arc segment generally parallel to said optic axis; and

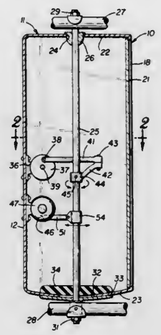
a first push rod having a relatively high linear coefficient of expansion, having a first end abutting against said support member and a second end abutting an intermediate point between said ends of said first lever, wherein;

said second end of said first lever member communicates with said floating lens barrel to effect movement thereof greater than the linear expansion of said first push rod.

4,190,326
MOTOR CONTROLLED MIRROR POSITIONING APPARATUS

Robert Brodbeck, P.O. Box 806, Littleton, Colo. 80120

Filed Aug. 7, 1978, Ser. No. 931,870
Int. Cl.² G02B 5/08, 7/18
U.S. Cl. 350—289 **3 Claims**



1. Vehicle rear view mirror positioning apparatus, for making mirror adjustments in rotary and tilt positions for the planar mirror, mounted in a housing having one transparent wall facing the mirror surface, comprising:

(a) generally rectangular housing means having one transparent wall and at least one metal wall,

(b) mounting means for said housing including a pair of generally horizontal arms depending outwardly from the vehicle,

(c) rear view mirror means mounted in said housing,

(d) mirror mounting means including a shaft secured between said arms and extending through said housing means interconnected with said rear view mirror means and arranged to tilt said housing means and said rear view mirror in one plane and rotate said housing means and said rear view mirror in another plane, said housing means being pivotally mounted to the top of said shaft for tilting and rotational movement,

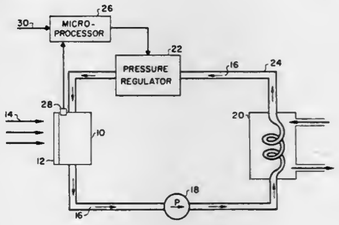
(e) a pair of individually activated motors mounted in said housing, and

(f) linkage means separately interconnecting said one metal wall and said housing means and said rear view mirror, one said linkage means and motor arranged to tilt said housing means and said mirror on actuation, and the other said linkage means and motor arranged to rotate said housing means and said mirror on actuation.

4,190,327
DEFORMABLE LIQUID MIRROR

Richard S. Hughes, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1978, Ser. No. 951,533
Int. Cl.² G02B 5/10
U.S. Cl. 350—310 **9 Claims**



1. A liquid laser mirror for reflection of light comprising:

a working liquid that reflects said laser light;

a pressure cell with an inlet and an outlet for containing said working liquid as it flows through said cell under predetermined pressure;

an optical plate transparent to said laser light which is within said pressure cell and oriented to face incoming laser light where said optical plate has been polished to eliminate scatter of light from the surfaces of said optical plate;

a pressure regulator connected to said pressure cell for controlling said predetermined pressure of liquid in said pressure cell by the input flow to said pressure cell;

a pump connected to the outlet of said pressure cell for circulating said working liquid; and

a heat exchanger connected between said pump and said pressure regulator for cooling said working liquid.

4,190,328
PROCESS FOR DETECTION OF BLOOD-BORNE PARASITES

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437; James V. Massey, III, 80 Driftwood La., Trumbull, Conn. 06610, and Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Dec. 1, 1978, Ser. No. 965,591
Int. Cl.² G02B 00/00
U.S. Cl. 350—320 **6 Claims**

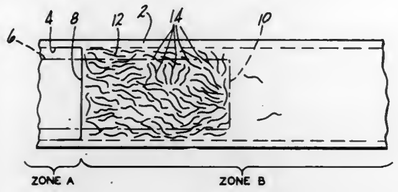
1. A method for visually detecting the presence of a particular parasite in a sample of anticoagulated blood, said method comprising the steps of:

(a) substantially filling a transparent capillary tube with a sample of whole blood to be tested for parasite infestation;

(b) centrifuging said blood sample in said tube to cause any parasites present in said blood sample to settle into a defined layer due to the specific gravity of the parasites;

(c) providing a generally cylindrical body in said capillary tube during said centrifuging step to form a narrow annular free space within said tube, said free space being radially bounded inwardly by the outer surface of said body

and outwardly by the bore wall of said tube into which free space at least a significant portion of said layer of the parasites settles during centrifugation whereby the population density of said portion of said layer of parasites is substantially increased to render the presence of parasites



in the blood sample readily discernable under appropriate optical magnification; and

(d) differentially highlighting the parasites in the blood sample to render the parasites highly visible with respect to surrounding blood cell types.

4,190,329

LIQUID CRYSTAL DISPLAY CELL OF THE REFLECTION TYPE

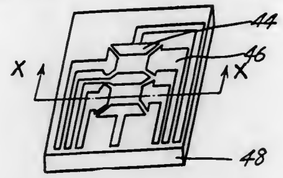
Isamu Washizuka, Kyoto; Satoshi Teramura, Kashihara; Shinji Tsugei, Yamatokoriyama, and Kazuyoshi Hirayama, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

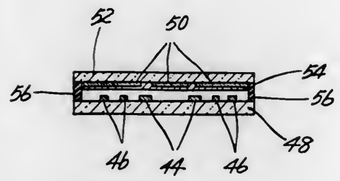
Continuation of Ser. No. 637,453, Dec. 3, 1975, abandoned. This application Feb. 22, 1978, Ser. No. 880,162

Claims priority, application Japan, Dec. 3, 1974, 49-138974

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—338 **5 Claims**





1. A liquid crystal display cell of the reflection type comprising:

a. a rear substrate;

b. segment shaped reflection electrodes and lead wires thereof formed on the rear substrate;

c. a transparent front substrate through which the display cell is viewed;

d. a reflection film formed in direct surface engagement on the transparent substrate, the reflection film covering the area of said lead wires on said rear substrate, but being removed at the positions corresponding to the segment shaped reflection electrodes formed on the rear substrate;

e. a transparent electrode formed uniformly over said transparent substrate and said reflection film directly engaging said transparent substrate only over that portion thereof from which said reflection film is removed;

f. a spacer for providing a predetermined distance between said two substrates; and

g. a liquid crystal composition filled between said two substrates; whereby said reflection film is viewed without intervention of said transparent electrode.

4,190,330

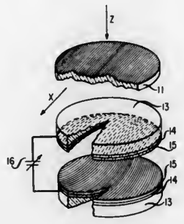
VARIABLE FOCUS LIQUID CRYSTAL LENS SYSTEM

Dwight W. Berreman, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1977, Ser. No. 864,328

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—331 **11 Claims**



1. Optical device comprising a variable focus optical focusing system consisting essentially of a first body of an essentially uniformly transparent birefringent nematic liquid crystal material, a second body of an essentially uniformly transparent birefringent liquid crystal material, means for aligning the directors in said first body in a first direction, means for aligning the directors in said second body in a second direction which is essentially perpendicular to said first direction, a pair of electrodes or an induction coil for applying across said first body and said second body an electric or magnetic field having a component perpendicular to said first direction and said second direction, means for varying the strength of said electric or magnetic field, and means for providing light passing through said first body and said second body and having a component which is perpendicular to said first direction and said second direction.

4,190,331

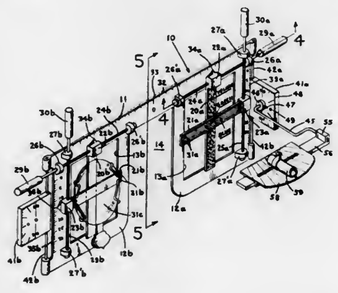
OPHTHALMIC MEASURING INSTRUMENT WITH ANGLE MEASURING MEANS

William V. Padula, II, 10 Manor Dr., Milford, Conn. 06460, and William V. Padula, I, 299 Manor Ave., Cranford, N.J. 07016

Filed Jun. 24, 1977, Ser. No. 809,536

Int. Cl.[2] A61B *3/10*

U.S. Cl. 351—5 **2 Claims**



1. An ophthalmic measuring instrument to be detachably connected to the eyeglass frame of a patient in front of the lens area in said eyeglass frame comprising,

a. an instrument frame having a front, a back, spaced eye viewing openings and a medially disposed nose opening,

b. clip means on the back of said frame for detachably connecting the instrument frame to the eyeglass frame of the patient so that the eye viewing openings are disposed substantially in front of and in alignment with the lens area of said eyeglass frame,

c. first and second vertically disposed transparent colored strips adjustably connected to the instrument frame to permit indexing of each of said strips in front of an associated one of said eye viewing openings,

d. first and second horizontally disposed transparent colored strips adjustably connected to the instrument frame to permit indexing of each of said strips in front of an associated one of said eye viewing windows in intersecting relation with an associated one of said vertically disposed colored strips,

e. the respective first and second horizontally disposed transparent colored strips having a color which causes a perceptive color change to the patient when the associated transparent colored strips bisect the visual axis of the patient's eye being measured,

f. graduated upper markings on the front of said frame having a center point to enable the said frame to be aligned with the center of the eyeglass frame to which it is attached and operatively associated with the first and second vertically disposed transparent colored strips to enable an MVA distance measurement to be made whenever either of said vertically disposed transparent colored strips bisect the visual axis of a given eye of the patient,

g. a first and second set of graduated markings on the front of said frame operatively associated with the first and second horizontally disposed transparent colored strips to permit the vertical displacement between the patient's respective eyes to be measured when the horizontally disposed transparent colored strips are in the visual axis of the patient, and

h. angle measuring means detachably connectable to said instrument frame for measuring the vertical inclination and vergence of each respective eye of the patient.

4,190,332

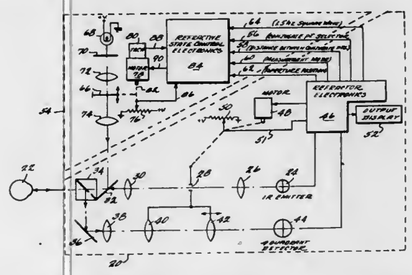
METHOD AND APPARATUS FOR CONTROLLING VISUAL REFRACTIVE STATE OF THE EYE

Richard H. Body, Centreville, and Edwin W. Evers, Reston, both of Va., assignors to Acuity Systems, Incorporated, Reston, Va.

Filed Oct. 14, 1977, Ser. No. 842,173

Int. Cl.[2] A61B *3/10*

U.S. Cl. 351—13 **26 Claims**



1. Apparatus for controlling the refractive state of an eye, said apparatus comprising:

a visual target;

an optical system for presenting an image of said target to said eye;

refraction means for objectively and substantially instantaneously determining said eye's refractive condition;

means coupled to said refraction means and to at least one of said target and said optical system for moving said image to a plane axially offset from the retina of said eye, said offset being in such a direction that when said eye attempts to focus on said image, the refractive state of said eye will change toward the desired goal; and

means for varying the position of said image to attract and maintain the interest of said eye.

4,190,333

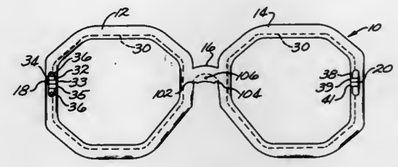
SPECTACLE FRAMES

Raymond E. Lambert, North Attleboro, Mass., assignor to Lambert Anodizing Co. Inc., Attleboro, Mass.

Filed Jan. 16, 1978, Ser. No. 869,636

Int. Cl.[2] G02C *1/08, 5/14, 5/22, 5/12*

U.S. Cl. 351—95 **14 Claims**



1. A spectacle frame comprises a main body portion having a front, sides and back and having two eye wires joined by a bridge portion, a slit formed in each eye wire so that a lens can be inserted and clamped therein, an upper barrel attached to each eye wire above the slit and a lower barrel attached to each eye wire below the slit and two T-bar members each having an elongated barrel projecting from a front plaque, the elongated barrel extending through a respective slit with the plaque disposed contiguous to the eye wire above and below the slit on the front side of the main body portion, the upper, lower and elongated barrels being aligned and having a bore extending therethrough, fastening means extending through the bore in the barrels to clamp the eye wires and T-bar members together and temple means attached to the frame.

4,190,334

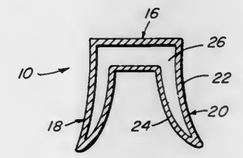
NOSE PAD FOR EYEGLASS FRAMES

Roderick J. O'Neil, 655 Main St., Waltham, Mass. 02154

Filed Aug. 28, 1978, Ser. No. 937,489

Int. Cl.[2] G02C *5/02*

U.S. Cl. 351—137 **6 Claims**



1. A nose piece for use with a pair of eyeglasses having a bridge extending between the lenses of said eyeglasses, comprising

(a) an inverted U-shaped hollow member adapted to contain a charge of fluid sealed therein,

(b) said member formed with a hollow cross-portion mountable to said bridge and a pair of spaced, depending curved hollow legs extending one from each end of said cross-portion to engage the nose of a person wearing said eyeglasses,

(c) the walls of said member being of an imperforate elastic material and the inner opposing walls of said legs being thinner than the outer walls thereof whereby said inner walls will expand and contract with changes in the pressure of said fluid to change the gap between said legs, and,

(d) squeezing means engaging said cross-portion for selec-

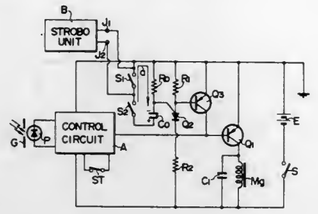
tively compressing said cross-portion to vary the pressure of said fluid.

4,190,335

SHUTTER CONTROLLING AID MEANS FOR USE WITH CAMERA

Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1977, Ser. No. 841,948
Claims priority, application Japan, Oct. 16, 1976, 51-24154
Int. Cl.² G03B *15/05*
U.S. Cl. 354—34 **10 Claims**



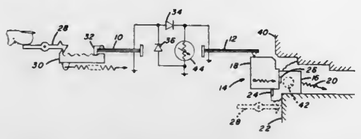
1. In combination:
a strobo unit;
an electrical shutter circuit and X contacts for operating said strobo unit, said X contacts being adapted to close during initiation of a photographing operation, said electrical shutter circuit including terminating means for terminating said photographing operation;
said strobo unit including flash means and power means for powering said flash means;
means for releasably electrically connecting said strobo unit to said electrical shutter circuit;
said flash means being illuminated responsive to closing of said X contacts;
said electrical shutter circuit being comprised of resistor-capacitor storing means being connected across said X contacts and charged by said strobo unit power means when said strobo unit is coupled with said electrical shutter circuit and said X contacts are open and being discharged upon closure of said X contacts to produce a closing signal indicating closure of said X contacts; and
said terminating means being responsive to said closing signal for terminating the photographing operation.

4,190,336

PIEZOELECTRIC POWER SUPPLY FOR CAMERAS

Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,488
Int. Cl.² G03B *7/08;* H01V *41/10*
U.S. Cl. 354—50 **3 Claims**



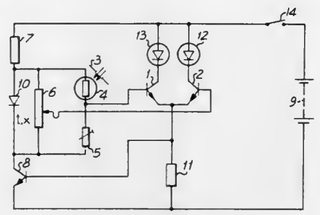
1. In photographic apparatus having (1) an aperture, (2) shutter means for selectively opening and closing the aperture to provide an exposure period, and (3) electrically energizable photoelectric means, including a piezoelectric charge storage device, for controlling the shutter means to vary the exposure period in accordance with scene luminance, the improvement comprising:
(a) charge generating means including a flexible piezoelectric member which is adapted to generate and store charge of one polarity upon being flexed toward a predetermined flexed configuration, and to generate and store charge of opposite polarity upon unflexing from said flexed configuration toward a relaxed configuration;
(b) actuating means for repeatedly flexing said member toward said flexed configuration and for allowing said member, between successive flexures, to unflex from said flexed configuration toward said relaxed configuration;
(c) means electrically connecting said piezoelectric member and said charge storage device for transferring charge of said one polarity to said storage device when said member is flexed toward said flexed configuration;
(d) means for preventing transfer of charge of said one polarity from said charge storage device to said piezoelectric member when said member unflexes from said flexed configuration toward said relaxed configuration; and
(e) means for discharging charge of said opposite polarity from said piezoelectric member when said member unflexes from said flexed configuration toward said relaxed configuration.

4,190,337

EXPOSURE MEASUREMENT CIRCUIT

Siegfried Schütze, and Werner Locke, both of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera- und Kinowerke, Dresden, German Democratic Rep.

Filed Jan. 30, 1978, Ser. No. 873,623
Claims priority, application German Democratic Rep., Jan. 31, 1977, 197151[U]
Int. Cl.² G03B *17/18;* G01J *1/44*
U.S. Cl. 354—60 L **7 Claims**



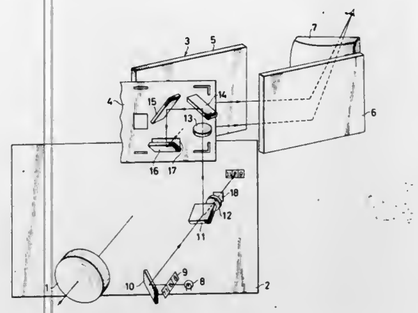
1. An exposure metering circuit comprising:
a measuring bridge having first and second feed points connected to an operating voltage source and having first and second outputs for providing a signal indicative of the balancing state of the bridge, said bridge including a photoconductive cell and setting controls for the insertion of exposure factors;
a differential amplifier having two inputs connected to the respective outputs of said bridge and having outputs connected to light emitting elements for the indication of a set under exposure, over exposure or correct exposure condition;
and wherein the first feed point of said measuring bridge is connected to the operating voltage source via a resistor and the second feed point of said bridge is connected to the operating voltage source via the collector-emitter path of a transistor which transistor is driven at its base by means of a voltage derived from the common emitter circuit of the differential amplifier, to provide compensation for circuit fluctuations.

4,190,338

DATA RECORDING CAMERA

Youichi Okuno, Yokohama; Hideo Yokota, Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,355
Claims priority, application Japan, Sep. 21, 1977, 52-114345; Sep. 21, 1977, 52-114347
Int. Cl.² G03B *17/24, 13/02*
U.S. Cl. 354—106 **5 Claims**



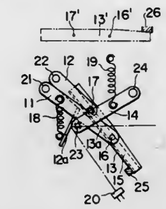
1. A data recording camera comprising:
an image forming optical system for forming the image of the object to be photographed on the photosensitive material;
a view finder optical system for observing the object to be photographed;
means forming data;
a light beam dividing device for directing the light beam from the data toward the photosensitive material and the view finder optical system, said dividing device producing a ghost light beam forming on the photosensitive material a ghost image of the data being produced due to the internal reflection of said light beam dividing device;
an optical system for forming the data image on the photosensitive material;
an optical system for forming the data image in the view finder; and
an optical member arranged in the path of the ghost light beam to substantially eliminate the ghost light beam.

4,190,339

RETRACTING AND RAISING TYPE MIRROR DRIVE DEVICE IN SINGLE-LENS REFLEX CAMERA

Akihiro Arai, Urawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,262
Claims priority, application Japan, May 31, 1977, 52-63548
Int. Cl.² G03B *19/12*
U.S. Cl. 354—156 **5 Claims**



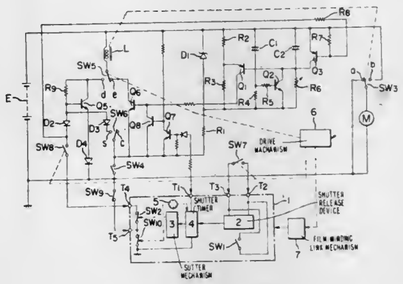
1. A mirror drive device for a single lens reflex camera of the type in which a mirror is movable between viewing and photographing positions, is mounted on a mirror supporting member within a camera body and is simultaneously pivoted and retracted out of the optical photographing path and into the photographing position in order to expose the camera lens to the photographic film, the device comprising:
first and second pivot shafts provided on said camera body and fixed in position with respect to said camera body, first and second coupling shafts provided on said mirror supporting member along a single edge thereof and first and second pivot arms, said first pivot arm being pivotally connected at one end thereof to said first pivot shaft and at the other end thereof to said first coupling shaft and said second pivot arm being pivotally connected at one end thereof to said second pivot shaft and at the other end thereto to said second coupling shaft, a first spring means coupled at one end thereof to one of said pivot arms and at the other end thereof to said camera body to pull said mirror towards said viewing position, a raising lever pivotally connected at one end thereof to said camera body and having a pin at the other end thereof in contact with one of said pivot arms, and a second spring means coupled at one end thereof to said camera body and at the other end thereof to said raising lever, said second spring means urging said pin against said pivot arm to move said pivot arm so as to raise said mirror from the viewing position to the photographing position.

4,190,340

MOTOR DRIVE APPARATUS FOR PHOTOGRAPHIC CAMERA

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 2, 1977, Ser. No. 847,920
Claims priority, application Japan, Nov. 5, 1976, 51/132312
Int. Cl.² G03B *1/18*
U.S. Cl. 354—173 **8 Claims**



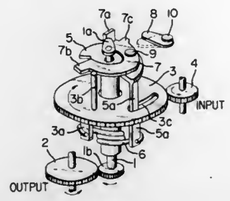
1. A motor drive apparatus for a camera for starting shutter release upon the turning on of a trigger switch, for starting film winding upon receipt of an exposure completion signal from said camera upon a completion of exposure and for generating a signal upon completion of film winding, comprising:
(a) a timer circuit adapted to start counting elapsed time upon receipt of said exposure completion signal from the camera and to generate a timer signal after the lapse of a predetermined period; and
(b) shutter release means adapted to generate a release signal and to start shutter release when said film winding completion signal is produced and said timer signal is generated.

4,190,341

MOTOR DRIVE DEVICE FOR CAMERA

Shiro Sugimori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,745
Claims priority, application Japan, Nov. 22, 1976, 51-139489
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—173 **5 Claims**



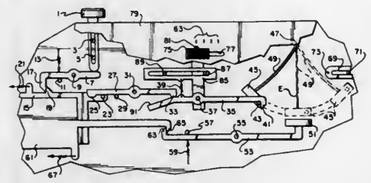
1. A motor drive device for a camera comprising:
a film advance shaft for advancing film with the aid of a drive from a motor,
a rotary shaft having a connecting portion and effective to transmit its rotation to said film advance shaft;
a drive plate rotatably mounted on said rotary shaft and rotatable by the drive from said motor;
a movable plate rotatably mounted on said rotary shaft;
resilient drive connection means between said drive plate and said movable plate so as to rotate them together, the resilient drive connection means allowing a relative rotation of the drive plate when the movable plate is stopped;
a coupling member pivotally mounted on said movable plate and being movable between a coupled position in which said coupling member is coupled to said rotary shaft so that the rotary shaft rotates in unison with said drive plate through said coupling member and a non-coupled position in which said coupling member and said rotary shaft are free from each other;
change-over means for changing over said coupling member from said non-coupled position to said coupled position by actuating said coupling member; and
a release member provided on said drive plate so as to pivotally move said coupling member to said non-coupled position when said movable plate in said coupled position is stopped through the coupling member by an increased film advance load applied to the rotary shaft after completion of film advance.

4,190,342

MECHANISM FOR CONTROLLING A TIMED FUNCTION IN A CAMERA

Werner Fassler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,195
Int. Cl.[2] G03B *9/08, 17/00, 17/40*
U.S. Cl. 354—202 **8 Claims**



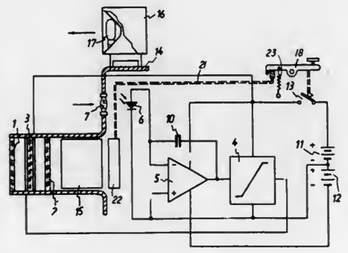
1. A mechanism for controlling a timed function in a camera, comprising:
means for initiating the timed function;
means operable for terminating the timed function;
means dampeningly oscillatable, beginning at selectable different amplitudes, in response to initiation of the timed function, and, after dampening for respective different intervals of time, oscillating at a predetermined lesser amplitude for operating said terminating means to terminate the timed function; and
means for selecting the amplitude at which said oscillatable means is to begin oscillating.

4,190,343

PHOTOGRAPHIC CAMERA WITH EXPOSURE CONTROL UTILIZING A PHASE CONTROLLABLE CRYSTAL

Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 392,807, Aug. 23, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,326
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1972, 2242809
Int. Cl.[2] G03B *9/56*
U.S. Cl. 354—227 **7 Claims**



1. An exposure-terminating arrangement for photographic cameras capable of making flashbulb exposures, the arrangement comprising, in combination, a pair of parallel planar polarization filters, a planar phase element located intermediate the filters and parallel thereto, the filters and the phase element being arranged in the path of light entering the camera normal thereto, the phase element having two control electrodes and being operative for rotating the polarization direction of polarized light passing therethrough in dependence upon the potential difference across its two control electrodes, a light-integrating device operative for receiving scene light and generating an integral signal corresponding to the time integral of the received light, and a threshold detector circuit having an input connected to the light-integrating circuit for receipt of the integral signal and having a pair of output terminals, each control electrode of the phase element being connected only to a respective one of the threshold detector circuit output terminals and the operation of the phase element accordingly being determined exclusively by the potential difference across the threshold detector circuit output terminals, the threshold detector circuit being capable of assuming only two states, the first being a state in which it applies across the control electrodes of the phase element a potential difference causing the phase element to permit polarized light emerging through the first filter to pass also through the second filter, the second being a state in which the threshold detector circuit applies across the control electrodes of the phase element a potential difference causing the phase element to prevent polarized light emerging through the first filter from passing through the second filter, the threshold detector being in the first state when the integral signal is below a predetermined value, the threshold detector assuming its second state and accordingly causing the phase element to terminate the exposure when the integral signal reaches the predetermined value, whereby when the integral signal quickly reaches the predetermined value due to high flashbulb scene

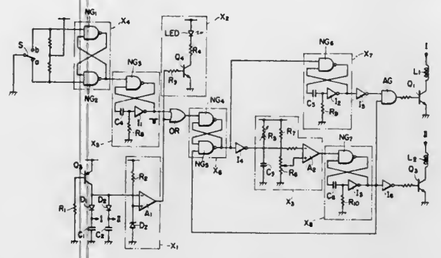
brightness levels the exposure can be immediately terminated without dependence upon the response times of moving parts.

4,190,344

DRIVING CIRCUIT FOR CAMERA SHUTTERS

Yasuo Ishiguro, and Kenji Wakazono, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,194
Claims priority, application Japan, Dec. 27, 1976, 51-159906
Int. Cl.[2] G03B *9/08*
U.S. Cl. 354—234 **2 Claims**



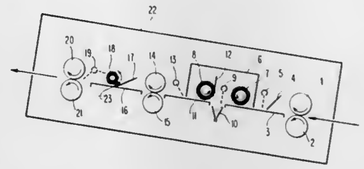
1. A driving circuit for camera shutters comprising:
a first driving coil for selectively opening a shutter;
a first capacitor;
means for selectively charging said first capacitor;
means, responsive to control signals applied thereto and including a switching element, for controllably providing a first current path to discharge said first capacitor through said first driving coil;
a voltage judging circuit, connected to said first capacitor, for generating a comparison signal indicative of whether the voltage of said means for selectively charging said first capacitor is above a predetermined value or not; and
a controlling circuit connected between said voltage judging circuit and said switching element, for, responsive to said comparison signal, generating a control signal to said switching element to render said switching element conductive when the voltage of said first capacitor is above the predetermined value to effect provision of said first current path;
a second driving coil for selectively closing said shutter;
a second capacitor;
means for selectively charging said second capacitor;
means, responsive to control signals applied thereto and including a second switching element, for controllably providing a second current path to discharge said second capacitor through said second driving coil;
a first one-shot multivibrator (OSM) circuit connected to said controlling circuit;
a first flip-flop (FF) circuit connected to said first OSM circuit and operated by the shutter releasing operation; and
an indicating circuit connected to said judging circuit and responsive to said comparison signal for generating indicia of when said first capacitor is below said predetermined value;
said controlling circuit comprising a two input OR gate having a first input thereto connected to said first OSM circuit and the second input thereof receptive of said comparison signal; and
a second FF circuit connected to said OR gate;
a second OSM circuit and first inverter connected to said second FF circuit;
an exposure timing controlling circuit connected to said first inverter;
a third OSM circuit connected to said exposure time controlling circuit;
a second inverter connected to said second OSM circuit;
an AND gate connected to said second inverter and said third OSM circuit, said AND gate supplying said control signal to said first switching element to effect opening of said shutter; and
a third inverter connected to said third OSM circuit, said third inverter supplying control signals to said second switching element to effect closing of said shutter.

4,190,345

LITHOGRAPHIC PLATE PROCESSING APPARATUS

Alfred S. Taylor, Fortunes Rocks, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 14, 1978, Ser. No. 924,653
Int. Cl.[2] G03D *5/04*
U.S. Cl. 354—318 **3 Claims**



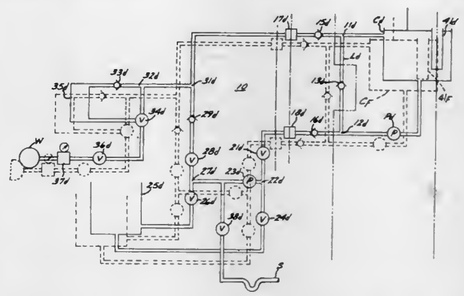
1. In a lithographic plate processing apparatus which comprises means for moving an exposed lithographic plate through the apparatus on an uphill slope, developer means within the apparatus for applying a developer liquid to the plate as it moves through the apparatus, and gumming means within the apparatus for applying gum to the plate after it has been developed, the gumming means including a baffle member under which the plate passes in contact to enter the gumming means and which forms a dam to hold a puddle of gum on the plate and against the baffle member, and spray means for spraying the gum onto the plate at the downstream end of the gumming means whereby the gum flows downhill over the upwardly moving plate, the improvement comprising, as part of the gumming means, a rotatable gumming scrub brush between the baffle member and the spray means and in a position to scrub the plate when it passes thereunder after passing through the puddle of gum and before passing the spray means:

4,190,346

AUTOMATED CLEAN-OUT SYSTEM FOR FILM PROCESSORS

John W. Hutson, 10250 Warner Ave. #H, Fountain Valley, Calif. 92708, and Robert L. Neal, 16911 Sims St. Apt. B, Huntington Beach, Calif. 92649

Filed Dec. 4, 1978, Ser. No. 966,084
Int. Cl.[2] G03D *3/02*
U.S. Cl. 354—324 **7 Claims**



1. In a film processor including a developer and fixer container the improvement comprising:
an automated clean-out system adapted to be connected to

the circulation loops around said developer and fixer containers of a film processor, including;

a first and second check valve respectively installed in said loops around said developer and fixer containers;

quick disconnect means installed directly in said loops adjacent said first and second check valves;

first and second conduit means respectively connected to said quick disconnects each said conduit means including a corresponding pump and valving means for selecting the direction of flow therethrough;

a first and second level detector respectively connected to said developer and fixer containers for sensing the level of liquids therein; and

automated sequencing means connected to said valving means, said pump and said first and second level detectors, said sequencing means including a first and second timer for advancing the selection of the direction of flow upon the occurrence of preselected time intervals.

4,190,347

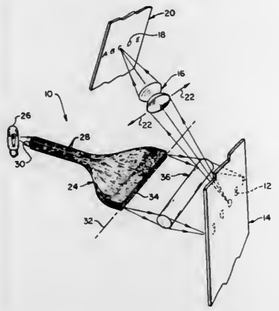
LINE ILLUMINATOR

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 10, 1978, Ser. No. 932,750

Int. Cl.[2] G03B *27/00, 27/54;* G03G *15/00*

U.S. Cl. 355—1 **8 Claims**



5. In an illuminator for a linescanning document copier including a light source, a bundle of light-conducting fibers having light-receiving ends tightly grouped in a generally circular array adjacent said light source and light-emitting fiber ends juxtapositioned along a straight line spaced from a document to be copies; the improvement comprising:

cylindrical lens means in said space between said light-emitting ends of said fibers and said document, said cylindrical lens means being in directly forwardly spaced relationship from said line of light-emitting fiber ends and extending approximately parallel to said line, said lens means having light-receiving and light-emitting opposite sides affording astigmatic imaging of said line of light-emitting fiber ends for blending of irregularities of light intensities emitted from said line of fiber ends.

4,190,348

LEAD EDGE TRANSFER SWITCHING

Bruce W. Friday, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

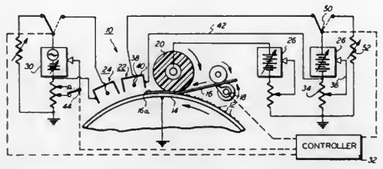
Filed Oct. 2, 1978, Ser. No. 948,069

Int. Cl.[2] G03G *15/16;* H01T *19/04*

U.S. Cl. 355—3 TR **14 Claims**

1. In an electrostatographic copying apparatus in which imaging material is transferred from an image support surface to a moving copy member by electrical transfer means including an electrical power supply, which transfer means applies electrostatic fields for said transfer of the imaging material and deposits electrostatic charges on the copy member which electrostatically resist the stripping of the copy member from said image support surface; and in which copying apparatus detacking corona generating means are also provided for at least partially neutralizing said charges deposited on the copy member by said transfer means so as to assist in the stripping of the lead edge of the copy member from said image support surface; the improvement comprising:

transfer switching means for applying a non-uniform increased transfer charge to the lead edge area of a copy member to provide a substantially increased electrostatic transfer field to the lead edge area of the copy member in proportion to the remainder of the copy member, prior to the copy member being subjected to said detacking corona generating means, to improve said transfer of said imaging material to the lead edge area of said copy member.



4,190,349

SLIDER RECIPROCATING DRIVING APPARATUS FOR USE WITH ELECTROPHOTOGRAPHIC COPYING MACHINE

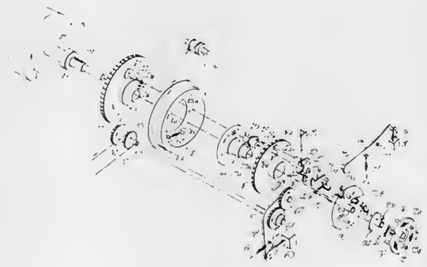
Yukihiro Ohno, Maebashi, and Nobuyuki Yanagawa, Chigasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 1, 1978, Ser. No. 911,412

Claims priority, application Japan, Jun. 2, 1977, 52-65122; Jun. 7, 1977, 52-66931

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **9 Claims**



1. A slider reciprocating driving apparatus for controlling reciprocating movement of a slider having a contact glass thereon for use with an electrophotographic copying machine of the type in which one copy is obtained by two revolutions of a photoconductor drum, said apparatus comprising, in combination, a drum shaft mounting said photoconductor drum, rotation operation means rotatably mounted on said drum shaft, and which reciprocates said slider with one reciprocating cycle of said slider corresponding to two revolutions of said photoconductor drum,

rotating means fixedly mounted on said drum shaft, and having a first notch in the peripheral surface thereof,

rotation control means rotatably mounted on said drum shaft, and having a second notch in the peripheral surface thereof,

stopper means comprising a rotatable shaft, rotatably mounted on said rotation operation means and disposed parallel to said drum shaft, and two ratchet pawls fixedly mounted on said rotatable shaft, one ratchet pawl being engageable with said notch of said rotating means and the other ratchet pawl being engageable with said notch of rotation control means,

forward driving means operable to drive said rotating means to move said slider in the forward direction,

engagement means operable to engage said two ratchet pawls with said first notch of said rotating member and said second notch of said rotation control member, respectively, when said slider is to be moved forwards,

disengagement means operable to disengage said two ratchet pawls from said notch of said rotating member and that of said rotation control member, respectively, when the forward movement of said slider has been completed,

backward driving means operable to drive said rotating means reversely to move said slider in the backward direction when forward movement of said slider has been completed, and

releasing means operable to disengage said backward driving means from said rotation operation member.

4,190,350

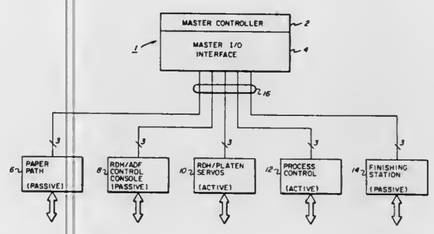
DISTRIBUTED MICROPROCESSOR CONTROL SYSTEM FOR A COPIER/DUPLICATOR

James J. Donohue, 9 Trailwood Cir., Brighton, N.Y.; Kenneth Gillett, 140 Via Sego, Redondo Beach, Calif. 90277; Charles P. Holt, 4400 Via Pavion, Palos Verdes Estate; Andrew T. Ling, 5203 Silver Arrow Dr., Rancho Palos Verdes, both of Calif. 90274; Richard M. Malinich, 28 Kevin Dr., Penfield, N.Y. 14526, and Frank M. Nelson, 14547 Valley Vista Blvd., Sherman Oak, Calif. 91403

Filed Aug. 30, 1977, Ser. No. 829,015

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **31 Claims**



1. A distributed processing system for reproduction machine, said machine producing copies of original documents and having a plurality of operating stations and a plurality of devices for controlling operational tasks within said operating stations, comprising:

a. a master programmable controller having program storage means for storing an operational program for controlling said machine,

b. at least one programmable area controller said programmable area controller being distinct from said master controller, said programmable area controller having program storage means for storing an operational program for controlling at least one of said devices,

c. at least one non-programmable area controller for controlling at least one of said devices; and

d. bus means coupling said programmable area controller and said non-programmable area controller with said master controller for transmitting and receiving data between said master controller and said programmable and non-programmable area controllers to control said operating tasks of said operating stations whereby to enable said machine to produce copies.

4,190,351

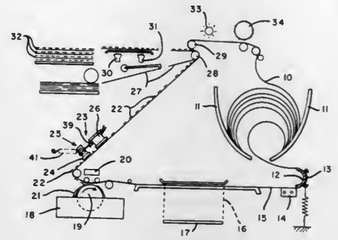
COPYING MACHINE WITH ELECTROMECHANICAL SCAVENGER ASSEMBLY AND PROCESS

Paul J. Macaluso, Norwalk, and Lawrence E. Clifford, Danbury, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 13, 1978, Ser. No. 960,587

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **12 Claims**



1. In an electrostatic copying apparatus comprising a continuous photoresponsive master, means for moving said master through a copying cycle comprising a charging station in which the photoresponsive surface of the master is provided with an electrostatic charge, an exposure station in which the charged surface is exposed to the light image of an imaged original sheet being copied, whereby the electrostatic charge is removed from said surface except in latent image areas exposed to the imaged areas of said original, a development station in which said latent image areas are developed by means of toner powder present in a two-component composition comprising said toner powder and magnetic carrier particles, and an image-transfer station in which said developed images are transferred to a copy sheet and fused thereon, the improvement which comprises a non-magnetic shield having a collection surface which is positioned parallel to and across the path of the master and uniformly closely-spaced from the toner-imaged surface of said master, said shield being located beyond said development station and in advance of said transfer station, a magnet assembly pivotally attached to the apparatus and comprising a magnet which is movable between working and retracted positions, means for pivoting said magnet assembly to move said magnet into working position behind said shield to create a sufficient magnetic field through said shield to attract any magnetic carrier particles which may be present on the surface of said photoresponsive master from said master to the adjacent collection surface of said shield, and means for pivoting said magnet assembly into retracted position to move said magnet away from said shield to remove said magnetic field from said shield sufficiently to cause said magnetic particles to be released from the collection surface of the shield.

4,190,352

METHOD AND APPARATUS FOR CONTINUOUSLY PATTERNING A PHOTOSENSITIVE TAPE

John H. Bruning, Brookside, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

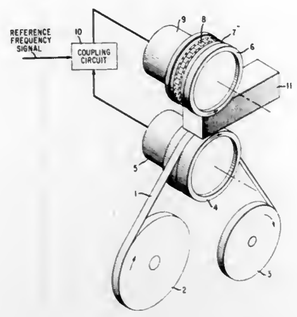
Filed Jun. 30, 1977, Ser. No. 811,971

Int. Cl.[2] G03B *27/32, 27/10, 27/70*

U.S. Cl. 355—19 **14 Claims**

1. Method for continuously patterning a photosensitive tape comprising the steps of: continuously projecting onto said tape a predetermined endless pattern that is defined entirely on the cylindrical surface of a transparent cylindrical body; translating said tape at a predetermined speed between a tape-feeding means and a tape-receiving means; rotating said body at said predetermined speed via a direct drive to synchronously lock the movements of said body and said tape to each other; optically coupling an optical system between said pattern and said tape; and illuminating said pattern through said transpar-

ent body for continuously projecting an image of said pattern onto said tape via said optical system; *wherein said optical system is characterized by a high-precision lens resolution relative*



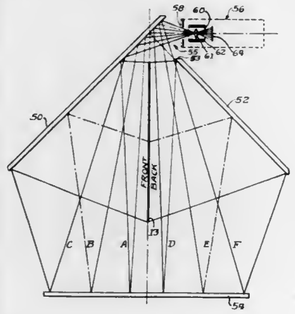
to the surface of said tape, and the movements of said body and said tape are synchronously locked to each other by means of electrical circuit locking techniques to within the lens resolution of said optical system.

4,190,353

OPTICAL SYSTEM FOR ROTARY CAMERA

Mervin W. LaRue, Jr., Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 27, 1978, Ser. No. 955,666
Int. Cl.² G03B *27/32*
U.S. Cl. 355—24 **20 Claims**



1. A microfilm recording apparatus for filming documents comprising:

(a) a camera having a lens with an optical axis, and film,

(b) a base structure,

(c) document transport means to move the documents past an aperture area such that the plane of the document portion in the aperture area is substantially perpendicular to the base structure

(d) a combining mirror mounted to the base plate substantially perpendicular to the plane of the document portion in the aperture area

(e) a camera mirror mounted to the base structure on one side of and at an acute angle to the document plane in the aperture area and at an acute angle to the combining mirror, and

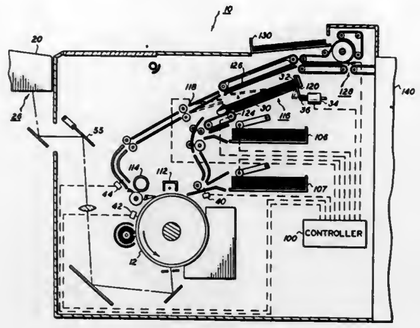
(f) each of the mirrors having a reflective surface, whereby a folded optical path lying substantially in one plane is formed from a point on the document in the aperture area to the film via the camera mirror, combining mirror, back to the camera mirror and through the lens.

4,190,354

COPIER JOB RECOVERY SYSTEM

Craig A. Smith, Pittsford, and Joachim Guenther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,127
Int. Cl.² G03G *15/00;* **B65H** *5/22, 31/08*
U.S. Cl. 355—3 SH **10 Claims**



1. In a copier adapted for pre-collation duplex copying, in which copy sheets are simplexed and normally fed to a first side of a duplex buffer set stacking means in collated serial page order, where said copy sheets are normally stacked relative to a main supporting surface means and then fed out from the second and opposite side of said buffer set stacking means in serial page order by a first sheet feeding means to be duplexed; a job recovery system for replacing lost copy sheets and continuing pre-collation duplex copying run, comprising:

means for making up one or more replacement simplexed copy sheets in response to the sensing of lost copy sheets during a duplex copying run;

shifting means for temporarily shifting the position of a buffer set stack of copy sheets in said buffer set stacking means relative to said main supporting surface means to provide a space therebetween into which said replacement simplexed copy sheets can be fed at said second side of said buffer set stacking means;

second sheet feeding means adjacent said buffer set stacking means for feeding said replacement simplexed copy sheets into said space;

said shifting means being further adapted to shift said buffer set stack back to its normal position after said replacement copy sheets have been fed into said space;

said second sheet feeding means and said shifting means being adapted to position said replacement simplexed copy sheets in a position to be fed out from said buffer set stacking means by said first sheet feeding means before other sheets in said buffer set stack so as to maintain a precollated buffer set stack in collated serial page order for continued copying.

4,190,355

FACETTED REFLECTOR

Stephen T. Avery, Rochester; John A. Durbin; William L. Lama, both of Webster, and Paul H. Stiebitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

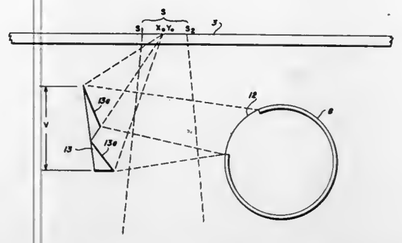
Filed May 3, 1978, Ser. No. 902,305
Int. Cl.² G03B *27/76*
U.S. Cl. 355—71 **6 Claims**

1. In a photocopier, a scanning illumination system for incrementally illuminating a scan strip on an object surface, including

a linear light source disposed adjacent to and on one side of said scan strip said light source having an aperture defined through a portion thereof through which light is directed to said scan strip,

a reflector located on the opposite side of said scan strip with its reflective surface facing said light source aperture so as to reflect illumination from said light source towards said scan strip,

said reflector comprising a plurality of plane mirror facets, each facet having an individual surface length and disposed at



an individual angle to a plane normal to said object surface such that every point on each facet surface reflects light received from said illumination source onto an instantaneous scan line within said scan strip, and

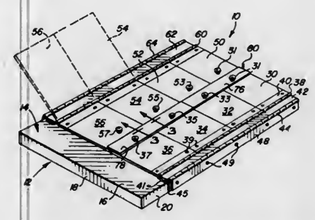
means to effect relative scan travel of said object surface and said illumination system.

4,190,356

PHOTOGRAPHIC EASEL APPARATUS

Paul A. Knapp, 1303 W. 9th St., Tempe, Ariz. 85282

Filed Jun. 1, 1978, Ser. No. 911,381
Int. Cl.² G03B *27/58, 27/44*
U.S. Cl. 355—74 **13 Claims**



1. Photographic easel apparatus for holding photographic paper, comprising, in combination:

base means, including

a planar top, including a first portion for holding photographic paper and a second portion adjacent the first portion comprising a focusing plane,

a first side and a second side adjacent the top,

panel means, including a plurality of panels on the first portion of the top individually movable from a closed position covering photographic paper disposed on the first portion of the top to an open position exposing the photographic paper disposed on the first portion of the top; and

means for aligning the photographic paper on the first portion of the top of the base means.

4,190,357

PHOTOGRAPHIC ENLARGING EASEL

Edward Kostiner, 218 Oakridge Dr., Baie d'Urfe, Quebec, Canada (H9X 2N4)

Filed Oct. 20, 1978, Ser. No. 953,074
Int. Cl.² G03B *27/58*
U.S. Cl. 355—74 **12 Claims**

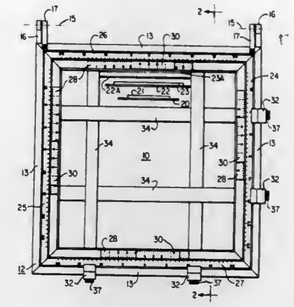
1. A photographic enlarging easel for positioning and masking a sheet of photographic paper comprising,

base plate having a flat surface for the sheet of paper,

rectangular open frame formed of four members, each having substantially similar cross sections, the frame pivoted about a pivot line parallel to and extending outside one edge of the base plate, the frame when in a closed position resting on the flat surface of the base plate allowing the sheet to extend beyond the base plate,

paper positioning means for locating the paper on the base plate,

plurality of removable carriages each carriage having a masking blade with a first end rigidly attached thereto, each carriage adapted to slide on a carriage track formed



integral with each member and extending from side to side of the frame, a second end of the masking blade adapted to slide in a guide slot on an opposite member of the frame, the masking blade resting on the flat surface of the base plate when the frame is in the closed position, each carriage having a locking means to lock the carriage to the member at any position on the track,

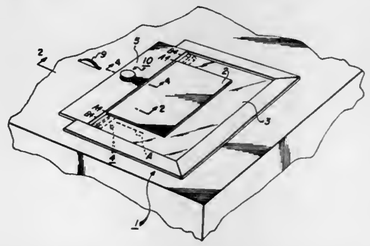
the frame having at least two sliding scales in each of two places adapted to measure border widths on four sides of the sheet in any location in the frame.

4,190,358

APPARATUS FOR POSITIONING AN ORIGINAL IN REPRODUCING MACHINES

Kazuyasu Sasuga, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,164
Claims priority, application Japan, Feb. 25, 1977, 52-19141
Int. Cl.² G03B *27/62*
U.S. Cl. 355—75 **2 Claims**



1. In a xerographic reproducing apparatus having a platen forming a part of a housing for supporting a document to be copied and an optical projection system for projecting light images of said document from said platen to a photosensitive member and a movable registration edge for properly aligning said document, the improvement comprising:

means for effecting incremental movement of said registration edge between first and second operative positions relative to said platen; said means for effecting incremental movement of said registration edge comprising a rack operatively coupled to said registration edge and pinion

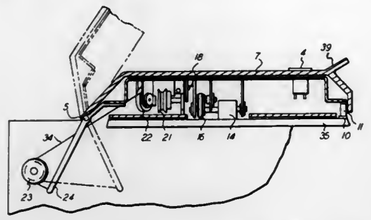
means operatively coupled to an actuatable wheel, said wheel protruding through said housing for manipulation thereof.

4,190,359

COPIER DOCUMENT HANDLING SYSTEM

Yuichi Murayama, and Terumasa Sugiyama, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Dec. 21, 1978, Ser. No. 972,162
Claims priority, application Japan, Mar. 8, 1978, 53/28462[U]
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **5 Claims**



1. In an original document handling system for a copier with a platen cover mountable over the copying platen of a copier, which platen cover is movable toward and away from the platen, said document handling system being adapted to automatically feed a document off of the platen after it has been copied by document drive means in said platen cover, the improvement comprising:

energy storage means connecting between said copier and said platen cover to mechanically capture and store mechanical energy obtained from said movement of said platen cover toward and away from said platen,

said energy storage means including overload protection means for limiting the maximum mechanical energy storage therein, and

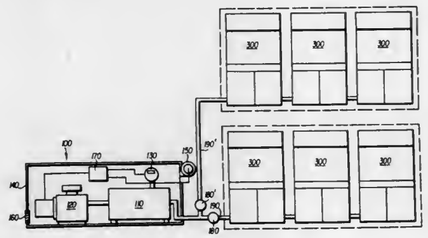
logic control means controlling electromechanical interconnecting means for operatively connecting said energy storage means to said document drive means to drive said document drive means for a limited period after the completion of copying of the document on said platen from said mechanical energy stored in said energy storage means obtained from said movement of said platen cover.

4,190,360

VACUUM CONTACT REPRODUCTION APPARATUS

Bruce B. Cunningham, Alexandria, Va., and Charles R. Barfield, Jr., Orlando, Fla., assignors to Lanman Lithotech, Inc., Orlando, Fla.

Filed Feb. 16, 1979, Ser. No. 13,190
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—89 **5 Claims**



1. In contact reproduction wherein a master transparency is duplicated onto a photosensitive material, apparatus in combination with plural vacuum contact printers, each having an evacuation chamber formed by a surface, for supporting the master transparency and photosensitive material, and a transparent cover coactively connected to said support surface to afford access into said chamber, and having a source of exposing radiation directed toward said transparent cover, said apparatus comprising:

(A) a vacuum holding tank, the interior of which defines an exhaustible reservoir, the volume of said reservoir being significantly greater than the combined volumes of the evacuation chambers of said plural vacuum contact printers;

(B) a high displacement vacuum pump operably connected to said vacuum holding tank to exhaust air from the interior thereof;

(C) a pressure control switch, coactively connected to the interior of said vacuum holding tank and to said vacuum pump, said pressure control switch having means responsive to the pressure level of the interior said vacuum holding tank whereby said vacuum pump may be selectively activated to evacuate the interior of said vacuum holding tank to form a source of fine vacuum;

(D) vacuum coupling means, operably connected to the respective evacuation chambers of each of said plural vacuum contact printers and to said source of fine vacuum, for selectively connecting said evacuation chambers to said source of fine vacuum to form a temporary fine vacuum in said evacuation chambers whereby said master transparency and photosensitive material are rapidly drawn into intimate contact;

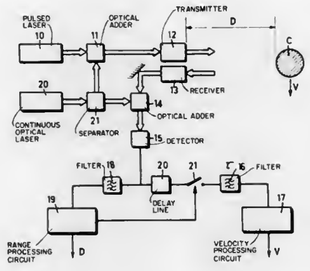
(E) exposure control means operably connected to the respective sources of exposing radiation of each of said plural vacuum contact printers for selectively activating said sources of exposing radiation while said master transparency and photosensitive material are drawn into intimate contact.

4,190,361

OPTICAL TELEMETERING APPARATUS

Gerard H. Dubrunfaut, Orly, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 28, 1978, Ser. No. 901,139
Claims priority, application France, May 4, 1977, 77 13589
Int. Cl.[2] G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **4 Claims**



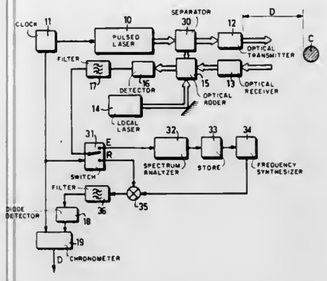
1. An optical telemeter with heterodyne detection of the type comprising a pulsed laser, an optical system at transmission for concentrating the energy supplied by the laser on a remote target, an optical system at reception for collecting part of the energy reflected by the target, a local oscillator for supplying a continuous light wave at a frequency near the operating frequency of the pulsed laser, first optical adder means for adding the reflected radiation from the reception optical system and the radiation supplied by the local oscillator, a photodetector receiving the radiation from said first optical adder means and supplying an electric output signal at the beat frequency, and a processing circuit for deriving the distance between the target and the apparatus from the output signal of the photodetector, second optical adder means mounted between the pulsed laser and the transmission optical system, a separator for diverting part of the radiation produced by the local oscillator and directing it towards said second optical adder means thereby to direct on said target a composite optical signal having a pulsed component and a continuous component, and a second processing circuit for deriving the velocity of the target from the output signal of the photodetector.

4,190,362

LASER TELEMETER

Gérard H. Dubrunfaut, Orly, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 28, 1978, Ser. No. 901,140
Claims priority, application France, May 4, 1977, 77 13588
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—5 **2 Claims**



1. An optical telemeter with heterodyne detection, comprising a pulsed laser controlled by a clock, an optical system at transmission for concentrating the energy supplied by the laser on a remote target, an optical system at reception for collecting part of the energy reflected by the target, a local oscillator for supplying a continuous light wave at a frequency near the transmission frequency of the pulsed laser, an optical adder for adding the reflected radiation from the reception optical system and the radiation supplied by the local oscillator, a photodetector receiving the radiation from said optical adder and supplying at its output an electric signal at the beat frequency, called reflection beat signal, and a chronometer connected to the clock and to the photodetector for measuring the time lapsed between the instant of transmission and the moment when the reflected signal is received, further comprising a separator for diverting part of the energy being transmitted by the pulsed laser onto said target and directing it towards said optical adder, means connected to said detector for storing, before the return of the reflected radiation, the transmission beat signal thus obtained, means for beating the transmission beat signal and the reflection beat signal, the resulting signal being applied to the chronometer, switch means receiving the output of the photodetector and having one output connected to said storing means and the other connected to said beating means, and having a drive input connected to said clock thereby to connect the detector to said storing means solely during the transmission of a pulse by said pulsed laser.

4,190,363

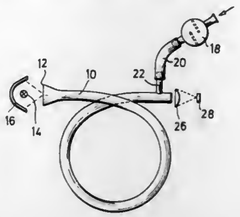
DEVICE FOR MEASURING CONCENTRATION OF A GAS

Werner Adrian, Im Roth 19, Ettlingen-Oberweier, Fed. Rep. of Germany (7505)

Filed Jun. 10, 1977, Ser. No. 805,334
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626642
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—246 **12 Claims**

1. In a device for measuring the concentration of a gas of the type in which a sample of the gas to be measured is introduced into a chamber through which radiation is passed from a source to a detector, and in which the radiation is selectively absorbed by the gas, the improvement wherein:

the chamber is formed from a curved tube, through which the radiation can pass from one end to the other, the interior surface of the tube being highly reflective of



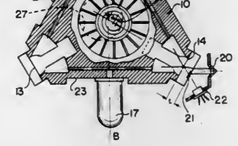
radiation at the absorption wavelength of the gas, the tube having an inlet adjacent one of its ends for introducing the gas to be measured and an outlet at the opposite end thereof for discharging the gas, the wall of the tube between the inlet and the outlet being imperforate.

4,190,364

RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, N.J., and George R. Gamertsfelder, Pleasantville, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 7, 1977, Ser. No. 831,114
Int. Cl.[2] G01B *9/02*; G01P *9/00*
U.S. Cl. 356—350 **5 Claims**



1. A ring laser gyroscope including:

a symmetrical block having a ring laser resonant cavity therein in which two laser beams are created;

reflective means, including an output mirror, mounted on said block for propagating the two laser beams in a closed loop in clockwise and counterclockwise directions around an input axis of the gyroscope;

a support means for the block positioned on the line of symmetry of the block having an axis extending along the input axis of the gyroscope;

resilient means mechanically coupling the block to the support means to permit angular movement of the block around the input axis;

a photodetector;

comepnsating interferometer means for causing the output from the gyroscope to be free from the influence of mechanical vibrations introduced to the block about the input axis over a substantial angular displacement of the block, comprising a stationary retro-reflector, an optical wedge attached to the outer surface of the output mirror, and a prism attached to the outer surface of said wedge for directing one of the laser beams to the retro-reflector and for directing the other laser beam and a reflected beam from the retro-reflector to the photodetector, the laser beam directed to the retro-reflector and the reflected laser

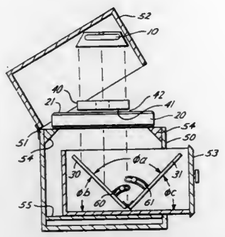
beam from the retro-reflector travelling along two parallel paths displaced from one another.

4,190,365

OPTICAL TESTING OF SURFACE FLATNESS

Calvin J. Hartman, Box 763, Clute, Tex. 77531

Filed Oct. 31, 1977, Ser. No. 847,244
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—352 **10 Claims**



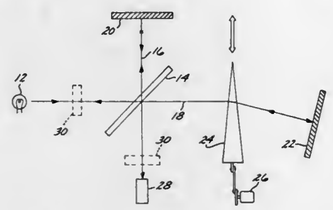
1. An apparatus useful for determining flatness of a surface, said apparatus comprising in operable combination,
- a monochromatic light source disposed to project light downwardly,
- an optical flat positioned in a substantially horizontal manner, having an optically flat surface facing upwardly toward said light source, and
- a reflective means positioned below the said optical flat to provide a view of the underside of the optical flat,
- wherein the light source, the optical flat and the reflective means are contained within a console having an adjustable lid portion and a lower main portion, the lower portion housing a drawer, with the light source being positioned within the lid portion, the reflective means being positioned within the said drawer in the said lower portion, and the optical flat being positioned above the said drawer.

4,190,366

REFRACTIVELY SCANNED INTERFEROMETER

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,457
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—346 **15 Claims**



1. A scanning spectral analysis interferometer, of the type wherein an interference pattern is generated by comparing light components traveling along, respectively, a first fixed-length path and a second variable-length path, comprising:
- a first stationary reflector determining the length of the first path;
- a second stationary reflector at the end of the second path;
- a single wedge-shaped prism intersecting the second path; and
- means for moving the prism across the second path to cause path length scanning.

4,190,367

DEVICE FOR ESTABLISHING A CONDITION AT THE SURFACE OF A SUBJECT

Sverker Hård af Segerstad, Långåsliden 28, Göteborg, Sweden (41270), and Olle Nilsson, Dr. Forseliusgata 50, Göteborg, Sweden (41326)

Filed Nov. 16, 1977, Ser. No. 852,154
Claims priority, application Sweden, Dec. 7, 1976, 7613703
Int. Cl.[2] C01B *9/02;* **G01N** *21/48;* **G01B** *11/30*
U.S. Cl. 356—354 **10 Claims**



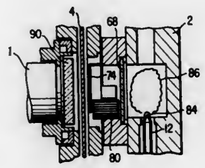
1. An optical detection device for measuring smoothness at a surface of a subject including
- a coherent light emitting source and means to mount said source so it directs a beam of light obliquely towards the surface of said subject,
- a photodetector and means to mount said photodetector outside the path of a main beam being mirror-image reflected from said surface but so it catches a secondary beam of scattered light reflected from an irregularity at said surface,
- a diffraction grating and means to mount said grating in the path of said main reflected beam, so a further beam, deflected from said main reflected beam will coincide said secondary beam within said photodetector,
- means for causing a relative movement between said grating and said subject, and
- further means for measuring the frequency and the amplitude of the time dependent photocurrent determined by the interaction of said reflected, secondary beam and said deflected beam within the photodetector.

4,190,368

SULFUR MONITOR ANALYZER

Edward Etess, San Diego, Calif., assignor to Monitor Labs, Inc., San Diego, Calif.

Filed Jun. 19, 1978, Ser. No. 916,911
Int. Cl.[2] G01J *3/50;* **G01N** *21/58*
U.S. Cl. 356—417 **11 Claims**



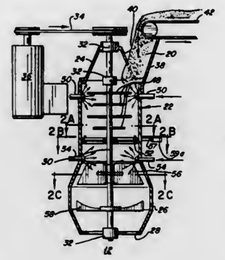
1. A system for detecting sulfur concentrations in a gas mixture sample which comprises:
- a flame holder;
- a flame chamber within which said flame holder is disposed;
- means for continuously obtaining and transferring a portion of the sample to said flame holder;
- means for continuously transferring hydrogen to said flame chamber, thus generating a flame and causing chemiluminescent radiation;
- means for detecting light from said chemiluminescent radiation for measuring signals indicative of concentrations in the sample; and
- optical shutter means disposed between flame chamber and said light detecting means for alternately exposing and obscuring the chemiluminescent radiation emitted from said flame chamber while continually exposing the flame to said light detecting means.

4,190,369

METHOD AND APPARATUS FOR MAKING MOLDS

Leslie D. Rikker, Oak Forest, Ill., assignor to National Engineering Company, Chicago, Ill.

Division of Ser. No. 731,930, Oct. 13, 1976, Pat. No. 4,121,646.
This application Jul. 14, 1978, Ser. No. 924,620
Int. Cl.[2] B28C *5/16, 7/06*
U.S. Cl. 366—16 **16 Claims**



1. A mixing device for dispensing a mixture of molding sand and a resin binder system onto a mold forming pattern comprising:
- a mixing chamber having an inlet for receiving sand adjacent an upper level and a discharge outlet for said mixture adjacent a lower end,
- a rotor mounted in said chamber including an upstanding rotating shaft extending between said inlet and said outlet and a plurality of radially extending mixing elements carried for rotation with said shaft,
- means for injecting binder into said chamber between said inlet and outlet for intimate mixing with said sand moved around said shaft by said mixing elements,
- said injecting means including a first conduit for injecting a first component of a resin binding system adjacent a first portion of said chamber and a second conduit for injecting a second component of a resin binder system intermediate the level of said first injecting conduit and said outlet of said chamber, and
- adjustable flow control means between said first and second conduits dividing said chamber into first and second sections for controlling the flow of intermixed sand and said first component therebetween.

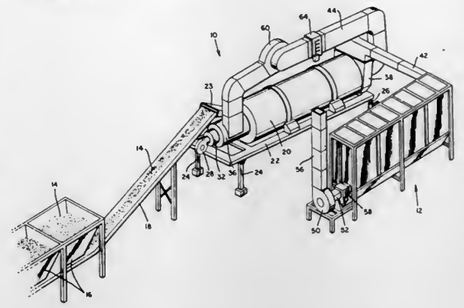
4,190,370

ASPHALT PLANT WITH IMPROVED TEMPERATURE CONTROL SYSTEM

James D. Brock, and Erble G. Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Nov. 24, 1978, Ser. No. 963,445
Int. Cl.[2] B28C *5/46*
U.S. Cl. 366—25 **19 Claims**

1. In an apparatus for producing asphalt-aggregate material including means for mixing asphaltic raw materials in a mixing enclosure, means for continuously admitting asphaltic raw materials into said mixing enclosure, means for continuously withdrawing asphalt-aggregate material from said mixing enclosure, a variable heat source for providing high temperature gases, and means for admitting said high temperature gases into said mixing enclosure, the improvement comprising:
- means for diluting said high temperature gases with dilution gases prior to admittance of said gases to said mixing enclosure;
- means for withdrawing said high temperature and dilution gases from said mixing enclosure;
- means for sensing the temperature of said asphalt-aggregate material as it is being withdrawn from said mixing enclosure; and



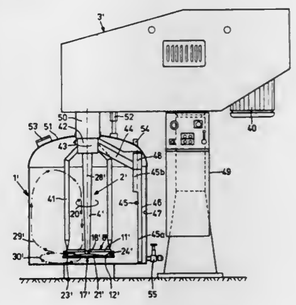
- means, responsive to variations in the temperature of said asphalt-aggregate material as said material is being withdrawn, for varying the rate of flow of said high temperature and dilution gases through said mixing enclosure to maintain said material as it is withdrawn at a first predetermined temperature while maintaining the temperature of said high temperature and dilution gases being admitted into said mixing enclosure at a second predetermined temperature.

4,190,371

APPARATUS FOR DISCONTINUOUS MIXING OF AT LEAST TWO MATERIALS

Herbert Dürr, Viernheim, and Helmut Müller, Mannheim, both of Fed. Rep. of Germany, assignors to Draiswerke GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,045
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757486
Int. Cl.[2] B01F *7/16, 13/06*
U.S. Cl. 366—139 **6 Claims**



1. An apparatus for discontinuous mixing of at least two substances, of which at least one is a liquid, the apparatus comprising a container, a mixer disposed in the container, said mixer having a first rotor driveable at high speed through a first shaft a second rotor, and respective teeth disposed on said first rotor and said second rotor in mutually concentric circles for movement past one another to form shearing slots, and at least a circle of teeth located farther outward radially on said

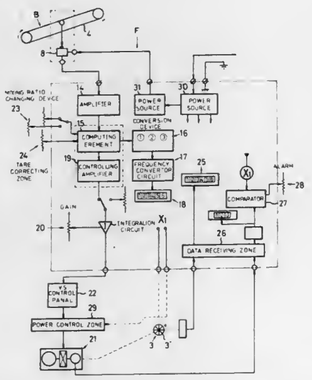
first rotor being disposed radially outside a circle of teeth on said second rotor, wherein the apparatus is provided with a secondary drive shaft for imparting rotation of said second rotor at a rotational speed substantially lower than the contemporaneous speed of rotation of said first rotor, and wherein said secondary drive shaft carries a scraper positioned in the vicinity of the interior wall of said container.

4,190,372

APPARATUS FOR TREATMENT OF SLUDGE DEPOSIT

Atsushi Takagi, Kanagawa; Hiroyuki Kuroiwa; Mitsuo Miura, both of Tokyo; Teruo Mizuhata, Hyogo; Takefumi Ito, Hokkaido; Masao Miyaguchi, and Tateo Kawamura, both of Tokyo, all of Japan, assignors to Takenaka Komuten Co., Inc., Osaka, Japan

Filed Dec. 30, 1976, Ser. No. 755,458
Int. Cl.² B01F *3/14, 15/02*
U.S. Cl. 366—141 **6 Claims**



1. An apparatus for the treatment of sludge deposits by mixing and kneading the sludge with a hardener to solidify the sludge deposit, said treatment apparatus comprising:

a sludge hopper for receiving and storing therein dredged sludge, said sludge hopper having a gate means for discharging the sludge;

a hardener hopper for storing hardener therein, said hardener hopper including a rotary feeder for controllably discharging the hardener;

a mixer for mixing and kneading the sludge and hardener;

a conveyor belt for transporting the sludge from said gate means to said mixer;

a conveyor scale connected to said conveyor belt for measuring the amount of sludge on said conveyor, said scale including a load cell and a meter for measuring the speed of said belt; and

an electric control device for controlling said rotary feeder in response to output signals from said scale;

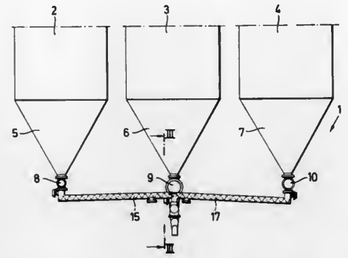
whereby the ratio between the amount of sludge and the amount of hardener fed to the mixer is maintained at a prescribed level.

4,190,373

METHOD AND APPARATUS FOR MIXING PULVERULENT DRYING SUBSTANCES AND/OR FLUENT MEDIA WITH ONE OR MORE LIQUIDS

Friedrich J. Zucker, Neuss, and Hans J. Langenbusch, Glessen, both of Fed. Rep. of Germany, assignors to Supraton F. J. Zucker KG, Neuss, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,162
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705535
Int. Cl.² B01F *7/00*
U.S. Cl. 366—160 **19 Claims**



11. An apparatus for mixing pulverulent drying substances and/or fluid media with one or more liquids, said apparatus comprising:

(a) a mixing chamber defining a mixing zone and having at least one inlet for receiving a first material comprising pulverulent drying substances and/or fluid media,

(b) nozzle means for introducing liquid into said mixing zone at the mixing chamber simultaneously with said first material at a pressure sufficient to form a finished resultant mixture within the mixing zone, and

(c) outlet means for continuously discharging said resultant mixture from the mixing zone.

4,190,374

LOOSE-LEAF BINDER

Stig E. V. Lindell, Sagagatan 13, S-171 47 Solna, Sweden

Continuation of Ser. No. 765,590, Feb. 4, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,795
Claims priority, application Sweden, Feb. 23, 1976, 7602082
Int. Cl.² B42F *3/00*
U.S. Cl. 402—3 **7 Claims**



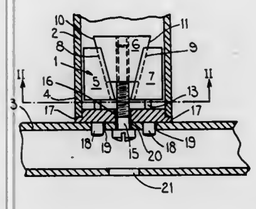
1. A binder comprising, in combination, a pair of covers, a spine interconnecting said covers for pivotal movement of said covers between an open and a closed position, said spine including a pair of spaced apart longitudinally extending half-sections having outer side edges connected to said covers, said half-sections being connected by a flexible member secured to said half sections defining a hinge, one of said half-sections being provided with label holder means comprising at least one substantially rigid flap member secured thereto extending over a portion of the length of said one half-section with one end of said flap extending substantially traverse from a portion of said one half-section to provide a plate-like projection; means on said projection to positively retain a label, said other half-section defining a recess opening into which the projection can extend and be seated when the covers of the binder are closed precluding the label holder means from being subjected to bending stresses during the process of opening and closing the binder, a latching device for selectively holding said half-sections together in the closed position of said covers, gripping means provided on said binder allowing for the insertion of fingers in said binder and means on said half-sections for holding hole-punched papers and the like.

4,190,375

FASTENING DEVICE

George A. Berry, Ashwell, England, assignor to International Computers Limited, London, England

Filed Jul. 7, 1977, Ser. No. 813,518
Claims priority, application United Kingdom, Jul. 23, 1976, 30714/76
Int. Cl.² F16B *7/00*
U.S. Cl. 403—7 **6 Claims**



1. A fastening device including at least two wedge elements each having a narrow and a wide end and a sloping face extending therebetween; and a deformable connection between the elements effective to permit the elements to be disposed with said sloping faces abutting one another and to permit sliding action between the elements, the deformable connection including a base plate, a frangible peg securing the wide end of at least one of said elements to the base plate, and means for connecting the narrow end of the other element to the base plate and for moving said other element towards the base plate to produce the sliding action between the elements.

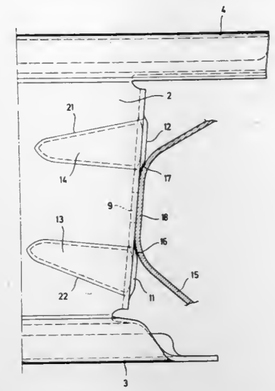
4,190,376

FASTENING DEVICE FOR A SAFETY FENCE BEAM

Hans Urlberger, Gutwerkstrasse 45, 8750 Aschaffenburg, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,070
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720414
Int. Cl.² E01B *5/18*
U.S. Cl. 403—14 **6 Claims**

1. In a fastening device for attaching a safety fence beam to a post wherein the fastening device is positioned intermediate the beam and post and includes transverse surfaces respectively attachable to the beam and post, the improvement comprising at least one corrugation in the surface attachable to said beam, said corrugation having a raised edge in aligning and supporting relation to said beam.

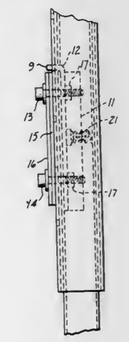


4,190,377

ADJUSTABLE COLUMN

Mark E. Pleuss, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 1, 1978, Ser. No. 882,077
Int. Cl.² F16B *7/14*
U.S. Cl. 403—108 **15 Claims**



1. An adjustable column including a pair of telescopically coupled longitudinal members with a laterally movable latch on one member that selectively engages spaced supports on the other member to adjust the column's length, wherein the improvement comprises: a manually tightenable lock supported on the latch, which lock secures the members together in a direction approximately parallel to the latch's movement.

4,190,378

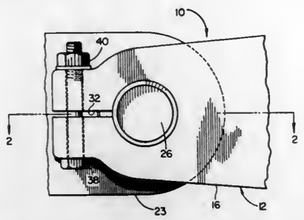
ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN PRESELECTED COMPRESSED STATE

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1979, Ser. No. 20,695
Int. Cl.² F16C *11/00*; F16D *1/12*
U.S. Cl. 403—146 **1 Claim**

1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to

the second member by a pivot pin assembly including aligned holes in the pair of parallel portions and the second member, a bushing received in the hole of the second member and first and second pairs of opposed Belleville springs respectively located on the pin at opposite ends of the bushings, the improvement comprising:



said pair of parallel portions, each including releasable clamp means for releasably clamping the pin in the holes thereof whereby the parallel portions may be clamped to the pin so as to be at a preselected distance from each other to thereby effect a preselected compression of the first and second pairs of Belleville springs.

4,190,379

DEVICE FOR RESERVING INDIVIDUAL PARKING AREAS

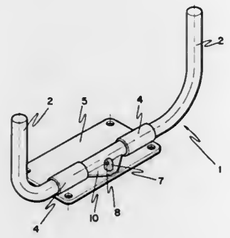
German Toro Sósa, Apolonia Morales, 21-90, and José L. Sever Ezcurra, Apolonio Morales, 21-80, both of Madrid, Spain

Filed Jun. 6, 1978, Ser. No. 912,988

Claims priority, application Spain, Nov. 16, 1977, 232.091[U]; Mar. 28, 1978, 234.966[U]

Int. Cl.² E01F *13/00*

U.S. Cl. 404—6 **8 Claims**



1. A barrier device for preventing unauthorized use of a parking area and for preventing unauthorized removal of a vehicle lawfully occupying the parking area, said barrier device comprising:

a generally U-shaped rigid barrier element including a horizontal member having extending from opposite ends thereof two parallel leg members;

a flat plate including means for rigidly fixing said plate to a floor adjacent an entrance to a parking area;

said flat plate including bearing means for rotatively supporting said barrier element;

said barrier element being fixed to said flat plate with said horizontal member rotatively supported by said bearing means for rotation in opposite directions about the axis of said horizontal member between an inoperative position, whereat said leg members extend substantially parallel to said flat plate and the floor of the parking space, and an operative position, whereat said leg members extend substantially vertically to said flat plate and the floor of the parking space;

stop means on said barrier element for cooperative abutment with said flat plate for limiting the extent of rotation of said barrier element with respect to said flat plate in at least one of said opposite directions and for thereby defining said operative position;

locking means cooperable with said stop means and with said flat plate for preventing rotation of said barrier element from said operative position to said inoperative position;

said horizontal member having a length sufficient to allow a vehicle to pass over said barrier element when said barrier element is in said inoperative position; and

said leg members having a length such that, when said barrier element is in said operative position, the upper ends of said leg members reach a height which is below the level of a bumper of a vehicle but which is sufficient to contact the undercarriage or lower parts of the vehicle, thereby presenting a barrier to the movement of the vehicle into or from the parking area.

4,190,380

DEVICE IN CONCRETE BLOCKS

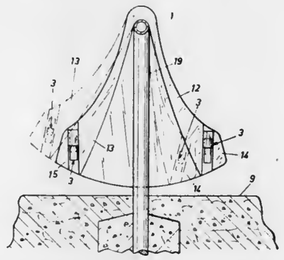
Bengt Ö. Almér, Saltholmsgatan 5, Vastra Frolunda, Sweden (S-421 76), and Karl G. Gidlöf, Sjögången 28, Västra Frolunda, Sweden (S-421 71)

Filed Dec. 8, 1978, Ser. No. 967,689

Claims priority, application Sweden, Dec. 12, 1977, 7714053; Oct. 27, 1978, 7811174

Int. Cl.² E01F *15/00*

U.S. Cl. 404—6 **14 Claims**



1. An improvement in concrete blocks of the kind intended to be interconnected in end-to-end positions to form barriers for delimitation of roadways, parking lots and similar enclosed areas, said blocks having an essentially triangular cross-section configuration and an elongate shape, the improvement comprising

a coupling element positioned at each end of said block, said element consisting of an essentially T-shaped metal piece cast into said block, the cross-bar of said T-shaped metal piece extending in parallel with the end face of said concrete block, said cross-bar arranged, jointly with a similar cross-bar of a coupling element positioned in the end face of the adjoining concrete block, to be enclosed by a tube, thus locking together said two blocks positioned end-to-end.

4,190,381

WAVE-COMPLIANT, BOTTOM TENSION BOOM

Ernest Knaus, Akron; Dale C. Goubeaux, Tallmadge; Anthony L. Dunne, Hudson, all of Ohio; George A. Lucas, Rockmart, Ga., and Jere A. Noerager, Houston, Tex., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 8, 1978, Ser. No. 932,051

Int. Cl.² E02B *15/04*

U.S. Cl. 405—72 **18 Claims**

1. A bottom tension boom for wave compliance, comprising:

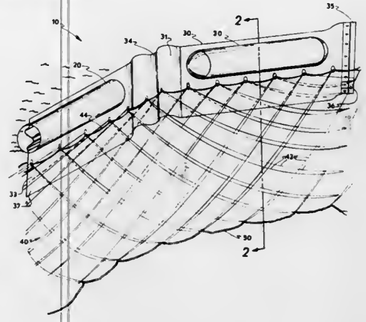
a plurality of flotation elements residing upon a body of water;

a contaminate impervious barrier, said barrier having an upper freeboard portion and a lower skirt portion, said flotation elements attached to said freeboard portion and causing said

flotation elements and said freeboard portion to largely reside upon the surface of said water, said skirt portion largely submerged in and extending downwardly into said body of water;

a lattice, said lattice containing a plurality of extensible strands, said strands attached to said skirt and extending downwardly therefrom and having a bottom portion;

a single tension line means for carrying the entire load on said boom, said single tension line means being a bottom tension line, said bottom tension line attached to said bottom portion of said lattice,



said lattice strands attached to said skirt and said bottom tension line in such a manner to form a criss-crossed lattice, said criss-crossed lattice strands attached at an inclination angle with respect to the horizontal of from about 10° to about 40° to said skirt and said bottom tension line when said skirt and said bottom tension line are in a horizontal position so that wave compliance of said flotation elements with said body of water is achieved while said bottom tension line remains relatively motionless, and

said barrier being longer than the corresponding length of said attached bottom tension line, said barrier having slack portions therein, said slack portions located between adjacent flotation elements.

4,190,382

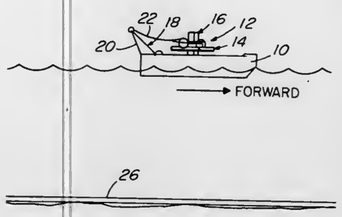
SEPARABLE TRENCHING APPARATUS

Thomas R. Schmitz, League City; Avadhesh N. L. Srivastav, Houston; Joe C. Lochridge, Houston, and William A. Morgan, Houston, all of Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Mar. 9, 1978, Ser. No. 884,987

Int. Cl.² E02F *5/02*

U.S. Cl. 405—159 **39 Claims**



1. Apparatus for entrenching an elongated pipeline and the like on the bottom of a body of water comprising

a burying sled base, including

first and second pontoon skids having generally parallel longitudinal axes, said pontoon skids being connected by a cross support means to straddle said pipeline,

a trench cutting assembly adapted to be connected to said sled base for cutting a trench beneath said pipeline, when said pipeline lies on said water bottom, and

remote connecting and disconnecting means operative in a first state for remotely connecting said cutting assembly in an operational relationship to said sled base for entrenching said pipeline and in a second state for remotely disconnecting and separating said cutting assembly from said sled base,

whereby said sled base may be left on the bottom of said body of water and said cutting assembly may be raised aboard a floating vessel.

4,190,383

STRUCTURAL ELEMENT

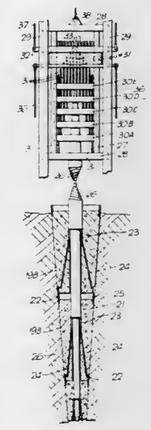
John F. S. Pryke, Broxbourne, and David S. Pryke, Brent Pelham, both of England, assignors to Pynford Limited, London, England

Filed Jan. 11, 1978, Ser. No. 868,529

Claims priority, application United Kingdom, Jan. 13, 1977, 1354/77; Jan. 24, 1977, 2711/77; Mar. 9, 1977, 9866/77

Int. Cl.² E02D *5/10*

U.S. Cl. 405—252 **12 Claims**



1. A method of driving a columnar load-bearing pile into the ground, said pile comprising a leading segment for penetrating the ground and a plurality of load-bearing segments, the leading segment having a leading edge and a trailing edge with a body extending therebetween, the cross-sectional area of the leading segment being smaller than the cross-sectional area of each load-bearing segment, each load-bearing segment having a leading edge, a trailing edge and a body extending therebetween, said method comprising the steps of:

(a) forcing the leading segment into the ground so that its entire axial length is tightly engaged therewith,

(b) forcing the leading edge of the first load-bearing segments into the ground until it abuts against the trailing edge of the leading segment,

(c) advancing the leading segment further into the ground an axial distance corresponding to a small fraction of its length to form a gap between the leading segment and the first load-bearing segment,

(d) advancing the first load-bearing segment further into the ground until the gap is closed and the leading edge of the first load-bearing segment abuts against the trailing edge of the leading segment,

(e) repeating steps (c) and (d) several times, and in the stated sequence, until the leading segment and the first load-bearing segment have been forced completely into the ground in tight frictional engagement along their axial lengths,

(f) forcing the leading edge of the second load-bearing segment into the ground until it abuts against the trailing edge of the first load-bearing segment, and

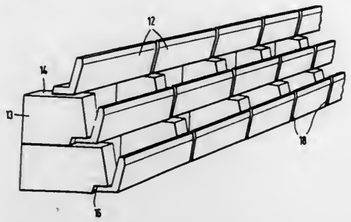
(g) repeating steps (c), (d) and (f) several times, and in the stated sequence, so that gaps between the adjacent segments are alternately formed and closed until the leading segment and the plurality of load-bearing segments have all been forced completely into the ground in tight frictional engagement along their axial lengths.

4,190,384

CONCRETE CONSTRUCTION ELEMENT SYSTEM FOR ERECTING PLANT ACCOMMODATING WALLS

Herwig Neumann, Herrenberger Str. 39, 7031 Hildrizhausen, Fed. Rep. of Germany

Continuation of Ser. No. 682,014, Apr. 30, 1976, abandoned.
This application Aug. 9, 1978, Ser. No. 932,449
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519232
Int. Cl.[2] E02D *5/20*; A01G *9/12*
U.S. Cl. 405—284 **14 Claims**



1. A system of construction elements for the erection of plant accommodating, slope-retaining walls comprising:

a plurality of L-shaped longitudinal elements arranged in multilevel relationship having a horizontally extending base plate portion and a substantially upwardly extending railing portion providing plant growth medium support surfaces, and

a plurality of section support elements acting as vertical partitions along said longitudinal elements, extending horizontally in the direction perpendicular to the direction of said longitudinal elements and protruding into the slope to be retained and having upper and lower seating surfaces adapted to be stacked one upon the other

wherein the shearing forces of the earth slope along the wall are sectioned by the vertical partitions,

wherein each of said sectional support elements displays a recess in said lower seating surface for overlapping the base plate portion of a longitudinal element supported on said upper seating surface of a lower section support element and

wherein the sectioned shearing forces are additionally divided by the base plate portions of the longitudinal elements.

4,190,385

PROTECTIVE CANOPY AND TEMPORARY ROOF SUPPORT FOR MINING MACHINERY

Ray Childress, P.O. Box 853, Richlands, Va. 24641

Filed Oct. 3, 1978, Ser. No. 948,209
Int. Cl.[2] E21C *11/02*
U.S. Cl. 405—288 **9 Claims**

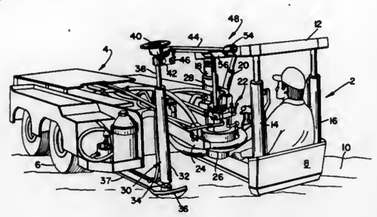
1. A temporary roof support for an ambulatory mining machine having a chasis, means for supporting the chassis for movement along the ground, means providing an operator station for said machine, a canopy over the operator station, and means for raising and lowering the canopy, the improvement which comprises:

a lengthwise extensible-retractable jack adapted to be vertically disposed away from one side of the operator station and having upper and lower end portions,

pressure fluid means for extending and retracting the jack,

mine-roof and ground-engaging means on the upper and lower portions respectively of the jack,

an arm,



horizontal pivot means connecting opposite ends of said arm respectively to said canopy and the upper end portion of the jack, and

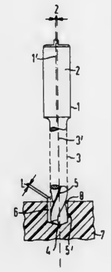
control means at said operator station for said pressure fluid means and for said mining machine.

4,190,386

METHOD OF PRODUCING HOLES FREE OF ACCRETIONS IN CIRCUIT BOARDS MADE OF PLASTIC

Bernhard Brabetz, and Helmut Hackl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,772
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742143
Int. Cl.[2] B23B *51/02*
U.S. Cl. 408—1 R **3 Claims**



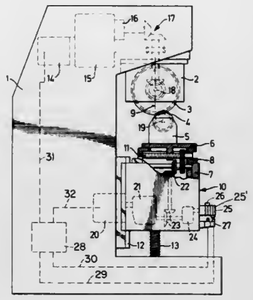
1. A method of producing accretion-free holes with a diameter of less than 1.5 mm in circuit boards made of plastic, comprising the steps of: providing a hard metal drill having a cylindrical chucking shank connected to a fluted twist cutting section having a central axis, rotating said fluted twist cutting section about an axis and feeding said fluted twist cutting section along said axis relative to a circuit board, supporting the fluted twist cutting section so that its central axis rotates eccentric to said feed axis of the fluted twist cutting section by a distance sufficient to drill a hole having a diameter of at least 20 micro-meters but not more than 50 micro-meters wider than the maximum diameter of the fluted twist cutting section.

4,190,387

APPARATUS AND TOOL FOR PRECISION WORKING, PARTICULARLY SHAVING, OF GEARS

Herbert Loos, Dorfen; Manfred Heckmaier, Unterpfaffenhofen, and Gerhard Reichert, Puchheim, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Fed. Rep. of Germany

Division of Ser. No. 767,153, Feb. 9, 1977, Pat. No. 4,119,014.
This application May 19, 1978, Ser. No. 907,744
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615718
Int. Cl.[2] B23F *19/06*
U.S. Cl. 409—33 **2 Claims**



1. Machine tool apparatus for shaving gear-shaped workpieces, comprising:

a machine frame;

first and second rotatable spindles on said frame, the axis of rotation of said first spindle being skewed relative to the axis of rotation of said second spindle;

a gear shaving tool mounted on one of said first and second spindles and a workpiece mounted on the other of said first and second spindles;

a carriage for moving said first spindle relative to said second spindle;

means for adjusting the distance between the geometric centers of the tool and the workpiece in one single selectable plane, which lies at a right angle to a common perpendicular to the axes of said first and second spindle at the smallest spacing between said geometric centers of said workpiece and said tool;

first reversible drive means for rotating one of said first and second spindles;

second reversible drive means for advancing one of said spindles relative to the other thereof in said one single selectable plane;

detecting means for detecting the position of the carriage relative to said second spindle and indicating the position through the issuance of plural signals; and

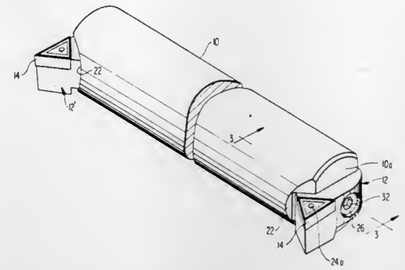
means responsive to a first one of said plural signals for controlling the speed of advancement and retraction of said first spindle relative to said second spindle and to a second one of said plural signals for controlling the direction of rotation of said first drive means to thereby control the direction of rotation of said first spindle, all as a function of the spacing between a reference position for said carriage and an actual position thereof.

4,190,388

SINGLE-POINT CUTTING TOOL

George W. Mullane, and Earl K. Harrison, both of 10928 Lucerne, Houston, Tex. 77016

Filed Jun. 2, 1978, Ser. No. 911,744
Int. Cl.[2] B23B *27/16, 29/02*
U.S. Cl. 408—188 **2 Claims**



1. A single point cutting tool comprising:

an elongated bar having opposed ends,

at least one end including a transverse flat walled groove including a flat bottom-wall and flat sidewalls intersecting the axis of said bar,

a tip holder of complementary flat wall configuration slidably mounted within said groove with one wall in contact with the bottom-wall of said groove,

said bar being tapped and threaded axially at said one end, within said groove bottom-wall,

said tip holder being bored at right angles to its wall contacting the bottom-wall of said groove,

a cutting tip mounted to one end of said holder and projecting laterally to one side of said bar,

a securing screw carried by said tip holder, passing through said groove and being threaded to said elongated bar at its axis to lock said holder to the groove end of said bar,

and wherein said tip holder is of trapezoidal configuration in a plane parallel to said transverse groove, and the end of at least one side of said bar, at right angles to the groove axis, is beveled towards said bar end, said tip is mounted to the tip holder adjacent the sidewall which is inclined outwardly in a direction away from the face of said tip holder contacting the bottom of said groove and acts in conjunction with said beveled side of said bar so as to minimize the effect of accumulated cuttings on the operation of the cutting tool during cutting; and

whereby, the forces during cutting are not transmitted from said tip holder to said bar through said screw, eliminating strain on the screw and shear force transmission to the screw, and the ability of the bar to withstand torque during cutting is maximized by the axial location of the single screw hole.

4,190,389

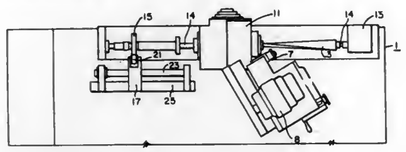
PROFILE MILLING MACHINE

Jerry W. Knight, Lewisville, and Mervyn Woodward, Winston-Salem, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 748,248, Dec. 6, 1976, abandoned. This application May 22, 1978, Ser. No. 908,045
Int. Cl.[2] B23C *1/18*
U.S. Cl. 409—120 **8 Claims**

1. An improved profile producing machine operable to machine a complete air foil from a workpiece utilizing a mechanism having means for rotating, traversing, and pivotally oscillating the workpiece over a milling cutter to form the air foil, the improvement comprising a plate cam disposed within said means for rotating, traversing and pivotally oscillating the workpiece to move in unison therewith and to impart the pivotally oscillating movement thereto; a cam follower dis-

posed to engage said cam; and means for moving said cam follower in unison with the traversing movement of said means



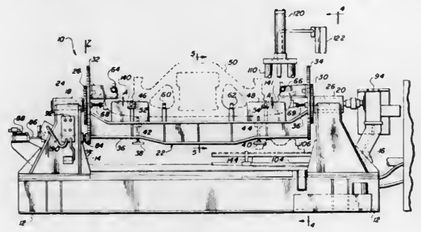
for rotating, traversing and pivotally oscillating the workpiece during the milling operation, whereby less expensive cams may be utilized to produce more uniform air foils.

4,190,390

APPARATUS FOR MACHINING CRITICAL SURFACES OF RAILROAD TRUCK SIDE FRAMES

Richard P. Yeates, Downers Grove; Boris S. Terlecky, Fox Lake, and Jagdish K. Shah, Chicago, all of Ill., assignors to Trailer Train Company, Chicago, Ill.

Filed Sep. 25, 1978, Ser. No. 945,215
Int. Cl.[2] B23C *3/00*
U.S. Cl. 409—198 **9 Claims**



1. An apparatus for machining critical wear surfaces of railroad truck side frame comprising:

a base;

a fixture rotatably mounted on the base, said fixture including leveling means for vertically leveling certain critical surfaces of the side frame on the fixture, stop means for horizontally aligning the side frame on the fixture, clamp means for clamping the side frame on the fixture, and gauge means for measuring the position of the certain critical surfaces of the side frame with respect to the fixture;

means for rotating the fixture between predetermined positions;

lock means for locking the fixture in selectable ones of said predetermined positions;

a machining head mounted on said base for movement in a first direction parallel to the axis of rotation of said fixture, for movement in a second direction horizontally and perpendicularly to the axis of rotation of said fixture; and a third direction vertically and perpendicularly to the axis of rotation of said fixture;

first stop means for controlling the limits of travel of said machining head in the first direction;

second stop means for controlling the limits of travel of said machining head in the second direction;

third stop means for controlling the limits of travel of said machining head in the third direction;

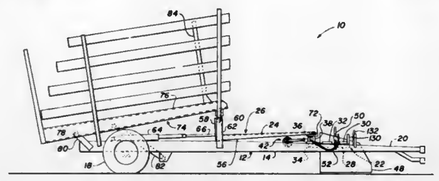
means for adjusting said first stop means in accordance with measurements of said gauge means so that said machining head is aligned with the certain critical surfaces at the limits of travel of said machining head in the first direction.

4,190,391

BALE RETAINER MEANS ON A BALE WAGON

George L. Sesser, Clovis, and Anthony E. Furtado, Geyserville, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 1, 1976, Ser. No. 691,677
Int. Cl.[2] B65G *21/20*
U.S. Cl. 414—39 **6 Claims**



1. In a bale wagon having means defining a bale-supporting area, means disposed adjacently along said bale-supporting area for receiving at least one bale, means for advancing said bale along said bale-receiving means from a bale-receiving end thereof to a position therealong aligned with a predetermined location on said bale-supporting area and means for moving said bale from said bale-receiving means to said bale-supporting area, the improvement which comprises:

bale retainer means arranged near said bale-receiving means for engaging said bale so as to substantially restrain said bale from moving toward said bale-receiving end of said bale-receiving means out of alignment with said predetermined location on said bale-supporting area during movement of said bale toward said bale-supporting area,

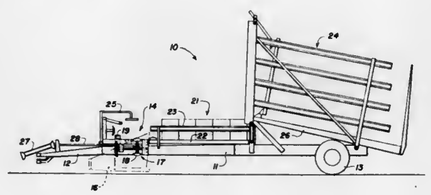
said bale retainer means including a finger element being biased toward a bale-engaging position wherein it extends into the path of advancement of said bale along said bale-receiving means so as to prevent said bale from being moved toward said bale-receiving end of said bale-receiving means, said finger element also being yieldable toward another position away from said path of bale advancement for allowing movement of said bale along said path toward said position along said bale-receiving means aligned with said location on said bale-supporting area.

4,190,392

STACK SIDE EVENER

L. Dennis Butler, Kingsburg, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 30, 1978, Ser. No. 891,972
Int. Cl.[2] A01D *87/12*; B65G *57/32*
U.S. Cl. 414—39 **7 Claims**



1. In a bale wagon having a mobile chassis, bale-receiving means mounted on said chassis, bale-accumulating means having first and second opposing sides and also mounted on said chassis, and means for transferring bales from said bale-receiving means to said bale-accumulating means, said bales being generally rectangular in shape with four flat surfaces and two opposing end surfaces, the improvement comprising:

stop means fixed to and extending along and above at least one of said first and second sides of said bale-accumulating means to limit the movement of bales and thereby define the outer limits of said predetermined position; and

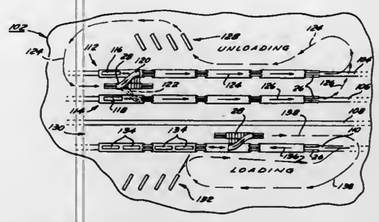
guide means fixed to said bale-accumulating means adjacent said bale-receiving means such that a bale being moved by said means for transferring will be engaged on one of its flat surfaces by said guide means and thereby directed along a path toward a predetermined position on said bale-accumulating means, said guide means comprising a series of elongate parallel spaced apart fins fixed to said bale-accumulating means and directed angularly from said bale-receiving means toward said stop means.

4,190,393

WHEELED VEHICLE CAR LOADING AND UNLOADING SYSTEM AND METHOD THEREFOR

Herbert T. Landow, North Tarrytown, N.Y., assignor to Landow Consulting Associates, Inc., North Tarrytown, N.Y.

Division of Ser. No. 559,714, Mar. 19, 1975, Pat. No. 4,076,174.
This application Feb. 22, 1978, Ser. No. 880,273
Int. Cl.[2] B61D *3/16, 47/00*; B65G *67/00*; B65J *1/10*
U.S. Cl. 414—333 **11 Claims**



1. A system for loading and unloading wheeled vehicles on a train of railroad cars, said system comprising, in combination, a first ramp at one end of said train, a side ramp device along side of and extending between said train and ground, means for forming said cars into a train-top roadway, a plurality of tractors for pulling said wheeled vehicles, and a roadway on the ground for tractors to travel between said ramps, and means for moving said side ramp device and said cars of said train relative to one another to position said side ramp device adjacent another one of said cars.

4. A method of loading and unloading trailers on a train of railroad cars, said method comprising the steps of sideloading a tractor by means of a first ramp at the side of said train, endloading a combination of said tractor and a first one of said trailers by means of a second ramp at one end of said train, moving said first ramp and said cars of said train relative to one another to position said first ramp adjacent another one of said cars, and repeating said sideloading and endloading steps for another one of said trailers.

4,190,394

METHOD FOR LOADING AND UNLOADING RAILROAD CARS

Stanley M. Herzog, and Randy L. Poggemiller, both of St. Joseph, Mo., assignors to Herzog Contracting Corporation, St. Joseph, Mo.

Filed Apr. 28, 1978, Ser. No. 901,230
Int. Cl.[2] B65G *67/00*
U.S. Cl. 414—786 **12 Claims**

1. A method of loading and unloading an open top railroad car comprising:

(a) providing a mobile powered apparatus having front and rear wheels movable over ground surface and including power actuated boom structures pivotally mounted at respective front and rear ends of said mobile apparatus wherein the front boom structure is of a length to reach below the ground surface and above the railroad car upper surface when the mobile apparatus is positioned on the ground and has a free end with a supportive foot member connected thereto and wherein the rear boom structure is articulated and of a combined length to reach the ground when said mobile apparatus is positioned on said car upper surface and said boom structure has respective arm lengths with a material engaging device pivotally mounted on a free end thereof and cooperative therewith, and a rear end of the mobile apparatus including outwardly swingable power actuated outrigger arms with respective supportive foot members connected thereto;

(b) moving said mobile apparatus over the ground surface and positioning same adjacent one end of an open top railroad car;

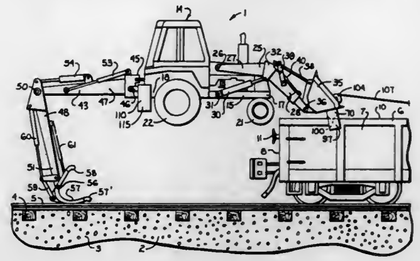
(c) raising said front boom structure

(d) engaging the front boom structure foot member with the upper surface of said railroad car;

(e) folding said rear boom structure; and

(f) engaging said material engaging device upon the ground surface longitudinally aligned with and adjacent the apparatus rear end;

(g) coordinatingly operating said front and rear boom structures and unfolding said rear boom structures in engagement with the ground surface while pressing downwardly with said front boom structure and said front supportive foot upon the railroad car upper surface to raise the mobile apparatus from the ground surface and above the upper surface of said railroad car and support said apparatus front end on the railroad car surface of said railroad front supportive foot with same;



(h) further unfolding said rear boom structure in engagement with the ground surface and moving said mobile apparatus forwardly toward said railroad car and supporting said apparatus rear end on the upper surface thereof by engaging the outrigger arms supportive foot members on the railroad car upper surface;

(i) moving said mobile apparatus along the upper surface of said railroad car; and

(j) operating said articulated rear boom structure and material engaging device to engage and disengage material relative to said railroad car and swing same to the ground surface alongside said railroad car.

4,190,395

MULTIPLE STAGE PUMP

Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 28, 1978, Ser. No. 901,154
Int. Cl.[2] F01D *13/00, 25/24*
U.S. Cl. 415—61 **5 Claims**

1. A multi-stage pump comprising:

a case having a suction inlet and a discharge outlet;

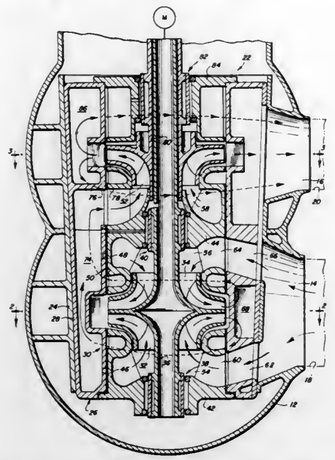
a first stage comprising multiple impellers on a first shaft;

a second stage comprising at least one impeller mounted on a second shaft;

means to rotate said shafts and the impellers mounted thereon;

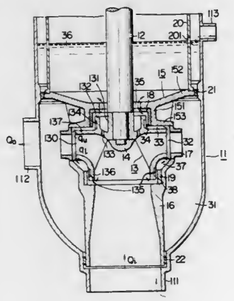
said first stage being so constructed and arranged with respect to said case and said second stage to pump from said suction inlet to said second stage impeller;

said second stage being so constructed and arranged to pump from said first stage to said discharge outlet;
inlet and outlet conduit means connected respectively with said suction inlet and discharge outlet;
an inner housing fitting within said case;



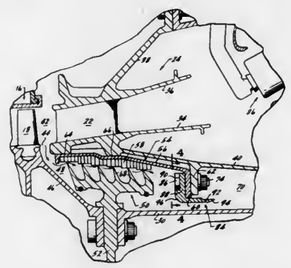
said inner housing containing said first and second impeller stages and being removable as a unit from said case without disconnecting said conduit means from said case;
inner tapered walls defining said case; and
an inner housing containing said impellers and having outer defining tapered walls complementary to the inner defining walls of said case.

4,190,396
SODIUM TURBINE PUMP
Shunzo Tomioka; Masaaki Nakano, both of Hitachi; Akira Suzuki, Tokyo, and Shizuichi Sakamoto, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 16, 1977, Ser. No. 778,089
Claims priority, application Japan, Mar. 19, 1976, 51-29215
Int. Cl.[2] F01D *11/00*
U.S. Cl. 415—110 **9 Claims**



1. A turbine pump for molten sodium, having an elongated cylindrical casing, comprising:
a shaft;
an impeller including a crown ring, mouth ring and vanes arranged radially and secured to said crown ring and said mouth ring therebetween, said crown ring being secured to one end of a shaft and formed with a cylindrical impeller ring extending along said shaft in concentric relation thereto;
an impeller casing, through which said shaft extends, said impeller casing providing a given clearance to said crown ring and said impeller ring;
a suction tube positioned in the close proximity of said mouth ring and surrounding same, for introducing molten sodium from externally of said casing into said impeller;
an upper ring positioned on a surface of said impeller casing, which faces said impeller ring, with a clearance between said upper ring and the outer peripheral surface of the impeller ring, the clearance serving as a static pressure bearing with molten sodium used as a lubricant;
a lower ring positioned on a surface of said suction tube, which faces said mouth ring, with a clearance between said lower ring and the outer peripheral surface of the suction tube, the clearance serving as a static pressure bearing with molten sodium used as a lubricant.

4,190,397
WINDAGE SHIELD
Jan C. Schilling, Middletown, and James E. Gutknecht, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Nov. 23, 1977, Ser. No. 854,186
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—112 **6 Claims**

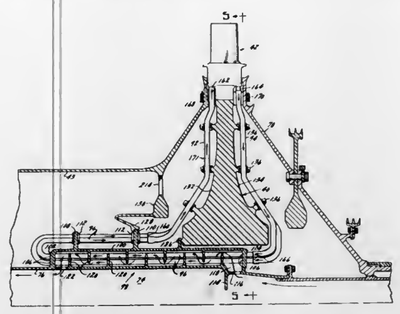


1. A windage shield for use in a fluid flowpath within a gas turbine engine to reduce fluid turbulence in a region of a first and second member and a fastener, each member having a generally radially extending flange connected together by the fastener, wherein an end of the fastener protrudes axially beyond said first member in the upstream direction, said windage shield comprising:
(a) a radially extending portion captured between the fastener and the first member;
(b) a recessed region within said radially extending portion wherein the upstream protruding end of said fastener provides a generally flush interface between the protruding end of said fastener and surrounding surfaces adjacent said upstream end; and
(c) a cylindrical section extending axially from said flange and extending downstream of said first and second members.

4,190,398
GAS TURBINE ENGINE AND MEANS FOR COOLING SAME
Robert J. Corsmeier, and James P. Rauf, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Jun. 3, 1977, Ser. No. 803,167
Int. Cl.[2] F01D *5/08;* **F02C** *7/12*
U.S. Cl. 415—114 **1 Claim**

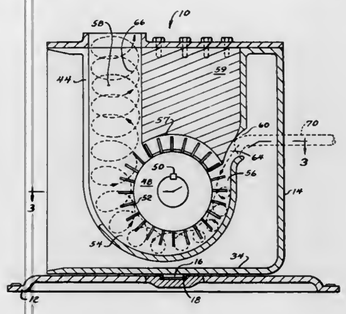
1. A turbine comprising:
a rotor disk bearing a plurality of hollow blades;
means, including a closed-loop passageway for each of said blades, for individually cooling each of said blades by the thermosiphon principle;

a hollow duct including a conical coolant passage therein, said duct being rotatable with said disk;
a heat exchanger, including an internal chamber, connected to and rotatable with said hollow duct, each of said closed-loop passageways passing through said heat exchanger chamber;
means for introducing a coolant from said coolant passage into said heat exchanger chamber;



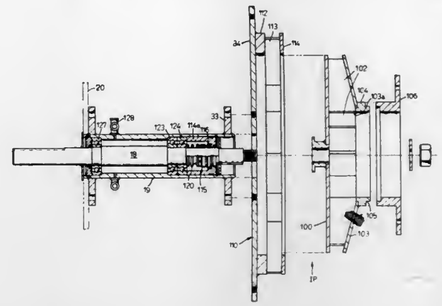
labyrinth means for directing the coolant around said closed-loop passageways within said heat exchanger chamber;
means for discharging the coolant from said heat exchanger chamber into said coolant passage; and wherein
said coolant introducing means is located at a lesser radius of said coolant passage than said coolant discharge means.

4,190,399
REGENERATIVE TURBINE
William L. Amminger, 239 Ridgefield, Memphis, Tenn. 38111
Filed May 16, 1978, Ser. No. 906,424
Int. Cl.[2] F01D *25/00;* **F01K** *25/06*
U.S. Cl. 415—116 **14 Claims**



1. An improved fluid-driven regenerative turbine comprising:
a rotor;
a housing having a rotor channel with the rotor mounted therein; the rotor channel having a primary driving fluid inlet region and a fluid outlet region; at least some of the primary driving fluid transferring energy to the rotor and flowing through the rotor channel in a helical path;
a primary fluid inlet channel in the housing providing primary driving fluid to the rotor channel primary fluid inlet region;
an auxiliary fluid inlet channel in the housing for providing auxiliary fluid to the rotor channel outlet region in a direction tangential to the helical path of the primary driving fluid in the rotor channel outlet region so that the helical motion of the fluid in the rotor channel outlet region is intensified.

4,190,400
INTEGRAL PUMP AND DRIVE SHAFT ASSEMBLY
Albert H. Sloan, 4201 Kean Rd., Fort Lauderdale, Fla. 33314
Division of Ser. No. 760,535, Jan. 19, 1977, Pat. No. 4,116,582, which is a division of Ser. No. 623,655, Oct. 20, 1975, Pat. No. 4,029,438. This application Jul. 20, 1978, Ser. No. 926,411
Int. Cl.[2] F04B *29/04, 29/08*
U.S. Cl. 415—170 A **7 Claims**

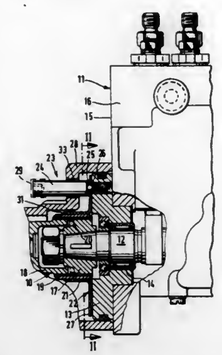


1. A pump and drive shaft assembly comprising: a pump having a pump housing including a back wall, an impeller rotatably mounted in said pump housing, a drive shaft housing detachably but rigidly secured at one end to said back wall of said pump housing and extending therefrom; a tubular seal holder axially fixed in said shaft housing, a drive shaft extending through and rotatably mounted in said shaft housing and connected in driving relationship with said impeller, a first anti-friction bearing means mounted in said shaft housing in abutting relationship with said tubular seal holder and rotatably supporting said shaft in said shaft housing, a flexible fluid seal between said shaft and said tubular seal holder, a mechanical, rotary seal located between said shaft and said tubular seal holder for excluding water from entering said shaft housing from said pump housing, and a second anti-friction bearing means in said shaft housing for supporting said shaft and axially spaced from said first bearing means.

4,190,401
LOCK ASSEMBLY FOR A DRIVE SHAFT OF A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES
Eberhard Hofmann, Kirchberg, and Erwin Weyrich, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 21, 1977, Ser. No. 853,670
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652950
Int. Cl.[2] F04B *39/00*
U.S. Cl. 417—313 **3 Claims**

1. A locking assembly for the drive shaft of a fuel injection pump for releasably fixing the rotary position of the shaft within the pump housing at a predetermined point corresponding to the initial point of fuel injection for an internal combustion engine prior to installation of the pump on the engine, comprising:
said pump, including a housing and a drive shaft extending outwardly of said housing;
means firmly connected to said drive shaft for rotation there-

with, said means having a portion which is flexible axially of said shaft; and



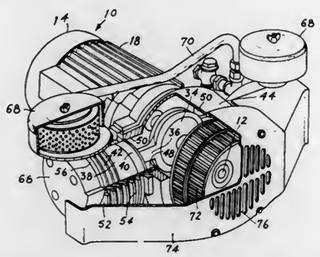
locking means for releasably clamping said flexible portion to said housing.

4,190,402

INTEGRATED HIGH CAPACITY COMPRESSOR

Meredith W. Meece, Monroe; Charles W. Ickes, Farmerville, and Fred H. Moore, Monroe, all of La., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 6, 1975, Ser. No. 575,112
Int. Cl.[2] F04B *35/04, 27/02*
U.S. Cl. 417—415 **6 Claims**



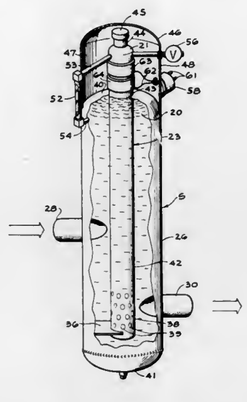
1. An integral reciprocating compressor, comprising:
a motor having a housing and a shaft extending therefrom;
a flywheel mounted on said motor shaft within said housing;
at least one pair of compression chamber forming means;
movable piston members disposed in each of said compression chambers;
means for connecting the piston members to said motor shaft so that the piston members in a pair of compression chambers undergo a simultaneous compression stroke;
a crankcase enclosing both the motor shaft and the means connecting the piston member to the motor shaft, said crankcase also connecting the motor housing and compression chamber forming means so that the compression chambers of a pair are positioned at opposite sides of said motor shaft;
valving means for allowing gas to controllably flow into and out of the compression chambers in response to piston member motion;
a vent window formed in said crankcase adjacent said motor housing;
air circulating means connected to said motor shaft for circulating air through the vent window and the crankcase for cooling the means connecting the piston members to said motor shaft; and
a shroud for directing the air circulated through said crankcase over the compression chamber forming means and the valving means, whereby the circulating air from the vent window first cools the connecting means and then the compression chambers and valving means, said shroud also including a vent opening through which the air circulating means circulates additional air, said additional air being directed by the shroud over the compression chamber forming means for providing additional cooling.

4,190,403

FLUID FLOW STABILIZER AND PHASE SEPARATOR

Robert C. Glover, Ventura, Calif., assignor to Fluid Kinetics Corporation, Ventura, Calif.

Continuation-in-part of Ser. No. 750,307, Dec. 13, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,545
Int. Cl.[2] F04B *11/00;* **F16L** *55/04*
U.S. Cl. 417—543 **4 Claims**



1. A fluid stabilizer adapted to pass a fluid stream and for absorbing pulsations created by abrupt changes in the fluid stream, comprising:
a closed tank of generally cylindrical configuration for receiving and delivering said fluid stream;
a tubular structure affixed somewhat concentrically in said tank defining at least one opening at the lower portion thereof for access by said fluid stream, said tubular structure extending out of said tank at the upper end of said tank to define an extending portion;
closure means at the upper end of said tubular structure for defining a space to retain a gaseous volume for capacitive action with said fluid stream; and
means affixed to the exterior of said extending portion for heating said space to retain a gaseous volume by vaporizing fluid from said stream.

4,190,404

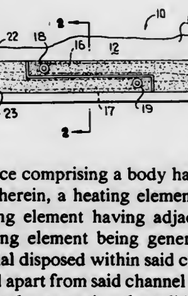
METHOD AND APPARATUS FOR REMOVING INCLUSION CONTAMINANTS FROM METALS AND ALLOYS

Kenneth E. Drs, Collinsville; Sebastian J. Salafia, Middletown, and Lee F. Schulmeister, Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1977, Ser. No. 860,521
Int. Cl.[2] B22D *27/02, 1/00, 23/08*
U.S. Cl. 425—8 **6 Claims**

1. A method for removing floating nonmetallic inclusions from a molten pool of metal in a crucible using an electron beam, comprising:
(a) impinging an electron beam onto the surface of the molten pool within the crucible;
(b) segregating floating nonmetallic inclusions in a portion of the pool surface by action of the electron beam;
(c) discharging clean molten metal from another portion of the pool surface which is substantially freed of inclusions by the beam action;
(d) preventing inclusions from being removed with the clean molten metal flowing from the crucible by manipulation of the beam impingement pattern on the pool surface.

4. Apparatus useful for removing floating nonmetallic inclusions from a molten metal charge, comprising:
(a) a crucible having a chamber for containing a pool of molten metal, a molten metal discharge channel, and an inclusion discharge channel, each channel being in communication with the chamber at diverse points around the periphery of the crucible;



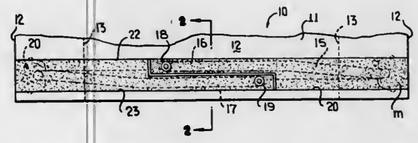
(b) means for introducing metal into the crucible;
(c) means for impinging an electron beam on the surface of a molten pool within the crucible, the beam adapted to maintain metal in the molten state and having an orientation and motion which causes floating inclusions to move toward the inclusion discharge channel;
(d) means for causing molten metal to flow from the crucible through the metal discharge channel;
(e) means for receiving clean metal flowing from the metal discharge channel.

4,190,405

HEATING DEVICE FOR A TIRE RETREADING MOLD

Kenneth T. MacMillan, Macon, Ga., assignor to Donald MacMillan & Son, Inc., Macon, Ga.

Filed Jan. 18, 1979, Ser. No. 4,578
Int. Cl.[2] B29H *5/04*
U.S. Cl. 425—20 **15 Claims**



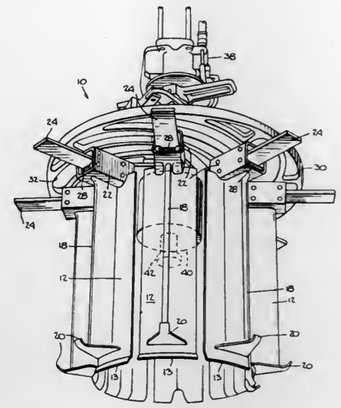
1. A heating device comprising a body having a continuous unending channel therein, a heating element disposed in said channel, said heating element having adjacent opposite end portions, said heating element being generally encased in a body of solid material disposed within said channel, and means formed separate and apart from said channel for traversing said channel and completely separating the solid material encasing one of said end portions from the solid material encasing another of said end portions whereby said end portions are free to move relative to each other upon expansion and/or contraction of said heating element.

4,190,406

APPARATUS FOR POSITIONING AND CURING A PRE-SHAPED TIRE CARCASS

Joseph C. Geck, and Floyd E. Hamilton, both of Detroit, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 730,414, Oct. 7, 1976, abandoned. This application Jul. 19, 1978, Ser. No. 926,051
Int. Cl.[2] B29H *5/02*
U.S. Cl. 425—38 **12 Claims**

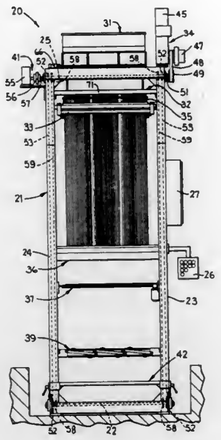


1. Apparatus for inserting a bladder of a pneumatic tire vulcanization mold into a pre-shaped partially toroidal raw tire carcass, said apparatus comprising:
transporter chuck means for detachably gripping a first bead of said carcass, said chuck means including a circumferential array of similar and equidistantly spaced segments and control means for selectively increasing and decreasing the effective diametral condition of said circumferential array of segments into and out of engagement with said first carcass bead;
a vulcanization mold section for vulcanizing said carcass into a final toroidal form, said mold section having means for engaging a second carcass bead; said mold section including at its center an endwise movable first piston rod having a free end portion concentrically arranged therein and movably axially relative thereto;
an inflatable vulcanizing bladder capable of assuming both a cylindrical and toroidal form surrounding said first piston rod with said free end portion being exterior of the bladder;
said first piston rod including circular plate means concentrically affixed to said free end portion thereof, said bladder having a circular edge secured to the periphery of said plate means in air-tight relation; said bladder having an opposite circular edge secured to said mold section in air-tight relation;
single-acting means for protracting the first piston rod to cause the bladder to assume the cylindrical form from the toroidal form, the single acting means being exterior to the bladder;
power cylinder means affixed to said transporter chuck means concentrically within said circumferential array of segments, said power cylinder means including a second piston rod having a free end portion that is axially engageable with the free end portion of the first piston rod and thereafter extensible to effect the retraction of the first piston rod and initiate the transformation of the bladder from the cylindrical form to the toroidal form internally of the carcass.

4,190,407
APPARATUS FOR FILLING HEATING TUBE

Steven L. Stroup, Lancaster Township, Wells County, and Galen B. Harman, La Grange, both of Ind., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Jun. 26, 1978, Ser. No. 919,422
Int. Cl.[2] A23G 1/20
U.S. Cl. 425—110 9 Claims

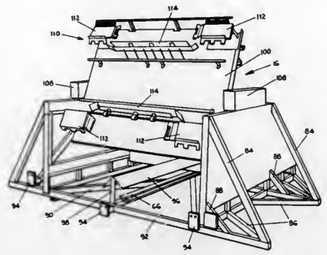


1. In an apparatus for manufacturing sheathed heating elements, including means for supporting a plurality of sheaths to be filled with a particulate material, means for positioning a plurality of resistive elements individually within said sheaths, a plurality of sets of inner and outer concentric filling tubes defining an annular filling passage therebetween for said material, means for positioning said plurality of sets of concentric filling tubes within said sheaths in surrounding relationship to said resistance elements, means for feeding the material through said passage as said tubes are withdrawn from said sheath so as to concentrically position each said resistance element within its respective sheath and to fill said sheath from the bottom thereof with said material, and valve means for controlling the feeding of said material through said passage, comprising the improvement wherein said valve means is directly associated with said inner and outer concentric tubes and is movable between a first opened position permitting flow through said passage into said sheath and a second closed position for positively preventing flow from said passage into said sheath, said valve means including a valve member positioned adjacent the lower ends of said tubes and movable relative to at least one of said tubes between said opened and closed positions, said valve member being fixed to one of said tubes of each set and extending concentrically thereof, said valve member projecting radially relative to said one tube so as to substantially radially span said annular passage, said valve member having a surface positionable closely adjacent a peripheral surface on a lower portion of the other of said concentric inner and outer tubes adjacent the lower end thereof for defining said closed position, and actuating means for causing limited relative axial displacement between said concentric inner and outer tubes for relatively moving said one tube axially downwardly relative to said other tube to thereby position said valve member axially below and spaced downwardly from said lower portion of said other tube, thereby permitting flow from said annular passage into said sheath.

4,190,408
AUTOMATIC LOADING AND UNLOADING APPARATUS FOR PRESS

James W. Bronkema, Grand Rapids, and Norman L. Hoeksema, Zeeland, both of Mich., assignors to Unique Tool & Die Co., Grand Rapids, Mich.

Filed Jun. 26, 1978, Ser. No. 919,155
Int. Cl.[2] B29C 17/00
U.S. Cl. 425—145 13 Claims



1. Apparatus for automatically loading and unloading a compression press wherein products are formed by compressing blanks between upper and lower die halves that are vertically movable with respect to each other to open and close the die, said apparatus comprising:

a frame adapted to be positioned adjacent the press;

blank holding means pivotably mounted in the frame for rotation about a horizontal axis through an angle of at least 180 degrees, the blank holding means including releasable gripping means for engaging and holding the blanks when they are laid on the blank holding means, such that the blanks are releasably retained in place on the blank holding means when the blank holding means is rotated so as to be turned upside down, said blank holding means being longitudinally movable with respect to the frame between a retracted position, wherein the blank holding means is withdrawn from the press, and an extended position, wherein the blank holding means is extended to a position between the separated halves of the die in alignment with the mold cavities in the die; and

control means for actuating the gripping means after uncompressed blanks are placed on the blank holding means, said control means turning the blank holding means upside down when loaded with uncompressed blanks and extending the loaded blank holding means into its extended position in alignment with the mold cavities in the die when the die halves are separated, the control means thereafter releasing the gripping means such that the blanks drop down on the lower die half in position to be compressed, the control means thereafter withdrawing the blank holding means to its retracted position and turning the blank holding means right side up for receipt of additional unformed blanks.

4,190,409
APPARATUS FOR INJECTING CONFLUENT STREAMS OF PLASTIC

Karl Hehl, Arthur-Hehl-Strasse 32 7298, Lossburg 1, Fed. Rep. of Germany

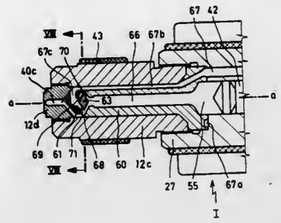
Filed Oct. 14, 1977, Ser. No. 842,105
Int. Cl.[2] B29F 1/12
U.S. Cl. 425—132 10 Claims

1. An apparatus for injecting confluent streams of plastic material from separate sources into the molding die of an injection molding machine, the apparatus comprising in combination:

first and second injection units, structurally connected to each other, each unit having a plastification cylinder, a plastification screw inside said cylinder, and hydraulic drive means operative to rotate and axially advance the plastification screw inside the plastification cylinder, thereby plastifying and injecting raw material from the forward end of the respective injection unit;

pulsation generating means operative to control the hydraulic drive means of at least one of the two injection units, for the execution of partial injection strokes, at regular intervals and of consistent displacement, and also operative to control the hydraulic drive means of both injection units, for the execution of alternating partial injection strokes, at regular intervals and of consistent displacement;

an injector nozzle connected to both injection units, said nozzle having a nozzle discharge channel on its forward extremity adapted for engagement against the opening of a sprue channel of the injection molding die, the injection nozzle further enclosing a pulsation chamber upstream of its discharge channel, and separate pulsation channels leading from the plastification cylinders of the two injection units to the pulsation chamber, so that the raw materials which are injected by the two plastification screws enter the pulsation chamber through entry ports of their separate pulsation channels and, after confluence inside the latter, exit therefrom via the nozzle discharge channel; and



a pulsating element floatingly arranged inside the pulsation chamber of the injector nozzle in such a relationship to the entry ports of the two pulsation channels that an inflow of raw material from one entry port will move the pulsating element into a port-closing position on the other entry port, and vice versa, thereby opening and closing the pulsation channels in unison with the injection pulsations which are being generated by the pulsation generating means.

4,190,410
COOKIE FORMING APPARATUS

Herbert C. Rhodes, 6811 SE. Ash Pl., Portland, Oreg. 97215

Filed Nov. 20, 1978, Ser. No. 962,248
Int. Cl.[2] A21C 3/10
U.S. Cl. 425—239 7 Claims

1. Cookie forming apparatus comprising:

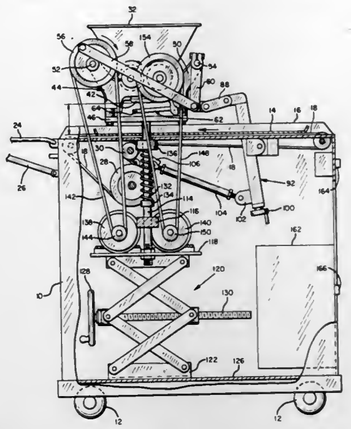
a hopper for receiving cookie dough, said hopper being provided with a die at the bottom thereof having a plurality of apertures through which cookie dough passes for taking on an exterior shape corresponding to the exterior shape of said apertures, and including a pair of adjacently opposed dough rolls positioned in said hopper above said die and rotated in opposite directions for forcing dough toward said apertures and extruding dough through said apertures,

a conveyor located underneath said die for receiving extruded dough therefrom,

a cutoff wire and a bail supporting said cutoff wire in alignment between said die and said conveyor in position for severing dough extruded through said die by said rolls,

first drive motor means having a driving connection with said conveyor and said bail for operating said conveyor and bail in predetermined relation causing said bail to pass said cutoff wire successively through extruded dough to provide cookie-shaped dough deposits on said conveyor and for moving said conveyor to receive cookie-shaped deposits at spaced locations as provided by successive operation of said bail,

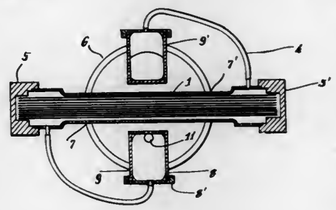
said second drive motor means independent of said first drive motor and having a driving connection to said dough rolls for turning said dough rolls independently from said first drive motor means, said last mentioned drive motor means being separately adjustable for determining the speed of rotation of said dough rolls and correspondingly the quantity of dough extruded through said apertures for each deposit severed by said cutoff wire.



4,190,411
CENTRIFUGAL POTTING APPARATUS

Yoshiaki Fujimoto, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 1, 1978, Ser. No. 929,891
Claims priority, application Japan, Aug. 4, 1977, 52/94283
Int. Cl.[2] B29C 5/04, 1/00
U.S. Cl. 425—434 6 Claims



1. Centrifugal potting apparatus comprising:

a rotator adapted for rotation about an axis of rotation;

a housing mounted on said rotator and disposed essentially symmetric with respect to said axis of rotation,

said hausing being provided with a pair of potting cases each spaced from said axis of rotation and adapted to receive a potting agent therein upon rotation of said rotator;

a pair of individual container means respectively associated with said pair of said potting cases and each adapted for holding a separate source of a potting agent to be delivered to the corresponding potting case under centrifugal force produced by rotation of said rotator, each of said container means being secured to a side of said rotator and in spaced relationship to said axis of rotation; and

tube means operably coupling said pair of container means with the respectively associated potting cases for deliver-

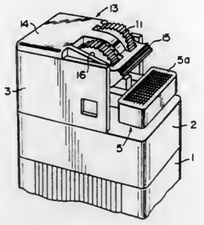
ing potting agent from the former to the latter upon rotation of said rotator.

4,190,412

DISPOSABLE CIGARETTE GAS LIGHTER WITH SNUFFING COVER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1977, Ser. No. 863,436
Claims priority, application Japan, Dec. 28, 1976, 51/158519; Dec. 28, 1976, 51/175768[U]
Int. Cl.[2] F23Q *25/00*
U.S. Cl. 431—151 **6 Claims**



1. A disposable cigarette gas lighter comprising a plastic fuel reservoir for retaining therein liquified inflammable gas and an operative lighter assembly mounted thereon, said lighter assembly including a flint holding means for holding a flint element, a sparking wheel provided with a pair of knurled wheels secured thereto, a spring element provided in the flint holding means for biasing the flint element onto the sparking wheel, a shaft for rotatably mounting the sparking wheel, a fuel nozzle for connecting the interior of the reservoir with the ambient air, a shut-off valve including means biasing it to a closed position incorporated in the nozzle, a valve opening lever for opening the shut-off valve, and a windbreak wall secured on the reservoir to surround the nozzle, wherein the improvement comprises a snuffing cover and means mounting said snuffing cover for rotational movement independent of said knurled wheels and valve opening lever between a closed position to close an open upper end of said windbreak wall and an open position to open the same, and means for holding the snuffing cover in its closed position, said snuffing cover having a finger engaging portion with which the finger used for rotating said knurled wheels is engaged after it has rotated the knurled wheels to move the snuffing cover from said closed position to said open position overcoming the force of said snuffing cover holding means.

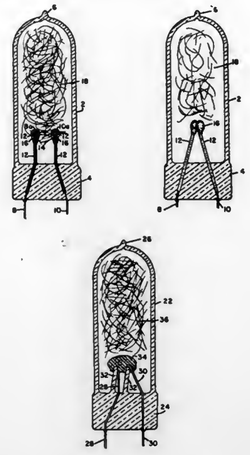
4,190,413

PHOTOFLASH LAMP

John W. Shaffer, and Daniel W. Bricker, both of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 30, 1977, Ser. No. 865,987
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—362 **13 Claims**

1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope,
a quantity of filamentary combustible material located within said envelope;
a combustion-supporting gas in said envelope;
and ignition means disposed in said envelope in operative relationship with respect to said combustible fill material, said ignition means including a pair of lead-in wires extending into said envelope in a spaced relationship, and a dried coating of primer material covering a portion of at least one of said lead-in wires within said envelope, said coating of primer material having been provided from a mixture comprising a particulate fuel, a binding agent, a solvent and a relatively coarse additive of electrically nonconducting inert particulate material;
said additive of inert particulate material being insoluble in



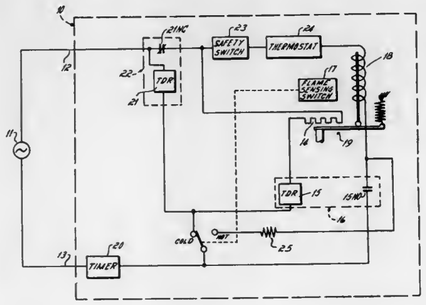
said solvent, having a solid particle size which is about 10 to 50 times larger in average diameter than that of said particulate fuel, and being present in an amount from about 10 to 60 weight percent of the dried mixture.

4,190,414

FAIL-SAFE GAS FEED AND IGNITION SEQUENCE CONTROL APPARATUS AND METHOD FOR A GAS-FIRED APPLIANCE

Richard A. Elmy, Louisville, Ky., assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Apr. 17, 1978, Ser. No. 897,183
Int. Cl.[2] F27D *19/00;* **F23N** *5/00, 5/20*
U.S. Cl. 432—46 **9 Claims**



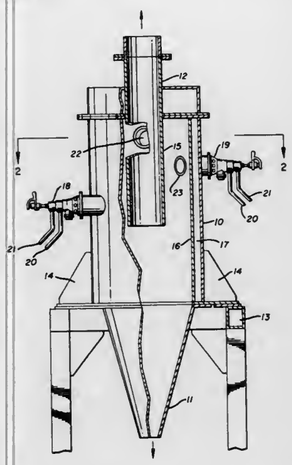
1. A fail-safe combustion control apparatus for controlling the gas feed and ignition sequence in a gas-fired appliance, comprising circuitry including:
power leads selectively connected to an external source of electrical power;
an incandescent igniter for kindling gas to provide a flame;
a gas feed time delay switch means having an operator and a normally open contact;
a flame sensing means having a cold contact and a hot contact for detecting said flame;
a time delay lockout switch means having an operator and a normally closed contact;
said incandescent igniter, said gas feed time delay switch means operator, said normally closed contact of said time delay lockout switch means and said cold contact being connected in series across said power leads;
a solenoid means for controlling a gas valve;
said solenoid means, said normally closed contact of said time delay lockout switch means and said normally open contact of said gas feed time delay switch means being connected in series across said power leads;
said time delay lockout switch means operator and said cold contact being connected in series across said power leads; and
a holding resistor;
said holding resistor, said hot contact, said solenoid means and said normally closed contact of said time delay lockout switch means being connected in series across said power leads.

4,190,415

CHIP DRYING AND CLEANING DEVICE

Raymond E. Singrey, R.D. #1, Williamsfield, Ohio 44093

Filed Jul. 10, 1978, Ser. No. 923,474
Int. Cl.[2] F27B *15/00;* **F26B** *17/00*
U.S. Cl. 432—58 **3 Claims**



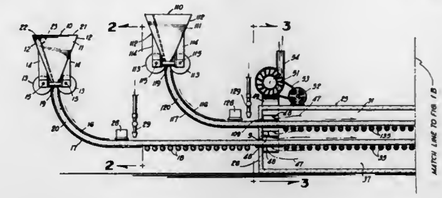
1. A chip or sand drying and cleaning device comprising a vertically positioned cylindrical body forming a hollow unrestricted oxidizing chamber, an open ended cone-shaped bottom on the lower end of said cylindrical body, a closure on the upper end thereof, at least two tangentially mounted burners on said cylindrical body in communication therewith, a fuel source for said burners, means located above said burners for delivering contaminated material into said cylindrical body, said burners and the products of combustion therefrom acting to create a high velocity cyclonic vortex whereby the contaminates are oxidized, tubular means extending downwardly through said closure centrally thereof for exhausting said products of combustion and said oxidized contaminates, the lower intake end of said tubular means communicating within said oxidizing chamber centrally thereof and below said burners and within said cyclonic vortex, the inner area of said cylindrical body being at least double the area of the tubular means for exhausting the products of combustion so that said cyclonic vortex will be unimpeded in imparting centrifugal spin to said contaminated material so as to carry it below said intake end of said tubular means and into said open ended cone-shaped bottom.

4,190,416

PROCESS AND APPARATUS FOR PRODUCING CELLULATED VITREOUS REFRACTORY MATERIAL IN PRESCRIBED SHAPES AND PRODUCTS THEREFROM

John W. North, 3467 Pierce Dr., NE., Chamblee, Ga. 30341

Filed Mar. 20, 1978, Ser. No. 888,507
Int. Cl.[2] F27B *9/02*
U.S. Cl. 432—128 **22 Claims**



1. Apparatus for firing of refractory raw material comprising:
(a) a longitudinally disposed kiln defining a pair of tendem arranged first and second chambers, said kiln having openings defining a front entrance port and a rear exit port for raw material;
(b) conveyor means in said chamber for feeding said raw material from said entrance port along a prescribed path successively through said first chamber and through said second chamber and out of said exit port;
(c) heating means in said second chamber for firing said raw material as it passes therethrough, said heating means including longitudinally spaced burners for firing transversely across the path of said material;
(d) conduit means connected to said kiln and communicating with said first chamber and said second chamber for directing stack gases formed by the gases heated by said heating means from said first chamber into the forward portion of said second chamber, said kiln having wall ports in said second chamber respectively opposite said burner means for receiving gases therefrom;
(e) exhause means adjacent to the entrance of said first chamber for discharging the stack gases from said first chamber, whereby the heating gases discharged into the forward portion of said first chamber through said conduit means are moved rearwardly adjacent to said raw material in counterflow relationship for drying and then preheating said raw material; and
(f) delivery means for delivering said raw material into said entrance.

4,190,417

PROCESS FOR DYEING AND PRINTING SHEETS

Helmuth Prochaska, Warren, N.J.; Gert F. Baumann, Pittsburgh, Pa.; Peter Rasche, Aachen, Fed. Rep. of Germany; Heinz Müller, and Alberto Gonzales-Dörner, both of Leverkusen, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa. and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 846,867

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651392

Int. Cl.[2] D06P *1/00*

U.S. Cl. 8—2.5 R **14 Claims**

1. Process for dry dyeing or printing of sheet-like structures by transfer printing, characterized in that said structures are brought into close contact, under pressure and at a temperature of about 160° to 350° C., with an unsupported foam sheet having a weight per unit area of 3 to 200 g/m^2 which has been dyed and/or printed with water insoluble dyes and which softens at this temperature, the said contact being maintained until the foam structure of the sheet has been substantially destroyed.

4,190,418

APPARATUS AND METHOD FOR PREPARING GRADIENT DYED SHEET

Harold O. Buzzell, Wollaston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 649,049, Jan. 14, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,355

Int. Cl.[2] D06P *7/00*

U.S. Cl. 8—4 **16 Claims**

1. A method of providing a dye density gradient to a web comprising a relatively small transverse dimension and top and bottom substantially parallel longitudinal edges, said web providing a lens stock from which lenses can be cut, which method comprises:

conducting said web into a bath of dye material in such a manner that the transverse plane through the longitudinal dimension of said web makes substantially a right angle with the plane of the surface of said bath and said bottom longitudinal edge of said web enters said dye bath at an acute angle to the surface of said dye bath so that the web is at least partially progressively immersed in said dye bath, and

conducting said web out of said dye bath

whereby a transverse dye density gradient is established on said web as a function of the residence time of the various portions of said web in said dye bath.

4,190,419

DEVICE FOR DETECTING SERUM BILIRUBIN

Robert Bauer, Bristol, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 22, 1978, Ser. No. 944,718

Int. Cl.[2] G01N *31/22, 33/16*

U.S. Cl. 23—230 B **10 Claims**

1. A test device for the detection of bilirubin in a serum sample which device comprises a carrier and, incorporated therewith, a composition comprising a diazonium salt, p-toluenesulfonic acid and dyphylline.

4,190,420

CONTAINER FOR DISPENSING ARTICLES TO AN AUTOMATED ANALYZER

Roger G. Covington; Stephen H. Miller, both of Rochester, and Archie J. Tucker, Middlesex, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,289

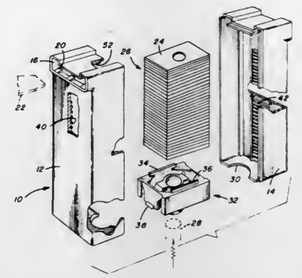
Int. Cl.[2] G01N *1/28;* **B65D** *83/10*

U.S. Cl. 422—63 **8 Claims**

1. A container for receiving and dispensing reagent articles of predetermined thickness to apparatus having a movable actuator and adapted to use the articles to carry out quantitative chemical analysis of fluid samples, said container comprising:

a casing having a chamber adapted to receive a stack of the articles and having an article dispensing station at which articles may be removed from said chamber for delivery to the apparatus;

a movable stack positioning element in said chamber engageable with one end of a received article stack to urge the



stack toward said dispensing station whereby the articles may be removed individually from the dispensing station and succeeding articles moved sequentially into alignment with the dispensing station, said stack positioning element being movable by the actuator a predetermined distance each time any but the last article is removed from said dispensing station; and

means for causing said element to be moved a distance different from said predetermined distance when the last article is removed from said dispensing station.

4,190,421

FIRESIDE TREATING COMPOSITIONS

Chih M. Hwa, Palatine, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Filed Jul. 17, 1978, Ser. No. 925,007

Int. Cl.[2] C10L *9/00, 10/00*

U.S. Cl. 44—4 **2 Claims**

1. A fireside treating composition consisting essentially of a mixture of powdered coal and a fuel additive in a coal:additive ratio of 1:10 to 10:1, in which the additive is a member selected from the group consisting of ammonium chloride, magnesium oxide, alumina, and copper carbonate.

2. Method of feeding a fireside additive to a boiler furnace characterized in that the additive is contained in the composition of claim 1.

4,190,422

METALLIC ABRASIVE PRODUCED FROM A STEEL MILL WASTE MATERIAL

Henry W. Hitzrot, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 906,310, May 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,116, May 24, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 965,550

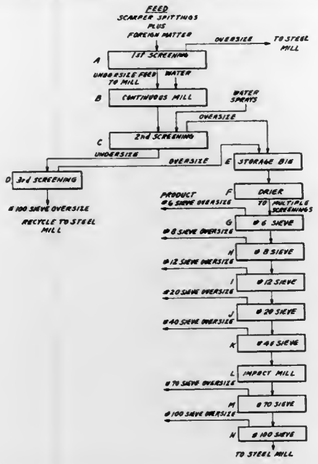
Int. Cl.[2] C21D *7/06;* **B24C** *1/10*

U.S. Cl. 51—309 **20 Claims**

1. A method for preparing scarfer spittings comprised of steel cores enclosed in shells of iron oxides and being within a size range of plus 50.8 mm to about minus #100 sieve size for use as size-graded steel abrasives useful in blast cleaning metallic and non-metallic surfaces, comprising:

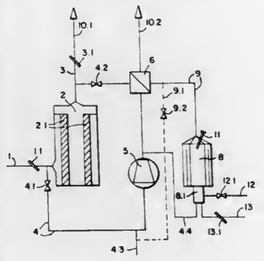
(a) screening said scarfer spittings in a first screening step to separate large non-usable spittings from smaller spittings and to remove foreign matter,

(b) charging said smaller spittings into a grinding mill,
(c) removing said shells of iron oxides from around said cores of said smaller spittings in said mill,
(d) screening the mixture produced in step (c) in a second screening step to separate said steel cores from said iron oxide shells,
(e) drying said steel cores, and
(f) screening said steel cores in a third screening step to produce a size-graded metallic abrasive product.



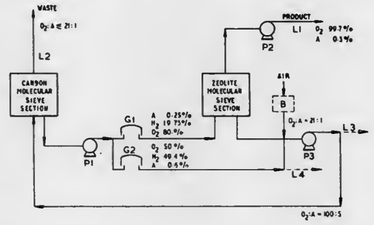
13. A size-graded steel abrasive material for blast cleaning metallic and non-metallic surfaces characterized by having a hardness within the range of R_c 20 to 35, a microstructure comprised of untempered lath-like martensite substantially free from intergranular and intragranular cracking, a grain size of about 3 to 4 and having an impact toughness equivalent to that of higher carbon and alloy grades of metallic abrasives.

4,190,423
METHOD OF OPERATING AN ADSORPTION FILTER
Karl Winter, Dortmund-Sölde, Fed. Rep. of Germany, assignor to CEAG Ceagfilter und Entstaubungstechnik GmbH, Dortmund, Fed. Rep. of Germany
Filed Feb. 21, 1978, Ser. No. 880,224
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707226
Int. Cl.² B01D *53/04*
U.S. Cl. 55—20 **4 Claims**



1. Method of separating vaporous or gaseous impurities from an air or gas flow by means of an adsorption filter wherein, after the filter has attained a predetermined loading of the impurities, the combination therewith of (1) conducting an inert gas in a circulatory loop through the adsorption fulter containing impurities to desorb same; (2) removing excess gas together with desorbed components contained in the excess gas from said circulatory loop and sending same to a combustion chamber where it is consumed; and (3) supplying heat energy for the desorption of the adsorption filter by conducting indirect heat exchange between the combustion chamber exhaust gas and the inert gas in the circulatory loop.

4,190,424
GAS SEPARATION
John W. Armond, Buckhurst Hill; David A. Webber, Bishops Stortford, and Kenneth C. Smith, Roydon, all of England, assignors to BOC Limited, London, England
Continuation-in-part of Ser. No. 702,497, Jul. 6, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,131
Claims priority, application United Kingdom, Jul. 17, 1975, 30093/75
Int. Cl.² B01D *53/04*
U.S. Cl. 55—58 **15 Claims**



1. A gas separation process employing a first section including at least one bed of molecular sieve carbon operated on a pressure swing adsorption cycle and a second section including at least one bed of zeolite molecular sieve operated on a pressure swing adsorption cycle, the process comprising: supplying a gas mixture containing oxygen, nitrogen and argon as feedstock to said first section; said first section providing, during a desorption step thereof, a first gas stream enriched in oxygen and depleted in nitrogen and argon as compared to said gas mixture; supplying such oxygen-enriched argon depleted gas as feedstock to the second section; said second section providing, during a feed step thereof, a second gas stream further enriched in oxygen and depleted in nitrogen than said first gas stream and providing, during a desorption step thereof, a third gas stream enriched in oxygen as compared to said gas mixture but less so than said second gas stream; and supplying said third gas stream to said first section to comprise part of the feedstock thereof.

8. A gas separation process employing a first section including at least one bed of zeolite molecular sieve operated on a pressure swing adsorption cycle and a second section including at least one bed of molecular sieve carbon operated on a pressure swing adsorption cycle, the process comprising: supplying a gas mixture containing oxygen, nitrogen and argon as feedstock to said first section; said first section providing, during a feed step thereof, a first gas stream enriched in oxygen and depleted in nitrogen as compared with said gas mixture; supplying such oxygen-enriched gas as feedstock to the second section; said second section providing, during a desorption step thereof, a second gas stream further enriched in oxygen than said first gas stream and depleted in argon, and providing, during a feed step thereof, a third gas stream enriched in oxygen as compared to said gas mixture but less so than said second gas stream; and supplying said third gas stream to said first section to comprise part of the feedstock thereof.

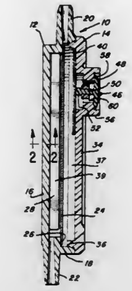
4,190,425
PROCESS FOR THE PREPARATION OF SILICIOUS POLYMERIC MATERIALS AND THEIR APPLICATIONS IN THE SEPARATION OF FLUIDS IN GASEOUS PHASE
Wilhelm Brüening, and Inäi M. R. deA. Brüening, both of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A.-Petrobas, Rio de Janeiro, Brazil
Continuation of Ser. No. 723,267, Sep. 14, 1976, abandoned, which is a continuation of Ser. No. 421,871, Dec. 5, 1973, abandoned. This application Jun. 28, 1978, Ser. No. 919,656
Int. Cl.² B01D *15/08*
U.S. Cl. 55—67 **15 Claims**



1. A process for separating the components of a mixture of non-polar organic compounds by gas phase chromatography comprising passing said mixture in a gaseous state through a solid stationary phase of micro-porous free flowing powder having a high surface area and good thermal stability, said phase comprising an intimate mixture of an organic macro molecular component (A) and (B) non-porous high purity silica in particles smaller than 500 angstroms which does not contain calcium, sodium or magnesium and is substantially free of metallic oxides, said silica having a surface area greater than 50 m^2/g, said macro molecular component (A) having been intimately mixed with the silica (B) by reaction of the monomeric components forming the macro molecular component (A) in the presence of said silica, whereby said silica particles are intimately disseminated throughout organic macro molecular chains without coordinate chemical bonding linkages between the silica and the organic macro molecular component.

4,190,426
GAS SEPARATING AND VENTING FILTER
Ricky R. Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Nov. 30, 1977, Ser. No. 856,147
Int. Cl.² B01D *46/00*
U.S. Cl. 55—185 **11 Claims**

1. A gas separating and venting filter comprising: a plastic heat-deformable plastic housing having walls defining an interior chamber, inlet opening means in said housing for conveying fluid into said chamber, one of said walls comprising liquid-wetting filter means for passing liquid only therethrough, outlet means downstream of said liquid-wetting filter means for conveying liquid therefrom, vent opening means in said housing communicating between the outside of said housing and said interior chamber to vent gas from said chamber, and planar liquid-repellent filter means covering said vent opening means and having a peripheral edge portion overlying said housing and sealed thereto to permit the passage of gas but to prevent liquid from escaping through said vent opening means, said liquid-repellent filter means comprising a plastic liquid-repellent filter membrane with a plastic fibrous backing disposed between said membrane and said housing, said filter means having a higher melt temperature than said housing, said



seal between said filter means and said housing comprising a continuous mechanical bond formed between said fibrous backing and said housing in which portions of said housing fill the interstices in portions of said fibrous backing.

4,190,427
PLANT CARE COMPOSITION
Robert J. Ravallo, Mahopac, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed May 4, 1977, Ser. No. 793,693
Int. Cl.² C05B *15/00;* **C05C** *9/00*
U.S. Cl. 71—29 **5 Claims**

1. An essentially anhydrous composition adapted for dispersion in a foamed state for treatment of vegetation or terrain comprising:
a. urea, urea-formaldehyde, potassium tripolyphosphate, and
b. an isopropyl alcohol and,
c. an effective amount of a long chain alpha olefin sulfonate containing at least 8 carbon atoms as a foam agent.

4,190,428
PLANT TREATING COMPOSITION
Martin S. Colton, Avon; Esra Pitchon, Flushing, and Robert J. Ravallo, Mahopac, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed May 4, 1977, Ser. No. 793,802
Int. Cl.² C05B *15/00;* **C05C** *9/00*
U.S. Cl. 71—29 **6 Claims**

1. A dry particulate plant treating composition foamable with water comprising:
a. urea-formaldehyde, urea, potassium tripolyphosphate and ferrous sulfate, and
b. a solid foaming agent, and
c. an alcohol of limited solubility which is soluble to the extent of approximately 15 to 20 parts per 100 parts of water or less.

4,190,429
CONTROL OF MICROBIAL CONTAMINATION
Jerry L. Rutter, Overland Park, Kans.; Janice M. Bergman, Kansas City, Mo., and Kurt J. Bevernitz, Mission, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.
Filed Aug. 17, 1978, Ser. No. 934,305
Int. Cl.² A01N *9/20*
U.S. Cl. 71—67 **3 Claims**

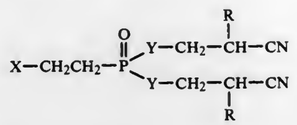
1. A method of inhibiting the growth of contaminating microorganisms which comprises contacting the microorganisms with an effective amount of N-adamantyl gluconamide.

4,190,430
DI-(CYANOALKYL)-β-HALOETHANEPHOSPHONATES AND DITHIOPHOSPHONATES AND USE AS PLANT GROWTH REGULATORS

Werner Trueb, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 803,792, Jun. 6, 1977, Pat. No. 4,137,064, which is a division of Ser. No. 612,501, Sep. 11, 1975, Pat. No. 4,042,370. This application Nov. 9, 1978, Ser. No. 959,209
Claims priority, application Switzerland, Sep. 18, 1974, 12677/74
Int. Cl.² A01N *9/36;* **C07F** *9/40*
U.S. Cl. 71—86 **9 Claims**

1. A compound of the formula:



wherein
X is chlorine or bromine,
Y is oxygen or sulfur, and
R is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, unsubstituted phenyl or phenyl substituted by one or more members selected from the group consisting of fluoro, chloro, bromo, cyano, carboxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkylcarbamoyl, trihaloalkyl, C_1–C_8 alkylsulphinyl, unsubstituted phenylsulphinyl, phenylsulphinyl substituted by a methyl or ethyl group or two methyl groups, C_1–C_8 alkylsulphonyl, unsubstituted phenylsulphonyl, phenylsulphonyl substituted by a methyl or ethyl group or two methyl groups, and nitro.

3. A method of regulating the growth of plants or regulating plant secretion by applying to the plants a plant growth or secretion regulating effective amount of a compound according to claim 1.

4,190,431
SUBSTITUTED OXADIAZOLIDINE-3,5-DIONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 535,323, Mar. 18, 1966, Pat. No. 3,437,664. This application Nov. 17, 1967, Ser. No. 703,497
Int. Cl.² A01N *9/22*
U.S. Cl. 71—92 **1 Claim**

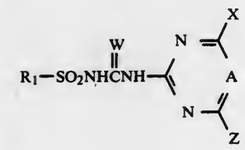
1. A method of destroying undesired vegetation which comprises applying to said vegetation a herbicidally effective amount of the compound 2-(3',4'-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione.

4,190,432
HERBICIDAL SULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1977, Ser. No. 820,882
Int. Cl.² C07D *251/18, 251/52;* **A01N** *9/22, 9/12*
U.S. Cl. 71—93 **37 Claims**

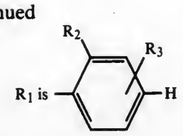
1. A compound selected from



(I)

where

-continued



R_1 is

R_2 and R_3 are independently hydrogen, fluorine, chlorine, bromine, methyl, methoxy, nitro or trifluoromethyl;
W is oxygen or sulfur;
X is $-NHCH_3$ or $-N(CH_3)_2$;
Z is methyl or methoxy; and
A is N and their agriculturally suitable salts provided that when R_2 is nitro or trifluoromethyl, R_3 can not be nitro or trifluoromethyl.

13. A composition for the control of undesirable vegetation consisting essentially of a compound of claim 1 and at least one of (a) a surface active agent and (b) a solid or liquid diluent.

4,190,433
THIOESTER OF 1,2-DIPHENYL-CYCLOHEX-1-ENE-4-CARBOXYLIC-ACID

Verena Laanio, Arisdorf; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 713,477, Aug. 11, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,210
Claims priority, application Switzerland, Aug. 15, 1975, 01664/75; Aug. 15, 1975, 01665/75; Aug. 15, 1976, 01666/75
Int. Cl.² A01N *9/12;* **C07C** *153/11*
U.S. Cl. 71—100 **3 Claims**

1. The methyl ester of 1,2-diphenyl-cyclohex-1-ene-4-thiocarboxylic-acid.

4,190,434
THERMAL PROCESSES FOR THE PRODUCTION OF MAGNESIUM

René Bonfils, Barbazan; André Ména, Saint Beat; Christian Payn, Barbazan, and Louis Septier, Le Fayet, all of France, assignors to Societe Francaise d'Electrometallurgie "Sofrem", Paris, France

Filed Jun. 14, 1978, Ser. No. 915,387
Claims priority, application France, Jun. 24, 1977, 77 20227
Int. Cl.² C22B *4/00*
U.S. Cl. 75—10 R **7 Claims**

1. A thermal process for the production of magnesium in a closed electric furnace in which magnesium oxide and a metallic reducing agent react in the presence of a molten slag to produce magnesium vapors which are transmitted from the reaction furnace to a condensation zone wherein the vapors are condensed to magnesium, the improvement wherein at least a part of the magnesium oxide is introduced into the furnace in the form of a slag from the manufacture of ferro-chromium and which contains at least 20% by weight magnesium oxide and at least 25% by weight aluminum oxide, and in which the molten slag is formed essentially of lime, silica and alumina present in the molecular ratio of CaO/SiO_2 of at least 1.8 and Al_2O_3/SiO_2 of at least 0.26.

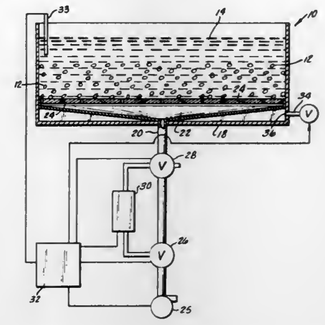
4,190,435
PROCESS FOR THE PRODUCTION OF FERRO ALLOYS

M. K. Olof Johnsson, Degerfors; Rune H. Lindström, Hagfors; Per-Åke Lundström, Hagfors, and Lars-Gunnar Norberg, Hagfors, all of Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Oct. 25, 1978, Ser. No. 954,464
Int. Cl.² C21C *5/52*
U.S. Cl. 75—12 **6 Claims**

1. Process for the production of ferro alloys having a low carbon content and containing in addition to iron at least one metal selected from the group consisting of manganese, chromium and molybdenum, characterised in that the process comprises the following steps which are repeated cyclically;
(a) adding to a converter containing a melt sump of the of the product to be produced, and a slag rich in oxide of chromium and/or manganese, in addition to iron, a silicon-containing or aluminum-containing reducing agent having an excess of silicon or aluminum respectively for reduction of the said oxides in the slag,
(b) intimately mixing the reducing agent with the slag by injecting a fluid into melt via at least one tuyere beneath the surface of the melt so that the melt, slag and reducing agent are intensively agitated, maintaining the temperature in the melt for the whole period above liquidus temperature, whereby the intensive agitation creates good conditions for effective reduction of metal oxides in the slag by reaction with silicon or aluminum respectively, while the excess silicon or excess aluminum remain dissolved in the melt,
(c) adding lime before, simultaneously with, and/or after said injection of fluid, the lime, being added in the quantity required to fix the silicic acid or aluminum oxide forming,
(d) tapping the slag of reduced chromium or manganese content from the converter when most of the said oxides in the slag have been reduced by said reducing agents,
(e) injecting a pulverulent concentrate containing an oxide of chromium and/or manganese by means of a carrier gas through the said tuyeres,
(f) adding lime before, simultaneously with and/or after injection of the said oxide concentrate,
(g) supplying heat to the melt during the injection of the oxide concentrate, by means of the electric induction, so that the temperature in the melt is for the whole period kept above the melt liquidus temperature, while the excess silicon or aluminum in the melt after being supplied with the said reducing agent reduces the injected metal oxides,
(h) continuing the injection of said oxide concentrate until the silicon content in the melt is reduced to the required content, whereby at the same time quantities of chromium and/or manganese are oxidized and go into the slag, which thus becomes rich in oxides of the said metals, and
(i) tapping the finished ferro-alloy through a tap hole beneath the slag surface, except for a melt sump ferro-alloy which is a volume sufficient to fill the space surrounded by the electric induction heating means, and repeating the process by a new addition of a reduction agent.

whereby a pregnant solution containing the desired elements or metals will be formed and allowing said solution to drain



from said container while providing a continuous flow of air into said solution.

4,190,437
LOW THERMAL EXPANSION NICKEL-IRON BASE ALLOY

William J. Boesch, Utica, and Gernant E. Maurer, New Hartford, both of N.Y., assignors to Special Metals Corporation, New Hartford, N.Y.

Continuation-in-part of Ser. No. 858,590, Dec. 8, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,715
Int. Cl.² C22C *38/08, 38/10*
U.S. Cl. 75—122 **14 Claims**

1. An alloy suitable for high temperature service and characterized by low thermal expansion and substantial freedom from notch sensitivity and deleterious microshrinkage, consisting essentially of 30 to 50% nickel, 10 to 20% cobalt, up to 5% columbium, up to 3% tantalum, up to 2.5% titanium, up to 0.1% carbon, up to 2.0% aluminum, 0.06 to 0.3% boron, up to 0.1% zirconium, up to 0.1% rare earth elements, up to 1.0% hafnium, balance essentially iron, the alloy being characterized in containing a eutectic boride.

4,190,436
AIR MIX AGITATION FOR THE EXTRACTION OF METALS FROM LEACHABLE ORES

Robert M. Hughes, 10039 Bristol, Alta Loma, Calif. 91701

Filed Dec. 20, 1977, Ser. No. 862,335
Int. Cl.² C22B *11/08*
U.S. Cl. 75—105 **8 Claims**

1. In the art of cyanidization of ore for the extraction of precious or other metals or elements an improved process for extracting such metals or elements from ore or other material wherein the improvement is comprised of, agitating and oxygenating pulverized ore or material immersed within a cyanide or other leaching solution by introducing timed or regulated bursts of air into a container containing said pulverized ore or material and said cyanide or other solution in a cyclic or regulated manner over a period of time ranging from 10 to 30 hours

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4,190,438
AMORPHOUS MAGNETIC ALLOY

Koichi Aso; Satoru Uedaira; Shigeyasu Ito; Hidemasa Tamura, and Yoshimi Makino, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1978, Ser. No. 940,172
Claims priority, application Japan, Sep. 12, 1977, 52-109746
Int. Cl.² C22C *38/02*
U.S. Cl. 75—123 B **4 Claims**

1. An amorphous magnetic alloy consisting essentially of:
(A) from 2 to 20 atomic % ruthenium;
(B) from 10 to 30 atomic % of at least one amorphous element selected from the group consisting of phosphorus, carbon, silicon, boron, and germanium;
(C) from 0 to 20 atomic % cobalt, nickel, or mixtures of the two, and
(D) the balance being at least 70 atomic % iron.

4,190,439

PROCESS FOR THE PREPARATION OF FINE GRAIN METAL CARBIDE POWDERS AND SINTERED ARTICLES THEREFROM

Frank P. Gortsema, Croton, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 429,269, Dec. 28, 1973, Pat. No. 3,932,594. This application Oct. 21, 1975, Ser. No. 624,401

Int. Cl.[2] B22F *1/00*

U.S. Cl. 75—211 **10 Claims**

1. A process for producing sintered metal carbide articles which comprises the steps of:

(a) impregnating a carbohydrate material with a compound of a metal;

(b) igniting the impregnated material product of step (a) to produce fragile agglomerates of sub-micron size metal oxide particles;

(c) comminuting the metal oxide product of step (b) to produce finely divided metal oxide powder having a mean particle size below one micron;

(d) heating said metal oxide powder in an atmosphere of methane and hydrogen to convert said metal oxide powder to metal carbide powder;

(e) compressing and sintering said metal carbide powder into a shaped article.

4,190,440

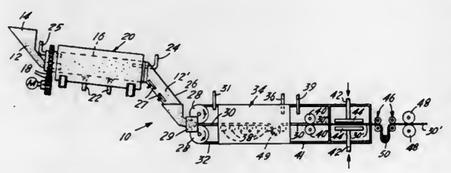
PROCESS FOR FABRICATING STEEL FROM FERROUS METAL PARTICLES

Albert J. Klein, Arlington Heights; Chiou-Tse Chen, Buffalo Grove, and Lou Kohl, Palatine, all of ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 809,794, Jun. 24, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,789

Int. Cl.[2] B22F *3/00, 1/00*

U.S. Cl. 75—211 **54 Claims**



1. A process for producing steel strip comprising:

(a) providing as-water-atomized ferrous metal powder whose particles have a martensitic structure, a surface layer of mostly iron oxide thereon, a particle size distribution range which includes no more than traces of about 20 mesh, no more than about 16 weight percent smaller than 230 mesh and the balance between 20 and 230 mesh and a total oxygen content of up to about 1.5 weight percent;

(b) heating said particles at a temperature between about 900° and 1200° F. for a conditioning period of at least about 10 but no longer than about 30 minutes while simultaneously agitating said particles and continuously flooding them with a controlled reducing atmosphere in sufficient volume to maintain the reducing action throughout said conditioning period to dry the powder particles and to substantially reduce the oxygen content of reducible iron oxides in the surface layer and to reduce the total oxygen content of the powder particles to less than about 0.30 weight percent, thereby obtaining free-flowing, substantially non-agglomerated, un-annealed conditioned, ferrous powder particles having a tempered martensitic structure and a porous, substantially pure ferrite layer thereon;

(c) compacting said heated particles in a controlled reducing or neutral atmosphere to produce a hot compacted strip;

(d) further heating said compacted strip in a controlled reducing or neutral atmosphere to between 1800°–2400° F.;

(e) hot-rolling said heated compacted strip in a controlled neutral or reducing atmosphere; and

(f) cooling said hot-rolled strip to between 200°–400° F. in a controlled reducing or neutral atmosphere.

4,190,441

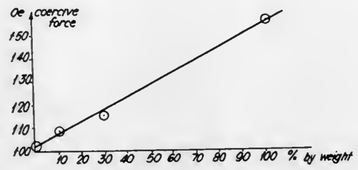
POWDER INTENDED FOR POWDER METALLURGICAL MANUFACTURING OF SOFT MAGNETIC COMPONENTS

Jan R. Tengzelius, Viken, Sweden, and Robert R. Fayles, Moorestown, N.J., assignors to Hoganas AB Fack, Hoganas, Sweden

Filed Mar. 2, 1978, Ser. No. 882,741

Int. Cl.[2] C22C *38/00, 1/04*

U.S. Cl. 75—251 **10 Claims**



1. In an improved composition, for the powder metallurgical manufacture by sintering of soft magnetic components which consists essentially of powdered iron and phosphorus, the latter being present in an amount of up to about 1.5% by weight of said composition, the improvement which comprises: said powdered iron being at least about 99.8% pure and containing less than about 5% by weight of particles exceeding 35 Tyler mesh (417 μm) and less than about 20% by weight of particles less than 100 Tyler mesh (147 μm), the remainder of the particles being in the range between about 35 and 100 Tyler mesh (417 and 147 μm), said phosphorus content and iron particle size distribution being such that on sintering said composition provides components of satisfactory mechanical strength and having soft magnetic properties about as good as or better than the soft magnetic properties of components made of solid iron of comparable purity.

4,190,442

FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,729

Int. Cl.[2] B22F *1/00*

U.S. Cl. 75—252 **8 Claims**

1. A flame spray powder mixture formed of agglomerates of an oxidizable metal separately mixed with a coating metal powder,

the average size of said agglomerates and said coating metal powder ranging from about 20 to 140 microns,

said agglomerates being made up of fine particles of said oxidizable metal of average size less than about 20 microns bound together in a matrix of a fugitive binder,

said oxidizable metal being characterized by a negative free energy of formation of the oxide of at least 30,000 calories per gram atom of oxygen referred to 25° C. and a melting point above 350° C.,

the composition of said powder mixture ranging from about 2% to 15% by weight of said oxidizable metal, with substantially the balance said coating metal powder.

4,190,443

FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 915,938, Jun. 15, 1978. This application Dec. 11, 1978, Ser. No. 967,919

Int. Cl.[2] B22F *1/00*

U.S. Cl. 75—252 **6 Claims**

1. A flame spray powder mixture formed of agglomerates of a metal disilicide and silicon combined together, with said agglomerates mixed with a coating metal powder,

said metal disilicide (MSi_2) and silicon when thermally fused together providing a eutectic phase of the binary MSi_2-Si,

said metal disilicide being at least one selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Re, Mn, and Co, said agglomerates being made of fine particles of said metal disilicide and silicon of average size less than about 20 microns bound together in a matrix of a fugitive binder,

the average size of said agglomerates and said coating metal powder ranging from about 30 to 140 microns,

the composition of said powder mixture ranging from about 2% to 15% by weight of said metal disilicide and sufficient silicon in the range of about 2% to 15% by weight to provide a eutectic phase of said binary MSi_2-Si, with substantially the balance of said flame spray powder mixture being said coating metal powder.

4,190,444

CONTINUOUS CASTING MOLD FLUX POWERS

George F. Carini, Penn Hills, Pa., assignor to The Clay Harden Company, Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,024

Int. Cl.[2] C22B *9/10*; B22D *11/00*

U.S. Cl. 75—257 **7 Claims**

1. In the continuous casting of steel wherein the steel is teemed from a tundish to a continuous casting mold, the improvement comprising introducing to said mold during teeming, a mold flux powder, consisting essentially of, in weight percent, at least three sequentially melting systems,

the first system comprising 10 to 20 percent of one or more glasses having softening point temperatures between 1200° and 2000° F.,

the second system comprising 10 to 20 percent cryolite, optionally mixed with fluorspar in a ratio up to 1, and

the third system comprising 60 to 80 percent of a mixture of flyash and whiting, the weight ratio of flyash to whiting in the mold flux powder being in the range 0.5 to 2,

whereby the fusion point, rate of fusion and fluidity can be tailored to the particular continuous casting process involved.

4,190,445

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEDIA AND PROCESS FOR MANUFACTURING THEREOF

Teruomi Takahashi, Yokohama, and Takehiko Matsuo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 666,778, Mar. 15, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 840,019

Claims priority, application Japan, Mar. 20, 1975, 50-33775

Int. Cl.[2] G03G *13/00, 5/04, 5/08*

U.S. Cl. 430—66 **14 Claims**



1. An electrophotographic photosensitive member which comprises a photoconductive layer composed of a photoconductor dispersed in an insulating organic polymer binder, a clearcoling layer having a thickness of from 0.5 to 10 microns on said photoconductive layer, said clearcoling layer consisting essentially of a water-insoluble organic polymer containing carboxylic acid or sulfonic acid groups and which is water-insoluble when said acid groups are in the acid form and water-dispersible or water-soluble when said acid groups are neutralized with a base, and a smooth-surfaced electrically-insulating layer capable of retaining an electrostatic charge form on said clearcoling layer, said acid groups being not more than five moles per one kilogram of the polymer.

4,190,446

PHOTOCROSSLINKABLE, HIGH-TEMPERATURE-RESISTANT POLYMERS AND THEIR USE IN COLOR IMAGING DEVICES

Thomas W. Martin, Rochester; Mohammad A. Sandhu, Pittsford, and Dennis J. Savage, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1978, Ser. No. 940,057

Int. Cl.[2] G03C *5/00, 1/68*; G03F *5/00*

U.S. Cl. 430—25 **6 Claims**

1. A method of producing a color imaging device, said device comprising:

(a) a semiconductive wafer having a surface comprising:

(i) an array of charge-handling semiconductive photosensors and

(ii) bonding pad areas and

(b) a layer of a polymer superimposed with said surface, wherein said polymer layer:

(i) contains a planar array of filter elements in microregistration with said array of photosensors, wherein each of said elements contains a heat-transferable dye and

(ii) has window areas which correspond with said bonding pad areas, said method comprising the steps of:

(1) coating said surface with a layer of a polymer which is a photocrosslinkable organic solvent-soluble condensation polymer having at least two recurring units and a Tg greater than 200° C., wherein said polymer contains sufficient ethylenically unsaturated, cross-linkable units to render said polymer insoluble in organic solvents on exposure to radiation to which said crosslinkable units are sensitive,

(2) exposing said polymer layer to a pattern of radiation which represents the negative of said bonding pad areas so as to crosslink said polymer layer except in areas corresponding to said bonding pad areas,

(3) contacting said polymer layer with an organic solvent so as to remove said polymer layer in areas corresponding to said bonding pad areas, and

(4) transferring dye into said polymer layer so as to form filter elements in microregistration with said photosensors.

4,190,447

COVER SHEETS FOR INTEGRAL IMAGING RECEIVER ELEMENTS

Michael K. Coil, Fairport, and Robert A. Sylvester, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 867,845, Jan. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,060, Apr. 20, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,403

Int. Cl.[2] G03C *5/54, 1/40, 1/76*

U.S. Cl. 430—214 **18 Claims**

1. In a photographic film unit comprising:

(a) an integral imaging receiver element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image providing material and a dye image receiving layer

containing a dye mordant; and having adjacent to said intergral imaging receiver element;

(b) a cover sheet comprising, in order, starting with the layer adjacent to said integral imaging receiver element, a barrier timing layer, a neutralizing layer for neutralizing an alkaline processing composition and a support; and

(c) an aqueous alkaline processing composition and means for discharging same between said integral imaging receiver element and said cover sheet;

the improvement comprising an alkali permeable hydrophilic layer which is substantially free of dye mordant coated over said barrier timing layer on said cover sheet so as to be between said barrier timing layer and said integral imaging receiver element.

5. The photographic film unit of claim 1 wherein said alkali permeable hydrophilic layer is the outermost layer of said cover sheet and wherein said alkali-permeable hydrophilic layer further comprises a matting agent.

4,190,448

DIFFUSION TRANSFER PHOTOGRAPHIC MATERIAL HAVING A CROSSLINKED CARBOXYLIC ACID POLYMER LAYER

Hidefumi Sera, and Ikutaro Horie, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Oct. 5, 1978, Ser. No. 948,726

Claims priority, application Japan, Oct. 5, 1977, 52-119640

Int. Cl.[2] G03C *1/40, 1/48, 5/54*

U.S. Cl. 430—216 **24 Claims**

1. An element for a diffusion transfer photographic light-sensitive material comprising a synthetic resin film support having thereon an image-receiving layer, a light-sensitive silver halide emulsion layer and a layer of a carboxylic acid polymer wherein the carboxylic acid polymer is cross-linked with a polyhydric alcohol in the presence of a condensation-type cross-linking agent where the amount of said condensation type cross-linking agent is about 0.5 millimol or more per mol of carboxyl groups in the carboxylic acid polymer, with the proviso that the layer of the carboxylic acid polymer is positioned other than between the image-receiving layer and the light-sensitive silver halide emulsion layer.

4,190,449

ANTIADHESIVE PHOTOGRAPHIC MATERIALS AND METHOD OF IMPROVING ANTIADHESIVE PROPERTY OF PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Takashi Naoi, and Ikutaro Horie, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Mar. 24, 1978, Ser. No. 889,799

Claims priority, application Japan, Apr. 5, 1977, 52/39134

Int. Cl.[2] G03C *1/78, 1/96, 1/76, 3/00*

U.S. Cl. 430—539 **5 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer and an outermost layer thereof containing gelatin and colloidal silica prepared by adding potassium hydroxide to an aqueous dispersion of colloidal silica, said aqueous dispersion being a dispersion of microparticles of silicic anhydride having an average particle size of about 7 to 120 mμ and said colloidal silica present in said aqueous dispersion having an SiO_2/Na_2O ratio of about 350 to about 1,200 and wherein the amount of said potassium hydroxide added is such that the colloidal silica has an SiO_2/K_2O ratio of about 50 to about 1,500.

4,190,450

CERAMIC CORES FOR MANUFACTURING HOLLOW METAL CASTINGS

Ronald R. Robb, Dover; Charles Yaker, Summit, and Lamar Burd, Andover, all of N.J., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Nov. 17, 1976, Ser. No. 742,593

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.9 **2 Claims**

1. A ceramic core for use in the casting of hollow metal parts at temperature a in excess of 2000° F. consisting essentially of fused silica in an amount of at least 50% by weight of the core, Cristobalite in an amount within the range of 2.5–35% by weight and the remainder a ceramic material selected from the group consisting of zircon and alumina.

4,190,451

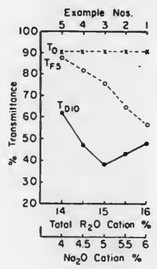
PHOTOCHROMIC GLASS

George B. Hares; David L. Morse; Thomas P. Seward, III, and Dennis W. Smith, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 887,677, Mar. 17, 1978, abandoned. This application Feb. 28, 1979, Ser. No. 14,981

Int. Cl.[2] C03C *3/08, 3/26;* **G02C** *7/10*

U.S. Cl. 106—47 Q **8 Claims**



1. A transparent photochromic glass which, in bodies of 2 mm cross section, will exhibit the following properties:

(a) at about 20° C. will darken to a luminous transmittance below 40% in the presence of actinic radiation; will fade at least 30 percentage units of transmittance after five minutes' removal from the actinic radiation; and will fade to a luminous transmittance in excess of 80% in no more than two hours after being removed from the actinic radiation;

(b) at about 40° C. will darken to a luminous transmittance below 55% in the presence of actinic radiation; will fade at least 25 percentage units of transmittance after five minutes' removal from the actinic radiation; and will fade to a luminous transmittance in excess of 80% in no more than two hours after being removed from the actinic radiation; and

(c) at about −18° C. will not darken to a luminous transmittance below 15% in the presence of actinic radiation;

said glass having a base composition consisting essentially, in weight percent on the oxide basis, of 0–2.5% Li_2O, 0–9% Na_2O, 0–17% K_2O, 0–6% Cs_2O, 8–20% $Li_2O+Na_2O+K_2O+Cs_2O$, 14–23% B_2O_3, 5–25% Al_2O_3, 0–25% P_2O_5, 20–65% SiO_2, 0.004–0.02% CuO, 0.15–0.3% Ag, 0.1–0.25% Cl, and 0.1–0.2% Br, the molar ratio of alkali metal oxide:B_2O_3 ranging between about 0.55–0.85, where the composition is essentially free from divalent metal oxides other than CuO, and the weight ratio Ag:(Cl+Br) ranges about 0.65–0.95.

4,190,452

NEUTRAL BRONZE GLAZINGS

Klaus Fischer, Porz, Fed. Rep. of Germany, and Robert Keul, Cormeilles-en-Parisis, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 637,016, Dec. 2, 1975, Pat. No. 4,101,705. This application Feb. 14, 1978, Ser. No. 877,743

Claims priority, application France, Dec. 3, 1974, 74 39459

Int. Cl.[2] C03C *3/04, 3/08, 3/30*

U.S. Cl. 106—52 **2 Claims**

1. A neutral bronze glass consisting essentially of the following ingredients in percentage by weight:

SiO_2: 60 to 75%
B_2O_3: 0 to 7%
Al_2O_3: 0 to 5%
Na_2O: 10 to 20%
K_2O: 0 to 10%
CaO: 0 to 16%
MgO: 0 to 10%
Fe_2O_3: 0.20 to 0.5%
CoO: 0.0025 to 0%
Se: 0.0025 to 0.0005%

said glass having at a thickness of 3 mm over the range of wavelengths from 400 to 750 nm a luminous transmittance above 70%, an excitation purity between 2% and 6%, a monochromatic transmittance to which the best straight line fit has at 400 nm a value between 5% and 15% lower than its value at 750 nm, and a dominant wavelength between 570–580 nanometers.

4,190,453

CASTING AND MOULDING COMPOSITIONS

Donald N. Hunter, and Lesley J. Wyatt, both of Bognor Regis, England, assignors to Rosemount Engineering Company Limited, England

Filed Apr. 13, 1978, Ser. No. 895,911

Claims priority, application United Kingdom, Apr. 18, 1977, 16035/77

Int. Cl.[2] C04B *19/00*

U.S. Cl. 106—85 **2 Claims**

1. A process for preparing a water free heatsettable casting or moulding composition which process comprises forming a mixture of alumina and a polyvalent metal polyphosphate by precipitating said polyvalent metal polyphosphate from an aqueous solution of an alkali metal polyphosphate in the presence of said alumina by the addition of a water-soluble polyvalent metal salt to said solution, thereafter separating said alumina and said polyvalent metal polyphosphate together from said solution, and drying the mixture of polyvalent metal polyphosphate and alumina.

4,190,454

CEMENT RETARDER AND RAPID HARDENING CEMENT CONTAINING THE SAME

Hirosi Yamagisi; Shozo Sakamaki; Koji Nakagawa, and Minoru Sirasawa, all of Oumi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,163

Claims priority, application Japan, Oct. 20, 1977, 52-126334

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **11 Claims**

1. A rapid hardening cement comprising a cement rapid hardening agent, a cement and a cement retarder and/or water, said cement rapid hardening agent comprising an amorphous calcium aluminate and an inorganic sulfate in an amount of 1 to 3 times by weight as that of said amorphous calcium aluminate, the chemical composition of said amorphous calcium aluminate consisting essentially of 35 to 47% by weight of calcium oxide based on the weight of said amorphous calcium aluminate and the balance of aluminum oxide, said cement retarder comprising 5 to 20% by weight, based on the weight of said retarder, of gluconic acid and/or tartaric acid and/or a water soluble salt thereof, 30 to 10% by weight, based on the weight of said retarder, of citric acid and/or an alkali salt thereof, and 50 to 85% by weight, based on the weight of said retarder, of an alkali carbonate, and said water being added in an amount of 2% or less by weight based on the weight of said cement rapid hardening agent.

4,190,455

PROCESS FOR THE MANUFACTURE OF SHAPED PRODUCTS FROM CALCIUM SULPHATE DIHYDRATE

Jan M. J. M. Bijen, and Peter A. M. Kleinjans, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 900,136, Apr. 26, 1978, abandoned, which is a continuation of Ser. No. 794,928, May 9, 1977, abandoned. This application May 4, 1978, Ser. No. 902,694

Claims priority, application Netherlands, May 8, 1976, 7604948

Int. Cl.[2] C04B *7/02, 11/12*

U.S. Cl. 106—98 **14 Claims**

1. A method for the controlled manufacture of shaped products comprising the steps of forming a mixture of $CaSO_4.2H_2O$, a particulate inorganic material, cement and water and compressing said mixture to form shaped products, wherein said mixture contains hydraulic cement in an amount of between about 8 and 15 percent by weight of the combined dry weight of said $CaSO_4.2H_2O$ and particulate inorganic silicious material, and from about 5 to 50 percent by weight water, and wherein said manufacture is controlled to obtain shaped products having a crushing strength within about 10 percent of the predetermined crushing strength D by selecting S and P in accordance with the formula:

$$D=2.6\times10^3(100-S)^{-1.2}\times P^{0.43}$$

wherein:

D is the predetermined crushing strength in kg/cm^2;

P is the pressure in kg/cm^2 applied to said mixture in forming said shaped article; and

S is the amount of said particulate inorganic silicious material in said mixture expressed as a percent by weight of the dry weight of $CaSO_4.2H_2O$ and particulate inorganic silicious material present in said mixture and wherein S is between about 20 to 70 percent by weight and P is between about 50 and 500 kg/cm^2.

4,190,456

CEMENTITIOUS COMPOSITION CONTAINING ASBESTOS FIBRES AND PREPARED USING A SURFACTANT

Victor J. Absolon, Plaisir, France; George T. Hurst, Newport, Australia; John C. Worboys, Doncaster, Australia; George H. Barnett, North Balwyn, Australia, and Ross P. Dickson, Oakleigh, Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Jun. 27, 1978, Ser. No. 919,548

Claims priority, application Australia, Jul. 1, 1977, 0679/77; Jul. 1, 1977, 0680/77; Jul. 1, 1977, 0681/77

Int. Cl.[2] C04B *31/08*

U.S. Cl. 106—99 **37 Claims**

1. Cementitious compositions containing hydraulic cement and novel asbestos fibres characterized in that the said asbestos fibres have surfactant thereon and are derived from asbestos-bearing material by a process which comprises firstly treating said asbestos-bearing material with a surfactant adsorbable on or reactable with said asbestos fibre to form a dispersion and secondly agglomerating said dispersion.

4,190,457

PREPARATION OF INORGANIC XEROGELS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jun. 9, 1978, Ser. No. 914,258
Int. Cl.² C01B *33/16*
U.S. Cl. 106—122 **31 Claims**

1. A process for preparing an inorganic xerogel which comprises contacting an inorganic hydrogel with a contacting system which comprises at least one organosilicon compound of the formula

$$R_nSiA_{4-n}$$

wherein n is an integer of 2 or 3, wherein each R is a saturated or unsaturated hydrocarbon group and each R can be the same or different and wherein A is selected from the group consisting of hydroxy radicals, halides, and alkoxy radicals in which the alkyl group therein contains from 1 to about 10 carbon atoms; and,

heating the thus contacted inorganic hydrogel at an elevated temperature such that essentially all the liquid components contained therein are removed, wherein the amount of the at least one organosilicon compound employed in the contacting step is an amount sufficient to provide an increase in pore volume of the contacted and heated inorganic hydrogel as compared to the pore volume of the heated inorganic hydrogel not contacted with the organosilicon compound.

4,190,458

METAL-SILICA SOLUTION FOR FORMING FILMS ON SEMICONDUCTOR SURFACES

Raymond DiBugnara, Huntington Beach, Calif., assignor to TRW Inc., Los Angeles, Calif.

Division of Ser. No. 741,793, Nov. 15, 1976, Pat. No. 4,126,713. This application Mar. 27, 1978, Ser. No. 890,810
Int. Cl.² C09K *3/00*
U.S. Cl. 106—287.16 **5 Claims**

1. A partially cross-linked metal chloro-silicate solution for coating semicondutor devices and the like produced by the steps of:

(a) forming a mixture of:

(i) a first alcohol solution of a platinum chloride and a chloride-ion producing cross-linking agent for tetraethylorthosilicate, and

(ii) a second alcohol solution of tetraethylorthosilicate; and

(b) aging said mixture a predetermined length of time so as to form a partially cross-linked tetraethylorthosilicate composition.

4,190,459

PROCESS FOR THE PRODUCTION OF MINERAL FIBER MATS

Rainer Welte, Leverkusen, Fed. Rep. of Germany; Peter Markusch, New Martinsville, W. Va.; Dieter Dieterich, Leverkusen, and Werner Dietrich, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,766
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2728074
Int. Cl.² C04B *31/08, 31/42;* C09K *3/00*
U.S. Cl. 106—287.25 **6 Claims**

1. A process for the production of mineral fiber mats by bonding mineral fibers with binders, wherein an emulsion of water glass and isocyanate which has been prepared in a preceding mixer is used as binder.

4,190,460

SULFUR PLASTICIZATION WITH OLEFINS

Richard D. Cassar, West Chester, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Filed Apr. 3, 1978, Ser. No. 892,815
Int. Cl.² C09K *3/00*
U.S. Cl. 106—287.32 **14 Claims**

1. A process for plasticizing sulfur to obtain a flexible, elastomeric material which consists essentially of adding to sulfur with thorough mixing at a temperature of from about 115° to about 160° C. from about 10% to about 50% by weight of said sulfur a mixture of dicyclopentadiene and an olefinic material selected from the group of (1) an unsaturated bridge-ring hydrocarbon containing at least two double bonds, (2) a cyclic or acyclic di- or triolefinic terpene, and (3) a hydrocarbon where a cyclic diene is fused to an aromatic ring, wherein said bridge-ring hydrocarbon is selected from the group consisting of:

(a) unsaturated derivatives of bicyclo[2.2.1]heptane, containg at least two double bonds,

(b) unsaturated derivatives of bicyclo[2.2.2]octane containing at least two double bonds,

(c) unsaturated derivatives of bicyclo[3.2.1.]octane containing at least two double bonds,

(d) unsaturated derivatives of bicyclo[3.3.1]nonane containing at least two double bonds, and

(e) unsaturated derivatives of bicyclo[3.2.2]nonane containing at least two double bonds;

wherein said cyclic or acyclic di- or triolefin terpene is selected from the group consisting of: dipentene, ψ-limonene, 3,8-p-menthadiene, α- and β-phellandiene, α- and γ-terpinene, terpinolene, isoterpinolene, myrcene, ocimene, alloocimene, p-cymene, α- and β-caryophyllene,

wherein said hydrocarbon with a cyclic diene fused to an aromatic ring is selected from the group consisting of indene, acenaphthalene and azulene, and wherein the weight ratio of said dicyclopentadiene to said olefinic material is from about 25:75 to about 75:25.

4,190,461

METHOD FOR REMOVING METALLIC SEEDS FROM NYLON TUBING USED IN INTERSTITIAL BRACHYTHERAPY

Bruce W. Hedger, Burbank, Calif., assignor to Alpha-Omega Services, Inc., Paramount, Calif.

Filed Mar. 20, 1978, Ser. No. 890,572
Int. Cl.² B08B *3/12*
U.S. Cl. 134—1 **7 Claims**

1. A method for recovering metallic seeds embedded in nylon which comprises the steps:

a. adding nylon with radioactive metallic seeds embedded therein to a solvent in which nylon dissolves to form a mixture comprising dissolved and undissolved nylon, solvent, and metallic seeds; and

b. subjecting the mixture to ultrasonic waves to substantially completely dissolve the nylon in the solvent, thus freeing up the metallic seeds.

4,190,462

DISSOLVING BARIUM SULFATE SCALE WITH AQUEOUS SOLUTIONS OF SALTS OF CARBOXYMETHYL MONOCYCLIC MACROCYCLIC POLYAMINES

Reike De Jong; Gerridina J. Torny-Schutte, and David N. Reinhoudt, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1979, Ser. No. 3,155
Claims priority, application United Kingdom, Jul. 4, 1978, 28757/78
Int. Cl.² B08B *3/08*
U.S. Cl. 134—2 **5 Claims**

1. A process for removing barium sulfate scale from fluid-contactable surfaces in a location into which fluid can be flowed which comprises;

flowing into contact with said surfaces an aqueous solution consisting essentially of water, an effective complexing amount of a monovalent cation salt of a monocyclic macrocyclic polyamine containing at least two nitrogen-linked carboxymethyl groups and enough dissolved monovalent basic compound to provide a solution pH of at least about 8;

said polyamine having an intra-molecular cavity or crypt which is selectively receitive to multivalent cations; and,

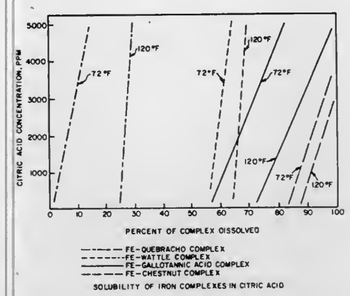
said aqueous solution being both capable of relatively rapidly and extensively dissolving solid barium sulfate and free of any bicyclic macrocyclic polyether.

4,190,463

METHOD OF REMOVING IRON OXIDE DEPOSITS FROM HEAT TRANSFER SURFACES

Roy I. Kaplan, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 5, 1979, Ser. No. 9,563
Int. Cl.² B08B *3/08*
U.S. Cl. 134—3 **6 Claims**



SOLUBILITY OF IRON COMPLEXES IN CITRIC ACID

1. A method for removing iron oxide deposits from heat transfer surfaces which comprises the sequential stepsl

(a) contacting such surfaces with an aqueous solution which contains at least 25 parts per million of a hydrolyzable tanning extract and has a pH of not more than 8.5 for a period of time sufficient to complex with a substantial portion of the iron oxide deposits; and then

(b) removing the complexed deposits formed in step (a) with an aqueous solution having a pH not greater than 4 which contains at least 1000 parts per million of citric acid.

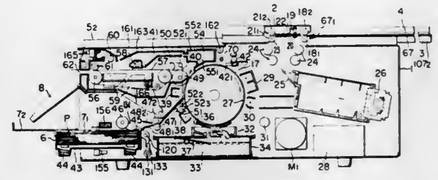
4,190,464

METHOD FOR CLEANING A PHOTOCONDUCTIVE SURFACE WITH LIQUID TONER

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 588,228, Jun. 19, 1975, abandoned, which is a division of Ser. No. 583,247, Jun. 3, 1975, Pat. No. 4,009,955, which is a continuation of Ser. No. 461,104, Apr. 15, 1974, abandoned, which is a continuation of Ser. No. 258,820, Jun. 1, 1972, Pat. No. 3,804,512. This application Dec. 14, 1977, Ser. No. 860,457
Claims priority, application Japan, Jun. 3, 1971, 46-38917; Jun. 3, 1971, 46-38918; Jun. 9, 1971, 46-48632[U]; Jun. 10, 1971, 46-41195; Jun. 10, 1971, 46-41196; Jun. 10, 1971, 46-41197; Jun. 21, 1971, 46-44611; Aug. 30, 1971, 46-6674
Int. Cl.² B08B *3/12, 6/00;* G03G *21/00;* B08B *7/00*
U.S. Cl. 134—6 **29 Claims**

1. A method of operating an electrophotographic machine including a rotatable medium, electrostatic latent image means for forming an electrostatic latent image on said rotatable medium, liquid developer means for applying liquid developer to the electrostatic latent image to form a toner image thereof on said medium, transfer means for transferring the toner image from said rotatable medium to transfer material, cleaning means, including a cleaning blade, contacting said rotatable medium for cleaning same for repetitive use, and means for supplying cleaning liquid to the contact area between said cleaning means and said rotatable medium, said electrostatic latent image means, liquid developer means, transfer means and cleaning means being disposed sequentially along the path of movement of said rotatable medium in the direction of rotation, said method comprising:



(a) supplying, once said machine starts to operate, cleaning liquid onto said contact area for a predetermined period of time while said rotatable medium is maintained in a fixed position; then

(b) rotating said rotatable medium through a predetermined angle while said cleaning means is being operated for wet-cleaning, wherein said angle corresponds to at least one half of a full rotation; and then

(c) enabling said machine to carry out an image-forming operation.

4,190,465

LUMINESCENT SOLAR COLLECTOR STRUCTURE

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 13, 1978, Ser. No. 959,964
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 FC **12 Claims**



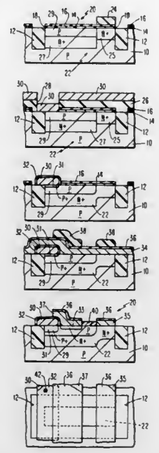
1. A luminescent solar collector having at least two light conducting layers, each layer being physically and optically coupled to the next adjacent layer, one of said at least two layers (1) being relatively thick compared to each of the other of the other said layers and (2) having at least one photocell optically and physically coupled on a minor portion of one of the extended face surfaces thereof, and the other of said at least two layers being luminescent, said relatively thick layer having the highest refractive index of any layer in said collector, said photocell-coupled layer optionally containing a luminescent species which if present has an emission that is absorbed by and activates another luminescent species in another of the layers of said collector, each of the layers of said collector other than the photocell-coupled layer having an index of refraction at least 0.04 less than said relatively thick layer, said relatively thick layer being at least ten (10) times as thick as the sum of all other layers of said luminescent solar collector.

4,190,466

METHOD FOR MAKING A BIPOLAR TRANSISTOR STRUCTURE UTILIZING SELF-PASSIVATING DIFFUSION SOURCES

Arup Bhattacharyya, Essex Center, and Francis W. Wiedman, III, Stowe, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,182
Int. Cl.² H01L *21/265, 21/225, 21/31*
U.S. Cl. 148—1.5 **28 Claims**



1. A method of making a transistor structure in a semiconductor substrate of a given conductivity type having a major surface comprising the steps of:
isolating a region of said semiconductor substrate at said major surface,
forming a collector region of a conductivity type opposite to that of said given conductivity type below and spaced from said major surface so as to define a base region between said collector region and said major surface,
applying a first self-passivating conductive layer to a first portion of said major surface,
passing impurities of said given conductivity type to said first portion of said major surface through said first self-passivating conductive layer to form a contact region in said base region,
forming an insulating layer on the outer surface of said self-passivating conductive layer,
applying a second conductive layer to said insulating layer and to a second portion of said major surface adjacent to said first surface portion, and
passing impurities of said opposite conductivity type through said second conductive layer to said second surface portion adjacent said first surface portion to form within said base region an emitter region spaced within the thickness of said insulating layer from said first surface portion.

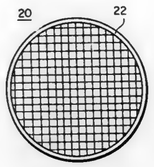
4,190,467

SEMICONDUCTOR DEVICE PRODUCTION

Suei-Yuen P. Lien, West Windsor Township; Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 970,031
Int. Cl.² H01L *21/225*
U.S. Cl. 148—1.5 **5 Claims**

1. A method of processing a semiconductor wafer by thermal gradient zone melting, comprising:
selecting a suitable semiconductor wafer to be processed,
depositing a metal suitable for thermal migration through said semiconductor wafer in a desired pattern on a first surface of said wafer,
said metal pattern including a layer of metal around the periphery of said first surface of said wafer adjacent the edge of said wafer, and



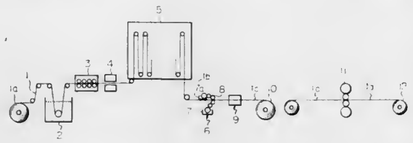
heating the wafer so as to cause the metal of said pattern to melt and to cause the thermal gradient migration through said semiconductor wafer in the directon of the second surface of said wafer.

4,190,468

PROCESS FOR COATING AN ELECTRICAL STEEL SHEET WITH AN ANTI-STICKING LAYER

Minoru Kitayama, and Motoharu Nakamura, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,508
Claims priority, application Japan, Aug. 15, 1977, 52-97632
Int. Cl.² C21D *1/18, 1/26, 1/78*
U.S. Cl. 148—12 A **5 Claims**



1. A process for producing an electrical steel sheet coated with an anti-sticking layer, comprising the steps of:
continuously annealing an electrical steel sheet;
applying, onto at least one surface of said annealed sheet, a coating liquid which consists essentially of at least one colloidal inorganic substance selected from the group consisting of colloidal silica, alumina sol, colloidal titanium oxide, colloidal lithium silicate and colloidal artificial mica, and which is in an amount sufficient enough for forming a dry anti-sticking layer having a weight of 0.02 to 0.8 g per m^2 of said surface, while said annealed sheet is kept at a temperature of from 50° to 150° C.;
drying said applied coating liquid on said surface by utilizing the heat remaining in said annealed sheet, and
temper-rolling said dried sheet at a reduction of 0.2 to 10 percent.

4,190,469

METHOD FOR FORMING FORSTERITE INSULATING FILM ON AN ORIENTED SILICON STEEL SHEET

Toshio Ichida; Michiro Komatsubara, both of Chiba, and Hiroshi Shimanaka, Funabashi, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 956,912
Claims priority, application Japan, Nov. 9, 1977, 52-133543
Int. Cl.² H01F *1/04*
U.S. Cl. 148—113 **3 Claims**

1. In a method for forming forsterite insulating film having a high adhesion on an oriented silicon steel sheet, wherein a water slurry containing an annealing separator consisting essentially of magnesia and a CaO impurity, is applied on surfaces of an oriented silicon steel sheet, and then the silicon steel applied with said water slurry is dried, the coated silicon steel sheet is wound up into a coil and annealed at high temperatures to form forsterite films, the improvement comprising adjusting the content (Xg/l m^2 of both surfaces of the steel sheet) of water carried together with the annealing separator into the coil depending upon the content (Yg/l m^2 of both surfaces of the steel sheet) of CaO carried into the coil so as to satisfy the following formula

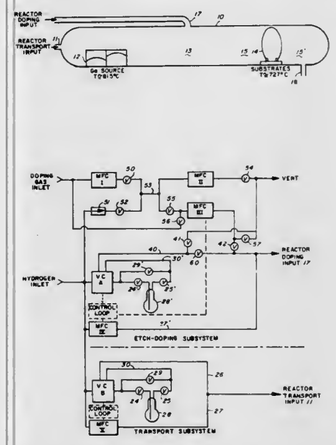
$$(1.25X)^2+(10Y)^2 \leqq 1.$$

4,190,470

PRODUCTION OF EPITAXIAL LAYERS BY VAPOR DEPOSITION UTILIZING DYNAMICALLY ADJUSTED FLOW RATES AND GAS PHASE CONCENTRATIONS

Robert E. Walline, Bedford, Mass., assignor to M/A COM, Inc., Burlington, Mass.

Filed Nov. 6, 1978, Ser. No. 958,207
Int. Cl.² H01L *21/205, 21/66*
U.S. Cl. 148—175 **28 Claims**



1. A method of producing an epitaxial layer of a compound comprising a first material selected from the group consisting of boron, aluminum, gallium, indium and mixtures thereof and a second material selected from the group consisting of phosphorus, arsenic, antimony and mixtures thereof, said method comprising,
passing a carrier gas flow through a liquid halide of said second material to obtain a first vapor containing a halogen, carrier gas and second material as a raw reactor input vapor, while monitoring said carrier gas flow and adjusting it to obtain a predetermined mass of halogen and second material in said raw vapor,
and forming a final reactor input vapor while maintaining a constant flow rate of said final vapor at a constant concentration of second material by monitoring the total volume of carrier gas in said raw vapor as added per unit of time and adjusting said raw vapor by adding a volume of additional carrier gas to form said final vapor,
passing said final vapor to a source of said first material in a reactor where a reaction takes place, passing the products of said reaction to a seed crystal and depositing said epitaxial layer on said seed crystal.

4,190,471

PYROTECHNIC DISSEMINATING FORMULATIONS

James P. Flynn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1969, Ser. No. 853,609
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.6 **6 Claims**

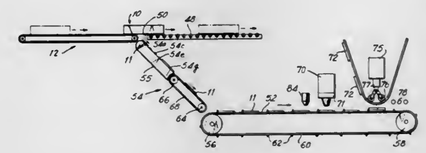
1. A composition comprising by weight:
(a) from about 40 to about 60% of a psychotomimetic agent,
(b) from about 15 to about 40% of a nitrate, chlorate or perchlorate oxidizer, and
(c) from about 15 to about 40% of a cross-linked organic polymeric binder comprising an aliphatic sulfur-containing organic compound having a plurality of mercapto groups (—SH) in the molecule, and a curing agent selected from the group of trifunctional tris[2(1-aziridinyl)ethyl]benzene tricarboxylates or an aliphatic sulfur-containing epoxy resin having a functionality of at least about 1.5, said binder comprising sufficient quantities of the components thereof so that the ratio of mercapto group equivalents to reactive group equivalents of the curing agent is from about 0.6 to about 1.4.

4,190,472

AUTOMATED SYSTEM FOR THE APPLICATION OF COVERGLASSES ON HISTOLOGICAL AND CYTOLOGICAL SLIDES

Alex Slonicki, 86 Bacon St., Winchester, Mass. 01890

Filed Sep. 28, 1977, Ser. No. 837,642
Int. Cl.² A65C *9/08;* **A01N** *1/00*
U.S. Cl. 156—57 **9 Claims**



1. A process for finishing stained glass slides comprising the steps of: inserting stained slides into pivotable slide holders elements in a rack, moving said rack over an opening in a rack support and discharging a respective inserted stained slide from said rack through an opening in the bottom of said rack by pivoting said slide holder elements, said slide holder elements for said respective inserted slide overlying said rack support opening, said respective slide dropping onto a conveying means; repeating said steps of moving said rack and discharging a respective slide; transporting said slides on said conveying means in a direction away from said rack; depositing glue onto said slides while on said conveying means after being transported away from said rack; and applying a cover glass to each of said slides while on said conveying means so that each cover glass adheres to each slide by means of said glue.

7. A system for processing and finishing stained glass slides comprising:
(a) a staining rack for receiving stained slides and including slide holder elements movable in unison from a first position inclined at a first angle from the vertical to a second position inclined at a second angle from the vertical and means for discharging the stained slides therefrom;
(b) conveying means for receiving the discharged stained slides from said staining rack, and for transporting the stained slides in a direction away from said staining rack said conveying means comprising:
a rack support formed with an opening, said staining rack being movable across said opening, said slide holder elements being in one of said first and second positions, the rack opening being sufficiently wide for a slide inserted into the staining rack slide holder elements to

drop therethrough; a first propelling means disposed below said rack; and

a second propelling means having an inclined position and being placeable in the vicinity of said rack and of said first propelling means, whereby the dropped slide lands on said second propelling means, and is pushed by the latter onto said first propelling means being movable at a predetermined velocity and

(c) a slide finishing station cooperating with said conveying means, said slide finishing station including means for depositing glue onto the stained slide, the stained slide carrying the glue, and means for applying a cover glass to the glue-carrying slide.

4,190,473

PROCESS FOR ACCELERATING THE HARDENING OF JOINTS GLUED WITH CRYSTALLINE HARDENING ADHESIVES

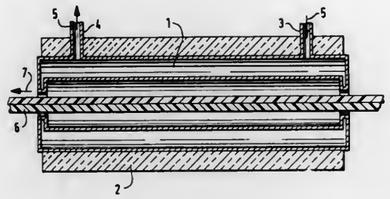
Erhard Soecknick, Düsseldorf, and Erich Weimar, Viersen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,361

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659502

Int. Cl.² B29C *25/00*

U.S. Cl. 156—80 **4 Claims**



1. In a process for accelerating the hardening and improving the strength of joints glued with crystalline hardening adhesives, according to which the materials to be joined are coated with an adhesive and heated for the purpose of driving off the thinner and joined together, the improvement being rapidly cooling the freshly glued heated joint after the materials are heated and joined together by means of a low boiling liquified gas by passing the glued joint through the passageway of a tunnel having a heat exchange jacket with a chilling medium inlet and outlet therefore and feeding the low boiling liquified gas into the inlet for obtaining a temperature of −30° C. to −50° C. at the tunnel entrance, and obtaining a final adhesion upon the joint leaving the device in which it is shockwise cooled and rewarmed to ambient temperature with the shockwise cooling accelerating the crystalline hardening and thereby maximizing the strength of the joint in a minimal time.

4,190,474

METHOD OF MAKING A PRINTED CIRCUIT BOARD HAVING MUTUALLY ETCHABLE COPPER AND NICKEL LAYERS

Betty L. Berdan, and Betty M. Luce, both of Willowick, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 22, 1977, Ser. No. 863,109

Int. Cl.² C25D *1/00*

U.S. Cl. 156—151 **5 Claims**

1. A method of producing a readily etchable printed circuit board including a resinous substrate and a sheet of copper foil having a nickel barrier layer deposited on one surface thereof with the opposite surface of said nickel layer being bonded to said resinous substrate which comprises:

providing a sheet of copper foil,

depositing a layer of nickel on a surface of said sheet of copper foil in which said nickel layer contains an effective amount of sulfur to render said copper foil and said nickel barrier layer mutually etchable, and

bonding the exposed surface of said nickel barrier layer to said resinous substrate.

4,190,475

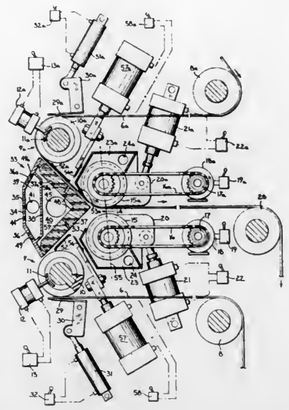
PAPER ROLL WEB SPLICING

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed May 16, 1978, Ser. No. 906,592

Int. Cl.² B65H *19/08*

U.S. Cl. 156—157 **22 Claims**



1. For use in a machine for utilizing a traveling continuous web of paper or the like and wherein a plurality of supply rolls are provided so that when the web of one roll is nearly exhausted, the fresh web of a new roll can be substituted therefor, apparatus comprising:

(a) a frame,

(b) A splicing mechanism on said frame and with said mechanism including:

(1) a pair of spaced input idler rolls for receiving webs from the supply rolls,

(2) and a pair of normally spaced nip rolls disposed downstream of said idler rolls and forming a splicing nip therebetween through which running web normally passes,

(c) an elongated paper preparation head disposed between said idler rolls and extending rearwardly toward said nip rolls,

(d) first means associated with the front portion of said head for securely holding the leading end portion of a fresh web to the head for preparation by cut-off and application of adhesive to the outer face of the web edge portion,

(e) and second means associated with a rearwardly extending portion of said head for pressurizingly forcing a prepared fresh web being threaded along said rearwardly extending head portion away from the latter to prevent engagement by the adhesive on said web edge portion with said rearwardly extending head portion.

18. For use in a machine for utilizing a traveling continuous web of paper or the like and wherein a plurality of supply rolls are provided so that when the web of one roll is nearly exhausted, the fresh web of a new roll can be substituted therefor, apparatus comprising:

(a) a frame,

(b) a splicing mechanism on said frame and with said mechanism including:

(1) a pair of spaced input idler rolls for receiving webs from the supply rolls,

(2) and a pair of normally spaced nip rolls disposed downstream of said idler rolls and forming a splicing nip

therebetween through which running web normally passes,

(c) an elongated paper preparation head disposed between said idler rolls and extending rearwardly toward said nip rolls,

(d) a flexible clamping spring disposed adjacent each said input idler roll upstream from said head and adapted to clamp a running expiring web against its adjacent idler roll,

(e) a high friction surface on each said idler roll,

(f) and means to brake the said adjacent idler roll so that said expiring web is braked therewith to a stop.

4,190,476

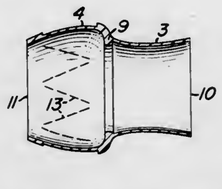
PROCESS OF FORMING A PROJECTILE BY FOLDING A RESILIENT TUBULAR MEMBER AND FILLING SAME WITH PAYLOAD

Abraham Flatau, 2003 Stockton Rd., Joppa, Md. 21085; Donald N. Olson, 38 Atherton Rd., Lutherville, Md. 21093, and Miles C. Miller, 504 Haverhill Rd., Joppa, Md. 21085

Division of Ser. No. 422,493, Dec. 6, 1973, Pat. No. 3,951,070, which is a continuation-in-part of Ser. No. 310,626, Nov. 29, 1972, Pat. No. 3,898,932. This application Jan. 12, 1976, Ser. No. 648,240

Int. Cl.² B29C *17/02*; F42B *13/12*

U.S. Cl. 156—218 **5 Claims**



1. A process of making a projectile comprising the steps of: forming a resilient structure into a substantial tubular annular shape with a outer wall portion and an inner wall portion located along the tubular extent thereof with a foldable portion therebetween and folding same thereat for defining a payload carrying portion; filling said payload within said carrying portion and closing the fill area.

4,190,477

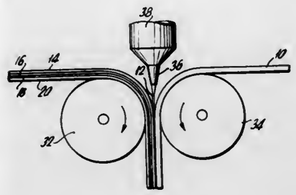
POUCH

William F. Ossian, Appleton; Thomas S. Wildenberg, Kimberly, both of Wis., and Henry Warmbier, New Hope, Minn., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 866,928, Jan. 4, 1978. This application May 1, 1978, Ser. No. 901,644

Int. Cl.² B29B *3/00*

U.S. Cl. 156—244.11 **5 Claims**



1. A method of making a multiply laminated structure comprising an inside sealing layer containing polypropylene and an outer metal foil layer, which method comprises:

(a) applying a primer layer to said metal foil, said primer layer being a graft copolymer of maleic anhydride and propylene wherein the maleic anhydride moieties are grafted onto a polypropylene backbone;

(b) drawing said primed metal foil laminate and said sealing layer in face-to-face relation into the nip defined by a pair of rollers; and

(c) simultaneously drawing a hot layer of extrusion grade polypropylene into said nip between said sealing layer and primer layer to thereby laminate said sealing layer to said primer layer.

4,190,478

PROCESS AND APPARATUS FOR PRODUCTION OF FACED OR LAMINATED SHEETS

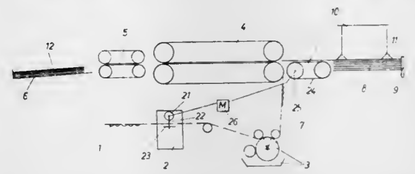
Ralf Meisenberg, Düren-Birkesdorf, Fed. Rep. of Germany, assignor to O. Dorries GmbH, Düren, Fed. Rep. of Germany

Filed Oct. 27, 1978, Ser. No. 955,642

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748675

Int. Cl.² B32B *31/00*

U.S. Cl. 156—252 **31 Claims**



1. A process for producing faced sheets, comprising the steps of:

providing an elongated carrier web having lines of perforations that extend transversely to the direction of travel of the carrier web;

mounting a plurality of covering sheets in series to the carrier web, with each covering sheet being mounted to the carrier web and with each covering sheet having a leading edge facing in the direction of travel of the carrier web and having a trailing edge facing in the opposite direction;

then tearing off a section of the carrier web along a line of perforations and with the respective covering sheet being on the torn off section of the carrier web; the covering sheets being so placed that at least one of the leading and trailing edges of each covering sheet projects beyond the adjacent line of perforations on the separated section of the carrier web.

4,190,479

METHOD OF PRODUCING A JOINT CAPABLE OF TRANSMITTING HIGH TORQUE

Derek R. Smith, Bristol, England, assignor to Union Carbide Corporation, New York, N.Y.

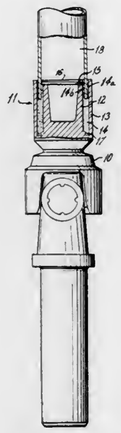
Continuation of Ser. No. 753,819, Dec. 23, 1976, abandoned. This application Oct. 24, 1978, Ser. No. 954,112

Int. Cl.² B32B *1/08, 1/02*

U.S. Cl. 156—294 **16 Claims**

1. A process for securely bonding a tubular shaft to an end fitting provided with a mating section having two concentric cylindrical walls which describe an annular cavity adapted to receive the tubular shaft therein to produce an assembly wherein the shaft and end fitting are in axial alignment and which is capable of transmitting high torque which comprises: (1) fitting an annular groove positioned near the top of the inner cylindrical wall of the mating section of the end fitting with a resilient sealing ring having an inner diameter such that it is retained in place by the groove and an outer diameter greater than that of the outer diameter of said inner cylindrical wall, said sealing ring being designed to fit snugly into the tubular shaft and form a tight fit between said inner cylindrical wall and the shaft; (2) filling the annular cavity between the

inner and outer cylindrical walls of the mating section of the end fitting with a suitable liquid bonding agent; (3) inserting one end of the tubular shaft into the annular cavity between the inner and outer cylindrical walls of the mating section of the end fitting so as to compress the resilient sealing ring at the top of the inner cylindrical wall snugly between said inner cylindrical wall and the inner circumference of the tubular shaft and effect a seal therebetween; (4) further inserting the tubular shaft into the annular cavity between the inner and outer cylindrical walls of the mating section of the end fitting, thereby displacing excess bonding agent present in the annular cavity and causing said excess bonding agent to flow out of said annular cavity via the space between the outer circumference of the tubular shaft and the inner circumference of the outer cylindrical wall of the mating section; (5) continuing to insert the tubular shaft into the annular cavity between the inner and



outer cylindrical walls of the mating section of the end fitting until said tubular shaft has been forced into place over an annular shoulder positioned near the base of the inner cylindrical wall, said annular shoulder having an outer diameter greater than that of the outer diameter of said inner cylindrical wall and being designed to fit snugly into the tubular shaft and form a tight fit between said inner cylindrical wall and the inner circumference of said tubular shaft; and (6) curing said bonding agent to the thermoset state so as to bond the shaft and the mating section of the end fitting together in axial alignment, there being present a spacing between the outer circumference of the shaft and the inner circumference of the outer cylindrical wall of the mating section of the end fitting as well as between the inner circumference of the shaft and the outer circumference of the inner cylindrical wall of the mating section of the end fitting.

4,190,480
SUPPORT FOR DEFORMABLE ARTICLES AND METHOD OF MAKING THE SAME
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226
Continuation-in-part of Ser. No. 752,609, Dec. 20, 1976, Pat. No. 4,104,508. This application May 22, 1978, Ser. No. 908,208
Int. Cl.[2] B32B *3/02*
U.S. Cl. 156—296 **10 Claims**

1. The method of making a support carpet for supporting heat softening articles in a stream of heat, comprising the following steps in the sequence set forth:

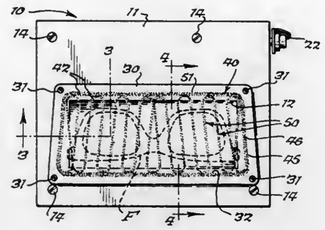
providing a woven tape having lengthwise warp strands and crosswise woof strands;

winding said tape on a form having a multiplicity of projecting pegs to form a zig zag course to provide alternate rows of said tape with alternate spaces between, with a first selvage edge projecting beyond the ends of said pegs and the second selvage edge at the base of said pegs;

impregnating said first edge with a bonding material;

allowing said bonding material to set;

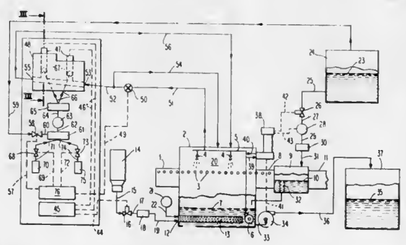
removing said bonded tape from said form;



cutting said woof strands at the second selvage edge;

and stripping off several of said warp strands to leave said woof strands individually free, one from the other, at said second edge, while said woof strands and warp strands are bonded at said first selvage edge.

4,190,481
APPARATUS FOR ION CONTROL OF SOLUTIONS
Daniel L. Goffredo, Riverton, N.J., assignor to Chemcut Corporation, State College, Pa.
Filed Dec. 30, 1977, Ser. No. 865,859
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—345 **18 Claims**



1. In an apparatus for etching or otherwise chemically treating articles with treatment solution, wherein chamber means is provided for treating articles therein, wherein delivering means is provided for delivering treatment solution to articles in said chamber means, wherein detecting means of the sensor cell type is provided, connected to said delivering means for sampling treatment solution for detecting the ion concentration of the treatment solution, wherein compensation means are provided for adding an ion-corrective fluid to the treatment solution in said delivering means, and wherein regulator means are connected to said sensor cell means for receiving an indication of ion concentration therefrom, and connected to said compensation means for controlling the amount of ion-corrective fluid being added to said delivering means, the improvement comprising:

(a) cleaning liquid supply means;

(b) means connecting said cleaning liquid supply means to said sensor cell means for delivery of cleaning liquid thereto;

(c) calibration liquid supply means; and

(d) means connecting said calibration liquid supply means to said sensor cell means for delivery to said sensor cell means of a calibration solution of known ion concentration.

13. In an apparatus for etching or otherwise chemically treating articles with treatment solution, wherein treatment solution is periodically sampled in a sensor cell for detecting the ion concentration of the solution, the improvement comprising said sensor cell having an inlet and outlet for treatment fluid, a conduit in said cell interconnecting said inlet and outlet; at least two electrodes carried by said cell; each said electrode having a solution-contacting portion extending internally of said cell in communication with said conduit; and said cell being of substantially transparent construction.

4,190,482
TIRE BUILDING APPARATUS
Toshinori Yabe, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 9, 1978, Ser. No. 905,039
Claims priority, application Japan, May 13, 1977, 52/55875
Int. Cl.[2] B29H *17/22*
U.S. Cl. 156—403 **4 Claims**



1. A tire building apparatus comprising in combination:

a tire building drum, including:

a cylindrical tire building drum body form so as to be radially expansible and contractable and so as to be rotatable around a rotary axis thereof and having two axial ends, and

a pair of bead applying mechanisms disposed in close proximity of both axial ends of said tire building drum body to be rotatable together with said tire building drum body, and said mechanims being formed so as to be radially expansible and contractable; and a transfer ring, including:

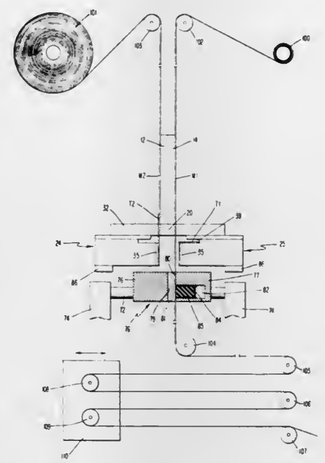
an annular frame movable toward and away from a position where said annular frame surrounds said tire building drum,

a tire component carrying mechanism having a plurality of tire component carrying members radially movably mounted on said annular frame and being capable of carrying a tire component in concentrical relation with said rotary axis of said tire building drum body to mount said tire component on and around said tire building drum, and

a pair of bead carrying mechanisms mounted on said annular frame to be disposed at both axial ends of said tire component carrying mechanism in spaced relation with each other, each of said bead carrying mechanims having a plurality of bead carrying members which is made radially movable to carry beads in concentrical relation with said tire building drum body, said bead carrying mechanism being movable toward and away from a position in which said carrying mechanisms respectively surround said bead applying mechanisms and being capable of setting beads on said tire component in cooperation with said bead applying mechanism while said annular frame surrounds said tire building drum.

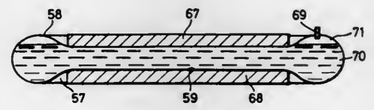
4,190,483
BUTT SPLICER
Ralph L. Ryan, East Hanover, and Charles M. Taitel, Parsippany, both of N.J., assignors to Compensating Tension Controls, Inc., West Caldwell, N.J.
Continuation of Ser. No. 777,586, Mar. 15, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 915,880
Int. Cl.[2] B65H *21/00*
U.S. Cl. 156—504 **7 Claims**

1. Apparatus for butt splicing the end of a supply web to a running web including stationary knife means having a pair of spaced knife edges; first and second moveable knife members each selectively cooperating with a respective one of said knife edges to sever said running web; means on said stationary knife means for holding the end of said supply web at either of said knife edges, the running web being positioned on the opposite side of said stationary knife means from the supply web and between the knife edge and the moveable knife member cooperating therewith; each of said knife members including a leading surface, means on each said surface for holding the lower portion of a strip of adhesive tape, and means providing a recess adjacent each said leading surface for receiving the upper portion of a strip of tape carried by the moveable knife which is adjacent the running web; means for moving the moveable knife member adjacent the supply web into a ready position where the leading surface thereof is aligned with the



end of the supply web and holds the end of a strip of tape which is affixed to the end of the supply web, and means for moving said knife member adjacent to the running web toward the other knife member so that the running web is cut and the leading surfaces act against each other to press the two tape strips to opposite sides of the web ends, each said recess being formed to keep the upper portion of the tape strip out of contact with the web ends during the splicing operation until it is drawn from the recess by movement of the spliced web.

4,190,484
PRESS FOR PRODUCING SHAPED ARTICLES
Andreas P. I. Pohl, Munich, Fed. Rep. of Germany, assignor to Rembert Duvelius and Rudiger Graf Von Stosch, both of, Fed. Rep. of Germany
Division of Ser. No. 733,193, Oct. 18, 1976, Pat. No. 4,080,243. This application Sep. 28, 1977, Ser. No. 837,176
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1975, 2546944; Aug. 10, 1976, 2635924
Int. Cl.[2] B32B *31/00;* **B30B** *1/23*
U.S. Cl. 156—580 **7 Claims**



1. A press to apply pressure to a three dimensional shaped article which comprises:

(a) a first horizontal pressing plate and a second horizontal pressing plate facing each other with a nip therebetween;

(b) a flexible hollow member disposed against said first horizontal pressing plate on the side opposite said nip, said flexible hollow member being a part of a closed system containing a pressure medium and means for regulating

the pressure of said pressure medium said flexible hollow member being formed from non-stretchable metal sheets;

(c) an inflexible support behind said flexible hollow member, whereby upon a change of the pressure of said pressure medium, said first horizontal pressing plate is caused to move relative to said second horizontal pressing plate; and

(d) a flexible hollow member marginal zone projecting beyond all sides of said first horizontal pressing plate and inflexible support and forming a hollow space which is larger than the remainder of said flexible hollow member in contact with said first pressure plate and inflexible support;

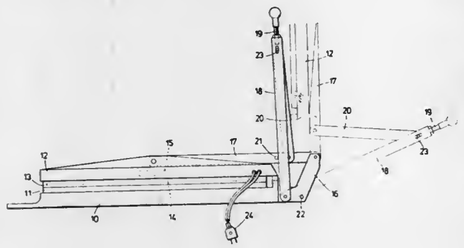
wherein said flexible hollow member takes the form of a large-area pressure cushion bearing against the pressure plate, wherein the marginal zones of the pressure cushion can move freely and are subjected to exclusively tensile stressing when the press makes its stroke, that the pressure and upsetting lines at the corners of the pressure cushion which are defined by the movement of the wall zones occuring during the pressing and release of the pressure cushion are interrupted by a geometrical change in the cross-section of the closed system.

4,190,485

METHOD OF WELDING A THERMOSHRINKABLE SHEET AND A DEVICE FOR USE IN THE METHOD

Kazutoki Takeda, Mito; Yasuo Negishi, Yokohama, and Yutaka Hibino, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1977, Ser. No. 846,505
Claims priority, application Japan, Nov. 5, 1976, 51/133349
Int. Cl.[2] B30B *15/34;* B32B *31/00*
U.S. Cl. 156—583.9 **3 Claims**



1. A device for use in welding overlapping ends of a synthetic resin sheet, which comprises:

a base;

a bracket extending upwardly from the rear end of the base;

a receiving plate fixedly mounted on the base;

an openable board with a thermosensitive element incorporated therein;

a pressing plate secured to the openable board having a heater incorporated therein;

a first link pivotally connected at one end of the upper end of the bracket and the other end to the openable board;

an operation lever pivotally connected at one end to the lower end of the bracket;

a second link pivotally connected at one end to the free end portion of the operation lever and at the other end to the first link;

whereby the operation lever, and the first and second links constitute a power amplifier mechanism when the pressing plate is pressed against the receiving plate on which the overlapping ends of the sheet are placed while the cylindrical materials are placed under the base; and

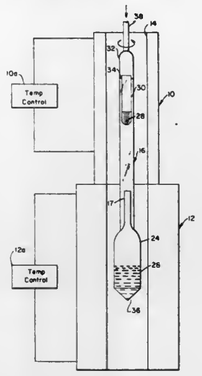
an adjustment means for adjusting the toggle linkage which comprises a thumb screw threaded into the free end of the operation lever, and a pivot serving as a fulcrum of the second link, the pivot being inserted into a slot provided adjacent the free end of the operation lever so that the end of the thumb screw abuts the end of the second link.

4,190,486

METHOD FOR OBTAINING OPTICALLY CLEAR, HIGH RESISTIVITY II-VI, III-V, AND IV-VI COMPOUNDS BY HEAT TREATMENT

Nanse R. Kyle, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 403,577, Oct. 4, 1973, abandoned. This application Mar. 8, 1977, Ser. No. 775,667
Int. Cl.[2] B01J *17/36*
U.S. Cl. 156—601 **26 Claims**



26. A method for heat treating a II-VI, III-V and IV-VI compound comprising the step of separately applied coordinated decreasing of overpressure of one compound constituent with lowering of compound temperature within the pressure-temperature region corresponding to the area of the pressure-temperature phase diagram of the compound bounded by the line of constituent minimum pressure and the line of compound stoichiometry.

4,190,487

REACTIVE ATMOSPHERE PROCESSING METHOD OF CRYSTAL GROWTH OF ALKALINE EARTH CHLORIDES

Ricardo C. Pastor, Manhattan Beach, and Antonio C. Pastor, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 645,151, Dec. 30, 1975, abandoned. This application Feb. 21, 1978, Ser. No. 879,551
Int. Cl.[2] B01J *17/08, 17/18;* C01B *9/02*
U.S. Cl. 156—617 SP **11 Claims**

1. A process for growing ultra-pure large single crystals of alkaline earth metal chlorides comprising the steps of:

(a) charging a crystal growth crucible with an alkaline earth metal chloride,

(b) raising the temperature of said crucible to render said charge molten by placing said crucible in a furnace,

(c) passing a mixture of an inert carrier gas and vapors from a carbonaceous chloride selected from the group consisting of CF_3Cl, CH_3Cl, CH_2Cl_2, $C_6H_5CH_2Cl$, and mixtures thereof having a pyrolytic decay constant between 0.9×10^{-2} and 10^{-1} seconds^{-1} at the melting point of said metal chloride through said crucible at a preselected flow rate, and thereby causing a reactive atmosphere containing nascent chlorine to be created,

(d) creating a temperature gradient across said crucible by passing a coolant through one end of said crucible thereby lowering the temperature of said charge and initiating a recrystallization of said molten charge,

(e) slowly pulling a single crystal from said molten melt in Bridgman-Stockbarger style until all of said crystal has been removed from the hot zone of said furnace, and

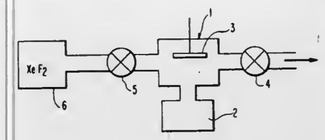
(f) maintaining a steady purge of said gaseous mixture over said crystal while causing said crystal to cool from its recrystallization temperature at a preselected cooling rate for a period of four hours prior to allowing said crystal to cool to ambient temperatures in the presence of said gaseous purge.

4,190,488

ETCHING METHOD USING NOBLE GAS HALIDES

Harold F. Winters, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1978, Ser. No. 934,731
Int. Cl.[2] C23F *1/00;* H01L *21/306*
U.S. Cl. 156—643 **16 Claims**



1. A method for etching a surface comprising exposing the surface to be etched to at least one noble gas halide for a sufficient time to etch said surface to the desired extent.

4,190,489

GOLD ETCHANT COMPOSITION AND METHOD

Surinder K. Bahl, and Gale L. Leach, both of Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 21, 1978, Ser. No. 944,631
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—664 **8 Claims**

4. A method of etching a gold layer from a substrate material comprising the steps of contacting said gold layer with an aqueous solution comprising a mixture of an alkali metal bromide and bromine for a time sufficient to etch away said gold layer.

4,190,490

IMPREGNATION AND DIGESTION OF WOOD CHIPS

George H. Tomlinson, II, Ile Perrot, Canada, assignor to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 457,453, Apr. 3, 1974, abandoned. This application May 1, 1975, Ser. No. 573,558
Int. Cl.[2] D21C *1/02, 3/22*
U.S. Cl. 162—19 **10 Claims**

1. A method of digesting small chips to produce a chemical wood pulp comprising; presteaming said chips in a presteamer, continuously introducing said presteamed chips and a chemical-containing impregnation liquor into an impregnation zone in an impregnator to form a mixture consisting essentially of all of said chips and impregnation liquor in said impregnator, said mixture having a consistency of less than 10%, said liquor in said mixture containing a substantial excess of said chemical over that required for subsequent digestion of the chips, continuously passing said mixture through said impregnation zone, agitating said mixture substantially throughout said zone during passage of said mixture through said zone thereby to maintain said consistency substantially constant whereby residence time of said chips in said impregnation zone is substantially uniform, continuously withdrawing said mixture from said impregnator after passage through said zone, removing said chips, impregnated with sufficient chemical for subsequent digestion, from excess impregnation liquor, returning at least a portion of said excess liquor to said impregnation zone together with a fortifying amount of cooking chemical, introducing said separated impregnated chips into a cooking zone and digesting said impregnated chips in said cooking zone.

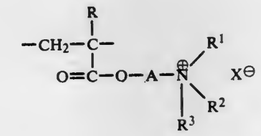
4,190,491

PROCESS FOR CONTROLLING PITCH IN PAPERMAKING

Thomas J. Drennen, Lafayette Hills, and Robert A. Gill, Abington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 710,823, Aug. 2, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,537
Int. Cl.[2] D21C *9/08*
U.S. Cl. 162—76 **6 Claims**

1. A process for controlling pitch in papermaking comprising the step of incorporating in a pitch-containing paper pulp slurry about 0.01 to 0.05% by weight based on pulp solids of a water-soluble, linear cationic polymer comprised of units of the formula:



wherein

A is a (C_2–C_3) alkylene group,

R is H or CH_3;

R^1 is a hydroxyethyl or hydroxypropyl group,

R^2 is a (C_1–C_4) alkyl group,

R^3 is a (C_1–C_4) alkyl group, and

X is an anion;

said polymer having a viscosity average molecular weight of about 35,000 to 70,000.

4,190,492

METHOD OF PRODUCING ACOUSTICAL FIBERBOARD

Lewis W. Eckert, and Olivia D. Stewart, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 21, 1977, Ser. No. 862,845
Int. Cl.[2] D21H *5/18*
U.S. Cl. 162—145 **4 Claims**

1. A method for increasing the sound absorption of a conventional acoustical fiberboard of the type produced by removing water from an aqueous fiberboard slurry comprising mineral wool fibers and a binder, the improvement comprising incorporating agglomerated particles into said aqueous fiberboard slurry prior to removing water from said slurry, said agglomerated particles being in the form of balls having diameters of from about 0.03 to about 0.4 inch, being formed from an aqueous composition comprising fiberboard dust, 0.5 to about 3 percent by weight of the aqueous composition of a glactomannan gum or glactomannan gum derivative, and 0.02 to about 2.5 percent by weight of a crosslinking agent, and being incorporated in an amount to yield an agglomerated particle-fiberboard slurry solids ratio of from about 10 to about 50 weight percent agglomerated particles to about 50 to about 90 weight percent fiberboard slurry solids.

4,190,493

COATED STRUCTURAL COMPONENT FOR A HIGH TEMPERATURE NUCLEAR REACTOR

Kim S. Yee, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 660,862, Feb. 24, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,422

Claims priority, application Switzerland, Feb. 26, 1975, 2420/75

Int. Cl.² B32B *15/00*

U.S. Cl. 176—60 **4 Claims**

1. In a helium cooling circuit of a high temperature nuclear reactor, a structural component comprising

a substratum of a nickel-base alloy containing a carbide-former, said alloy comprising in percent by weight at least
0.02 to 0.15% carbon
5.5 to 16% chromium
3 to 13% of the sum of molybdenum and tungsten
6 to 11% of the sum of aluminum and titanium
and the remainder being nickel;

an intermediate layer of nickel of at least 99% purity anchored on at least a portion of said substratum; and

a pore-free protective layer on said intermediate layer of a metal selected from the group consisting of tungsten and molybdenum, said protective layer being sufficient to bond carbon from carbon containing impurities in said circuit into said protective layer as a carbide to form a very stable layer of protection against further carbonization;

said intermediate layer being sufficient to inhibit a decarbonization of said substratum through a reaction of carbon therein with said protective layer.

4,190,494

SPACER WITH POLYGONAL INTERCONNETORS

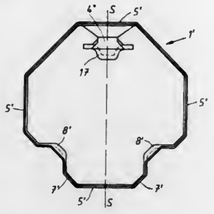
Torsten Olsson, Västerås, Sweden, assignor to Aktiebolaget ASEA-ATOM, Västerås, Sweden

Filed Mar. 23, 1978, Ser. No. 889,304

Claims priority, application Sweden, Dec. 21, 1977, 7714562

Int. Cl.² C21C *3/30*

U.S. Cl. 176—76 **9 Claims**



1. A spacer assembly for supporting a plurality of vertically arranged fuel rods while efficiently mixing a cooling medium horizontally therethrough, said spacer assembly comprising:

at least one spacer cell having similar upper and lower polygonally shaped members interconnected by at least one oblong spring assembly, said polygonally shaped members adaptable for surrounding and supporting an individual fuel rod extending therethrough;

said spring assembly including a middle portion lying substantially within a vertical plane extending through said spacer assembly, said middle portion being biased into supporting contact with said fuel rod;

substantially straight upper and lower spring members joining said upper and lower polygonally shaped members with said middle portion;

said upper and lower spring members each including a first substantially straight section attached to a respective polygonal member and extending toward said fuel rod, said upper and lower spring members each including a second substantially straight section attached to said middle portion and extending away from said fuel rod and further including a third substantially straight section joining said first and second sections to form a pair of oblique angles therebetween;

whereby a vertically flowing cooling medium located adjacent to said fuel rod is provided with a net horizontal flow component directed away from said fuel rod.

4,190,495

MODIFIED MICROORGANISMS AND METHOD OF PREPARING AND USING SAME

Roy Curtiss, III, Birmingham, Ala., assignor to Research Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,365

Int. Cl.² C12K *1/02*

U.S. Cl. 435—172 **11 Claims**

1. In an operation wherein recombinant DNA-containing cloning vector is introduced into or is present in a microorganism for replication therein and wherein said microorganism is grown for replication of said cloning vector, the improvement which comprises employing as said microorganism a microorganism having the following characteristics:

(a) said microorganism being capable of having recombinant DNA or foreign genetic information introduced thereinto and recovered therefrom along with its expression or production of useful gene products;

(b) said microorganism being dependent for growth and survival upon defined conditions;

(c) said microorganism being incapable of establishment, growth or colonization and/or survival under conditions or in ecological niches that are non-permissive for said microorganism;

(d) said microorganism being capable of causing recombinant DNA or foreign genetic information incorporated therein to undergo degradation under conditions or ecological niches that are considered non-permissive for said microorganism;

(e) said microorganism being capable of permitting cloning vectors containing recombinant DNA or foreign genetic information incorporated therein to be dependent for their replication, maintenance and/or function on said microorganism.

(f) said microorganism being substantially incapable of transmitting cloning vectors containing recombinant DNA or foreign genetic information incorporated therein to other organisms under non-permissive conditions for said microorganism;

(g) said microorganism being capable of being monitored by suitable means and/or techniques without substantial alteration of said microorganism; and

(h) said microorganism being susceptible of substantially minimal contamination with other organisms when recombinant DNA or foreign genetic information is incorporated therein and being substantially incapable of contaminating other organisms when incorporated therein or consumed thereby when recombinant DNA or foreign genetic information is present in said microorganism.

4,190,496

HOMOGENEOUS ENZYME ASSAY FOR ANTIBODIES

Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 760,499, Jan. 19, 1977, which is a continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, and a continuation-in-part of Ser. No. 689,234, May 24, 1976, Pat. No. 4,046,636, which is a continuation-in-part of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Jun. 2, 1977, Ser. No. 802,683

The portion of the term of this patent subsequent to Jun. 18, 1991, has been disclaimed.

Int. Cl.² G01N *31/14*

U.S. Cl. 435—7 **5 Claims**

1. A method for determining the presence of a receptor for a ligand in a medium suspected of containing said receptor, which comprises:

bringing together in an aqueous liquid zone:

(1) said medium; and

(2) soluble enzyme bound ligand;

wherein said enzyme bound ligand is at a concentration resulting in substantial reduction in enzymatic activity of said enzyme-bound-ligand in the presence of receptor in the concentration range of interest; and

analyzing in said zone for the effect of said medium on the enzymatic activity of said enzyme bound ligand.

4,190,497

APPARATUS FOR HEATING UP A CHAMBER OF A COKING BATTERY

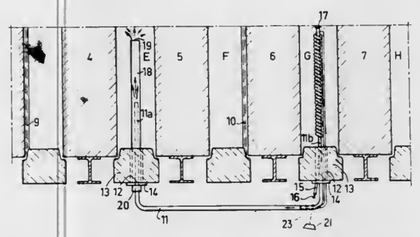
Günther Lagemann, and Wilhelm Heisterkamp, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 741,186, Nov. 12, 1976, Pat. No. 4,111,756. This application May 31, 1978, Ser. No. 911,410

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1976, 2551197

Int. Cl.² C10B *17/00, 25/06*

U.S. Cl. 202—150 **1 Claim**



1. A coking battery comprising a plurality of coking oven chambers; coking oven doors each having an opening therein; conduit means adapted to be received in the openings of said coking oven doors and connecting at least two coking oven chambers; means connecting said conduit means to said doors; said conduit means having upstream and downstream ends that extend into the respective coking oven chambers; and pump means for drawing gas by jetpump action from a first oven chamber into an upstream end of said conduit means and expelling said gas from a downstream end of said conduit means into a second oven chamber, said pump means comprising source means of relatively cool gas under pressure, pipe means connected to said gas source means and having a nozzle end in said conduit directed therein toward said downstream end, said pipe means having a coiled section between said source means and said nozzle end which lies within said first chamber, whereby gas in said coiled section is heated conductively through the walls of said pipe means, and a tube of larger diameter than said conduit means at said downstream end concentrically receiving said conduit means at said downstream end with annular spacing therebetween and extending beyond the downstream end of said conduit means, said tube having an outer end opening outside said second chamber.

4,190,498

SYSTEM TO ACQUIRE AND MONITOR OPERATING MACHINERY POSITIONS FOR HORIZONTAL COKE OVEN BATTERIES

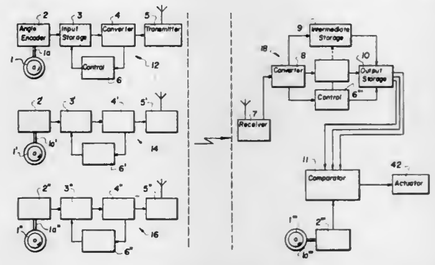
Wolfgang Teschner, Ratingen-Hüsel, and Dieter Bierbaum, Herne, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,444

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701930

Int. Cl.² C10B *33/10*

U.S. Cl. 202—262 **10 Claims**



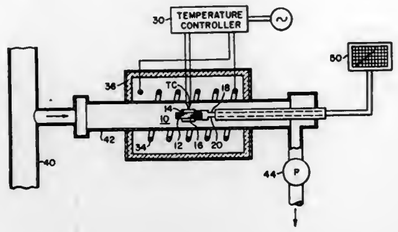
1. A system for detecting the relative position of a first coke device on one side of a horizontal coke oven battery with respect to the position of a second coke device on an opposite side of the horizontal coke oven battery and for activating the second coke device when the relative positions correspond along the coke oven battery, comprising a first wheel mounted on the first coke device for rotation with the movement of the first coke device along the coke oven battery, a first angle encoder connected to said first wheel for producing a first numerical value signal corresponding to the rotation of said first wheel and to the position of the first coke device along the coke oven battery, an input storage means which includes a code disc connected to said first angle encoder for recording and durably storing said first numerical value signal as a code pattern on said code disc, a second wheel mounted on the second coke device for rotation with the movement of the second coke device along the coke oven battery, a second angle encoder connected to said second wheel for producing a second signal corresponding to the rotation of said second wheel and the position of the second coke device along the coke oven battery, a comparator connected to said second angle encoder for receiving said second signal, a data link connected between said input storage means and said comparator for relaying said first numerical value signal to said comparator whereby said comparator compares said first numerical value signal with said second signal, and an actuator means connected to said comparator for actuating the second coke device when said first and second signals correspond to indicate the correspondence of positions of the first and second coke devices along the coke oven battery.

4,190,499

COMBUSTIBLES SENSOR

Alfred R. Pebler, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 345,393, Mar. 27, 1973, Pat. No. 4,005,001.
This application Jul. 29, 1974, Ser. No. 492,955
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **3 Claims**



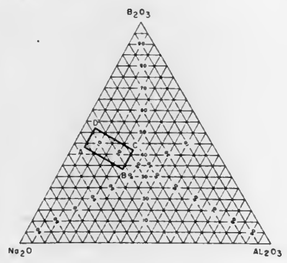
1. A method for determining the presence of fuels in an excess oxygen gas mixture through the use of an oxygen ion conductive solid electrolyte electrochemical cell having a first and second electrode disposed on opposite surfaces thereof, said first electrode composed of a material for supporting a first rate of catalytic combustion reactivity between the oxygen and fuel constituents of said gas mixture and said second electrode being composed of a material exhibiting a second rate of catalytic combustion reactivity between said oxygen and said fuel constituents of said gas mixture, said first and second catalytic combustion rates being different, comprising the steps of, maintaining a flow of an excess oxygen gas mixture containing fuels simultaneously to the surfaces of the first and second electrodes of the solid electrolyte electrochemical cell, heating said solid electrolyte electrochemical cell to a temperature sufficient to cause said first and second electrodes to initiate catalytic combustion of said oxygen and fuel constituents of said gas mixture, said differing rates of catalytic combustion produced by said first and second electrodes producing a solid electrolyte electrochemical cell output signal at said electrodes, and monitoring the output signal developed by said solid electrolyte electrochemical cell as an indication of the fuel constituents of said gas mixture.

4,190,500

SODIUM ION CONDUCTING SODIUM ALUMINUM BORATE GLASSES

Charles L. Booth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,915
Int. Cl.[2] H01M *6/18*
U.S. Cl. 204—1 R **29 Claims**



1. Method comprising electrically conducting sodium ions through a glass whose components lie within the area of the quadrilateral ABCD of the Na_2O, B_2O_3 and Al_2O_3 ternary diagram of FIG. 1 where the points A, B, C and D are defined by the mole percentages:

	Na_2O	B_2O_3	Al_2O_3
A	52	43	5
B	42	33	25
C	33	42	25
D	43	52	5

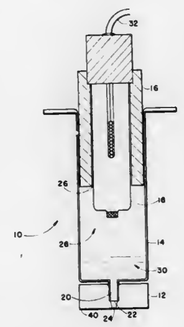
the mole percentages of the components within the quadrilateral totaling 100%, said glass containing additionally about 2 to 11 mole percent of at least one of ZrO_2, MgO, P_2O_5 and SiO_2.

4,190,501

PROCESS FOR MEASURING INTERNAL METAL STRESS

Olen L. Riggs, Jr., Bethany, Okla., assignor to Transworld Drilling Company, Oklahoma City, Okla.

Filed Aug. 21, 1978, Ser. No. 935,549
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **5 Claims**



1. A process for measuring internal stress in metals by surface testing comprising:

providing a metal surface;

providing a half-cell assembly comprising a body having a passageway therethrough with a compressible mask having a passageway therethrough positionally disposed and mounted upon one end of the body surrounding the passageway therethrough and in communicating alignment therewith, a reference electrode half-cell with a wiping collar having a passageway therethrough positionally disposed and mounted about the reference electrode half-cell, the wiping collar being at least partially inserted within the open end of the passageway through the body opposite the end whereon the compressible mask is positioned, and a saturated electrolyte solution contained in the passageway within the body;

positioning the passageway through the compressible mask of the half-cell assembly in juxtaposition with the metal surface;

compressing the compressible mask against the metal surface by application of axial force; and

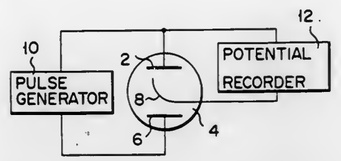
measuring the electrical potential between the metal surface and the reference electrode half-cell.

4,190,502

METHOD OF EVALUATING THE CORROSION RATE OF METAL

Ken-ichi Kanno; Masayuki Suzuki, both of Yokohama; Yuichi Sato, Atsugi, and Masamichi Machida, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 10, 1978, Ser. No. 950,051
Claims priority, application Japan, Oct. 7, 1977, 52-120779
Int. Cl.[2] G01N *27/46, 27/30*
U.S. Cl. 204—1 T **19 Claims**



1. A method of evaluating the corrosion rate of metal in a corrosive solution, comprising:

(A) the step of determining the polarization resistance R_p of a metal test piece having a surface area S and disposed in a corrosive solution, said step comprising:

(i) instantaneously feeding a given charge q_{Rp} to the electrical double layer of the test piece, thereby changing the potential of the test piece to have a predetermined polarization potential n_{Rp};

(ii) detecting, as a function of time, the variation of the polarization potential n_{Rp} (t) of the test piece due to a corrosion reaction, using a reference electrode disposed in the corrosive solution;

(iii) estimating an initial polarization potential n_{Rp} (0) of the test piece upon completion of the charge supply (t=0), based on the polarization potential n_{Rp} (t) detected as a function of time; and

(iv) calculating the polarization resistance R_p based on the given charge q_{Rp}, initial polarization potential n_{Rp} (0), surface area S, and the slope of log n_{Rp} (t)-t relation;

(B) the step of determining the Tafel slope β_a of anodic reaction of the metal test piece, said step comprising:

(i) instantaneously feeding the electrical double layer of the test piece with a charge $q_{\beta a}$ whose absolute value is larger than that of charge q_{Rp}, thereby changing the potential of the test piece to have a predetermined polarization potential $n_{\beta a}$ whose value is positive and higher than the polarization potential n_{Rp};

(ii) detecting, as a function of time, the variation of the polarization potential $n_{\beta a}$ (t) of the test piece due to a corrosion reaction, using the reference electrode; and

(iii) calculating the Tafel slope β_a of the test piece based on the polarization potential $n_{\beta a}$ (t) of the test piece detected as a function of time,

(C) the step of determining the Tafel slope β_c of cathodic reaction of the metal test piece, said step comprising:

(i) instantaneously feeding the electrical double layer of the test piece with a charge $q_{\beta c}$ whose absolute value is larger than that of the charge q_{Rp} and whose polarity is opposite to that of the charge $q_{\beta a}$, thereby changing the potential of the test piece to have a predetermined polarization potential $n_{\beta c}$ whose value is negative;

(ii) detecting, as a function of time, the variation of the polarization potential $n_{\beta c}$ (t) of the test piece due to a corrosion reaction, using the reference electrode; and

(iii) calculating the Tafel slope β_c of the test piece based on the polarization potential $n_{\beta c}$ (t) of the test piece detected as a function of time, and

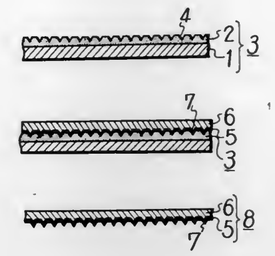
(D) the step of calculating the corrosion current density I_{corr} of the metal test piece based on the polarization resistance R_p, anodic Tafel slope β_a and cathodic Tafel slope β_c.

4,190,503

METHOD OF MANUFACTUREING A RECORD MATRIX

Jiro Ikeda, Fujieda, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,237
Claims priority, application Japan, Dec. 28, 1977, 52/160613; Oct. 19, 1978, 53/128748
Int. Cl.[2] C25D *1/10, 1/20;* C23C *3/02, 7/00*
U.S. Cl. 204—5 **14 Claims**



1. A method of manufacturing a record matrix comprising the steps of:

preparing a lacquer layer with a sound groove therein;

jointly spraying against said lacquer layer a reduction solution which contains 0.015 to 0.03 mol/l of borohydride compound and has a pH value from 10.5 to 11.5, and a metal salt solution which contains 0.02 to 0.04 mol/l of nickel salt, 0.02 to 0.04 mol/l of ammonium salt and 0.02 to 0.07 mol/l of lactic acid and has a pH value from 2.0 to 3.0 to effect electro-less plating of nickel on said lacquer layer and hence to form a surface metal layer having a projection strip extending therefrom corresponding to said sound groove in said lacquer layer;

forming a reinforcing layer over said surface metal layer; and

peeling said reinforcing layer together with said surface metal layer from said lacquer layer along the boundary surface therebetween.

4,190,504

ANTICORROSIVE OVERLAP-COATED STEEL MATERIAL

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 6, 1978, Ser. No. 949,132
Claims priority, application Japan, Nov. 11, 1977, 52/135304; Nov. 11, 1977, 52/135305
Int. Cl.[2] C25D *5/10, 5/48, 5/26*
U.S. Cl. 204—35 R **2 Claims**

1. An anti-corrosive overlap-coated steel material made by forming an electroplated layer of an Sn base-Zn alloy directly on the skin surface of an iron or steel material, then forming an electroplated layer of zinc on said alloy layer and further applying a chromate-treatment on said zinc layer.

4,190,505

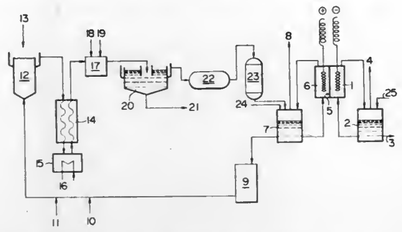
ELECTROLYSIS OF SODIUM CHLORIDE IN AN ION-EXCHANGE MEMBRANE CELL

Shinsaku Ogawa; Mitsuo Yoshida, and Hiroyuki Shiroki, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1978, Ser. No. 948,659
Claims priority, application Japan, Oct. 8, 1977, 52/120512; Nov. 26, 1977, 53/142061
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 **10 Claims**

1. A process for the electrolysis of sodium chloride in an electrolytic cell divided into an anode chamber and a cathode

chamber by a cation exchange membrane, wherein an aqueous solution of sodium chloride containing an iron cyanide com-



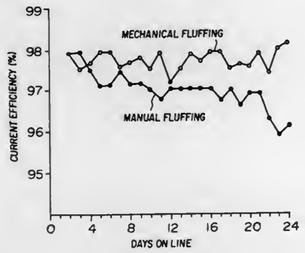
plex is purified so as to reduce the content of iron cyanide complex therein to an amount of not greater than 0.5 ppm before said solution is fed to the anode chamber.

4,190,506

ELECTROLYSIS OF ALKALI METAL CHLORIDE

Nobuhiro Kawasaki; Naoki Yoshida, and Takashi Yoshitugu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 17, 1978, Ser. No. 961,553
Claims priority, application Japan, Jan. 11, 1978, 53-1119
Int. Cl.[2] C25B *1/16, 1/26, 13/06*
U.S. Cl. 204—98 **6 Claims**



1. A method of electrolyzing an alkali metal chloride in a diaphragm electrolytic cell equipped with an asbestos diaphragm wherein said diaphragm is made, without the use of a polyameric binder, by the process comprising the steps of:

fluffing an asbestos fiber with a turbo rotary mill, with substantially no breakage of the asbestos fiber;

suspending the fluffed asbestos in a solution of a base; and depositing the suspended asbestos fiber on a wire net cathode for diaphragm electrolysis of an alkali metal chloride.

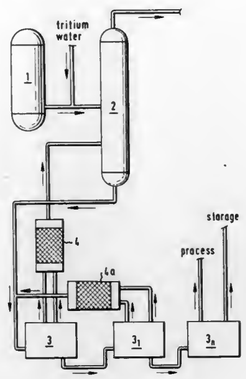
4,190,507

PROCESS FOR CONCENTRATING TRITIUM AND/OR TRITIUM HYDRIDE AND SEPARATING IT FROM TRITIUM WATER

Hans Hesky, Runkel, and Armin Wunderer, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,518
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711366
Int. Cl.[2] C25B *1/04*
U.S. Cl. 204—129 **3 Claims**

1. Process for recovering tritium and/or tritium hydride from tritium-containing water comprising the steps of vaporizing and removing tritium-free water, thereby leaving a stream consisting essentially of tritium hydroxide and di-tritium oxide and then electrolyzing the enriched mixture to obtain a high concentration of tritium and/or tritium hydride.



3. A process according to claim 1, wherein the enriched mixture is electrolyzed in an electrolytic enrichment cascade consisting of a series of electrolytic cells.

4,190,508

PROCESS FOR REMOVING CHALCOPHILE ELEMENTS FROM AQUEOUS SOLUTIONS BY ELECTROLYSIS

Hiroshi Kametani, and Tatsuya Mitsuma, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 1, 1979, Ser. No. 16,567
Claims priority, application Japan, Jun. 23, 1978, 53-75488
Int. Cl.[2] C02C *5/12*
U.S. Cl. 204—151 **10 Claims**

1. A process for removing a chalcophile element from an aqueous solution containing said element in the form of ion, which comprises electrolyzing said aqueous solution as a catholyte under acidic conditions in the presence of elemental sulfur powder suspended therein to precipitate the chalcophile element in the form of sulfide, and separating the precipitated sulfide from the aqueous layer.

4,190,509

ELECTROCHEMICAL PROCESS FOR THE REMOVAL OF CONTAMINANTS FROM AQUEOUS MEDIUM

Charles M. Chaffin, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1979, Ser. No. 13,857
Int. Cl.[2] C02C *5/12*
U.S. Cl. 204—152 **5 Claims**

1. In a method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, which comprises passing an electric current through the ionizing medium containing the ion to be removed between an anode which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contaminant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminant ion is produced, and removing said insoluble iron compound or complex with the contaminant ion from the ionizing medium, the improvement wherein the medium contained between the anode and the cathode is periodically vigorously agitated with a compressed gas.

4,190,510

PROCESS FOR THE ELECTROPHORETIC BREAKING OF EMULSIONS

Wolfgang Larbig, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,287
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808225
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—180 R **9 Claims**

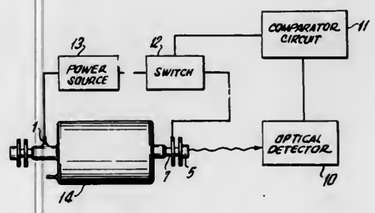
1. A process for electrophoretic breaking of electrically conductive emulsions of electrical conductivity greater than 2,000 μMhos which comprises adjusting the conductivity of said emulsion to a value in the range from 0.1 to 2,000 μMhos by increasing the dispersion of said emulsion and thereafter passing therethrough a constant-voltage field of 100 to 1,000 volts.

4,190,511

METHOD OF MANUFACTURING AN INTERNAL MIRROR TYPE GAS LASER TUBE

Keiichi Shintaku, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1978, Ser. No. 943,611
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 P **4 Claims**



1. A method of manufacturing an internal mirror type gas laser tube, said laser tube including an internal mirror and an internal anode, the method comprising the steps of, disposing a metallic member in the vicinity of the internal laser tube mirror, exciting an electric discharge by utilizing the internal laser tube anode and by employing said metallic member as a cathode to sputter the metal of said metallic member and to thereby form a metallic film on the surface of said internal mirror, said sputtered metal film reducing the reflection rate of the internal mirror to reduce the laser ouptut power to a predetermined value.

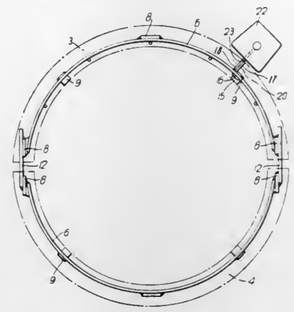
4. A method of manufacturing an internal mirror type gas laser tube comprising the steps of preparing an internal mirror type gas laser tube which has at least one metallic member in the vicinity of an internal laser mirror, measuring the output power of said gas laser, internally sputtering said metallic member to form a metallic film on said internal mirror and stopping the sputtering when the laser output power is reduced to a predetermined value.

4,190,512

SACRIFICIAL ANODES

Brian S. Wyatt, Acton Trussell, and Ronald H. Wassell, Telford, both of England, assignors to I.S.C. Alloys Limited, Bristol, England

Filed May 3, 1978, Ser. No. 902,299
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **9 Claims**



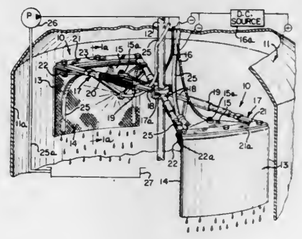
1. An arrangement for use in the cathodic protection of submarine bodies and structures, for example, pipelines including a plurality of anode bodies, each body including a first part which is constituted by a material which is electro-chemically active and a supporting core structure for the first part, the supporting structure being less electro-chemically active than the first part and defining a plurality of apertured regions along the body, said structure including a plurality of longitudinally extending members and a plurality of transversely extending members at least one of said transversely extending members being located near an end of said body and extending transversely beyond the edges of the body.

4,190,513

APPARATUS FOR CONTAINERLESS PORTABLE ELECTRO-POLISHING

John F. Jumer, 161 W. 131 Timber Trails Dr., Oak Brook, Ill. 60521

Filed Sep. 18, 1978, Ser. No. 943,371
Int. Cl.[2] C25F *3/16, 7/00*
U.S. Cl. 204—224 R **14 Claims**



1. In apparatus for electro-polishing relatively large surface areas having substantially uniform configuration, the improvement comprising,

a cathode support frame having cathode support portions conforming substantially to said configuration,

a permeable electrolyte-retaining blanket of uniform thickness and formed of dielectric material mounted on said frame by attachment to said conforming cathode support portions with an exposed outer surface facing outwardly from said frame for engagement with said surface areas and the opposite inner surface thereof facing inwardly,

foraminous cathode means mounted on said frame by attach-

ment to said conforming cathode support portions and in engagement with said inner surface of said blanket and spaced by said blanket a uniform distance from said surface areas, and

spray means for supplying electrolyte to said inner surface of said blanket.

4,190,514

ELECTROLYTIC CELL

Shunji Matsuura, Tokuyama; Toshio Oku, Yamaguchi; Masaaki Kurumatani, Tokuyama; Nobuyuki Kuramoto, Tokuyama, and Yasutaka Ozaki, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

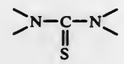
Filed Jun. 6, 1978, Ser. No. 912,987

Claims priority, application Japan, Jun. 6, 1977, 52-65854; Oct. 28, 1977, 52-128794

Int. Cl.[2] C25D *3/12;* **C25B** *11/02*

U.S. Cl. 204—242 **8 Claims**

8. A cathode for employment in an electrolytic cell which cathode comprises a supporting structure comprising (1) iron, (2) nickel, or (3) an alloy composed mainly of at least one member of the group of iron and nickel, said supporting structure having a nickel coating formed thereon by electroplating said supporting structure in a nickel electroplating bath in the presence of a S/N substance, said substance being at least one member selected from the group consisting of a thiocyanate ion, a thiosulfate ion, a dithiocarbamate ion, a thiocarboxylate ion, an amino acid ion, a thiocarbamoyl compound and thiourea wherein the thiocarbamoyl group and the group



are regarded anions, and said S/N substance being present in the electroplating bath in an amount of at least 0.1 ion equivalent per equivalent of nickel present as an ion in the bath.

4,190,515

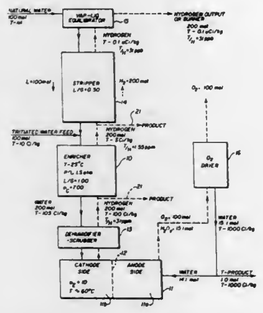
APPARATUS FOR REMOVAL AND RECOVERY OF TRITIUM FROM LIGHT AND HEAVY WATER

John P. Butler, and Martin Hammerli, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 18, 1978, Ser. No. 907,105

Int. Cl.[2] C25B *1/10, 1/00;* **C01B** *4/00;* **C01G** *57/00*

U.S. Cl. 204—266 **5 Claims**



1. Apparatus for removal of tritium from light and heavy water comprising:

(a) a catalyst isotope exchange column enricher with means for passing hydrogen gas and liquid water therethrough in countercurrent isotope exchange relationship,

(b) an electrolysis cell having an anode side and a cathode side and a separator therebetween,

(c) a dehumidifier-scrubber,

(d) means for passing the liquid water enriched in tritium from the catalyst column through the dehumidifier-scrubber to the electrolysis cell,

(e) means for passing the hydrogen gas evolved in the cathode side of the cell through the dehumidifier-scrubber to the catalyst column, said dehumidifier-scrubber adapted to adjust the humidity of the tritium depleted hydrogen gas to the conditions prevailing in the enricher, to bring the tritium concentration of the water vapor in the gas stream in isotopic equibilibrium with the liquid water from the enricher, and to transfer any entrained electrolyte in the hydrogen gas to the downflowing water stream,

(f) a stripper,

(g) means for passing the hydrogen gas from the catalyst column through the stripper to an output,

(h) means for passing liquid water feed through the stripper to the catalyst tower, said stripper adapted to reduce the tritium content of the already depleted hydrogen by transferring the tritium to the countercurrent stream of liquid water,

(i) means for introducing the tritiated water feed to the upper portion of the catalyst column,

(j) a gas drier,

(k) means for taking the oxygen gas evolved in the anode side of the electrolysis cell and highly tritiated water vapor from the cell and passing it through the gas drier to remove the water,

(l) means for returning this water to the cell, and

(m) means for taking a tritium product from the system.

4,190,516

CATHODE

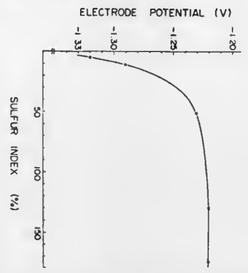
Yoshihisa Kajimaya; Takahide Kojima; Yoshio Murakami, and Shunji Matsuura, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jun. 26, 1978, Ser. No. 919,306

Claims priority, application Japan, Jun. 27, 1977, 52-75610

Int. Cl.[2] C25B *11/08;* **C25R** *11/06*

U.S. Cl. 204—290 R **11 Claims**



1. A cathode consisting essentially of a base material of copper, iron or nickel and formed thereon, a sintered coating composed mainly of at least one metal of Group VIII of the periodic table, said sintered coating having been prepared by (1) coating said base material with a solution or suspension of at least one sulfur-containing compound of said metal of Group VIII, which sulfur-containing metal compounds are capable of being predominantly converted to a metal by sintering said compounds, and (2) heating the coating, said sintered coating containing at least 3% of sulfur in terms of the sulfur index as defined in the specification.

4,190,517

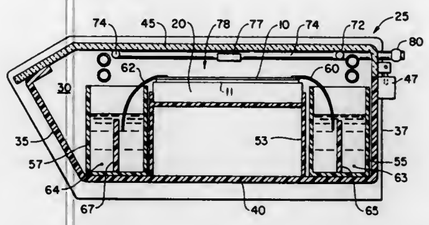
ELECTROPHORESIS APPARATUS

James F. Monthony, Albany; Timothy E. Delony, San Leandro; Eric G. Wallace, Napa, and Walter H. Schick, Walnut Creek, all of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Aug. 16, 1978, Ser. No. 934,153

Int. Cl.[2] G01N *27/26, 27/28*

U.S. Cl. 204—299 R **19 Claims**



1. In apparatus for performing electrophoresis on a sample within a medium, the apparatus including a housing, and a substantially horizontal cooling bed within the housing for supporting the medium and withdrawing heat therefrom during the electrophoresis, the improvement comprising:

a condenser overlying the bed and including a lowermost portion from which water may gravitationally drip, the lowermost portion being located outside a vertical projection of the cooling bed so that water gravitationally dripping from the condenser avoids the cooling bed; and

means for passing a cooling fluid through the condenser during electrophoresis.

4,190,518

SOLVENT REFINED COAL PROCESS

Joseph P. Giannetti, Allison Park, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1977, Ser. No. 865,605

Int. Cl.[2] C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **12 Claims**

1. A process for producing an upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content from coal containing from about 0.1 to about 30 weight percent ash, from about 0.25 to about 2.5 weight percent nitrogen and from about 0.3 to about 10 weight percent sulfur consisting essentially in the steps of (1) subjecting a slurry composed of said coal containing ash, nitrogen and sulfur and a solvent containing donatable hydrogen, together with hydrogen, to substantially catalyst-free hydrogenation conditions in a first hydrogenation zone wherein the temperature is in the range of about 343° to about 510° C., the pressure is in the range of about 500 to about 5000 psig, the solvent to coal weight ratio is in the range of about 0.5/1 to about 10/1, the hydrogen/coal feed weight ratio is in the range of about 0.01 to about 0.30/1, the hydrogen gas purity is in the range of about 85 to about 100 mole percent and the residence time is in the range of about 0.1 to about 5.0 hours, to form an intermediate coal-solvent slurry; (2) deashing said intermediate coal-solvent slurry to form a coal-solvent solution, said coal-solvent solution being such that in the absence of solvent therein at ambient temperature and pressure left behind would be deashed coal; (3) subjecting said coal-solvent solution to catalytic hydrogenation in a second hydrogenation zone in the presence of a catalyst consisting essentially of nickel, titanium and molybdenum wherein the temperature is in the range of about 260° to about 538° C., the pressure is in the range of about 500 to about 10,000 psig, the liquid hourly space velocity is in the range of about 0.3 to about 10 volume feed/volume catalyst/hour and the hydrogen flow rate is in the range of about 25 to about 190 kmol H_2/m^3 feed to obtain a liquid product, (4) separating said liquid product to obtain (a) said desired upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content than the coal charge, (b) a first liquid fraction boiling at a temperature in the range of about 100° to about 375° C. and (c) a second liquid fraction boiling above said first liquid fraction at a temperature in the range of about 200° to about 525° C.; and then (5) recycling at least a portion of said second liquid fraction to said first hydrogenation zone.

4,190,519

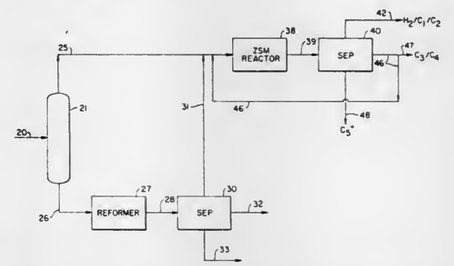
COMBINATION PROCESS FOR UPGRADING NAPHTHA

Stephen J. Miller, El Cerrito, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1978, Ser. No. 954,064

Int. Cl.[2] B01J *29/28;* **C07C** *15/02;* **C10G** *37/10, 39/00*

U.S. Cl. 208—79 **9 Claims**



1. A process for upgrading a naphtha-boiling-range hydrocarbon to useful products which comprises:

(1) separating said naphtha just below the boiling point of methylcyclopentane into a light naphtha fraction containing C_6 paraffins and lower-boiling hydrocarbons and a heavy naphtha fraction containing methylcyclopentane and higher-boiling hydrocarbons;

(2) reforming said heavy naphtha fraction under reforming conditions to produce a reformate enriched in aromatic compounds compared with said heavy naphtha fraction;

(3) passing at least a portion of said reformate together with said light naphtha fraction in contact with a ZSM-5-type zeolite catalyst under aromatization conditions including a pressure from 0.5 to 68 atmospheres and a temperature from 343° to 649° C. to produce an aromatics-enriched effluent;

(4) separating said aromatics-enriched effluent into a C_4- fraction and a C_5+ fraction; and

(5) recovering said C_5+ fraction as said product.

4,190,520

HYDROCARBON CONVERSION PROCESS

Steve A. Gewartowski, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 3, 1978, Ser. No. 866,663

Int. Cl.[2] C10G *35/04*

U.S. Cl. 208—95 **13 Claims**

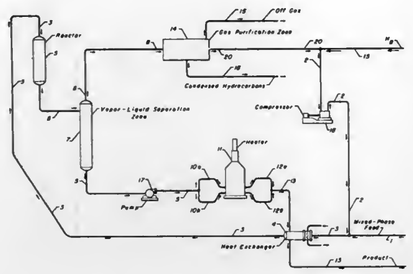
1. A hydrocarbon conversion process which comprises the steps of:

(a) passing a mixed-phase feed stream into an indirect heat exchange zone and effecting the vaporization of a portion of the feed stream and the heating of the mixed-phase feed stream to a desired temperature;

(b) passing the mixed-phase feed stream through a reaction zone maintained at mixed-phase hydrocarbon conversion conditions that effect the production of a mixed-phase reaction zone effluent stream and separating a liquid fraction;

(c) heating at least a portion of the liquid fraction of said mix-

ed-phase reaction zone effluent stream by passage of said portion through a fired heating zone maintained at least 15° F. to 20° F. above the temperature of the reaction zone inlet; and



(d) cooling at least a portion of said heated reaction zone effluent stream by passage of said effluent stream through the indirect heat exchange zone and indirect heat exchange against the feed stream of step (a).

4,190,521

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 7, 1978, Ser. No. 884,310
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 **16 Claims**

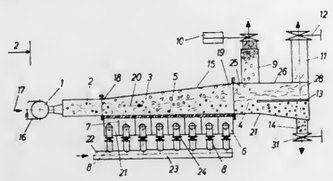
1. A process for reforming a gasoline fraction which comprises contacting the same at reforming conditions with an acidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % zinc, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum, catalytically available nickel, and zinc are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,190,522

APPARATUS FOR PURIFYING A SUSPENSION OF FIBROUS MATERIAL

Josef Trä, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,558
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737009
Int. Cl.² B03D *1/24*
U.S. Cl. 209—170 **9 Claims**



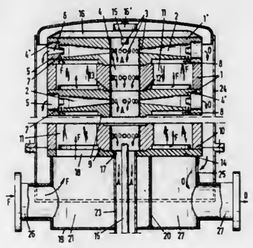
1. In apparatus for removing impurities entrapped in a liquid suspension of fibrous material including a generally horizontal fluidized bed chamber having spaced opposite ends, an imperforate top wall, and a perforated bottom wall, first means for introducing said suspension to said fluidized bed chamber through one end thereof for flow across said bottom wall toward the other end, the space between said bottom and top walls being filled with said liquid suspension from said one and to said other end of said fluidized bed chamber, a pressure chamber below said fluidized bed chamber and communicating with said bottom wall, and second means for introducing a fluidizing agent under pressure to said pressure chamber for upward flow through the perforations in said bottom wall and through the suspension in said fluidized bed chamber thereby to separate impurities from said suspension by flotation, the improvement comprising: a separation chamber having a forward end communicating with the other end of said fluidized bed chamber for receiving said suspension therefrom and having top and bottom walls and a rear wall, said separation chamber having at least one withdrawal opening in the forward region of said top wall for removing separated impurities from said suspension which have relatively low specific gravity and thus float to the top thereof, said separation chamber having at least one discharge opening in its rear lower region for removing separated impurities from said suspension which have relatively high specific gravity and thus settle to the bottom wall thereof, said last-named bottom wall being imperforate apart from said discharge opening, said separation chamber having at least one outlet opening therein in its rear upper region rearwardly of said one opening for removing the purified fibrous suspension therefrom.

4,190,523

RADIAL MULTIHYDROCYCLONE

Klaas B. Niemeijer, Veendam, Netherlands, assignor to Koninklijke Scholten-Honig N.V., Amsterdam, Netherlands

Filed Feb. 13, 1978, Ser. No. 877,551
Claims priority, application Netherlands, Feb. 17, 1977, 7701686
Int. Cl.² B04C *5/28*
U.S. Cl. 209—211 **3 Claims**



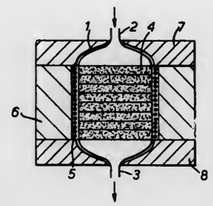
1. A multihydrocyclone comprising
a plurality of at least three stacked discs formed from polyurethane;
means securing and pressing the discs together;
means forming an overflow chamber surrounding the periphery of the discs;
said discs each having (1) a central duct communicating with the central ducts of the other discs with inner edge means of each disc surrounding the central duct and engaging corresponding inner edge means of the adjacent disc or discs such that the central ducts form a common dischage duct extending centrally through the stacked discs, (2) a plurality of cyclone chambers extending radially relative to the central duct with respective inner drain openings thereof opening into the central duct, (3) overflow duct means in the periphery of each disc at the outer ends of the cyclone chambers and forming overflow ducts between the respective cyclone chambers and the overflow chamber, (4) outer edge means at the periphery of the discs engaging corresponding outer edge means of the adjacent disc or discs whereby the stacked discs are closed to the overflow chamber except for the overflow ducts, (5) an annular cavity on at least one side of each disc between the inner and outer edge means forming an input chamber, and (6) tangential supply ducts communicating from the input chamber into the respective cyclone chambers;
means forming an input to one side of a first disc on one end of the stack discs; and
all of the discs between the one end of the stacked discs and the disc at the other end of the stack discs each having at least one through passage disposed between the inner and outer edges and communicating between the opposite sides of the discs into the input chambers, and at the first disc, from the input means.

4,190,524

MAGNETIC SEPARATORS

James H. P. Watson, St. Austell, England, assignor to English Clays Lovering Pochin & Co., Ltd., Cornwall, England

Filed Jul. 21, 1975, Ser. No. 597,686
Claims priority, application United Kingdom, Jul. 19, 1974, 32216/74
Int. Cl.² B03C *1/02*
U.S. Cl. 209—213 **2 Claims**



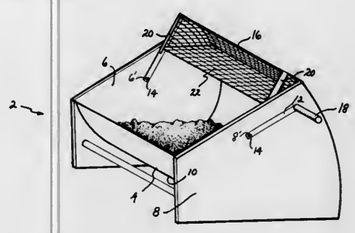
1. In a magnetic separator for separating magnetizable particles from a fluid having such particles in suspension therein, the separator comprising a separating chamber having an inlet and an outlet for a fluid, a packing material which is pervious to the fluid disposed within the separating chamber between the inlet and the outlet, and electromagnetic means for establishing a magnetic field in the region of the packing material within the separating chamber, the improvement which comprises the packing material being paramagnetic at normal operating temperatures and normal operating magnetic field intensities, said chamber additionally being provided with a packing material, which is pervious to the fluid and which is ferromagnetic at normal operating temperatures and normal operating magnetic field intensities, disposed between the paramagnetic packing material and the outlet.

4,190,525

LITTER AND REFUSE RECEPTACLE AND SEPARATOR

Paul B. Menzel, 523 N. Euclid Ave., Pittsburgh, Pa. 15206

Filed Sep. 26, 1978, Ser. No. 945,920
Int. Cl.² B07B *1/00*
U.S. Cl. 209—235 **3 Claims**



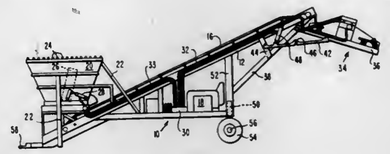
1. Apparatus for containment of a bed of litter material and for separation from said litter material of refuse deposited thereon, including:
a frame defining an open receptacle for the containment of litter and refuse,
a sifting screen member forming a concave scoop operatively connected for movement along a defined locus relative to said frame from an initial position above said litter bed, through said litter bed, and back to said initial position, whereby to traverse substantially the entire body of said litter bed and to sift accumulated refuse therefrom,
said screen member being detachable from said operative connection to said frame for disposal of the refuse sifted by said screen member.

4,190,526

PORTABLE SCREENING PLANT

Ernest C. Bachand, Auburn, Mass., assignor to Pioneer Cover-All, Inc., North Oxford, Mass.

Filed Jan. 5, 1978, Ser. No. 867,272
Int. Cl.² B07B *1/42*
U.S. Cl. 209—245 **5 Claims**



1. A portable screening plant comprising:
a support frame including an inclined conveyor support disposed in an inclined path;
an elongated endless loop conveyor belt disposed along said inclined path and extending between a lower supply end and an upper discharge end;
means mounted on said support frame and coupled to said conveyor belt for causing movement of the belt along said path;
a hopper attached to said support frame and disposed in a generally vertical disposition with its discharge end in association with the lower end of the conveyor belt and including a grizzly disposed over the upper supply end;
a plurality of wiper blades disposed within the hopper and each rotatably mounted for wiping contact with a respective hopper side wall;
hydraulic means coupled to the wiper blades and operative to cause rotatable reciprocating movement of the blades;
a wheel assembly attached to and supporting said support frame and operative to permit trailing of the plant;
said wheel assembly being attached to the support frame by telescoping members by which the support frame and conveyor belt can be raised to intended operating heights;
a shaker adjustably attached to the upper end of the support frame and capable of being disposed in a raised position to receive material discharged from the conveyor belt, and in a lowered position for stowage below the conveyor belt;
said shaker including:
a shaker screen;
a rigid frame pivotally connected at one end to said support frame near the upper end of said inclined conveyor support;
a linkage mechanism securing the shaker to the support frame and including a pair of articulated two section links each pivotally connected at one end to said support frame at a position below the pivotal connection of the shaker frame, and at the other end to the shaker frame at a position outward of the pivotal connection thereof to the support frame, each of said links being centrally hinged;
a pair of hydraulic actuators each interconnecting a respective one of said links and said support frame each pivotally

connected at one end to said support frame and at the other end to an associated link;

said hydraulic actuators being operative in a retracted position to retain said links in an open linear disposition to maintain the shaker in its raised operating position, and being operative in an extended position to cause folding of said links and downward pivoting of the shaker into its lowered position.

4,190,527
INTERLOCKING SCREEN ELEMENTS

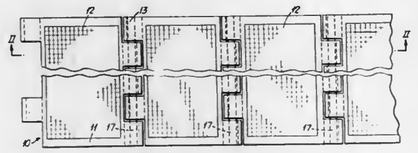
Clifford M. Spiller, The Smithy, Burghwallis, Doncaster, England

Filed Nov. 9, 1977, Ser. No. 850,104

Claims priority, application United Kingdom, Nov. 10, 1976, 46687/76

Int. Cl.² B07B *1/46*

U.S. Cl. 209—363 **5 Claims**



1. A sieve screen module comprising:

(i) a plurality of interlocked sieve elements, each sieve element having a rectangular parallelpiped body formed with through apertures to provide a mesh, opposed edges of said body having castellated formations arranged and dimensioned so as to be interdigitated with the complementary formations of the juxtaposed elements to provide a smooth joint, the underside of said formations being grooved to form together a continuous channel,

(ii) an elongate member extending along within said channel and a settable material contained in said channel which adheres to the elongate member and channel walls for locking said sieve elements together.

4,190,528
PROCESS FOR BIOLOGICAL PURIFICATION OF WASTE WATER

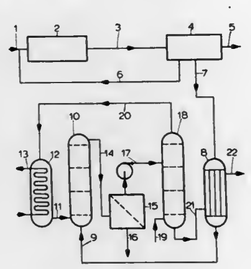
Bernardus H. N. Dassen, Kerkrade, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Jun. 20, 1978, Ser. No. 917,359

Claims priority, application Netherlands, Jun. 27, 1977, 7707081

Int. Cl.² C02C *1/06*

U.S. Cl. 210—8 **8 Claims**



1. Process for biological purification of waste water, in which a suspension of the activated sludge formed during the purification is hydrolyzed in a basic medium and at an elevated temperature, said process being conducted by giving the suspension a pH of between about 8 and about 11 and carrying out the hydrolysis in the presence of a volatile base selected from the group consisting of ammonia and ammonium carbonate at a temperature of between about 90° C. and about 300° C., to obtain a hydrolysate containing at least one of naturally occurring amino acids or oligopeptides, separating the hydrolysate from the suspension, expelling said volatile base from said hydrolysate, and returning said volatile base to adjust said pH.

4,190,529
MIXED-FORM POLYHALIDE RESINS FOR DISINFECTING WATER

Gary L. Hatch, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 920,260, Jun. 6, 1978, which is a continuation of Ser. No. 656,416, Feb. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 563,068, Mar. 28, 1975, abandoned. This application Feb. 2, 1979, Ser. No. 8,875

Int. Cl.² C02B *3/10*

U.S. Cl. 210—29 **6 Claims**

1. A method of disinfecting water containing bacteria, said method comprising:

(a) providing a quantity of a mixed-form polyhalide bactericidal resin comprising a strong base anion-exchange resin having anion exchange sites and having attached to a predominant number of such sites polyhalide anions of the following formulas:

$$a(I_3^-) \text{ and } b(I_5^-)$$

wherein:

a=0.4 to 0.8 of the exchange sites;

b=0.1 to 0.3 of the exchange sites;

a+b=a predominant number of the anion sites available for exchange; and

a+2(b) equals or exceeds 1.0;

(b) contacting the water to be disinfected with said resin at a flow rate controlled to permit killing of substantially all bacteria contained therein.

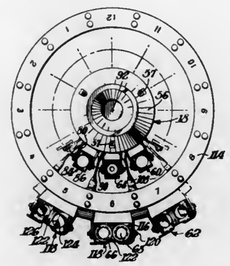
4,190,530
CENTRIFUGAL METHOD AND APPARATUS FOR PROCESSING FLUID MATERIALS

Jesse G. Forsythe, Jr., Media, Pa.; Donald R. Johnson, Wilmington, and Linda M. St. Onge, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1978, Ser. No. 892,508

Int. Cl.² B01D *15/06*

U.S. Cl. 210—31 R **31 Claims**



23. A centrifugal method of processing fluid materials using first, second, and third unconnected fluid flow paths comprising the steps of:

placing said materials in said first fluid flow path,

using centrifugal force, by rotating all of said paths about a common axis in a first sense, to move said materials along said first flow path to one of said second and third flow paths, and

switching said materials from said first flow path to the other one of said second and third flow paths by angularly accelerating said first flow path differently than said second and third flow paths about said axis.

4,190,531
METHOD OF CONCENTRATING AND COLLECTING OIL SPILLS

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,674

Int. Cl.² C02B *9/02*

U.S. Cl. 210—62 **2 Claims**

1. A method of concentrating, collecting and controlling oil spilled in water, which method comprises spreading around the periphery of said oil a liquid composition consisting essentially of

(a) from 0.1 to 95.0% of a fluorochemical of the formula

$$(R_f)_nTmZr$$

where n is 1 or 2;

m is 0 or 1;

r is 1 or 2;

R_f is a straight or branched chain perfluoroalkyl group of 1 to 20 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms, or said perfluoroalkyl containing at most one chlorine or hydrogen atom for every two carbon atoms;

T is a covalent bond, or a connecting group with a functionality of n+r for linking a maximum of 2 R_f groups and 2 Z groups, the connecting group T being R or $R_3(X—R_4)_p$ wherein R_3 and R_4 are independently straight or branched chain, saturated or unsaturated, or halo substituted, alkylene or arylene of up to 12 carbon atoms, X is thio, oxy or imino where the nitrogen in said imino is secondary or tertiary and p is 1 to 4;

Z is one or two neutral or polar groups selected independently from $—CONR_1R_2$, —OH, —CN, $—CONR_1COR_2$, $—SO_2NR_1R_2$, $—O_2CR_1$ and $—CO_2R_1$, where R_1 and R_2 are independently hydrogen, straight or branched chain alkyl or 1 to 12 carbon atoms or straight or branched chain alkyl of 1 to 12 carbon atoms substituted by one or more of —OH, $—COCH_3$ or $—CONHCH_3$, and where said R_f contains more than 6 carbon atoms Z may also be substituted by $—CO_2H$, $—SO_3H$, $—PO(OH)_2$, $—OSO_3H$, $—S_2O_3Na$ or quaternary ammonium; with the proviso that said fluorochemical has a solubility in water less than 0.01% by weight;

(b) from 5 to 99.9% of a diluent in which said fluorochemical is at least 0.1% soluble and which diluent has a solubility in water greater than 0.01%; and

wherein said fluorochemical exhibits a persistent spreading pressure greater than 50 dynes/cm at less than 10 mg./sq. meter, such that said composition forms a durable, rapidly spreading, water insoluble surface film to contract, collect and control said oil.

4,190,532
CHARGED FILTER AID MATERIAL AND ION EXCHANGE BED

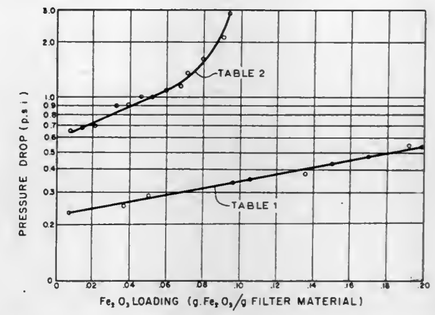
Christopher J. Halbfoster, Greenbrook, N.J., assignor to Ecodyne Corporation, Union, N.J.

Continuation-in-part of Ser. No. 695,098, Jun. 11, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,319

Int. Cl.² B01D *37/02*

U.S. Cl. 210—75 **27 Claims**

1. An improved filter material comprising: a mixture of cation exchange resin particles and treated filter-aid material, said mixture being capable of producing a clumping phenomenon said resin particles being in the size range of about 60 to 400 mesh, and said treated filter aid material being characterized by a negative surface charge prior to treatment, said filter aid material having been treated with an electrolyte-type compound that produces a positive surface charge by bonding thereon.



4,190,533
FILTER METHOD

Gene Hirs, Livonia, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Feb. 12, 1976, Ser. No. 657,666

Int. Cl.² B01D *23/24*

U.S. Cl. 210—80 **1 Claim**

1. In a method of filtering contaminants from a liquid, the steps of:

flowing contaminated liquid through a deep bed filter comprised of at least two contiguous, vertically superimposed filter media layers, thereby accumulating contaminants within the interstices of the bed to achieve a clarified filtrate, the filter media of the uppermost of said layers (a) consisting essentially of hydrophilic, oleophobic granules substantially symmetrical and substantially uniform in size and shape to provide a porous entrance surface for the contaminated liquid, the granules having a uniformity coefficient of substantially about and not less than 1, wherein the uniformity coefficient is defined as the number obtained by dividing the sieve opening, in millimeters, which will pass sixty percent of the granules, by the sieve opening in millimeters which will pass just ten percent of the granules, and (b) having a specific gravity in the range of between about 1.05 and about 1.4;

terminating the flow of contaminated liquid after the filter has become at least partially clogged by accumulated contaminants;

rejuvenating the deep bed filter by flowing backwash liquid upwardly through the bed to expand both layers substantially in situ to remove accumulated contaminants, the specific gravity of the uppermost of the layers facilitating expansion for the removal of contaminants; and

reforming the bed with substantially distinct layers subsequent to the backwashing step and achieving an entrance surface in the uppermost of said layers having a porosity substantially the same as the porosity of said surface prior to the filtration cycle.

4,190,534
WASTE WATER FILTRATION AND SLUDGE REMOVAL SYSTEM

Everette L. Wyatt, Carthage, Mo., assignor to Armco Steel Corporation, Middletown, Ohio

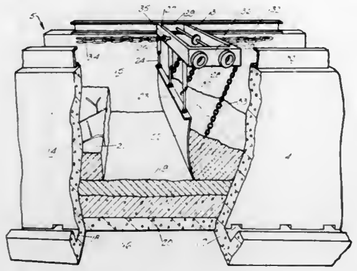
Filed May 8, 1978, Ser. No. 903,781

Int. Cl.² B01D *23/24*

U.S. Cl. 210—80 **13 Claims**

1. A waste water filtration and sludge removal system for filtering and removing sludge materials suspended in water comprising:

(a) A trough-like filtering tank having a pair of spaced upstanding longitudinal walls supported by a substantially planar imperforate floor, one end of said tank forming a charging station for introducing water containing sludge into said tank, the opposite end of said tank forming a discharge station for removing sludge from the tank;
(b) A permeable filter bed overlying said floor for filtering the sludge from said water, the sludge being retained in a cake-like layer on the upper surface of said filter bed, said tank including means for recovering filtered water draining downwardly through said bed;
(c) A screed blade mounted for reciprocating movement in directions parallel to said walls, the lower edge of said blade



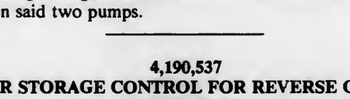
being positioned to just contact the upper surface of said filter bed for removing the sludge layer deposited thereon with minimal disturbance of said upper surface of said filter bed; and
(d) Means for moving said screed blade in a forward direction toward said discharge station to move the sludge to the discharge station, and in a reverse direction away from said discharge station to return said blade for another scraping operation, said blade producing minimal disturbance of the sludge layer when moving in said reverse direction, said discharge station including an opening therein of sufficient dimensions to permit facile passage therethrough of sludge being discharged from said opening.

4,190,535
MEANS FOR SEPARATING LYMPHOCYTES AND MONOCYTES FROM ANTICOAGULATED BLOOD
Albert A. Luderer, Corning; Gerald Odstrchel, Horseheads, and Anthony R. Zine, Jr., Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Continuation-in-part of Ser. No. 881,252, Feb. 27, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 922,825
Int. Cl.² B01D *21/26*
U.S. Cl. 210—83 **29 Claims**



8. A method for separating platelets, lymphocytes, and monocytes from anticoagulant blood comprising the steps:
(a) a water-insoluble thixotropic gel-like substance which is chemically inert to blood constituents and having a specific gravity between 1.065–1.077 g/cc is placed in a sample of anticoagulated blood;
(b) the gel-blood sample is centrifuged at a force of at least 1200 G's for a sufficient length of time to cause the gel-like substance to form a barrier between the plasma, platelets, lymphocytes and monocytes and the heavier blood cells;
(c) the plasma is removed from atop said barrier leaving said platelets, lymphocytes and monocytes resting thereupon;
(d) a buffer solution compatible with platelets, lymphocytes, and monocytes, inert to the gel-like substance, and having a specific gravity less than that of the gel-like substance is deposited upon said barrier;
(e) the buffer solution is agitated to cause the said platelets, lymphocytes, and monocytes to become suspended therein; and then
(f) the suspension of platelets, lymphocytes, and monocytes in buffer is removed from contact with said barrier.

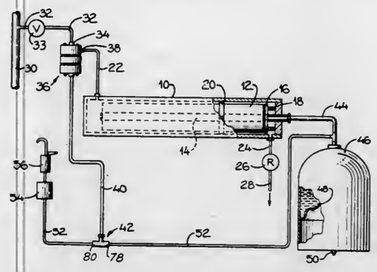
4,190,536
PERISTALTIC PUMPING MEANS FOR BLOOD DIALYSIS
Lars Grimsrud, Salmon, Id., assignor to A/S Nycotron, Drammen, Norway
Filed Feb. 22, 1978, Ser. No. 880,156
Claims priority, application Norway, Feb. 23, 1977, 770605
Int. Cl.² B01D *31/00*
U.S. Cl. 210—93 **2 Claims**



1. Dialysis apparatus for regulated blood dialysis comprising a dialyzer having flow passages for blood and dialysate, respectively, separated by semipermeable barriers for transferring liquid from the blood to the dialysate, the blood and dialysate being driven through their respective flow passages by individually associated pumping means, the improvement wherein said pumping means for the dialysate comprise two peristaltic pumps mounted on a common shaft and having the same pumping capacity and being respectively disposed on the inlet and outlet sides of said flow passage for dialysate through the dialyzer, one of said pumps being connected between a dialysate source and the inlet of the flow passage for dialysate through the dialyzer, the other of said pumps being connected between the outlet of said flow passage and a dialysate discharge conduit, a peristaltically actuated hose section of the peristaltic pump on the outlet side of the dialysate flow passage being surrounded by a sealed jacket having an interior in open communication with the interior of said hose section, and a tap outlet connected with means for gauging the amount of tapped liquid being arranged in communication with said flow passage between said two pumps.

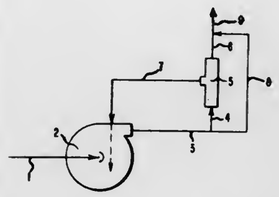
4,190,537
WATER STORAGE CONTROL FOR REVERSE OSMOSIS SYSTEM
Raymond A. Tondreau, San Marcos, and Donald T. Bray, Escondido, both of Calif., assignors to Desalination Systems, Inc., Escondido, Calif.
Filed Dec. 21, 1977, Ser. No. 862,860
Int. Cl.² B01D *31/00*
U.S. Cl. 210—98 **8 Claims**

1. Reverse osmosis apparatus comprising a pressure resistant container housing a semipermeable membrane; means for introducing a solute-containing feed water into said pressure resistant container under elevated pressure; means for releasing high solute content concentrate from said pressure resistant container while maintaining operating pressure therein; means for collecting permeate separated from said feed water by transport through said semipermeable membrane and for storing said permeate in a storage tank under elevated pressure; and a dispensing device connected to said storage tank for dispensing said permeate therefrom; in which the improvement comprises:
a. an automatic valve in said means for introducing said solute-containing feed water into said pressure resistant container;
b. control means for closing said automatic valve when the pressure in said storage tank rises above a first predetermined pressure and for opening said automatic valve when the pressure in said storage tank falls below a second predetermined pressure below said first predetermined pressure, said control means being actuated by the liquid pressure in a sensing conduit between said valve and the interior of said storage tank; and,



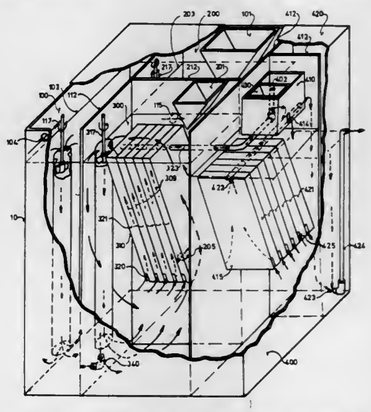
c. a constricted passageway device comprising; a tubular body, having an inlet end connected to said storage tank and an outlet end connected to said dispensing device, a section of reduced internal diameter in said body, and a section of expanded internal diameter on the downstream side of said section of reduced internal diameter, to produce a lowered pressure throat section in said tubular body when said permeate flows through said tubular body from said inlet end to said outlet end, said lowered pressure throat section of said tubular body communicating with said sensing conduit whose contained liquid pressure actuates said control means for said automatic valve;
d. whereby opening said permeate dispensing device to dispense permeate from said storage tank causes flow of said permeate through said constricted passageway device causing temporary reduction of pressure in said sensing conduit and servo opening action of said automatic valve.

4,190,538
PUMP SEAL FLUSH
Carl Chen, Newark, Del., assignor to E. I. Du Pont de Nemours And Company, Wilmington, Del.
Filed Sep. 22, 1978, Ser. No. 945,062
Int. Cl.² B01D *25/08, 25/32, 29/20, 35/02*
U.S. Cl. 210—167 **2 Claims**



1. Apparatus for flushing a pump seal comprising
(i) a pump having a mechanical seal,
(ii) the discharge line of said pump being connected to an inertial filter, said filter comprising an impervious shell having an inlet and two outlets, the inlet and one outlet being connected by a cylindrical porous filter element centrally disposed within said shell, the other outlet communicating with an annulus for filtrate between the shell and the filter element, the filter element having a porosity such that the filtrate will be essentially solids free and the filter element self-cleaning, and
(iii) the filter having two discharge lines connected to the outlets, the discharge line for filter filtrate being connected to the pump and communicating to the mechanical seal.

4,190,539
APPARATUS FOR ON-SITE RENOVATION OF SANITARY WATERS
Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)
Filed Aug. 16, 1978, Ser. No. 934,255
Int. Cl.² C02C *1/08*
U.S. Cl. 210—195.4 **6 Claims**



1. A self contained apparatus for renovation of sanitary waters comprising a waste water receiving tank divided by common partitions into three bioreaction chambers, means for flowing waste water into the first bioreaction chamber, said bioreaction chambers being in communication via restricted openings in said common partitions for flowing the waste water by gravity from chamber to chamber in the direction from first chamber into the third chamber, said bioreaction chambers being also equipped wih an opening in said common partitions for recirculating a portion of the content from said third bioreaction chamber, will all bioreaction chambers being equipped with submerged mechanical mixers for recirculating, mixing and aerating the contents therein to maintain optimum process conditions, said third bioreaction chamber in addition being equipped with a suspended solids separator for separation of suspended solids from the thusly treated waste water and for retaining the separated suspended solids in said third bioreaction chamber, said suspended solids separator being composed of number of parallel settling channels completely submerged in the content in said third bioreaction chamber, said settling channels each being equipped with an opening located in the side wall at the bottom of the chamber and a restricted opening at the top for flowing the treated waste water upwardly through said settling channels and out through said restricted opening into a horizontally positioned effluent collection pipe, means for chemical treatment, a purification chamber and an exit pipe for discharge of treated effluent out of the apparatus.

4,190,540
PERMANENT MAGNETIC SEPARATOR FOR LIQUIDS

Heinrich Spodig, 4714 Selm-Bork, Netteberge 202, Fed. Rep. of Germany

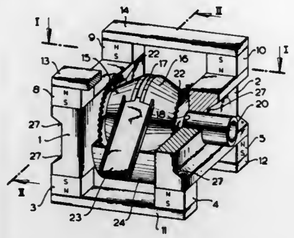
Filed Dec. 27, 1977, Ser. No. 825,690

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637802

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.² B01D *35/06*

U.S. Cl. 210—222 **6 Claims**



1. A permanent magnetic separator for liquids to be purified comprising at least one set consisting of two hollow bowl-shaped bodies each of which hollow bowl-shaped bodies is positioned rotatably on a hollow shaft, said hollow bowl-shaped bodies being arranged opposite each other symmetrically and with an operating air gap therebetween, said hollow shafts serving as inflows for the introduction of the liquid to be purified into the interiors of said hollow bowl-shaped bodies, the outflow of said liquid occurring through said operating gap, a container partially surrounding said hollow bowl-shaped bodies and into which said liquid passes after separation therefrom of the ferromagnetic impurities, spaced permanent magnets positioned outside of said bowl-shaped bodies, separate pole shoes each in contact with their associated permanent magnetics, said pole shoes being disposed between two pairs of permanent magnets each pair of which permanent magnets is disposed, respectively, below and above said hollow shafts and being connected by mild iron bridges positioned, respectively, below and above pairs of permanent magnets to form a closed magnetic system, said hollow bowl-shaped bodies being oppositely polarized, said pole shoes carrying said hollow shafts, said ferromagnetic impurities being collected from the liquid to be purified in said operating air gap and on and adjacent to the edges of said hollow bowl-shaped bodies, and a stripper associated with said operating air gap to remove said ferromagnetic impurities during rotation of said hollow bowl-shaped bodies for discharge and removal of said ferromagnetic impurities.

4,190,541
WASTE WATER TREATMENT APPARATUS

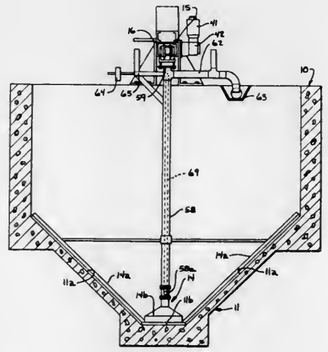
Thomas B. Wade, Poplar Grove, and James A. Knight, Pearl City, both of Ill., assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed Jan. 18, 1979, Ser. No. 4,376

Int. Cl.² B01D *21/24*

U.S. Cl. 210—241 **12 Claims**

12. In a waste water treatment apparatus including a tank having an open top and fluid inlet and fluid outlet means communicating with the tank, a generally horizontal carriage support rail extending across the top of the tank, a carriage mounted in the rail for movement therealong over the top of the tank, tank cleaning means mounted on the carriage and extending downwardly from the carriage into the tank for movement with the carriage along the tank, carriage drive means including a drive motor and an endless chain entrained over a pair of sprockets having upper and lower runs generally paralleling the carriage support rail, and means connecting the carriage to the chain for movement thereby back and forth along the carriage support rail, the improvement wherein said carriage support rail comprises a box-shaped beam having a top wall and spaced side walls extending downwardly from the top wall and a pair of inwardly extending carriage support flanges on the side walls spaced apart to define a track opening therebetween, means mounting said sprockets inside the box-shaped beam adjacent its ends to support said chain inside the beam with the upper and lower runs of the chain extending lengthwise of an upright plane substantially medially between the spaced side walls of the beam, said carriage including a pair of laterally spaced wheel mounting members extending inside said box-shaped beam at relatively opposite sides of said endless chain, and at least one wheel mounted on each of said wheel mounting members inside said beam and in rolling engagement with the upper side of a respective one of the carriage support flanges on the box-shaped beam to support the carriage for movement along the beam, said drive means being operative to drive said endless chain in only one direction, said endless chain having a drive lug extending outwardly therefrom intermediate the side edges of the chain for movement in a closed loop course in said upright plane, an upper follower rigidly mounted on the carriage and overlying the upper run of



said chain to be engaged by the drive lug when the drive lug is moving along the upper run of the chain for moving the carriage in one direction, the drive lug moving out of engagement with the upper follower when the lug moves downwardly over one of said sprockets whereby to interrupt movement of the carriage in said one direction, a lower follower rigidly mounted on the carriage and underlying the lower run of the chain to be engaged by the drive lug when the drive lug is moving along the lower run of the chain for moving the carriage in the other direction, the drive lug moving out of engagement with the lower follower when the drive lug moves upwardly around the other of said sprockets whereby to interrupt movement of the carriage in said other direction, said upper and lower followers being spaced apart in a direction lengthwise of said carriage and said upper follower being located adjacent the end of the carriage that leads when the carriage is moved in said one direction and said lower follower being located adjacent the end of the carriage that leads when the carriage is moved in said other direction, and chain guide means underlying the upper run of said chain means and overlying the lower run of said chain means.

4,190,542
DISPOSABLE COLUMN

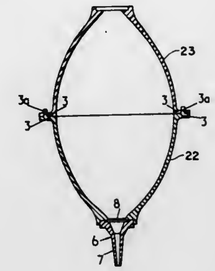
Martin E. Hodgson, Harlow; Graham D. Munro, Buntingford; David P. Rickman, Ware, and Jack Fennimore, Welwyn, all of England, assignors to Smith & Nephew Research Ltd., Harlow, England

Continuation of Ser. No. 491,329, Jul. 24, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,826

Claims priority, application United Kingdom, Jul. 26, 1973, 35678/73

Int. Cl.² B01D *27/02*

U.S. Cl. 210—282 **10 Claims**



1. Disposable haemoperfusion equipment comprising:
(A) a column,
(i) formed in biocompatible synthetic polymer material,
(ii) having a smooth internal surface,
(iii) enclosing perforate internal support means towards each end of said column
(iv) diminishing in diameter from a maximum diameter intermediate said ends, and then
(v) converging smoothly at each end of said column to an inlet port and an outlet port respectively, each such port defining a minimal dead space between itself and the nearer support means,
(vi) said column having a length to maximum diameter ratio of 1.5:1 to 5:1 and an internal volume of 50 to 800 ml., and
(vii) said column being formed as two identical halves located end to end, each half possessing a first frusto-conical tapering portion having an included angle of from 10° to 30°, and a second frusto-conical tapering portion, integral with said first portion, but of an included angle of from 50° to 70°, tapering to a liquid flow connection at each end of said column;
(B) a body of absorbtive particulate material,
(i) substantially filling the column and held between the support means so that the particles do not move relatively in use, and
(ii) consisting of particles having a smooth biocompatible surface; and
(C) a biocompatible liquid charge filling the column, chosen from the group of degassed isotonic saline and plasma extender.

10. Disposable haemoperfusion equipment, comprising:
(A) a column, the internal shape of which is that of a trochoid of revolution,
(i) formed in biocompatible synthetic polymer material,
(ii) having a smooth internal surface,
(iii) enclosing perforate internal support means towards each end of the column,
(iv) diminishing in diameter from a maximum diameter intermediate said ends, and then
(v) converging smoothly at each end of said column to an inlet port and an outlet port respectively, each such port defining a minimal dead space between itself and the nearer support means,
(vi) said column having a length to maximum diameter ratio of 1.5:1 to 5:1 and an internal volume of 50 to 800 ml;
(B) a body of absorbtive particulate material,
(i) substantially filling the column and held between the support means so that the particles do not move relatively in use, and
(ii) consisting of particles having a smooth biocompatible surface; and
(C) a biocompatible liquid charge filling the column, chosen from the group of degassed isotonic saline and plasma extender.

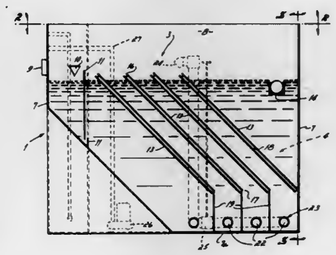
4,190,543
WASTE WATER TREATMENT APPARATUS

Jerard M. Pederson, 3502 Clifton Ave., Cincinnati, Ohio 45220, and William J. Beckman, Jr., 1722 Fireside Dr., Cincinnati, Ohio 45230

Filed Jul. 19, 1978, Ser. No. 926,073

Int. Cl.² B01D *29/04*

U.S. Cl. 210—332 **6 Claims**



1. Waste water treatment apparatus for removing suspended solids from waste water comprising in combination:
at least one filtration chamber, said chamber having a plurality of walls including bottom and side walls, said filtration chamber also having waste water receiving and discharging means,
a plurality of wedge wire media panels mounted within said filtration chamber, said panels having perforations therein through which the waste water is directed, said media panels extending from approximately the bottom wall of said filter chamber to the normal waste water surface level and extending between the side walls, and said media panels being inclined with respect to the vertical axis of the side walls such that the portion of the media panel adjacent to said bottom wall is closer to the discharging means than is the portion of the media panel adjacent to said waste water surface level, whereby a biological mat is established on and adjacent to the media panels so as to filter the solids by adsorption.

4,190,544
FILTER ELEMENT FOR A ROTATABLE DISC FILTER

Ferdinand Schnellmann, Jona, and Hanspeter Meier, Rapperswil, both of Switzerland, assignors to Chemap A.G., Männedorf, Switzerland

Continuation of Ser. No. 874,906, Feb. 3, 1978, abandoned. This application Nov. 30, 1978, Ser. No. 964,939

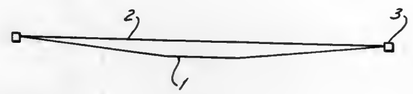
Claims priority, application Switzerland, Feb. 23, 1977, 2247/77

Int. Cl.² B01D *33/28*

U.S. Cl. 210—461 **8 Claims**

1. In combination with a pressure disc filter of the type in which media to be filtered corrodes metal upon contact therewith, a filter element comprising a metallic filter plate having upper and lower surfaces and being subject to corrosion upon contact with the media to be filtered, said filter plate having a center outlet; a coating covering said surfaces except said

outlet and being at least resistant to corrosion on contact with the media to be filtered, said coating having an upwardly facing surface having a plurality of rectangular, substantially equally dimensioned and evenly spaced projections each extending upwardly from the upwardly facing surface to thereby



provide a plurality of vertical channels all of which extend radially to said outlet and through which filtrate is drained directly into the outlet; and a filter cloth at least partially overlying said coating and being supported on said projections, so that filtrate passes through said filter cloth onto said coating without coming into contact with said metallic filter plate.

4,190,545

APPLICATION OF FLUOROCARBON COMPOUND TO SYNTHETIC ORGANIC POLYMER YARN

Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 1,625, Jan. 8, 1979. This application Mar. 30, 1979, Ser. No. 25,635

Int. Cl.[2] D06M *13/34*

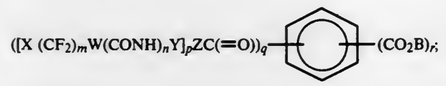
U.S. Cl. 252—8.75 **27 Claims**

1. A spin finish for yarn, made from synthetic organic polymer, to be processed at high temperature into a yarn that is oil repellent and resistant to soiling, said spin finish comprising:

a. about 5 to 25 percent by weight of said spin finish of a first noncontinuous phase consisting essentially of

i. about 15 to 80 weight percent of a nonhomogeneous mixture of a salt of dinonyl sulfosuccinate, a salt of dimethyl naphthalene sulfonate, and ammonium perfluoroalkyl carboxylate, and

ii. about 20 to 85 weight percent of a fluorochemical compound having the formula



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF)_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different;

b. about 50 to 90 percent by weight of said spin finish of water; and

c. about 5 to 25 percent by weight of said spin finish of a second noncontinuous phase which is capable of being emulsified with said first noncontinuous phase and said water without separation of any of the component parts of said spin finish.

4,190,546

TRACTION FLUID

Stanley Kulik, Hawley, near Camberley, and Anthony M. Smith, Ashford, both of England, assignors to The British Petroleum Company Limited, Middlesex, England

Filed Jul. 20, 1978, Ser. No. 926,233

Claims priority, application United Kingdom, Aug. 27, 1977, 36091/77

Int. Cl.[2] C10M *1/50, 1/16, 1/20*

U.S. Cl. 252—49.6 **5 Claims**

1. A traction fluid comprising from 50 to 90% wt of a naphthenic hydrocarbon or mixture of naphthenic hydrocarbon which is one or more alkylated dicyclohexyl methanes, from 8 to 40% wt of a silicone fluid and from 2 to 10% wt of a co-solvent which is an aromatic hydrocarbon or aromatic ether which ensures complete miscibility between the naphthenic hydrocarbon and silicone fluid, the percentages being by weight of the three components.

4,190,547

NON-FLAMMABLE INSULATING MATERIAL

Harald Mahnke; Jüergen Nieberle, both of Ludwigshafen; Volker Trautz, Neckarhausen, and Heinz Weber, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,193

Int. Cl.[2] C04B *43/02*

U.S. Cl. 252—62 **2 Claims**

1. Non-flammable insulating material having good fire resistance and a density of from 80 to 230 g/l, which material comprises

(A) from 99 to 80% by weight of expanded perlite or vermiculite having a mean particle diameter of from 0.05 to 3 mm and a bulk density of from 30 to 150 g/l and

(B) from 0 to 40% by weight of inorganic additives, selected from the group consisting of glass fibers, rockwool, mineral wool, talc and gypsum, the particles being bonded to one another by

(C) from 1 to 20% by weight of a heat-resistant organic high molecular weight binder, selected from the group consisting of crosslinked melamine/formaldehyde and phenol/formaldehyde resins,

wherein the insulating material contains, as an additional binder 0.2 to 4% by weight, based on the mixture, of an alkylphenol/phenol/formaldehyde condensate C'.

4,190,548

PLASTIC BONDED PERMANENT MAGNET AND METHOD OF MAKING SAME

Max Baermann, Postfach 26, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 925,966

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736642

Int. Cl.[2] H01F *1/06*

U.S. Cl. 252—62.54 **9 Claims**

1. In a plastic bonded permanent magnet including particles of a cobalt-rare earth alloy permanent magnet material dispersed within a plastic binder, the improvement comprising: said binder being a substantially oxygen free plastic.

4,190,549

SOAP FOR SCOURING PAD

Tetsuya Imamura, and Takashi Hiraide, both of Tokyo, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1978, Ser. No. 961,214

Claims priority, application Japan, Dec. 26, 1977, 52/156948

Int. Cl.[2] A47L *17/08;* **C11D** *9/02, 17/04*

U.S. Cl. 252—91 **5 Claims**

1. A soap-filled steel wool scouring pad in which the soap consists essentially of neutralized alkali metal salt of fatty acid, said fatty acid having an average carbon number of 16 to 20 and an iodine value of 30 to 45, the degree of neutralization of said fatty acid with the alkali metal being from 85 to 98% by weight.

4,190,550

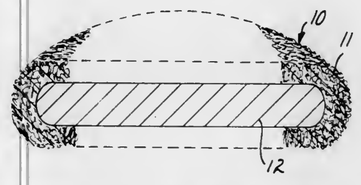
SOAP-FILLED PAD

Douglas D. Campbell, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 397,345, Sep. 14, 1973, abandoned. This application Dec. 14, 1977, Ser. No. 860,332

Int. Cl.[2] C11D *17/00*

U.S. Cl. 252—93 **6 Claims**



1. A seamless, fibrous soap-filled pad, having particular utility in imparting a cleansing and mildly stimulating rubbing action to human skin, comprising in combination:

a seamless edgeless continuous envelope of needled crimped, resilient, stretchy synthetic organic fibers which are at least about 3 cm long and have about 2 to about 10 crimps per cm,

said envelope surrounding a core of solid, surfactant material, the thickness of the envelope wall lying outward from said core being at least about 5 mm, and being held in integral form solely by the needled inter-entanglement of said fibers.

said pad being of a size capable of being readily held in the palm of the user.

4,190,551

GRANULAR OR POWDERY DETERGENT COMPOSITION OF HIGH FLUIDITY

Moriyasu Murata, and Fumio Sai, both of Chiba, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,221

Claims priority, application Japan, Jun. 14, 1977, 51/70358

Int. Cl.[2] C11D *1/72, 7/02, 17/06*

U.S. Cl. 252—99 **24 Claims**

1. A non-sticky dry powder consisting essentially of particles of water-insoluble, amorphous, phosphorus-containing alkali metal aluminosilicate having the formula

$$X(M_2O).Al_2O_3.Y(SiO_2).Z(P_2O_5).\omega(H_2O)$$

wherein M is Na or K; X, Y and Z are mole numbers satisfying the relations

$0.20 \leqq X \leqq 1.0$

$0.20 \leqq Y \leqq 4.00$

$0.001 \leqq Z \leqq 0.80$

and ω is zero or an optional positive number, said particles having adsorbed thereon water-soluble, synthetic, nonionic surface active agent, said powder containing from 1 to 75 wt. % of said nonionic surface active agent.

4,190,552

PASSIVATION OF METALS ON CRACKING CATALYSTS WITH AN ANTIMONY TRIS (HYDROCARBYL SULFIDE)

Brent J. Bertus; Dwight L. McKay, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1978, Ser. No. 926,697

Int. Cl.[2] C10G *9/16, 11/06;* **C07F** *9/90*

U.S. Cl. 252—411 R **7 Claims**

1. A method for passivating a contaminating metal upon a hydrocarbon cracking catalyst, which comprises contacting said cracking catalyst with an antimony tris (hydrocarbyl sulfide) to add the same thereto.

4,190,553

REJUVENATION OF DAMAGED ZEOLITE-SUPPORTED METAL CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 470,868, May 17, 1974, abandoned. This application Oct. 5, 1978, Ser. No. 948,890

Int. Cl.[2] B01J *29/38, 29/12, 29/22;* **C10G** *13/10*

U.S. Cl. 252—412 **12 Claims**

1. A method for rejuvenating a catalyst comprising about 0.1–3 wt.% of a non-zeolitic Group VIII noble metal supported on a siliceous zeolite carrier having an ion exchange capacity of at least about 0.1 meq/g, and wherein at least about 50% of the original zeolitic metal content of said zeolite carrier has been replaced with hydrogen ions and/or polyvalent metal ions, but which still contains some zeolitic sodium and/or magnesium ions, said catalyst having been previously subjected to thermal and/or hydrothermal conditions resulting in a maldistribution of said Group VIII noble metal on said carrier with resultant reduction in hydrogenation activity and in a deleterious migration of said zeolitic sodium and/or magnesium cations resulting in a reduction in cracking activity, which comprises:

(A) contacting said catalyst in an oxidized or sulfided state with a volumetric excess of a reagent consisting essentially of a 0.1–30 weight-percent aqueous ammonium hydroxide solution, and correlating the contacting time with the temperature and reagent strength so as to effect a substantial improvement in hydrogenation activity of said catalyst while retaining therein at least about 90 percent of said Group VIII noble metal;

(B) exchanging out a measurable portion of said zeolitic sodium and/or magnesium ions by adding an acid component to said ammonium hydroxide solution while said solution remains in contact with said catalyst, said acid component being added in an amount such that said catalyst is contacted with an extractive proportion of an aqueous ammonium salt solution having a pH below about 8;

(C) separating the catalyst from the resulting ammonium salt extract of zeolitic metal cations; and

(D) drying and calcining the separated catalyst at temperatures in the range of about 500°–950° F. while maintaining water vapor partial pressures below about 10 psi.

4,190,554

METHOD FOR REACTIVATION OF PLATINUM GROUP METAL CATALYST WITH AQUEOUS ALKALINE AND/OR REDUCING SOLUTIONS

Kiaki Yamauchi; Yukihiko Morimoto; Toshikatu Sasaki, and Katsumi Nakai, all of Osaka, Japan, assignors to Osaka Gas Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 861,521, Dec. 16, 1977, Pat. No. 4,147,660. This application Dec. 26, 1978, Ser. No. 972,868

Claims priority, application Japan, Dec. 22, 1976, 51/155512; Feb. 15, 1977, 52/15635; Apr. 25, 1977, 52/48285; Apr. 25, 1977, 52/48286; Apr. 27, 1977, 52/49507

Int. Cl.² B01J *23/96, 29/38;* **C10G** *13/10*

U.S. Cl. 252—412 **11 Claims**

1. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for hydro-cracking of hydrocarbons or alkanols with an aqueous solution of an inorganic alkaline compound of alkali metal or alkaline earth metal or mixtures thereof in a concentration of 0.001 to 10 N at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

6. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for hydro-cracking of hydrocarbons or alkanols with an aqueous solution of a reducing substance in a concentration of 0.01 to 10% by weight at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

4,190,555

CATALYST SYSTEM FOR POLYMERIZING ALPHA-OLEFINS AND METHOD OF MAKING SAME

Yoshinori Takamura, Otake; Hakusei Hamada, Nerima; Kiyoyuki Kitamura, Otake; Tetsuro Inada, Otake; Kunio Kodama, Otake, and Katuyuki Usami, Otake, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 762,843

Claims priority, application Japan, Feb. 5, 1976, 51-10805

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B **19 Claims**

1. A method of preparing an activated titanium component for use in an α-olefin polymerization catalyst system having at least one organo-aluminum compound admixed therein, said method comprising:

(a) reacting at a temperature in the range of 50°–200° C. and in the presence of an aromatic compound selected from aromatic hydrocarbons and halogenated aromatic hydrocarbons

(i) a titanium compound having the general formula $TiX_n(OR)_{4-n}$, wherein X is a halogen, R is a hydrocarbon group radical and n is 2 to 4,

(ii) a metal selected from the class consisting of groups II and III of the Periodic Table and present in the reaction in a molar amount of from 0.5 to 20 times the moles of the titanium compound, and

(iii) at least one halide of a metal selected from the class consisting of groups II and III of the Periodic Table and present in the reaction in a molar amount of from 0.5 to 20 times the moles of the titanium compound;

(b) treating the thus obtained reaction product with 0.1–20 moles of an organic compound selected from hydrocarbyl and chlorohydrocarbyl ethers, ketones and esters per mole of product at a temperature in the range of −50° to 150° C.;

(c) further treating the thus treated reaction product with 0.1–20 moles of a tetrahalide of a metal selected from the group consisting of titanium, vanadium and mixtures thereof, per mole of product at a temperature in the range of −80° to 80° C.; and

(d) aging the thus further treated reaction product at a temperature greater than 30° C. for a time ranging from 30 minutes to 24 hours.

4,190,556

PRODUCTION OF UNSATURATED NITRILES USING CATALYSTS PROMOTED WITH VARIOUS METALS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Arthur F. Miller, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 380,527, Jul. 19, 1973, abandoned. This application Aug. 1, 1977, Ser. No. 821,033

Int. Cl.² B01J *21/02, 27/14, 23/84, 23/64*

U.S. Cl. 252—432 **9 Claims**

1. A catalyst having the following formula:

$$X_aA_bD_cFe_dBi_eMo_{12}O_x$$

wherein

X is Ge, Ag, Cr, Ru, Ti, W or mixture thereof;

A is an alkali metal, alkaline earth metal, rare earth metal, Nb, Ta, Tl, P, As, B, Sb or mixture thereof;

D is Ni, Co, Mg, Mn, Zn, Cd or mixture thereof;

wherein

a is 0.01 to about 4;

b is 0 to about 4;

c and d are 0.01 to about 12;

e is 0.01 to about 6; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present; and

wherein said catalyst contains at least one of the following element combinations: Cr++W, Ge+W, Cr+P and Ge+P.

4,190,557

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 883,115, Mar. 3, 1978, Pat. No. 4,137,153, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Aug. 10, 1978, Ser. No. 932,575

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.² B01J *27/08, 27/10, 23/64*

U.S. Cl. 252—441 **20 Claims**

1. A catalytic composite comprising the pyrolyzed reaction product of a catalytically effective amount of a rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the pyrolysis of said carbonyl component, and of a zinc component.

4,190,558

CATALYSTS FOR PREPARING AROMATICS FROM SYNTHESIS GAS

Walter H. Seitzer, West Chester, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Division of Ser. No. 890,331, Mar. 27, 1978, Pat. No. 4,139,550, which is a continuation-in-part of Ser. No. 722,292, Sep. 10, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,490

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **5 Claims**

1. A catalyst composition useful for converting CO and hydrogen to aromatic fuel mixtures comprising a copper-chromium promoted iron catalyst in admixture with type Y molecular sieve having a sodium cation content of less than about 0.2 wt.%, an SiO_2/Al_2O_3 weight ratio of less than about 6.0, and an NH_4O content of less than about 4 wt.%, wherein the volume ratio of iron catalyst to molecular sieve is about 0.1 to 10.0.

4,190,559

METAL CATALYST SUPPORT HAVING RECTANGULAR CROSS-SECTION

William B. Retallick, West Chester, Pa., assignor to Oxy-Catalyst, Inc., West Chester, Pa.

Filed Oct. 13, 1978, Ser. No. 951,980

Int. Cl.² B01J *35/02*

U.S. Cl. 252—477 R **9 Claims**

1. A metal catalyst support comprising:

a. a stack of metal strips;

b. said strips having indentations of uniform height, wherein the spacing between said strips is equal to said height; and

c. wherein said indentations are spaced along said strips in a varying, non-repetitive pattern, wherein the indentations in adjacent strips cannot coincide and nest together.

4,190,560

PROCESS FOR PREPARING CATALYST ON CARRIER SYSTEMS

John W. Geus, and Leonardus A. M. Hermans, both of Utrecht, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 894,612, Apr. 6, 1978, abandoned. This application May 19, 1978, Ser. No. 907,777

Claims priority, application Netherlands, Apr. 6, 1977, 7703762; France, Apr. 5, 1978, 78 10060; Fed. Rep. of Germany, Apr. 6, 1978, 2814914; Italy, Apr. 5, 1978, 48750A/78; Japan, Apr. 5, 1978, 53-40163; United Kingdom, Apr. 3, 1978, 12945/78

Int. Cl.² B01J *29/10, 23/62*

U.S. Cl. 252—459 **14 Claims**

1. In a process for the preparation of a particulate, at least inchoately catalytically active composition affixed to the surface of a finely divided solid particulate carrier material by the steps of

forming an aqueous medium initially containing said carrier material homogeneously suspended in an aqueous solution of

at least one water soluble compound of at least one metal capable of forming said catalytically active composition, which will form a water insoluble compound of said metal upon an increase of the hydroxyl ion concentration in said aqueous medium, and a hydrolzable agent which upon heating will develop hydroxyl ions in said aqueous medium,

heating and stirring said aqueous medium so as to gradually and homogeneously increase the hydroxyl ion concentration throughout said aqueous medium thereby effecting the precipitation of said water insoluble compound substantially homogeneously onto said carrier material, separating said carrier material, having said water insoluble compound deposited thereon, from the remaining aqueous solution of said aqueous medium,

the improvement wherein said carrier material has a particle size of less than 10 microns, said hydrolyzable agent is a compound forming cyanate ions in said aqueous medium, and said aqueous medium, initially formed at a temperature of less than about 20° C., is heated to a temperature of between about 20° C. and 50° C. to hydrolyze said cyanate ions thereby gradually and homogeneously raising the hydroxyl ion concentration within said aqueous medium.

6. The process of claim 1, wherein said carrier material is a finely divided, highly porous silica or alumina, and said catalytically active composition includes at least one member selected from the group consisting of the elements nickel, cobalt, iron or copper, oxides of such elements, or any combination with each other or with other metals.

8. The proces of claim 1, wherein said separated carrier material, having said insoluble compound deposited thereon, is washed and dried and thereafter reduced at a temperature less than 500° C., thereby forming a metal as such catalytically active compound.

4,190,561

ESTERS OF CYCLOHEXENE, ODORIFEROUS COMPOSITIONS CONTAINING SAID ESTERS AND PROCESS FOR THE PREPARATION THEREOF

Bernard Auger, Peymeinade; Marcel Plattier, Antibes, and Paul J. Teisseire, Grasse, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

Filed Nov. 10, 1976, Ser. No. 740,361

Claims priority, application Switzerland, Nov. 17, 1975, 14896/75

Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 R **4 Claims**

1. The compound 1,5,5-trimethyl-4-(1-formyloxy-ethyl)-cyclohex-1-ene.

4,190,562

IMPROVED WATER ABSORBENT COPOLYMERS OF COPOLYMERIZABLE CARBOXYLIC ACIDS AND ACRYLIC OR METHACRYLIC ESTERS

Ira J. Westerman, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 4, 1977, Ser. No. 784,100

Int. Cl.² C08F *20/18, 20/44, 20/56*

U.S. Cl. 260—17.4 UC **18 Claims**

1. A film forming water absorbing interpolymer of monomers comprising (1) from about 40 to 87 weight percent of an olefinically unsaturated carboxylic acid monomer, (2) 2 to 20 weight percent of an acrylic ester monomer of the formula

$$CH_2{=}C(R')-C(=O)-O-R$$

where R′ is hydrogen, methyl or ethyl and R is an alkyl group containing 10 to 30 carbon atoms and (3) 5 to 30 weight percent of at least one acrylic or methacrylic nitrile or amide said weight percents based on said interpolymer.

4,190,563

PARTICULATE ABSORBANT MATERIAL SURFACE TREATED WITH POLYETHER TO IMPROVE DISPERSIBILITY IN BLOOD

John A. Bosley, Higham Ferrers; Vicki Maddison, Bedford, and Alan A. McKinnon, Higham Ferrers, all of England, assignors to Lever Brothers Company, Inc., New York, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,924

Claims priority, application United Kingdom, Oct. 18, 1977, 43308/77; Apr. 10, 1978, 13951/78

Int. Cl.² C08L *3/02*

U.S. Cl. 260—17.4 GC **10 Claims**

1. A water-swellable particulate absorbant material surface-treated to enhance its dispersibility in blood with an effective amount of at least one polyether selected from the group consisting of polyoxyethylenes, polyoxypropylenes and polyoxyethylene-polyoxypropylene block copolymers, said effective amount of polyether being such as to permit capillary flow of blood through a mass of the particulate absorbent; wherein:

(a) said water-swellable particulate absorbent material has a water retention value of at least 2 g/g; and

(b) said polyether has a molecular weight of about 300 to about 6,000.

4,190,564

CATIONIC ELECTROPHORETIC COATING COMPOSITIONS

Akira Tominaga, and Yasuyuki Hirata, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Continuation of Ser. No. 783,229, Mar. 31, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,280
Claims priority, application Japan, Jun. 29, 1977, 52-38649
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 PT **11 Claims**

1. A cationic electrophoretic coating composition comprising an aqueous medium and a resinous binder dispersed therein, said resinous binder comprises:

(A) A water-soluble or water-dispersible resin prepared by contacting a reaction product with a partially blocked polyisocyanate having in the molecule not more than one free isocyanate group and at least one blocked isocyanate group on the average at a temperature of 40° to 130° C., and subsequently by neutralizing the resulting product with an acid, said reaction product being prepared by reacting a compound selected from the group consisting of fatty acid, polyamide or mixtures thereof with an adduct, said adduct being prepared by reacting an epoxy resin with a basic amino compound, the amount of said fatty acid and/or polyamide used being 1 to 100 parts by weight per 100 parts by weight epoxy resin and the basic amino compound being used in an amount not exceeding one mole per mole of epoxy group and

(B) at least one polymer selected from the group consisting of an ethylene oxide addition polymer, a propylene oxide addition polymer and derivatives of the ethylene oxide addition polymer and/or propylene oxide addition polymer, said polymers and derivatives having a number average molecular weight of 500 to 10,000 and having a solubility of up to 60 parts by weight in 100 parts by weight of water at 25° C., the partially blocked polyisocyanate being used in an amount of 1 to 100 parts by weight per 100 parts by weight of the epoxy resin and the component (B) being used in an amount of 0.5 to 30% by weight based on the component (A) as solid.

4,190,565

FILLED HOT-MELT ADHESIVES CONTAINING MODIFIED POLYETHYLENE

Mary J. Cook, and Kenneth W. Hyche, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,157
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—27 R **10 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of

(a) about 35 to 90 percent by weight of at least one modified polyethylene having a saponification number of about 3 to 10 prepared by reacting polyethylene with a member of the group consisting of unsaturated polycarboxylic acid, anhydride and esters thereof,

(b) about 10 to 70 percent by weight of at least one filler having a particle size of less than 20 microns, and

(c) about 10 to 40 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin, polyterpene resin and rosin ester resin.

4,190,566

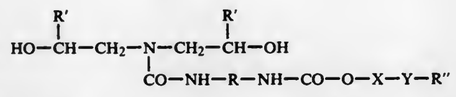
WATER-DISPERSIBLE POLYURETHANES

Klaus Noll, and Josef Pedain, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

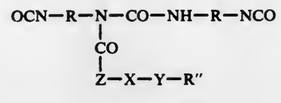
Filed Dec. 2, 1976, Ser. No. 746,919
Int. Cl.[2] C08L *75/12*; C08G *18/78*; C08L *75/08*
U.S. Cl. 260—29.2 TN **9 Claims**

1. Non-ionic, water-dispersible polyurethanes produced using an isocyanate group to isocyanate-reactive group equivalent ratio of from about 0.8:1 to 2.5:1 having a substantially linear molecular structure and about 3 to 30% by weight, based on the weight of the polyurethane, of lateral polyalkylene oxide polyether chains containing ethylene oxide units which are responsible for dispersibility, wherein from about 40 to 95% of the alkylene oxide units of the lateral polyalkylene oxide polyether chains, based on the number of alkylene oxide units, consist of ethylene oxide units and from about 5 to 60% are selected from the group consisting of propylene oxide, butylene oxide and styrene oxide units.

3. A process for producing water-dispersible polyurethanes having a substantially linear molecular structure and about 3 to 30% by weight, based on weight of the polyurethane, of lateral polyalkylene oxide polyether chains by reacting organic diisocyanates with difunctional organic compounds ("difunctional" in the context of the isocyanate polyaddition reaction) containing terminal isocyanate-reactive hydrogen atoms and having a molecular weight of from about 300 to 6000 in the presence of synthesis components containing hydrophilic groups which guarantee the dispersibility of the polyurethanes and optionally in the presence of chain extenders having a molecular weight below about 300 known in polyurethane chemistry and optionally in the presence of the aids and additives commonly used in polyurethane chemistry, wherein the synthesis components containing hydrophilic groups are diols corresponding to the following general formula:



and/or diisocyanates corresponding to the following general formula:



wherein

R—represents a difunctional radical of the type obtained by removing the isocyanate groups from a diisocyanate having a molecular weight of from about 112 to 1000,

R'—represents a hydrogen atom or a monofunctional hydrocarbon radical having from 1 to 8 carbon atoms,

X—represents a difunctional radical obtained by removing the terminal oxygen atom from a polyalkylene oxide radical having from about 5 to 90 alkylene oxide units, of which, based on the number thereof, from about 40 to 95% consist of ethylene oxide units and from about 5 to 60% are selected from the group consisting of propylene oxide, butylene oxide and styrene oxide units,

Y—represents oxygen or —NR'''—,

R'' and R''' which may be the same or different, each represent monofunctional hydrocarbon radicals having from 1 to 12 carbon atoms, and

Z—represents a radical which has the same definition as Y and wherein the equivalent ratio of isocyanate groups to isocyanate-reactive groups is from about 0.8:1 to 2.5:1.

4,190,567

AQUEOUS CATIONIC POLYURETHANE EMULSION WITH GLYCIDYL ETHER CURING AGENT

Hidemasa Ohmura, and Masahiro Saito, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 857,026
Claims priority, application Japan, Dec. 13, 1976, 51/149543
Int. Cl.[2] C08L *63/00, 75/02, 75/12*
U.S. Cl. 260—29.2 TN **15 Claims**

1. A curable cationic polyurethane emulsion capable of forming a film possessing excellent physical properties, which comprises a mixture of a cationic polyurethane resin aqueous emulsion and from 2 to 50 parts by weight, per 100 parts by weight of the polyurethane resin, of an epoxide group-containing compound selected from the group consisting of diglycidyl ethers of diol selected from ethylene glycol, propylene glycol, polyoxyethylene glycol, polyoxypropylene gycol, neopentyl glycol and bisphenol A, polyglycidyl ethers of polyol selected from glycerin, trimethylol propane, pentaerythritol, diglycerol and sorbitol, and allyl glycidyl ether and oligomers thereof, said cationic polyurethane resin emulsion having been prepared by either

(1) reacting an isocyanate-terminated urethane prepolymer (A) with an excess amount of a polyalkylene polyamine to form a polyurethane urea polyamine (B), and either

(a) mixing said polyurethane urea polyamine (B) with an aqueous solution of an acid,

(b) reacting said polyurethane urea polyamine (B) with an epihalohyrin and mixing the resulting reaction product with an aqueous solution of an acid, or

(c) partially reacting free amino groups of said polyurethane urea polyamine (B) with a blocked polyisocyanate having one free isocyanate group, which blocked polyisocyanate has been obtained by reacting a polyisocyanate with an isocyanate-blocking agent, and mixing the resulting reaction with an aqueous solution of an acid, or

(2) reacting said urethane prepolymer (A) with a polyalkylene polyamine derivative having at least two primary or secondary amino groups and at least one functional group having the formula $—CH_2—CH(OH)—CH_2X$, in which X is Cl, or BR, and mixing the resulting reaction product with an aqueous solution of an acid.

4,190,568

MINERAL STABILIZED RESIN EMULSION

Fred H. Haney, 10216 Vultee Ave., Downey, Calif. 90241

Filed Jan. 2, 1979, Ser. No. 512
Int. Cl.[2] C08L *23/26*
U.S. Cl. 260—29.6 XA **12 Claims**

1. A mineral stabilized resin emulsion formed as an aqueous slurry consisting essentially of:

(i) about 35 to about 65 percent by weight of a material selected from the group consisting of low to zero acid number hydrocarbon resins having a softening point above about 80° F. and penetration within a range of from about 40 dmm to 190 dmm at 77° F.,

(ii) about 0.2 to about 2.0 percent by weight of at least one component selected from the group consisting of benzoic acid, stearic acid, octanoic acid, napthenic acid, salicylic acid and mixtures thereof for solubilizing said hydrocarbon resin,

(iii) about 2.0 to about 5.0 percent by weight of a mineral stabilizer selected from the group consisting of montmorillonite mineral compounds, clays, and mixtures thereof, and

(iv) about 0.1 to about 4.0 percent by weight of a complexing agent selected from the group consisting of hydrochloric acid, sulfuric acid, acetic acid, phosphoric acid, chromic acid, sodium dichromate, potassium dichromate, aluminum sulfate, aluminum chloride, calcium chloride, magnesium sulfate, sodium aluminate, ferric chloride, ammonium chloride and mixtures thereof;

(v) about 35 to about 55 percent by weight water;

the water solubility of the reaction product formed upon reaction of said complexing agent with the solubilized hydrocarbon resin i) being at least about 0.02 gms. per hundred grams of water.

4,190,569

BAKING FINISHES OF LOW SOLVENT CONTENT

Ruprecht Kroker, Bobenheim-Roxheim; Hans Sander, Ludwigshafen, and Hermann Gausepohl, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 820,721, Aug. 1, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 939,969
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728459
Int. Cl.[2] C08K *5/05*
U.S. Cl. 260—31.6 **7 Claims**

1. A baking finish of low solvent content comprising (A) an acrylate resin, (B) an epoxy resin, and (C) a mixture of organic solvents, with or without pigment, catalyst and other conventional auxiliaries, the acrylate resin (A) being a copolymer containing α,β-olefinically unsaturated carboxylic acid copolymerized units having a K value (measured by the Fikentscher method) of less than 15 and an acid number of from 70 to 250 mg of KOH/g; the epoxy resin (B) containing at least 2 oxirane groups per molecule, and the organic solvent mixture (C) comprising from 20 to 80% by weight of a solvent having a boiling point of from 100° to 280° C. and a dielectric constant of from 2 to 4.99 and from 80 to 20% by weight of a solvent having a boiling point from 80° to 200° C. and a dielectric constant of from 5 to 27, the weight ratio of the components (A):(B) being from 9:1 to 6:4 and the weight ratio of the components (A+B):(C) being from 7:3 to 5:5, wherein the acrylate resin (A) has a mean molecular weight $\overline{Mn}$ of from 1500 to 3000 and an inhomogeneity (Mw/Mn), measured by gel permeation chromatography of from 1.5 to 2.0, said acrylate resin (A) being a copolymer of from 12 to 25% by weight of acrylic acid or methacrylic acid, from 5 to 70% by weight of one or more esters of acrylic acid or methacrylic acid from the group consisting of ethyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, 2-ethylhexyl acrylate n-butyl acrylate, from 5 to 70% by weight of styrene and from 0 to 20% by weight of an alkanediol monoester of acrylic acid or methacrylic acid.

4,190,570

CABLE FILLER

John J. Kaufman, Parker, Pa., and Thomas E. Luisi, Plainview, N.Y., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 798,977, May 20, 1977, Pat. No. 4,105,619. This application Aug. 4, 1978, Ser. No. 931,051
The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.
Int. Cl.[2] C08K *5/01*
U.S. Cl. 260—33.6 PQ **13 Claims**

1. A cable filling and flooding composition comprising at least about 90% by weight of petrolatum; about 5–7% by weight polybutene-1; about 0.5–2.0% by weight of polyethylene; and about 0.5–2.0% by weight of an amorphous rubber.

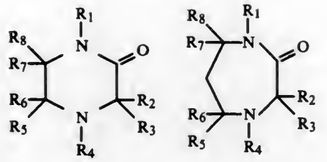
4,190,571

SUBSTITUTED 2-KETO-1,4-DIAZACYCLOALKANES AND UV-LIGHT-STABILIZED COMPOSITIONS CONTAINING THEM

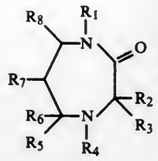
John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 21, 1977, Ser. No. 835,065
Int. Cl.[2] C08K *5/34*
U.S. Cl. 260—45.8 N **19 Claims**

1. A composition resistant to degradation by ultraviolet light comprising an organic polymer subject to ultraviolet light degradation having dispersed therein an effective amount of a 2-keto-1,4-diazacycloalkane stabilizer compound represented by a structural formula selected from the group consisting of



and



wherein, R_1 and R_4 independently represent hydrogen, alkyl, hydroxyalkyl, haloalkyl, cyanoalkyl, aminoalkyl, alkenyl, aralkyl, and carboalkoxy;

R_4 optionally also represents oxygen;

R_2 and R_3 independently represent alkyl, haloalkyl, cyanoalkyl, cycloalkyl, hydroxy-cycloalkyl, aminoalkyl, and alkenyl; and,

R_5, R_6, R_7, R_8 independently represent alkyl, haloalkyl, cyanoalkyl, aminoalkyl, alkenyl, and aralkyl;

R_7, R_8 additionally also represent hydrogen; and,

R_7, R_8, may when taken together with the carbon atom to which they are attached, form an alkylene ring.

4,190,572

METHOD OF PRODUCING A LEATHER-LIKE SHEET WITH A DELICATE APPEARANCE AND A DELUXE HAND

Takeo Nishimura, Okayama; Mikihiro Matsui, Ibaraki; Tomio Mizuse, and Shunji Ishizaki, both of Himeji, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Continuation-in-part of Ser. No. 805,700, Jun. 13, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,759

Claims priority, application Japan, Jun. 14, 1976, 51/70061

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—46.4 **8 Claims**

1. A method of producing a leather-like sheet having a deluxe feeling comprising producing a fully cured leather-like sheet comprising a porous substrate consisting of a porous layer of elastomer and a porous layer of fibrous material and a nonporous coating layer of elastomer coated in a thickness of 0.5 to 50μ on the surface of said porous substrate, crumpling said fully cured sheet in the substantial absence of tension in a liquid medium which is inert to the constituents of the leather like sheet and, then drying said crumpled sheet at a temperature not exceeding 100° C. in the substantial absence of tension.

4,190,573

PROCESS FOR THE ISOLATION OF THE POLYVALENT PROTEINASE INHIBITOR

Oswald Zwisler; Gerhard Guthöhrlein; Hans-Heinrich Nau, all of Marburg an der Lahn, and Helmut Rinno, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 881,527, Feb. 2[nd], 1978, abandoned, which is a continuation of Ser. No. 713,814, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 549,432, Feb. 12, 1975, abandoned. This application Feb. 12, 1979, Ser. No. 11,679

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1974, 2406971

Int. Cl.[2] C07G *17/00*

U.S. Cl. 260—112 R **9 Claims**

1. In a method for isolating polyvalent proteinase inhibitor, obtained by the aqueous extraction of animal organs, from an aqueous solution of said inhibitor, which method comprises contacting said aqueous solution with an acid ion exchanger to adsorb said inhibitor thereon and subsequently desorbing said inhibitor from said acid ion exchanger, the improvement wherein said aqueous solution of said inhibitor is contacted at a pH from 0.5 to 10.5 with an ion exchanger selected from the group consisting of polyphenol-ω-sulfonic acid, polystyrene sulfonic acid, and polystyrene phosphonic acid and having a particle size between 0.03 and 0.08 mm, or with an ion exchanger which is a copolymer of ethene sulfonate and acrylamide having a particle size between 0.03 and 3 mm, whereby said inhibitor is adsorbed on said ion exchanger, and said inhibitor is then eluted from said ion exchanger with water or a salt solution at a pH from 1 to 13.

4,190,574

SUBSTRATE FOR THE QUANTITATIVE DETERMINATION OF PLASMINOGEN ACTIVATORS

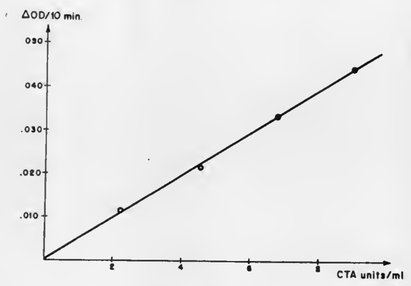
Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed May 19, 1977, Ser. No. 798,426

Claims priority, application Switzerland, May 28, 1976, 006816/76

Int. Cl.[2] C07C *103/52;* **C12K** *1/04*

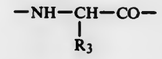
U.S. Cl. 260—112.5 R **5 Claims**



1. A substrate for use as a reagent in the determination of plasminogen activators, inhibitors thereof and plasminogen preactivators, and trypsin, trypsin inhibitors and trypsinogen in human and mammal body fluids and tissue extracts which has the following structure:

$$R^1—X—Y—Z—NH—R^2 \qquad I$$

wherein X represents a group having the formula



in which R^3 is a straight or branched alkyl radical having 1 to 7 carbon atoms or a cyclohexyl or cyclohexylmethyl radical, Y represents a seryl group or a glycol group. Z represents an arginyl group, R^1 represents hydrogen or an acyl or sulfonyl group and R^2 represents an aromatic hydrocarbon radical optionally carrying substituents which permit chromophoric or fluorescent activity, —NH—R^2 being a chromophoric or fluorescent group, and which has the property to release a split product of formula NH_2R^2 under the action of plasminogen activators, the quantity of said split product being quantitatively measurable by photometric, spectrophotometric or fluorescence-photometric methods.

4,190,575

POLYPEPTIDES RELATED TO SOMATOSTATIN

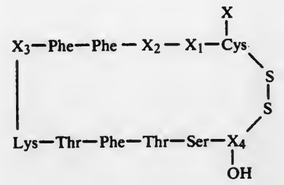
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,173

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 S **5 Claims**

1. A compound of the formula:



wherein:

X is H, Ala-Gly, Gly-Gly-Gly, Ala-D-Ala, acetyl, or benzoyl;

X_1 is Arg or His;

X_2 is Glu or Asp;

X_3 is Trp or D-Trp; or 6-F-D-Trp; and

X_4 is Cys or D-Cys; or the reduced linear form thereof, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,190,576

SEPARATION OF MACROMOLECULES

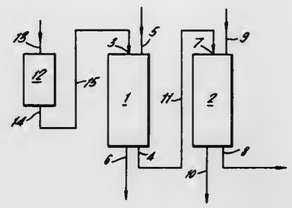
Alan R. Thomson, Abingdon, and Brynley J. Miles, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 18, 1976, Ser. No. 743,292

Claims priority, application United Kingdom, Nov. 26, 1975, 48693/75

Int. Cl.[2] A23J *1/20;* **B01D** *15/04*

U.S. Cl. 260—122 **13 Claims**



1. A process for the separation of macromolecules from a fluid substance containing the macromolecules which comprises contacting the fluid substance with discrete porous absorbent particles of inorganic material having an interconnected porosity throughout which provides an extended surface area and a pore structure such as will allow the macromolecules to permeate the particles and be sorbed, the pores of said particles having a diameter in the range of 1,000 to 10,000 A, the discrete porous particles being selected such that a proportion thereof have acidic surfaces for contacting the macromolecules in the fluid substance and a proportion thereof have basic surfaces for contacting the macromolecules in the fluid substance.

4,190,577

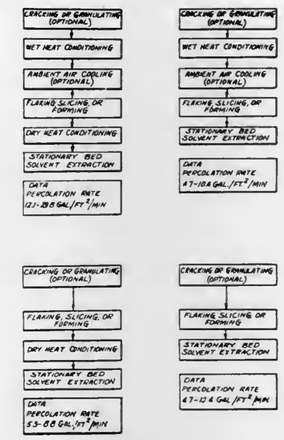
LOW FAT PEANUT FLOUR PREPARED BY SOLVENT EXTRACTION OF OIL FROM PEANUT FLAKES

Bobby C. Steele, Conyers; Douglas R. Barr, Norcross; Charles T. Hunt, Lithonia, and James L. Ayres, Stone Mountain, all of Ga., assignors to Gold Kist, Incorporated, Lithonia, Ga.

Division of Ser. No. 521,145, Nov. 5, 1974, Pat. No. 4,008,210. This application Nov. 18, 1976, Ser. No. 742,882

Int. Cl.[2] A23J *1/14;* **C11B** *1/10*

U.S. Cl. 260—123.5 **2 Claims**



1. A low fat peanut flour from which the bitter, musty, raw peanut flavor has been removed made from a process which comprises, wet heat conditioning at a temperature of from 160° to 240° F. whole peanuts, peanut splits, peanut granules, or cracked peanuts to a moisture content of more than 6 but less than 12%, flaking said wet heat conditioned peanuts, dry heat conditioning said flaked peanuts to a moisture content of from 1.9 to 6% and treating said dry heat conditioned flakes with a hydrocarbon solvent for the removal of oil contained in said flakes.

4,190,578

DIALYSIS MONITORED PREPARATION OF METAL SALTS OF AZO PIGMENTS

Alexander Hamilton, and Colin Nelson, both of Glasgow, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,299

Claims priority, application United Kingdom, Oct. 28, 1976, 44771/76

Int. Cl.[2] C09B *45/14, 45/16, 45/18, 45/20*

U.S. Cl. 260—150 **6 Claims**

1. An azo, sulfonated dyestuff process in which the amount of excess sulfonated diazo or coupling component is continuously monitored and the addition of diazo component or coupling component to the reaction is automatically controlled by means of an automatic chemical analyser which incorporates a dialyzer module, wherein an azo metal sulfonate salt pigment of a water-soluble sulfonated dyestuff is obtained by adding the corresponding water-soluble aluminum, cadmium, chromium, cobalt, copper, iron, lead, magnesium, mercury, nickel, tin, titanium, zinc, calcium, barium, strontium or manganese metal salt to said water-soluble sulfonated azo dyestuff at some stage prior to the passage of the sample through the dialyser.

4,190,579

SYNTHESIS OF BETA-LACTAMS FROM AZETIDINE CARBOXYLIC ACID ESTERS

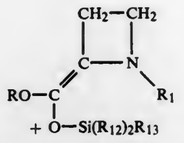
Harry H. Wasserman, New Haven, Conn.; Bruce H. Lipshutz, Yonkers, N.Y., and James S. Wu, New Haven, Conn., assignors to Research Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,593

Int. Cl.² C07D *205/08, 403/06, 409/06, 407/06*

U.S. Cl. 260—239 A **7 Claims**

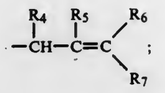
1. A process for preparing a cyclic lactam which comprises oxidizing an enamine ketene acetal of the formula



wherein

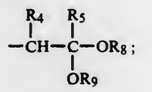
R and R_1 are each independently selected from the group consisting of:

(a) alkenyl of the formula



wherein R_4 is alkoxy, aryloxy, alkoxyaryl, aryloxyalkyl or aryloxyaryl, R_5 is hydrogen or alkyl of 1–3 carbon atoms and R_6 and R_7 are each hydrogen or alkyl of 1–3 carbon atoms;

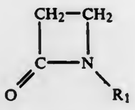
(b) an acetal group of the formula



wherein R_4 and R_5 have the above-indicated values and R_8 and R_9 are each alkyl of 1–3 carbon atoms or R_8 or R_9, together with the oxygen atoms to which they are bonded, form alkylenedioxy of 2–3 carbon atoms;

R_{12} and R_{13} are each independently alkyl, phenyl, alkylphenyl, phenylalkyl or alkylphenylalkyl of 1–4 carbon atoms in each alkyl group

with singlet oxygen to form a corresponding cyclic lactam of the formula:



wherein R_1 has the above-indicated values.

4,190,580

OPTICALLY ACTIVE MAYTANSINOIDS AND MAYTANSINOID PRODUCTION METHOD

Naoto Hashimoto, Suita, and Toyokazu Kishi, Nara, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

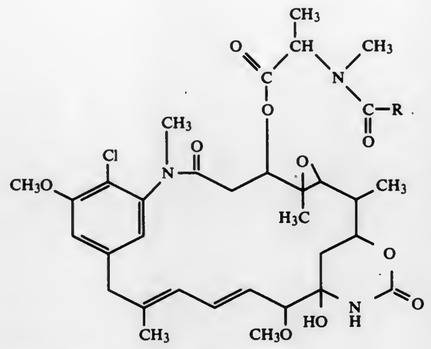
Division of Ser. No. 886,815, Mar. 15, 1978, Pat. No. 4,137,230. This application Oct. 5, 1978, Ser. No. 948,895

Claims priority, application Japan, Nov. 14, 1977, 53/137078; Feb. 20, 1978, 53/18675

Int. Cl.² C07D *198/18*

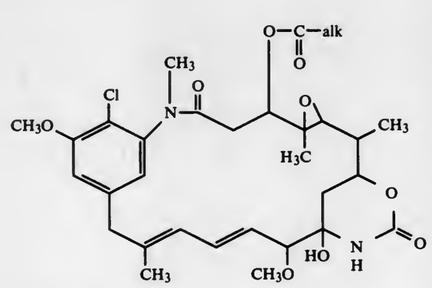
U.S. Cl. 260—239.3 P **11 Claims**

1. A method of producing a maytansinoid of the formula:

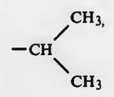


wherein R is lower alkyl, which comprises:

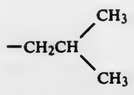
(a) treating a compound of the formula



wherein alk is

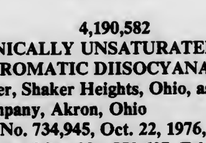


$-CH_2CH_2CH_3$ or



under conditions of reductive hydrolysis to yield maytansinol; and

(b) contacting the maytansinol with an acid of the formula



wherein R is lower alkyl, in the presence of a carbodiimide to yield said maytansinoid.

4,190,581

NOVEL PENICILLIN DERIVATIVES

Yoshiaki Watanabe, Kodaira; Chihiro Yokoo, Gyoda; Toshifumi Asaka, Omiya, and Jiro Sawada, Kodaira, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

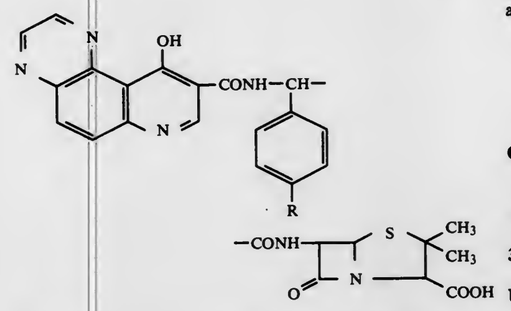
Filed Jul. 31, 1978, Ser. No. 929,566

Claims priority, application Japan, Aug. 12, 1977, 52-96726; Dec. 28, 1977, 52-160559

Int. Cl.² C07D *499/50, 401/04*

U.S. Cl. 260—239.1 **5 Claims**

1. Penicillin derivatives of the formula



and pharmaceutically acceptable salts thereof, wherein R is hydrogen or hydroxy.

4,190,582

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

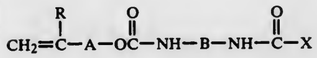
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,644

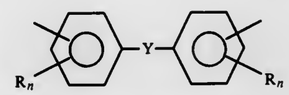
Int. Cl.² C07D *223/10*

U.S. Cl. 260—239.3 R **2 Claims**

1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group; A is a carbonyloxyalkylene group having 2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $-(CH_2)_n$; n=0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of caprolactam.

2. A compound of claim 1 wherein R is hydrogen or methyl group; B is phenylene, tolylene, naphthalene, or a group where Y is $-(CH_2)_n$, and n=0 to 1.

4,190,583

PROCESS FOR THE PREPARATION OF 3,4-METHYLENEDIOXYMANDELIC ACID

Kurt Bauer, Holzminden, and Reiner Molleken, Galmback Ortst. Warbsen, both of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,553

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754490

Int. Cl.² C07D *317/44*

U.S. Cl. 260—340.5 R **2 Claims**

1. A process for the preparation of 3,4-methylenedioxymandelic acid, which comprises reacting glyoxylic acid with 1,2-methylenedioxybenzene in the presence of a strong acid having a dissociation constant in water of over 4.74×10^{-4}.

4,190,584

PROCESS FOR PREPARING OXAZOLES

George O. Weston, Havant, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

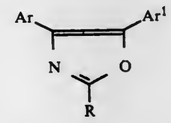
Continuation-in-part of Ser. No. 822,596, Aug. 8, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,123

Claims priority, application United Kingdom, Aug. 13, 1976, 33876/76

Int. Cl.² C07D *263/32;* **A61K** *31/42*

U.S. Cl. 548—236 **7 Claims**

1. In a process for the preparation of a compound selected from 4,5-diaryloxazol-2-ylalkanoic acids having the formula



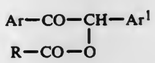
(I)

wherein Ar and Ar^1 represent the same or different aryl radicals selected from the group consisting of phenyl, naphthyl, thienyl, furyl and phenyl substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro and di(lower alkyl)amino and R represents carboxyethyl or carboxypropyl, and their non-toxic salts, wherein an aroylaryl carbinol having the formula



(II)

(where Ar and Ar^1 are as defined above) is esterified with a reactive derivative of a butanedioic or pentanedioic acid to form a keto ester having the formula



(III)

(where Ar, Ar^1 and R are as defined above) in a reaction mixture, and the keto ester is cyclised with a nitrogen-donating cyclising agent to form an oxazole, the improvement which comprises adding the nitrogen-containing cyclising agent to the reaction mixture in which the keto ester is formed.

4,190,585

PROCESS FOR THE PRODUCTION OF INDOLYL LACTIC ACID

Leander Tenud, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Filed Sep. 13, 1974, Ser. No. 505,566

Claims priority, application Switzerland, Sep. 13, 1973, 13171/73

Int. Cl.[2] C07D *307/22, 209/218*

U.S. Cl. 260—326.13 R **14 Claims**

1. The process for the production of indolyl lactic acid which comprises: (i) heating an aqueous solution of 2,3-dihydro-2,5-furan dicarboxylic acid to boiling, (ii) reacting the aqueous solution with phenyl hydrazine or a water soluble HX salt of phenyl hydrazine, wherein X is chlorine, bromine, iodine, fluorine or bisulfate, and (iii) converting the resulting phenylhydrazone by heating from 100° to 150° C. with an aqueous solution containing 8 to 15 percent of sulfuric acid to indolyl lactic acid.

4,190,586

α-ACETYLENIC DERIVATIVES OF α-AMINO ACIDS

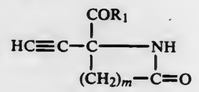
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 812,267, Jul. 1, 1977, Pat. No. 4,133,964. This application Oct. 2, 1978, Ser. No. 947,940

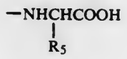
Int. Cl.[2] C07D *207/26, 211/76*

U.S. Cl. 260—326.45 **4 Claims**

1. A compound of the formula



wherein m is the integer 2 or 3, and R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $—NR_3R_4$ wherein each of R_3 and R_4 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms and can be the same or different, or



wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,190,587

4-(3-OXO-4-TRIFLUOROMETHYL-1-OCTENYL)-2-OXO-2H-CYCLOPENTA[B]FURANS

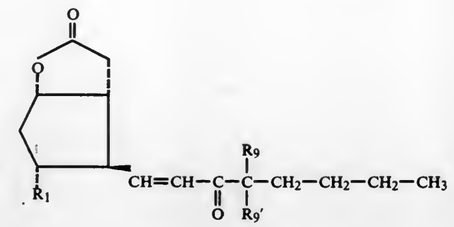
George W. Holland, North Caldwell; Jane L. Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 745,257, Dec. 8, 1976, Pat. No. 4,112,225, which is a continuation-in-part of Ser. No. 683,576, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 480,458, Jun. 18, 1974, Pat. No. 4,052,446, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Jun. 23, 1978, Ser. No. 918,626

Int. Cl.[2] C07D *307/93*

U.S. Cl. 260—343.3 P **3 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, $—CH_2OR_1'$ or $—COOR_1'$; R_1' is lower alkyl or hydrogen; R_9 is hydrogen, lower alkyl or fluoro; R_9' is trifluoromethyl or enantiomers or racemates thereof.

4,190,588

METHOD OF PREPARING A SUBSTITUTED BUTYROLACTONE ACETIC ACID

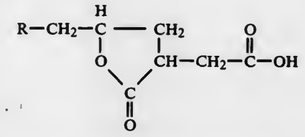
El-Ahmadi I. Heiba, Princeton, and Albert L. Williams, Hopewell Township, Mercer County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,360, Apr. 27, 1973, Pat. No. 3,925,232, which is a continuation-in-part of Ser. No. 212,626, Dec. 27, 1971, abandoned. This application Sep. 30, 1975, Ser. No. 618,173

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **4 Claims**

1. The method of preparing a butyrolactone acetic acid having the structure



wherein R is hydrogen or hydrocarbyl of 1 to about 300 carbon atoms, said method comprising the steps of (1) reacting an alkenyl succinic anhydride, wherein the first and second carbon atoms attached to the succinyl group are unbranched, with a mineral acid in the presence of water thereby forming a reaction mixture of said butyrolactone acetic acid and by-product alkenyl succinic diacid, (2) treating said reaction mixture with an inert organic solvent and distilling, thereby withdrawing said solvent, said mineral acid and water from said reaction mixture and converting said by-product alkenyl succinic diacid to anhydride, and (3) subsequently treating the mixture of said butyrolactone acetic acid and alkenyl succinic anhydride with mineral acid in the presence of water thereby increasing the butyrolactone acetic acid content of said mixture.

4,190,589

CORIOLIN DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Yuya Nakayama, Omiya; Mamoru Kunishima, Tokorozawa; Akira Matsuda, Omiya; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

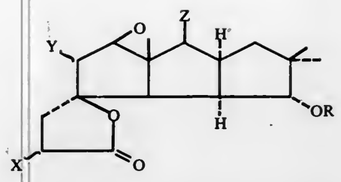
Filed May 4, 1978, Ser. No. 902,824

Claims priority, application Japan, May 17, 1977, 53/56019

Int. Cl.[2] C07D *493/10*

U.S. Cl. 260—343.6 **5 Claims**

1. Coriolin derivatives represented by the general formula:



where

R: $—CO(CH_2)_6CH_3$ or $—COCH(OH)(CH_2)_5CH_3$,

X: $=CH_2$,

Y: OH, =O and

Z: —OH or $—OCH_3$.

4,190,590

AZIDE AND ISOCYANATE DERIVATIVES OF 2-NITRO-3-PHENYLBENZOFURAN

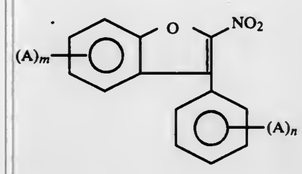
Vernon R. Fletcher, Davis, Calif., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Dec. 26, 1978, Ser. No. 973,152

Int. Cl.[2] C07D *307/82, 307/84*

U.S. Cl. 260—346.73 **7 Claims**

1. A compound of the formula



wherein A is OCN— or

and m and n are zero or one and the sum of m and n is one.

4,190,591

ODORANT AND FLAVORANT

Roman Kaiser, Uster, and Peter Naegeli, Wettingen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 11, 1978, Ser. No. 868,632

Claims priority, application Austria, Jan. 21, 1977, 364/77; Switzerland, Jul. 27, 1977, 9281/77

Int. Cl.[2] C07D *307/94*

U.S. Cl. 260—347.8 **1 Claim**

1. Synthetically manufactured 2,6,10,10-tetramethyl-1-oxaspiro[4,5]-decan-7-one.

4,190,592

PROCESS FOR SPLITTING THE L-(−)-α-PHENYLETHYLAMINE SALT OF D-(−)-α-AZIDOPHENYLACETIC ACID

Günter Bison, Troisdorf-Sieglar; Reiner Elfgen, Troisdorf-Spich; Walter Heinzelmann, Lecerkusen; Josef Winterscheid, St. Augustin, and Wolfgang Wolfes, Mondorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 26, 1975, Ser. No. 617,166

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1974, 2446656

Int. Cl.[2] C07C *117/08*

U.S. Cl. 260—349 **13 Claims**

1. A process for splitting the L-(−)-α-phenylethylamine salt of D-(−)-α-azidophenylacetic acid and for producing a pure D-(−)-α-azidophenylacetic acid, which comprises forming a suspension of the salt and a liquid diluent in which the salt is insoluble and in which D-(−)-α-azidophenylacetic acid is soluble, admixing particles of an acidic cation exchange material with said suspension, reacting the salt with the acidic cation exchange material at a temperature of not more than 40° C. in the presence of said liquid diluent and recovering a highly purified D-(−)-α-azidophenylacetic acid from the resultant reaction mixture.

4,190,593

CORTISOL RADIOIMMUNOASSAY METHOD AND CORTISOL DERIVATIVES USEFUL THEREFOR

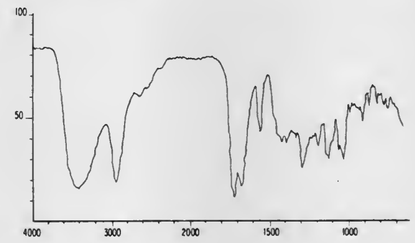
Masaharu Kojima; Hisao Sone, both of Fukuoka; Hiroshi Ogawa, Kashiwa; Nobuhiko Nakazawa, Urawa, and Seiji Tachibana, Tokyo, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

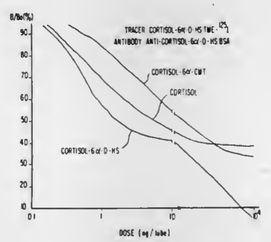
Filed Jun. 1, 1977, Ser. No. 802,397

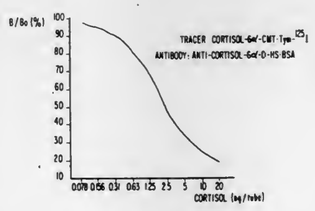
Claims priority, application Japan, Jun. 1, 1976, 51-63985

Int. Cl.[2] C07J *5/00*

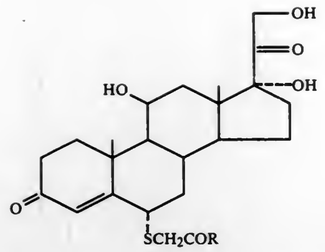
U.S. Cl. 260—397.45 **6 Claims**







1. A compound of the formula (E)



(E)

wherein R represents a tyrosine lower alkyl ester residue, a tyramine moiety, a histamine residue, a 7-aminoheptanoyltyrosine lower alkyl ester moiety, a radioiodinated tyrosine lower alkyl ester moiety, a radioiodinated tyramine residue, a radioiodinated histamine moiety, a radioiodinated 7-aminoheptanoyltyrosine lower alkyl ester moiety, or a polylysine.

4,190,594

RETINOIC ACID DERIVATIVES

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

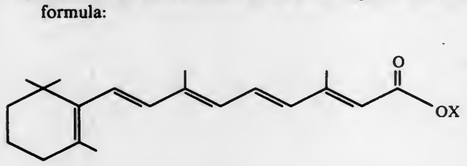
Division of Ser. No. 628,177, Nov. 3, 1975, Pat. No. 4,108,880. This application May 15, 1978, Ser. No. 906,168

Int. Cl.[2] C09F *5/00*; C11C *3/00*; A61K *7/42*

U.S. Cl. 260—404 **8 Claims**

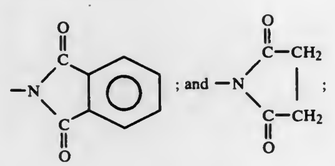
1. A derivative of all-trans-retinoic acid selected from the group consisting of:

(A) esters of all-trans-retinoic acid having the following formula:

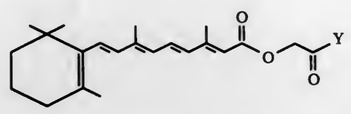


(I)

wherein X is a member selected from the group consisting of: 2-cyclohexylethyl; 10-carbomethoxydecyl; 4-hydroxybutyl; cholesteryl; 4-bromobenzyl;



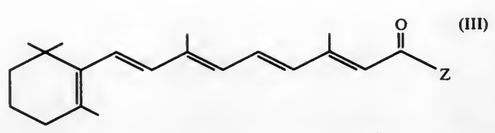
(B) esters of all-trans-retinoic acid having the following formula:



(II)

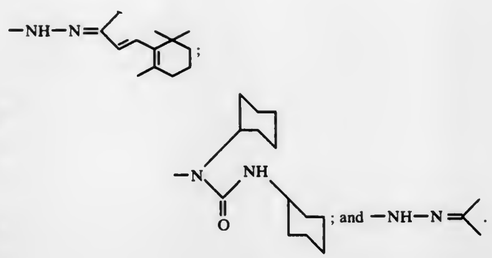
wherein Y is a member selected from the group consisting of: cholesteryl; phenyl; 4-bromophenyl; 4-nitrophenyl; 4-cyanophenyl; and 2,4-dichlorophenyl; and

(C) amides of all-trans-retinoic acid having the following formula:

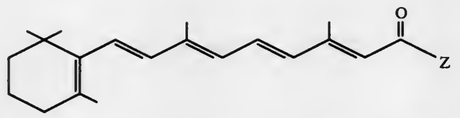


(III)

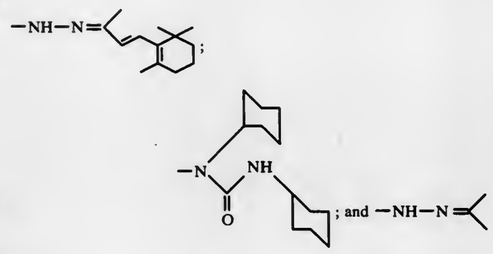
wherein Z is a member selected from the group consisting of: n-propylamino; tert.-butylamino; 1,1,3,3-tetramethylbutylamino; 4-hydroxyphenylamino; 4-carbomethoxy-3-hydroxyphenylamino; β-(3,4-dimethoxyphenyl)-ethylamino; 2-benzothiazolylamino; 1-imidazolyl; 1-(2-nicotinoylhydrazolyl); 1-benzotriazolyl; 1-(1,2,4-triazolyl);



2. An amide of all-trans retinoic acid according to claim 1 having the following formula:



wherein Z is a member selected from the group consisting of: n-propylamino; tert.-butylamino; 1,1,3,3-tetramethylbutylamino; 4-hydroxyphenylamino; 4-carbomethoxy-3-hydroxyphenylamino; β-(3,4-dimethoxyphenyl)-ethylamino; 2-benzothiazolylamino; 1-imidazolyl; 1-(2-nicotinoylhydrazolyl); 1-benzotriazolyl; 1-(1,2,4-triazolyl);



3. N-n-Propyl all-trans-retinamide according to claim 2.

4,190,595

PROCESS FOR DEHALOGENATING THE METAL-HALIDE BOND IN A LOW VALENT GROUP VIII METAL HALIDE COMPLEX

Steven E. Diamond, Randolph, and Frank Mares, Whippany, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 8, 1978, Ser. No. 931,653

Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 R **19 Claims**

1. A process for dehalogenating the metal-halide bond in a low valent Group VIII metal halide complex comprising the step of reacting the metal halide complex, containing at least one metal-halide bond with an alkali or alkaline earth metal alkylamide, containing at least one alkyl group containing a hydrogen atom in the beta position with respect to the metal atom, in an inert anhydrous organic solvent therefor, at a temperature from about −80° C. to the decomposition temperature of the metal complex resulting from the dehalogenation, under an inert atmosphere and anhydrous conditions, at a pressure from about 0.001 to 10 atmospheres, said metal alkylamide being present in an amount of at least about 1 equivalent per equivalent of metal-halide bond in said metal halide complex desired to be dehalogenated, and said metal halide complex containing ligands capable of stabilizing the metal halide complex and said metal atom capable of forming metal-ligand bonds capable of stabilizing the metal complex resulting from the dehalogenation.

4,190,596

VARIOUS 15-DEOXY-16-HYDROXY-16-ETHYNYL AND 16-ETHYNYLSUBSTITUTED PROSTAGLANDINS

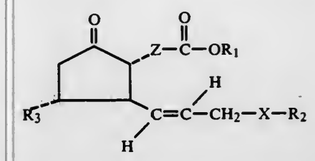
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 5, 1977, Ser. No. 857,848

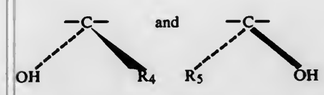
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—448.2 D **56 Claims**

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; R_3 is selected from the group consisting of hydrogen and hydroxy; X is selected from the group consisting of a divalent moiety of the formula:



wherein R_5 is selected from the group consisting of ethynyl, 1-propynyl and trimethylsilylethynyl; Z is selected from the group consisting of $-(CH_2)_6-$, $-(CH_2)_4SCH_2-$ and $-(CH_2)-O-CH_2-$; the racemic mixture thereof; the mirror image thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

4,190,597

VARIOUS 15-DEOXY-16-HYDROXY-16-ETHYNYL AND 16-ETHYNYLSUBSTITUTED PROSTAGLANDINS

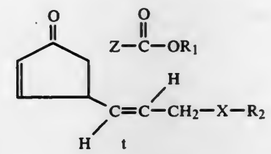
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 5, 1977, Ser. No. 857,849

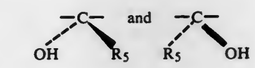
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—448.2 D **47 Claims**

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; X is selected from the group consisting of a divalent moiety of the formula:



wherein R_5 is selected from the group consisting of ethynyl, 2-propynyl and trimethylsilylethynyl; Z is selected from the group consisting of $-(CH_2)_6-$, $-(CH_2)_4SCH_2-$ and $-(CH_2)_4-O-CH_2-$; the racemic mixture thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

4,190,598

CATALYTIC PROCESS FOR PRODUCTION OF POLYHYDRIC ALCOHOLS IN PRESENCE OF AMMONIUM CARBOXYLATES

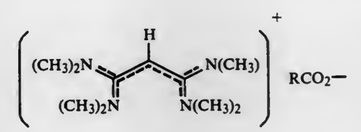
Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,314

Int. Cl.[2] C07C *27/06, 29/16*

U.S. Cl. 260—449 L **7 Claims**

1. The process for producing alkane polyols in a homogeneous liquid phase mixture which comprises reacting hydrogen and an oxide of carbon in the presence of a rhodium carbonyl complex and an ammonium carboxylate at a pressure of from about 500 psia to about 50,000 psia and a temperature of from about 100° C. to about 375° C. sufficient to produce said alkane polyols, wherein said ammonium carboxylate has the general formula:



wherein R is hydrogen, an unsubstituted monovalent hydrocarbon radical or a substituted monovalent hydrocarbon radical where the substituent is halogen, hydroxyl, nitro, sulfonyl, phosphoryl, alkoxy, oxo, carbalkoxy or alkoxycarbonyl.

4,190,599

AMIDE-CONTAINING DIISOCYANATES AND PREPARATION THEREOF

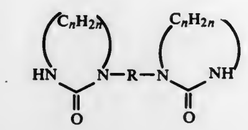
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 874,402, Feb. 1, 1978, Pat. No. 4,138,398, which is a continuation-in-part of Ser. No. 754,189, Dec. 27, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,252

Int. Cl.[2] C07C *118/00, 119/042, 119/048*

U.S. Cl. 260—453 P **8 Claims**

1. A process for converting a bis cyclic urea having the formula



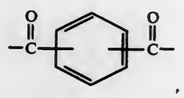
into a diisocyanate having the formula

$$OCN—C_nH_{2n}—NH—R—NH—C_nH_{2n}—NCO$$

wherein C_nH_{2n} is the same in each formula and is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is the same in each formula and is a divalent radical selected from the group consisting of



wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and

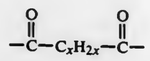


which process comprises heating said bis cyclic urea at a temperature sufficiently high to open both rings of said cyclic urea to form said diisocyanate.

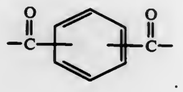
4. A diisocyanate having the formula

$$OCN—C_nH_{2n}—NH—R—NH—C_nH_{2n}—NCO$$

wherein C_nH_{2n} is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is a divalent radical selected from the group consisting of



wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and



4,190,600

PROCESS FOR THE MANUFACTURE OF M-HALOBENZOYL HALIDES

Franz Landauer, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,249

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743144

Int. Cl.[2] C07C *63/12*

U.S. Cl. 260—544 D **13 Claims**

1. In a process for the preparation of m-halobenzoyl halides by chlorinating or brominating benzoyl chloride or benzoyl bromide in the absence of a solvent and in the presence of a catalyst and a cocatalyst, at a temperature of from about 0° to 90° C., the improvement comprising using as the catalyst $FeCl_3$ or $FeBr_3$ and as the cocatalyst sulfur, a sulfur halide, thioglycolic acid, thioacetic acid, thiphenol, thiophene, thiourea, or mixtures thereof.

4,190,601

PRODUCTION OF TERTIARY AMINES BY REDUCTIVE ALKYLATION

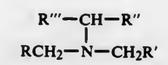
Quintin W. Decker, St. Albans, and Erich Marcus, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,096

Int. Cl.[2] C07C *85/08*

U.S. Cl. 260—583 R **15 Claims**

1. A process for the production of tertiary amines of the formula



which comprises the reductive alkylation at from 20° C. to 200° C. of (I) a secondary amine of the formula



with (II) a member from the group of the aliphatic aldehydes and the aliphatic ketones of the formula



where R and R′ can be:

(a) alkyl, substituted or unsubstituted, linear or branched, having from one to twenty carbon atoms;

or (b) a substituted or unsubstituted cycloalkyl having from four to eight ring carbon atoms;

or (c) a substituted or unsubstituted hydroxyalkyl, linear or branched, having from one to twenty carbon atoms;

or (d) a substituted or unsubstituted aralkyl having from seven to twenty carbon atoms;

or (e) hydrogen;

and R″ and R‴ singly can be:

(a) alkyl, substituted or unsubstituted, linear or branched, having from one to twenty carbon atoms;

or (b) hydrogen;

or (c) when taken together they can be alkylene having from three to six carbon atoms forming a cyclic ketone, in contact with hydrogen at a superatmospheric pressure, a water-segregating agent and a catalytically effective amount, sufficient to carry out the reductive alkylation, of a hydrogenation catalyst.

4,190,602

MONOACETALS OR AROMATIC 1,2-DIKETONES

Jean Brunisholz, Monthey, and Rudolf Kirchmayr, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

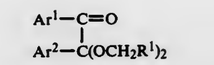
Division of Ser. No. 701,769, Jul. 2, 1976, abandoned, which is a division of Ser. No. 380,039, Jul. 17, 1973, abandoned. This application Jun. 22, 1978, Ser. No. 919,580

Claims priority, application Switzerland, Jul. 28, 1972, 11295/72; Jun. 28, 1973, 9417/73

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—590 D **3 Claims**

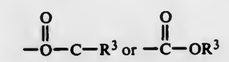
1. Process for the production of monoacetals of aromatic diketones of formula I



(I)

wherein R^1 represents hydrogen, alkyl having 1 to 5 carbon atoms, alkenyl having 2 or 3 carbon atoms, aralkyl having 7 to 9 carbon atoms, aralkenyl having 8 or 9 carbon atoms, or a group $—(CH_2)_n—X$,

wherein n represents a whole number from 1 to 3, and X denotes halogen, $—OR^3$, $—SR^3$, $—OAr^3$, $—SAr^3$



and R^3 represents alkyl having 1 to 4 carbon atoms, Ar^1, Ar^2 and Ar^3 each independently represent a phenyl radical unsubstituted, or at most trisubstituted by halogen, alkyl or alkoxy having 1 to 4 carbon atoms or by phenyl, which process comprises reacting an aromatic 1,2-diketone of the formula $Ar^1—CO—CO—Ar^2$ either with a sulphurous acid ester of the formula $(R^1CH_2O)_2SO$ in the presence of an anhydrous acid and a primary monoalcohol R^1CH_2OH at a temperature of about 20° to 120° C. or with thionyl chloride and a primary monoalcohol R^1CH_2OH at a temperature of from about 0° to 20° C. and subsequently heating to from about 20° to 120° C.

4,190,603

TRICYCLO[2.2.1.0^{2,6}]HEPTAN-3-ONES

Peter Funfschilling, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

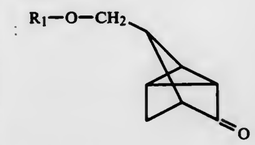
Division of Ser. No. 856,616, Dec. 2, 1977, Pat. No. 4,148,807, which is a division of Ser. No. 765,560, Feb. 4, 1977, Pat. No. 4,079,065. This application Nov. 20, 1978, Ser. No. 962,073

Claims priority, application Switzerland, Feb. 11, 1976, 1650/76

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 B **3 Claims**

1. A compound of the formula



wherein R_1 is an acid stable group stable at a pH which is more acidic than pH 2.

4,190,604

PROCESS FOR PRODUCING DESOXY-α-ACIDS

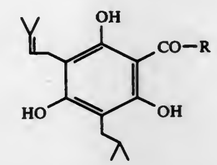
Urs Burckhardt, Basel, and Richard J. Troxler, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,129

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—592 **5 Claims**

1. A process for producing desoxy-α-acids of the formula I

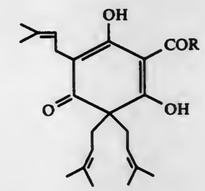


(I)

in which

R represents a straight-chain or branched-chain alkyl group having 1 to 5 carbon atoms,

which process comprises converting a β-acid of the formula II

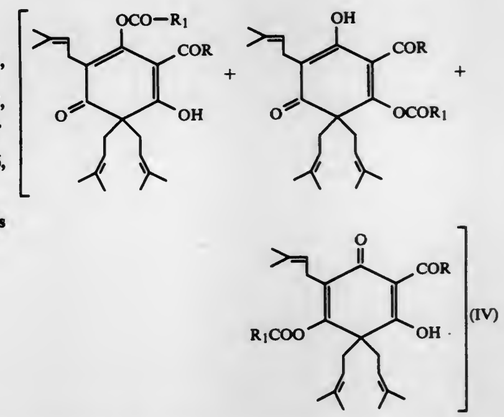


(II),

in which R has the meaning given under the formula I, by reaction with an acylating agent of the formula III

$$R_1—CO—X \qquad \text{(III)}$$

in which R_1 represents an alkyl group having 1 to 3 carbon atoms, and X represents chlorine, bromine or a group $R_1—CO—O—$, at a temperature of from 0°–50° C. when X is chlorine or bromine and at a temperature of from 50°–150° C. when X is $R_1—CO—O$, in the presence of a base, into a mixture of monoacylation products of the formula IV



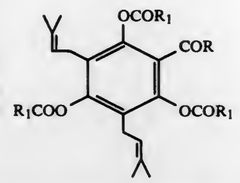
(IV)

in which R and R_1 have the meanings given under the formulae I and III; subsequently reacting this monoacylation product at

160° to 250° C., in the presence of from 0.1–10%, by weight of anhydride, of a carboxylic acid of the formula V

R_1COOH (V),

in which R_1 has the meaning given above, with an anhydride of such a carboxylic acid, with the splitting-off of isoprene, to give a triacyl compound of the formula VI



(VI),

in which R and R_1 have the aforesaid meanings; and then hydrolysing this compound at a temperature of from 0°–50° C. with aqueous alkali to yield a desoxy-α-acid of the formula I.

4,190,605

CATALYST ACTIVATION IN OXIDATION PROCESS

Wayne C. Muench; Glen O. Strand, and Thad S. Hormel, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1978, Ser. No. 920,883
Int. Cl.² C07C *45/16*
U.S. Cl. 260—600 R **6 Claims**

1. In the process for the selective production of hydroxybenzaldehyde where hydroxybenzyl alcohol in an alkaline aqueous medium is oxidized with molecular oxygen in the presence of a palladium-carbon catalyst to form hydroxybenzaldehyde, the improvement comprising conditioning the catalyst by reacting molecular oxygen with a sufficient quantity of feed comprising a mixture of orthohydroxybenzyl alcohol and para-hydroxybenzyl alcohol in an alkaline aqueous medium in the presence of said palladium-carbon catalyst until the rates of oxidation of orthohydroxybenzyl alcohol and para-hydroxybenzyl alcohol are nearly equal whereby the conditioned catalyst is activated and the product yield is increased.

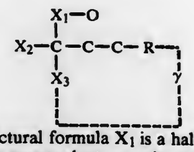
4,190,606

PROCESS FOR DEHALOGENATION AND/OR PREVENTION OF HALOGENATION

George A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 697,166, Jun. 17, 1976, abandoned, which is a division of Ser. No. 497,609, Aug. 15, 1974, Pat. No. 4,008,279. This application Oct. 17, 1977, Ser. No. 842,778
Int. Cl.² C07C *47/02*
U.S. Cl. 260—601 R **30 Claims**

1. A process for replacing an alpha halogen atom on an alpha halogenated carbonyl compound of the following structural formula



wherein such structural formula X_1 is a halogen atom, X_2 is a hydrogen atom, a monovalent organic radical or a halogen atom X_3 is a hydrogen atom, a halogen atom, a monovalent organic or divalent organic radical, and R_1 is a hydrogen atom, a hydroxyl group, a monovalent organic radical or a divalent organic radical, wherein when X_3 and R_1 are divalent organic radicals such are joined to each other so as to form a cyclic compound with a hydrogen atom, said process comprising causing there to be in an aqueous solution of said halogenated carbonyl compound at least one hydrogen ion in solution for each alpha halogen atom to be so replaced, and at least sufficient cuprous ions in solution to completely react with and be oxidized by any molecular oxygen present, plus at least two cuprous ions for each alpha halogen atom to be replaced, said process being conducted at a temperature within the range of about 70° to 250° C. and at pressure sufficient to maintain a liquid phase.

22. In a continuous conversion process for converting an alkene to an aldehydo alkane product, said aldehydo alkane being one which has a lower boiling point than water, which conversion process comprises the steps of:

(a) passing said alkene through an alkene reaction zone concurrently with an aqueous acidic oxidant catalyst solution comprising water containing dissolved there a noble metal oxidation catalyst, cupric ions, and chloride ions, whereby said alkene is oxidized to form a reaction product comprising predominantly said aldehydo alkane product admixed with said catalyst solution in a chemically reduced condition, said reaction product also containing small amounts of an alpha chlorinated aldehydo alkane formed as byproduct;

(b) separating said reaction product into fractions comprising (i) a crude aldehydo alkane product fraction which contains the major portion of said aldehydo alkane product and a portion of said alpha chlorinated aldehydo alkane, and, (ii) an aqueous reduced catalyst solution fraction containing said noble metal and copper in a reduced form, including cuprous chloride in solution and as cuprous chloride crystals, and also containing hydrochloric acid, and also containing a minor amount of said aldehydo alkane as well as a portion of said alpha chlorinated aldehydo alkane;

(c) separating said crude aldehydo alkane product fraction so as to recover therefrom an aldehydo alkane product of improved purity and an alpha chlorinated aldehydo alkane fraction;

(d) in a catalyst reoxidation zone reoxidizing said aqueous reduced catalyst solution fraction with a gas comprising molecular oxygen to oxidize a portion of the copper values contained therein to the cupric form; and

(e) recycling the resulting aqueous reoxidized catalyst solution to said alkene reaction zone;

the improvement which comprises passing said alpha chlorinated aldehydo alkane fraction to a dechlorinator vessel where it is mixed, in the absence of molecular oxygen, with a portion of said aqueous reduced catalyst solution fraction or a portion of said aqueous reoxidized catalyst solution and with an alkene corresponding to said alkene under such conditions as to cause dechlorination of at least a portion of the alpha chlorinated aldehydo alkane to a said aldehydo alkane and cause the said alkene to be oxidized to form a said aldehydo alkane, the amount of said aqueous reduced catalyst solution or the said aqueous reoxidized catalyst solution and the amount of said alkene passed to said dechlorinator vessel being such that there is caused to be in solution with said alpha chlorinated aldehydoalkane at least one hydrogen ion for each chlorine atom to be replaced in said dechlorination and at least two cuprous ions for each chlorine atom to be replaced in said dechlorination, said dechlorinator vessel being maintained free of molecular oxygen and at a temperature within the range of about 140° to 200° C. and a pressure which will effect boiling of the water present in said dechlorinator vessel at a rate such that from about 2 to 50% of the water entering the dechlorinator vessel per unit time is vaporized and removed as vapors per unit time; continuously removing vapors from said dechlorinator vessel containing vaporized water as well as vaporized aldehydo alkane, said vapors being treated to recover aldehydo alkane therefrom; and, continuously removing liquid from the liquid phase of said dechlorinator vessel and passing same to said reoxidation zone.

4,190,607

METHOD FOR THE PREPARATION OF 2,3-DIMETHYL-PENT-4EN-ALDEHYDE

Frank J. Stiefel, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,201
Int. Cl.² C07C *47/20*
U.S. Cl. 260—601 R **6 Claims**

1. A method for preparing 2,3-dimethyl-pent-4en-aldehyde which comprises heating allyl crotyl ether at a temperature of 125°–136° C. and ambient pressure in the presence of a transition metal catalyst selected from the group consisting of molybdenum, palladium, rubidium and ruthenium.

3. A method for preparing 2,3-dimethyl-pent-4en-aldehyde which comprises adding a mixture of crotyl alcohol and allyl chloride to a condensing agent in a Solvent selected from the group comprising dimethyl formamide, dimethyl acetamide, toluene and/or benzene to produce allyl crotyl ether, heating said allyl crotyl ether at a temperature of 125°–136° C. and ambient pressure with a transition metal catalyst and selected from the group consisting of molybdenum, palladium, rubidium and ruthenium and recovering the 2,3-dimethyl pent-4en-aldehyde produced thereby.

4,190,608

PROCESS FOR THE OXIDATION OF OLEFINS USING CATALYSTS CONTAINING VARIOUS PROMOTER ELEMENTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 490,428, Jul. 22, 1974, Pat. No. 4,001,317. This application Aug. 26, 1976, Ser. No. 717,838
Int. Cl.² C07C *47/20, 51/20*
U.S. Cl. 260—604 R **10 Claims**

1. In the process for the preparation of unsaturated aldehydes and acids from propylene or isobutylene by the vapor phase oxidation of propylene or isobutylene with molecular oxygen at a temperature of about 200° to 600° C. in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst of the formula

$$X_aA_bD_cE_dFe_fBi_gMo_{12}O_x$$

wherein

X is at least one element selected from the group consisting of Y, Ru, Ga, and Zr;

A is at least one element selected from the group consisting of an alkali metal and Tl;

D is at least one element selected from the group consisting of Ni, Co, Mg, Zn, Cd, Ca, and Sr;

E is at least one element selected from the group consisting of P, As, B, S, and Al;

and wherein

a is less than 5.0 excluding 0;

b is a positive number less than or equal to 4; d is a number from 0 to 4; 0–4;

c, f and g are numbers from 0.1–12; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

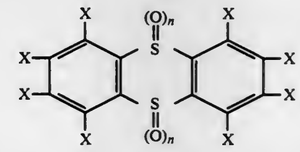
4,190,609

PROCESS FOR THE DIRECTED CHLORINATION OF XYLENES

Henry C. Lin, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 729,439, Oct. 4, 1976, Pat. No. 4,069,264. This application Dec. 30, 1977, Ser. No. 866,136
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.² C07C *25/04*
U.S. Cl. 260—650 R **21 Claims**

1. A process for the nuclear chlorination of xylene comprises reacting ortho-xylene or meta-xylene with chlorine in the presence of a Lewis acid catalyst and a co-catalyst comprising a thianthrene compound or a mixutre of thianthrene compounds characterized by the formula:



where n is 0 to 1, and each X is independently hydrogen, an electron-withdrawing substituent or an electron-donating substituent with the proviso that the total number of electron donating substituents is at least one and no more than four; the total number of electron-withdrawing substituents is at least one and no more than seven; no more than three electron-donating substituents are present at the peri-positions.

4,190,610

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH PENTADIENE

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 819,441, Jul. 27, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,228
Int. Cl.² C07C *13/32*
U.S. Cl. 585—361 **10 Claims**

1. Process for the catalytic and codimerization of norbornadiene with 1,3-pentadiene comprising:

(a) contacting norbornadiene and 1,3-pentadiene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and an alkyl aluminum chloride selected from the group consisting of diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride:

(b) having the contacting occurring at a temperature within the range from between about 20° C. to about 100° C. and

(c) continuing the contacting until the 1,3-pentadiene-norbornadiene codimer is prepared.

4,190,611

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH NORBORNENE

James E. Lyons, Wallingford; Harry K. Myers, Jr., Aston, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 819,442, Jul. 27, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,230
Int. Cl.² C07C *13/32*
U.S. Cl. 585—361 **10 Claims**

1. Process for the catalytic codimerization of norbornadiene and norbornene comprising:

(a) contacting norbornadiene and norbornene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous

acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range from between about 20° C. to about 100° C.; and

(c) continuing the contacting until the codimer of norbornadiene and norbornene is prepared.

4,190,612

REGIOSELECTIVE ISOMERIZATION AT CARBON ATOM VICINAL TO DOUBLY BONDED TERTIARY CARBON ATOM BY SULFUR DIOXIDE CATALYSIS

Divakaran Masilamani, Morristown, and Milorad M. Rogic, Whippany, both of N.J., assignors to Allied Chemical Corporation, MorrisTownship, Morris County, N.J.

Filed Dec. 20, 1977, Ser. No. 862,313

Int. Cl.² C07C *5/30, 13/20, 21/02*

U.S. Cl. 585—378 **14 Claims**

4. A method for isomerizing an olefinic compound having a hydrogen nucleus or isotope thereof attached to a carbon atom vicinal to a tertiary double bonded carbon atom comprising:

maintaining said compound as solution in dry liquid sulfur dioxide whereby allylic rearrangement of a hydrogen bond takes place.

4,190,613

SEPARATING AGENT FOR RUBBER POWDERS

Joachim Thörmer, Leverkusen; Jochen Schnetger, Odenthal-Hoeffe; Gerhard Giersiepen, Leichlingen, and Wilhelm Göbel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 811,144, Jun. 28, 1977, abandoned. This application Sep. 21, 1977, Ser. No. 835,298

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629705

Int. Cl.² C08L *9/02, 9/06, 11/00*

U.S. Cl. 525—215 **5 Claims**

1. A freeflowing rubber powder mixture which is stable against coalescence and cohesion comprising a vulcanisable rubber in powder form and from 3 to 12% by weight, based on the rubber, of polyacrylonitrile.

4,190,614

METHOD FOR THE PRODUCTION OF LOW DENSITY COPOLYMERS OF ETHYLENE

Akira Ito, and Kenji Iwata, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,308

Claims priority, application Japan, Apr. 13, 1976, 51-40888

Int. Cl.² C08F *4/02, 255/02*

U.S. Cl. 525—106 **11 Claims**

1. A method for the production of a low density copolymers of ethylene and α-olefins having a density of 0.925 to 0.950 g/ml and a bulk density of more than 0.35 g/ml by copolymerizing ethylene and an α-olefin, which comprises:

(1) using a catalyst consisting of (A) titanium and/or vanadium compounds selected from the transition metal component of a Ziegler catalyst supported with a magnesium compound and (B) an organoaluminum compound,

(2) subjecting ethylene to a pre-polymerization in a liquid diluent in the presence of said catalyst prior to in the copolymerization, the amount of ethylene to be prepolymerized being more than 50 g per 1.0 g of said catalyst component (A) and not more than 20% by weight of the entire amount of the ethylene and α-olefin monomers to be polymerized, and

(3) successively, conducting the copolymerization of ethylene and an α-olefin at temperatures of not higher than 100° C. in the presence of a low-boiling hydrocarbon diluent having a boiling point of not higher than 40° C.

4,190,615

OLIGOMERIC ESTER CHAIN CONDENSATES OF SUBSTITUTED 1-HYDROXY-1,1-DIPHOSPHONIC ACID

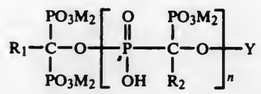
Larry W. Becker, Wilmington, Del., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 11, 1978, Ser. No. 941,537

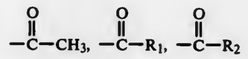
Int. Cl.² C07F *9/40*

U.S. Cl. 260—931 **5 Claims**

1. A compound having the formula



where M is a water soluble cation; R_1 and R_2 each represent a group having the formula C_xH_{2x+1}; x is from 6 to and including 13; Y is



or hydrogen; and n is 1 or greater.

4,190,616

PHOSPHINITE AND PHOSPHONITE COMPOUNDS

James R. Jennings; Philip J. Hogan, and Lawrence F. M. Kelly, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 841,924, Oct. 13, 1977, Pat. No. 4,138,428. This application Oct. 17, 1978, Ser. No. 952,138

Claims priority, application United Kingdom, Oct. 21, 1976, 45324/76; Oct. 21, 1976, 52888/76; Apr. 12, 1977, 15029/77

Int. Cl.² C07F *9/46, 9/48*

U.S. Cl. 260—945 **1 Claim**

1. A compound selected from the group consisting of isopropyl bis p-isopropoxyphenylphosphinite, isopropyl phenyl (p-methoxyphenyl)phosphinite, isopropyl phenyl (p-isopropoxyphenyl)phosphinite, isopropyl phenyl (p-dimethylaminophenyl)phosphinite, isopropyl phenyl (p-tertiarybutoxyphenyl)phosphinite, di-isopropyl p-isopropoxyphenylphosphonite, di-ethyl p-isopropoxyphenylphosphinite, cyclohexyl bis p-methoxyphenylphosphinite, isopropyl phenyl (p-diethylaminophenyl) phosphinite, isopropyl bis p-methoxyphenylphosphinite, isopropyl bis dimethylaminophenylphosphinite, isopropyl phenyl (p-tertiarybutylphenyl)phosphinite, di-isopropyl p-methoxyphenylphosphonite, di-isopropyl p-dimethylaminophenylphosphinite, and di-ethyl p-dimethylaminophenylphosphonite.

4,190,617

MIXING PUMP SYSTEM

Henry F. Hope, 3192 Huntingdon Rd., Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Aug. 7, 1978, Ser. No. 931,407

Int. Cl.² B01F *7/16, 15/06*

U.S. Cl. 261—28 **49 Claims**

1. In a system for circulating and homogeneously mixing a plurality of fluids:

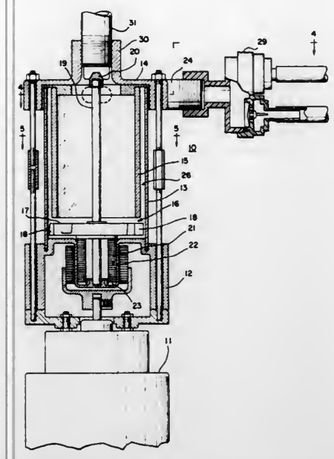
a cylindrical chamber having near one end an impeller rotatable about the axis of the chamber,

an inner cylinder concentric within the chamber,

which cylinder extends to the end of the chamber at the end remote from the impeller and defines an opening with the chamber at the end nearest the impeller,

means for introducing the fluids into the annular space between the chamber wall and the inner cylinder to cause these fluids to flow inwardly into the inner cylinder in the region of the impeller,

means for rotating the impeller to cause an alteration of the fluid at least in the region of the impeller,



means for the passage of fluid from within the inner cylinder to the outside of the system, and

whereby homogeneous mixing of the fluids is accomplished.

4,190,618

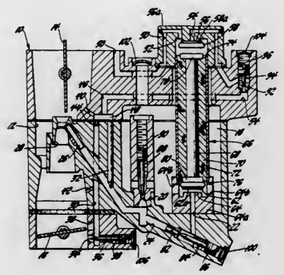
CARBURETOR

Timothy K. Sheffer, Churchville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1979, Ser. No. 17,080

Int. Cl.² F02M *7/16*

U.S. Cl. 261—50 R **6 Claims**



1. A carburetor comprising main and idle fuel passages, a metering orifice in said main fuel passage, an air bleed opening into said idle fuel passage, and a metering apparatus reciprocable between a rich position and a lean position, said metering apparatus including a metering valve engaged with said metering orifice in said lean position to restrict fuel flow through said main fuel passage and displaced from said metering orifice in said rich position to permit increased fuel flow through said main fuel passage, said metering apparatus further including a bleed valve engaged with said air bleed in said rich position to restrict air flow through said air bleed and thereby permit increased fuel flow through said idle fuel passage and displaced from said air bleed in said lean position to permit increased air flow through said air bleed and thereby restrict fuel flow through said idle fuel passage, wherein said valves are permanently magnetic, and wherein said carburetor further comprises an electromagnet pole member associated with said valves, an electromagnet coil surrounding said pole member for causing said pole member to drive said valves to one of said rich and lean positions when said coil is energized, and permanent magnet means for biasing said valves to the other of said rich and lean positions when said coil is deenergized.

4,190,619

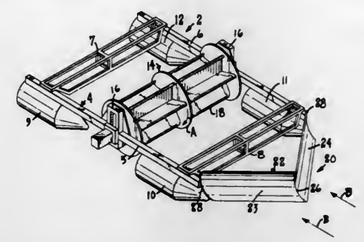
LIQUID AERATING ROTOR ASSEMBLY

Lloyd G. Cherne, Edina, Minn., assignor to Cherne Industries, Inc., Edina, Minn.

Filed Jul. 17, 1978, Ser. No. 924,886

Int. Cl.² B01F *7/04*

U.S. Cl. 261—92 **3 Claims**



1. An improved liquid aerating rotor assembly for aeration of liquid during relative movement of the liquid and the rotor assembly along a desired path, wherein the rotor assembly is of the type which comprises a support frame; a rotor rotatably supported on the support frame for rotation about a horizontal axis, the rotor having means for aerating the liquid as it rotates; power means for rotating the rotor about its axis; and means for supporting the support frame on the surface of the liquid, and wherein the improvement comprises means for directing sub-surface liquid to the rotor for mixing and aerating the sub-surface liquid which is substantially free of large floating debris, wherein the directing means comprises a scoop having:

(a) an inlet end located beneath the surface of the liquid;

(b) an outlet end located above the surface of the liquid and adjacent to and surrounding the rotor; and

(c) an enclosed vertical body section which fluidically connects the inlet and outlet ends to form the scoop, wherein the vertical body section extends above the surface of the liquid to surround the rotor and form a pool of liquid contained inside the vertical body section which the rotor can contact and aerate, and wherein the liquid in the pool is constantly replenished during rotation of the rotor with sub-surface liquid which is drawn in through the inlet end and conducted through the vertical body section into the pool by rotation of the rotor.

4,190,620

DEVICE FOR GENERATING SUPER ATMOSPHERIC PRESSURES OF SENSITIVE MATERIALS IN A GAS STREAM

Thomas H. Vanderspurt, Gillette, N.J., and Paul D. Taylor, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,750

Int. Cl.² B01F *3/04*

U.S. Cl. 261—148 **6 Claims**

1. An apparatus for converting a stream of sensitive organic material from a liquid state to a vapor state in combination with a carrier gas, comprising:

A. a tower having:

1. a vaporization stage in the upper part thereof,

2. a stripping stage in the lower part thereof,

3. a heating means for said vaporization stage, and

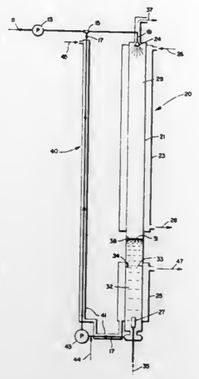
4. a cooling means for said stripping stage;

B. an inlet means for introducing said liquid sensitive material at an elevated pressure to the top of said tower;

C. an inlet means for introducing said carrier gas into the bottom of said tower;

D. an outlet means for removing combined carrier gas and vaporized sensitive material from said vaporization stage;

E. a recirculating line for transferring the contents of said stripping stage to said liquid inlet means; and



F. a cooling means for cooling the contents of said recirculating line.

4,190,621

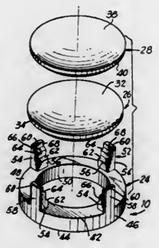
METHOD FOR MOLDING OPTICAL PLASTIC LENSES OF THE STANDARD AND BIFOCAL TYPE

Martin Greshes, 70 Corey La., East Meadow, N.Y. 11554

Continuation-in-part of Ser. No. 776,129, Mar. 10, 1977, abandoned. This application Jun. 27, 1977, Ser. No. 810,357

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 **38 Claims**



24. A method of producing an ophthalmic toric bifocal lens comprising the steps of

supporting a bifocal lower mold having a recessed bifocal well area on its concave surface,

filling said lower mold with a resin material,

positioning an upper mold in vertically and selectively spaced relationship to said lower mold, whereby said resin material is displaced to extend between the overlapping surfaces of said molds to form the configuration of said bifocal lens with a bifocular portion on the convex lens surface corresponding to said bifocal well on said lower mold,

curing said resin material situated between said molds,

cooling said resin material and said molds, whereby said lower mold is capable of movement to compensate for shrinkage of said resin material, and

separating said bifocal lens from between said molds.

4,190,622

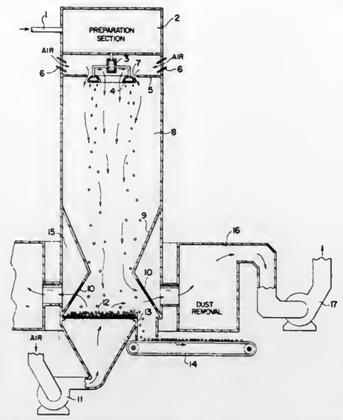
PROCESS FOR PRILLING UREA

Norris J. Landis, Cleveland Heights, Ohio, assignor to Standard Oil Company (Ohio), Ohio

Filed May 4, 1978, Ser. No. 903,648

Int. Cl.[2] B22D *23/08;* **C05C** *9/00*

U.S. Cl. 264—14 **8 Claims**



1. A process for prilling a material in a tower wherein droplets of molten material fall through a first zone and are contacted co-currently with a first gas stream and at least partially solidifying said material thereby forming a prill, and cooling and collecting said prills in a second zone comprising a fluid bed, said bed being maintained by a second gas stream flowing countercurrent to the first gas stream, wherein both first and second gas stream exit near the bottom of the tower.

4,190,623

RADIATION TREATMENT OF HIGH-POLYMER TEXTILE MATERIALS

Wolfgang Bobeth; Adolf Heger; Helmar Pässler, all of Dresden; Hermann Roloff, Berlin; Ellen Patitz, Dresden; Adolf-Ernst Schwind, Deutsch-Wusterhausen, and Erwin Zilinski, Berlin, all of German Democratic Rep., assignors to Forschungs Institut Fuer Textiltechnologie, Karl Marx Stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 141,167, May 7, 1971, abandoned, Division of Ser. No. 473,303, May 24, 1974. This application Apr. 9, 1975, Ser. No. 566,334

The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.

Int. Cl.[2] B01D *47/00;* **B01F** *3/04*

U.S. Cl. 264—22 **18 Claims**

1. The process of texturing a high polymer textile material comprising the steps of moving a beam of homogeneous high energy irradiation so as to impinge upon the material and to cause formation of chemically active species in said material, subjecting selected localized surface areas of the material to a heat treatment prior to or after said irradiation for a sufficient time to destroy or prevent the formation of said active species in said areas; and finally treating the material with a shrinking medium by reaction with said chemically active species so as to cause a differential shrinkage between said heat treated and said non-heat treated areas and thus accomplishing a texturing effect.

4,190,624

PROCESS FOR THE EXTRUSION OF COMPOSITIONS BASED ON ALPHA-OLEFIN POLYMERS

Joseph Alard, Andenne, and Jean-Louis Derroitte, Mormont, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Jun. 5, 1978, Ser. No. 912,071

Claims priority, application France, Jun. 7, 1977, 77 17978

Int. Cl.[2] B29D *7/20*

U.S. Cl. 264—146 **11 Claims**

1. Process for the extrusion of a composition based on an alpha-olefin polymer, followed by a cooling with water of the extruded material, comprising: extruding an alpha-olefin composition which comprises stabilizing amounts of (a) at least one phenolic anti-oxidant and (b) at least one organic phosphite; and (c) at least one carbonate of an alkaline-earth metal in an amount effective to reduce the entrainment of water by the extruded material.

4,190,625

THERMOPLASTIC ELASTIC POLYSULFIDE POLYMERS

Stuart M. Ellerstein, Princeton, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 704,010, Jul. 9, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,299

Int. Cl.[2] B28B *3/20*

U.S. Cl. 264—176 R **1 Claim**

1. A process for the preparation of a shaped thermoplastic elastomeric article of manufacture which comprises the extrusion of a cured polysulfide rubber, said polysulfide rubber having sulfur linkages averaging at least 1.8 sulfur atoms per linkage unit and, containing a catalytic amount of an alkali metal hydroxide, through a die under heat and pressure and allowing the extrudate to cool to room temperature.

4,190,626

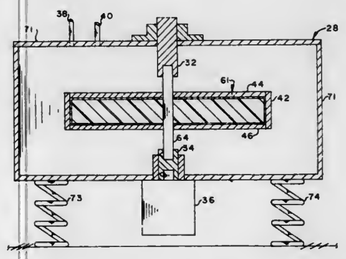
METHOD OF MANUFACTURE OF BONDED FIBER FLYWHEEL

George M. Weyler, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 5, 1978, Ser. No. 912,276

Int. Cl.[2] B29D *3/00;* **G05G** *1/00*

U.S. Cl. 264—229 **7 Claims**



1. The method of constructing a flywheel comprising:

forming a desired dimensioned, round, cylindrically-shaped, matrix of layered, glass fiber cloth within a cylindrical case, and there being an uncured fiberglass bonding material covering the fibers of the cloth and between layers of cloth and filling the case;

placing a vertically positioned axle concentrically through said round matrix;

while said bonding material is still in an uncured state, placing said case within a curing chamber with said axle rotably supported;

rotably driving said axle, whereby fibers of said matrix are stressed by centrifugal force; and

while said matrix is so rotably driven, applying a desired degree of heat to said matrix and effecting the curing of said bond material with fibers of said matrix in a stressed state, and fibers of said matrix becoming bonded together and to said axle.

4,190,627

METHOD OF PRILLED SULPHUR STORAGE IN THE OPEN AREA

Halina Leszczynska, and Jerzy Leszczynski, both of Warsaw, Poland, assignors to Instytut Przemysku Organicznega, Warsaw, Poland

Filed Oct. 20, 1978, Ser. No. 952,933

Claims priority, application Poland, Oct. 28, 1977, 201816

Int. Cl.[2] B65G *65/28, 69/16*

U.S. Cl. 422—40 **2 Claims**

1. The method of storing prilled sulphur in an open area comprising the steps of forming a dump of prilled sulphur of any size and shape, limiting said dump by immovable or movable blocking side walls, treating the surface of said dump to preclude liquid sulphur penetration into the interior thereof by covering said surface with a layer of crushed sulphur and then spraying said dump with liquid sulphur to form a protective layer of solidified sulphur thereon.

2. The method of storing prilled sulphur in an open area comprising the steps of forming a dump of prilled sulphur of any size and shape, limiting said dump by immovable or movable blocking side walls, treating the surface of said dump to preclude liquid sulphur penetration into the interior thereof by spraying said surface with water at a temperative equal to or lower than the ambient temperature and then spraying said dump with liquid sulphur to form a protective layer of solidified sulphur thereon.

4,190,628

KIT FOR DETERMINING THE LEVEL OF LDL CHOLESTEROL IN BODY FLUIDS

Barry D. Sears, Marblehead, Mass., assignor to Trustees of Boston University, Boston, Mass.

Continuation-in-part of Ser. No. 853,598, Nov. 21, 1977, Pat. No. 4,126,416. This application Oct. 26, 1978, Ser. No. 955,279

Int. Cl.[2] G01N *33/16, 31/02*

U.S. Cl. 422—61 **6 Claims**

1. A diagnostic kit for detecting LDL cholesterol in a body fluid containing LDL cholesterol and another form of cholesterol selected from VLDL cholesterol, HDL cholesterol, and combinations thereof comprising, in combination:

a. a reagent containing a lectin which is a specific agglutinating agent for LDL whereby LDL contained in said body fluid can be selectively agglutinated; and,

b. a reagent for determining the amount of cholesterol in said specifically agglutinated LDL.

4,190,629

EMISSION CONTROL APPARATUS FOR DIESEL ENGINES

John B. Strachan, Wamberal, Australia, assignor to Domino Equipment Pty. Ltd., New South Wales, Australia

Filed Nov. 28, 1977, Ser. No. 855,433

Int. Cl.[2] F01N *3/02, 3/08, 3/15*

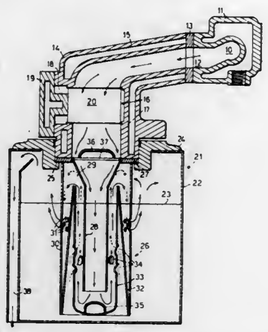
U.S. Cl. 422—169 **3 Claims**

1. An emission control apparatus for a diesel engine for use in gaseous mining applications comprising an adaptor which is jacketed for cooling by circulated water; a purifier chamber within the adaptor; an inlet to the said chamber for connection to the outlet from the exhaust manifold of a diesel engine; an outlet from the said chamber; a catalytic purifier within the said chamber for reduction of carbon monoxide of exhaust gases passing from the said inlet through the said chamber to the said outlet; a water scrubber comprising a casing to contain

a quantity of water; an inlet to the casing of the water scrubber connected to the outlet from the said purifier chamber; a domed baffle positioned between said outlet from said purifier chamber and the inlet to said water scrubber; a two-pass scrubber unit within the casing connected to the inlet to the casing and adapted to direct exhaust gases on a circuitous path through water in the casing, said scrubber unit including:

a central tube extending downwardly from the top of the casing and surrounding the casing inlet to a position below the water level of the casing;

(ii) an inner perforated tube disposed coaxially about the central tube with perforations below the water level, its upper end above the water level, its lower end closed and below the lower end of the central tube;



(iii) a dome secured to the lower end of said inner perforated tube and adapted to direct gases exiting downwardly from said central tube in an upward direction through said inner perforated tube;

(iv) an outer perforated tube secured to the top of the casing and surrounding the casing inlet and disposed coaxially about the inner perforated tube and with perforations below the water level, and

(v) an upwardly tapered tubular baffle with its lower end secured and sealed to that of the outer perforated tube and its upper end secured and sealed to that of the inner perforated tube.

4,190,630

APPARATUS FOR PULLING SINGLE CRYSTALS FROM MELT

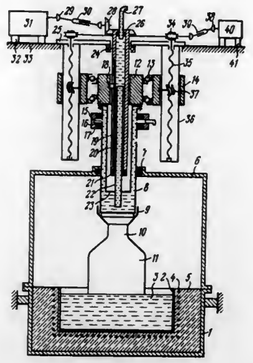
Vitaly Y. Apilat; Marx I. Litichevsky; Oleg S. Mjulendorf, and Lev G. Eidelman, all of Kharkov, U.S.S.R., assignors to Vsesojuzny Nauchno-Issiekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv, Kharkov, U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,812

Int. Cl.² B01J *17/18*

U.S. Cl. 422—249 **4 Claims**

1. An apparatus for pulling single crystals from melt comprising: a hollow rod having a seed crystal holder; carriage means in which said rod is mounted for axially moving said rod in a reciprocating manner with said seed crystal along a vertical axis; first drive means for moving said carriage means in a reciprocating manner; second drive means for rotating said rod in said carriage means, said second drive means including a drive shaft located and extending within said hollow rod coaxially therewith defining a space therebetween; means for rotating said drive shaft; means for engaging said rod and said drive shaft for combined rotation of both said drive shaft and said rod about the longitudinal axis of said drive shaft and for axial reciprocating movement of said rod with said carriage with respect to and axially along said drive shaft, said engagement means comprising a radially extending pin rigidly secured at one end to the rod and a longitudinally extending groove provided in the outer periphery of the drive shaft receiving for slidable movement therein the free end of the pin; a sleeve disposed in said space between the rod and the drive shaft surrounding a substantial portion of the length of the drive



shaft; a pipe longitudinally extending within said drive shaft rigidly secured to the rod; and means for providing circulation of coolant within the space between the sleeve and the rod.

4,190,631

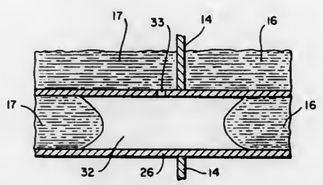
DOUBLE CRUCIBLE CRYSTAL GROWING APPARATUS

Thomas J. Dewees, Falls Township, Bucks County, Pa.; John S. Fangman, and Wen Lin, both of Ewing Township, Mercer County, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,454

Int. Cl.² B01J *17/18*

U.S. Cl. 422—249 **5 Claims**



1. An apparatus for growing a single crystal semiconductor billet, comprising:

first and second chambers, each adapted to contain a semiconductor melt; and

a hollow interconnecting member, communicating between the chambers to permit flow of the melt from the first to the second chamber and being of such a length as to inhibit back diffusion of the melt therethrough, the member having at least one aperture extending through the wall thereof to permit the escape of gas within the member while substantially precluding the flow of melt therethrough.

4,190,632

PROCESS FOR TREATING AIR-BORNE (METALLIC) DUSTS CONTAINING SILICON DIOXIDE TO FORM PRECIPITATED SILICIC ACIDS AND SILICATES

Karl Achenbach, Frankfurt, and Gunter Turk, Hanau, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,217

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609831

Int. Cl.² C01B *33/26, 33/12*

U.S. Cl. 423—118 **8 Claims**

1. A process for treating air-borne dust containing silicon dioxide in order to convert the silicon dioxide into a silicic acid or a silicate, wherein the air-borne dust is a waste product from a silicon metal or silicon alloy production process and is harmful to the environment, said process comprising the following stages:

Stage I. Dissolving said air-borne dust in an alkali metal hydroxide solution at a temperature of about 60° to about 110° C. in order to form an alkali metal silicate solution having a high modulus (SiO_2:alkali metal oxide);

Stage II. Purifying said alkali metal silicate solution during or after Stage I by treating said solution with activated charcoal and at least one oxidation agent, separately or in admixture, said oxidation agent being selected from hydrogen peroxide and alkali metal peroxide, in order to remove organic compounds from said solution and to form a non-decomposable residue and separating said non-decomposable residue from said alkali metal silicate solution;

Stage III. (A) Reacting said alkali metal silicate solution with at least one acid, aluminum salt, magnesium salt, calcium salt, or mixtures of said acids and salts, at a temperature of about 60° to about 110° C. and at a pH of about 1 to about 12 to thereby form a precipitate;

(B) Filtering, washing, drying and comminuting said precipitate to form a finely divided, amorphous, substantially pure, precipitated silicic acid or silicate having a whiteness according to Berger at a wave length of 460 mμ of about 90 to about 95% and a specific surface area of about 30 to about 800 m^2/g BET.

4,190,633

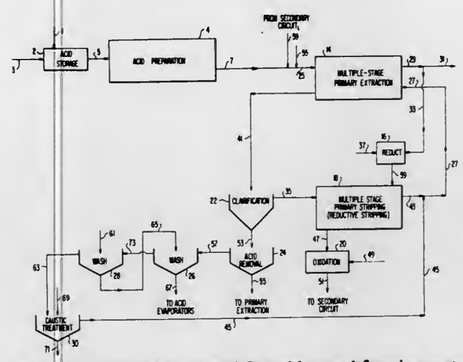
CRUD HANDLING CIRCUIT

Jay C. Smith, Gonzales; Ronald J. Manuel, Prairieville, and James E. McAllister, Baton Rouge, all of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,947

Int. Cl.² C01B *25/16*

U.S. Cl. 423—321 S **7 Claims**



1. A process for treating semi-floatable, crud-forming material formed during the extraction of dissolved constituents from aqueous wet process phosphoric acid phase using an organic solvent extractant phase, comprising the steps of:

(a) operating the solvent extraction stages of the process to allow the formation of the semi-floatable crud material;

(b) removing at least a portion of the semi-floatable crud material, together with a portion of the solvent, from said stages; and,

(c) separating the removed solvent from the semi-floatable crud material by the steps of:

(i) clarifying the removed solvent and semi-floatable crud material to remove organic material therefrom;

(ii) subjecting the underflow from the clarification step to a settling process to remove acid therefrom;

(iii) washing the solvent and semi-floatable crud material in amounts sufficient to further remove acid therefrom; and;

(iv) mixing the solvent and semi-floatable crud material with an aqueous caustic solution containing between 0.2–2.0% NaOH (by weight) and between 0–3% Na_2CO_3 (by weight) wherein the mixture of crud and caustic has a pH of between 4.5 and 11.0, in an amount sufficient to remove the solvent from the semi-floatable crud material and regenerate said solvent.

4,190,634

PURIFYING PHOSPHORIC ACID BY EXTRACTION WITH AN ALIPHATIC NITRILE

William A. Feiler, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 8, 1978, Ser. No. 904,066

Int. Cl.² C01B *25/22*

U.S. Cl. 423—321 S **7 Claims**

1. In the process for removing at least a portion of the impurities from impure aqueous phosphoric acid solutions containing at least 30% by weight of phosphoric acid by the successive steps of:

contacting the impure acid with a substantially water-insoluble solvent whereby a portion of the phosphoric acid is extracted into the solvent, forming a loaded solvent phase;

separating the solvent phase from the remaining materials;

contacting the solvent phase with water whereby a portion of the phosphoric acid is extracted into the water, forming an aqueous phosphoric acid solution of increased purity;

and separating the aqueous acid thus formed from the remaining materials;

wherein the improvement comprises contacting the impure acid with at least one aliphatic nitrile of from 4 to 10 carbon atoms in an amount effective to extract a portion of the phosphoric acid to form a loaded solvent phase with a smaller proportion of iron than the impure aqueous phosphoric acid solution.

4,190,635

PROCESSES FOR PREPARING SODIUM PERCARBONATE

Louis Mésaros, Oullins, and Paul Mollard, Sainte Foy les Lyon, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 11, 1978, Ser. No. 868,680

Claims priority, application France, Feb. 11, 1977, 77 03856

Int. Cl.² C01B *15/10*

U.S. Cl. 423—415 P **5 Claims**

1. A process for the production of sodium percarbonate, $2Na_2CO_3.3H_2O_2$, which process comprises providing a reaction mixture of solid sodium carbonate monohydrate a hydrated sodium carbonate containing from 75 to 90 percent Na_2CO_3 and 60 to 80 percent aqueous hydrogen peroxide, the reaction mixture containing a small but effective quantity of a nonionic surfactant, the surfactant being stable in concentrated solutions of hydrogen peroxide and alkaline sodium carbonate solutions, and forming sodium percarbonate, the apparent

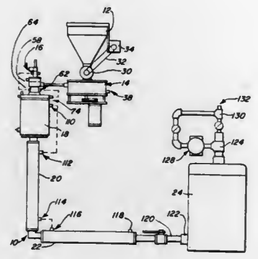
density of the solid sodium carbonate monohydrate or hydrated sodium carbonate being 0.985 g/cm^3 or greater.

4,190,636

PRODUCTION OF CARBON MONOXIDE IN A PLASMA ARC REACTOR

Donald W. Schmerling, York, and Frederick Giacobbe, Hanover, both of Pa., assignors to Chemetron Corporation, Chicago, Ill.

Filed Sep. 26, 1978, Ser. No. 945,991
Int. Cl.^{2} C01B *31/18*
U.S. Cl. 423—415 A **5 Claims**



1. A method of producing carbon monoxide comprising the steps of:

delivering a first stream of carbon dioxide to an arc to form a plasma,

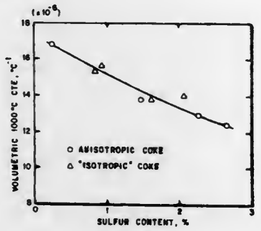
delivering solid carbon to the plasma, at least a portion of said solid carbon delivered to the plasma from an electrode of solid carbon, and at least a portion of said solid carbon delivered to the plasma in powdered form, said solid carbon powder carried by a second stream of carbon dioxide and injected into the plasma ahead of the arc, and quenching the resultant products.

4,190,637

GRAPHITE HAVING IMPROVED THERMAL STRESS RESISTANCE AND METHOD OF PREPARATION

Charles R. Kennedy, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,721
Int. Cl.^{2} C01B *31/04*
U.S. Cl. 423—448 **10 Claims**



1. A method for fabricating a graphite article comprising the steps of:

(a) providing a first coke article containing 1–3 wt.% sulfur and no added puffing inhibitors;

(b) impregnating said first coke article with a thermoplastic pitch by first heating said first coke article in contact with said thermoplastic pitch at a temperature within the range of 250°–300° C. at a pressure within the range of 200–2000 psig for at least 4–10 hours, and then heating said article at a temperature within the range of 465°–485° C. at a pressure of 200–2000 psig for about 16–24 hours to provide an impregnated article;

(c) heating said impregnated article for sufficient time to carbonize the impregnant to provide a second coke article; and

(d) graphitizing the second coke article at a temperature above the temperature at which puffing occurs.

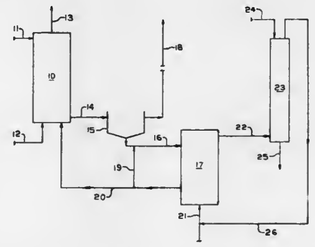
9. A graphite article characterized by a density at least 1.75 gm/cm^3, a fracture strain of at least 1%, a 1000° C. coefficient of thermal expansion less than 5.5×10^{-6}° C.$^{-1}$, a thermal stress resistance of at least 0.2%/(°C.$^{-1} \times 10^6$) and a Bacon Anisotropy factor less than 1.25.

4,190,638

PRODUCTION OF HYPOCHLOROUS ACID

Howard H. Hoekje, Corpus Christi, Tex., and Russell R. May, Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 7, 1978, Ser. No. 913,402
Int. Cl.^{2} C01B *11/04*
U.S. Cl. 423—473 **6 Claims**



1. A continuous process for preparing hypochlorous acid comprising the steps of:

(a) contacting cathode cell liquor with carbon dioxide containing gas to produce a wet, hydrated sodium carbonate-sodium bicarbonate precipitate;

(b) feeding the wet precipitate to a fluid bed reactor and contacting the precipitate with a countercurrent flow of a mixture of gaseous chlorine and water vapor at a rate sufficient to maintain the bed of precipitate in a fluidized condition, where the molar ratio of water vapor to chlorine gas in the mixture fed to the fluid bed reactor is from about 0.5:1 to 0.9:1;

(c) recycling a portion of precipitate that had been dried by contact with the gaseous mixture and mixing said portion with wet precipitate being fed to the fluid bed reactor; and

(d) absorbing the gaseous effluent from the fluid bed reactor in water.

4,190,639

RECOVERY OF HYDROGEN CHLORIDE IN CARBO-CHLORINATION OF METAL OXIDES

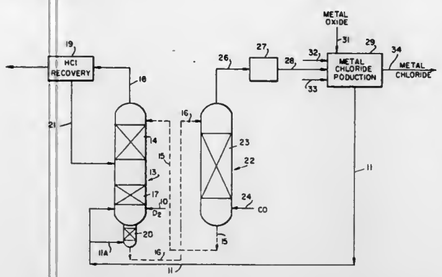
Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Sep. 25, 1978, Ser. No. 945,308
Int. Cl.^{2} C01B *9/02*
U.S. Cl. 423—491 **8 Claims**

1. In a process for converting a metal oxide to a metal chloride by carbo-chlorination with chlorine and carbon monoxide wherein there is produced a gas containing by-product hydrogen chloride, the improvement comprising:

(a) contacting said gas containing by-product hydrogen chloride with oxygen and a molten salt mixture containing the higher and lower valent chlorides of a multi-valent metal to recover by-product hydrogen chloride by enriching the molten salt mixture in the higher valent metal chloride;

(b) contacting molten salt from step (a) with at least a portion of the carbon monoxide to be employed as fresh feed in said carbo-chlorination, said contacting being effected to recover essentially all of the chlorine values added to said molten salt mixture in step (a) by both stripping of gaseous chlorine from the salt and reaction to produce phosgene;



(c) recovering from step (b) carbon monoxide, chlorine and phosgene; and

(d) employing recovered carbon monoxide chlorine and phosgene in said carbo-chlorination of a metal oxide to a metal chloride.

4,190,640

GENERATION OF NASCENT BROMINE FOR USE IN THE GROWTH OF ULTRA PURE METAL BROMIDES

Ricardo C. Pastor, Manhattan Beach, and Antonio C. Pastor, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 4, 1978, Ser. No. 965,802
Int. Cl.^{2} C01B *7/10*
U.S. Cl. 423—500 **4 Claims**

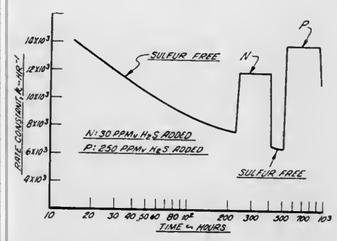
1. A process for the generation of nascent bromine at temperatures above 600° C. comprising the steps of first providing a reactive carrier gas comprised of an inert gas selected from the group consisting of N_2, He and Ar, and a reactive gas comprised of NO, or NO_2, passing said carrier gas over a nascent bromine source compound selected from a group consisting of CBr_4, $CHBr_3$ and CH_2Br_2 whereby the vapors of said bromine source compound are entrained in and mixed with said carrier gas, and passing said carrier gas containing said entrained bromine vapors into a pyrolysis chamber set to a preselected temperature greater than 600° C. whereby said bromine source compound will dissociate into nascent Br.

4,190,641

METHOD FOR PRODUCING HYDROGEN

John L. Preston, Jr., Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1978, Ser. No. 966,929
Int. Cl.^{2} C01B *1/02, 1/18*
U.S. Cl. 423—653 **8 Claims**



1. A method for producing hydrogen including the step of shift converting a hydrogen containing gas stream under a given set of conditions of length of time, flow rate, temperature, pressure, moles steam to moles carbon ratio, and inlet CO concentration using a chromia stabilized iron oxide shift catalyst, wherein the hydrogen sulfide content of the gas stream is maintained between 20 ppm and 520 ppm on a dry gas volume basis, but in no event more than that which would result in the conversion of the iron oxide to iron sulfide under said given conditions, and wherein the step of shift converting comprises reducing the carbon monoxide concentration of said gas stream to less than p% by volume using an amount "A" of said shift catalyst which is no greater than about two-thirds the minimum amount "B" which would be required under said given set of conditions if there were no hydrogen sulfide in said gas stream.

4,190,642

OCULAR THERAPEUTIC SYSTEM FOR DISPENSING A MEDICATION FORMULATION

Robert M. Gale, Mt. View; Monique Ben-Dor, and Nancy Keller, both of Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 896,720, Apr. 17, 1978. This application May 11, 1979, Ser. No. 38,086
Int. Cl.^{2} A61K *9/22, 9/24, 9/50, 9/52*
U.S. Cl. 424—19 **11 Claims**

1. An ocular therapeutic system for dispensing a medication formulation to an eye, said system sized, shaped and adapted for easy insertion and comfortable retention in the eye and comprising, depots of a medication formulation consisting essentially of from 1 to 40 weight percent of a pilocarpine therapeutically acceptable salt of 0.1 to 100 micron size and 1 to 25 weight percent of an epinephrine therapeutically acceptable salt of 0.1 to 100 micron size, said depots dispersed in and surrounded substantially individually by a polymer that is impermeable to the passage of the medication formulation and permeable to the passage of eye fluid.

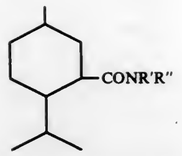
4,190,643

COMPOSITIONS HAVING A PHYSIOLOGICAL COOLING EFFECT

Hugh R. Watson, Wargrave, England; David G. Rowsell, View Bank, Australia, and David J. Spring, Slough, England, assignors to Wilkinson Sword Limited, London, England

Continuation-in-part of Ser. No. 486,564, Jul. 8, 1974, Pat. No. 4,136,163, which is a continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jun. 26, 1978, Ser. No. 919,152
Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71
Int. Cl.^{2} A61K *7/22*
U.S. Cl. 424—54 **13 Claims**

1. In a consumer product for application to or consumption by the human body comprising a consumer product base and, as additives in said base, (i) at least one of the following: a flavourant, colourant, perfuming agent, surface active agent, antiseptic or pharmaceutically active agent, and (ii) an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body in those parts of the human body with which the product comes in contact during use, the improvement which comprises using as the cold receptor stimulating ingredient an effective amount of a substantially odourless cold receptor stimulating compound of the formula:



where, when taken separately, R′ is H and R″ is pyridyl, or, when taken together and with the nitrogen atom to which they are attached, R′ and R″ jointly represent a 5–7 membered cyclic or heterocyclic group of up to 10 carbon atoms.

4,190,644

HAIR CONDITIONING COMPOUNDS

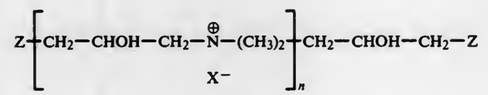
Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application May 4, 1978, Ser. No. 902,894

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **2 Claims**

1. A method of conditioning the hair which comprises applying to the hair a conditioningly effective amount of a compound or mixture of compounds having the formula:



where Z is selected from the group consisting of X and $-N(CH_3)_2$, wherein X is a halogen having an atomic weight greater than 34, where X^- is the anionic form of X, there being one such anionic halogen for each cationic nitrogen, and wherein n is an integer of from 2 to 20, said compound or mixture of compounds being formed by the reaction of equimolar proportions of 1,3-bis-dimethylamino-2-propanol and 1,3-dichloro-2-propanol, the reaction being affected at a temperature of about 40° to about 90° for about 2 to 12 hours.

4,190,645

ROTAVIRUS INNER CAPSID SUBUNIT PREPARATIONS

June D. Almeida, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 838,219, Sep. 30, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,230

Claims priority, application United Kingdom, Sep. 30, 1976, 40608/76

Int. Cl.² A61K *39/12;* **C12K** *7/00*

U.S. Cl. 424—89 **8 Claims**

1. A rotavirus inner capsid antigenic subunit preparation substantially free from complete virus particles and fragments thereof, wherein the subunits have a sedimentation coefficient of 17.5S, and a molecular weight of $>2\times10^5$ and $<2\times10^6$.

3. A method for preparing a rotavirus inner capsid subunit preparation as claimed in claim 1 or claim 2 comprising suspending a sample of faecal material obtained from a mammal infected with rotavirus, incubating the suspension at 30° to 45° C. for at least 20 minutes, removing and concentrating the subunits from the suspension by centrifugation and/or filtration.

4,190,646

POLYPEPTIDE COMPOSITIONS AND METHODS

Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 851,777, Nov. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,175, Nov. 11, 1975, abandoned. This application Jan. 26, 1979, Ser. No. 6,893

Int. Cl.² A61K *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **32 Claims**

1. A polypeptide having the biological capability of inducing the differentiation of T-lymphocytes but not of complement receptor (CR+) B lymphocytes, said polypeptide having the following sequence:

R-NH-ARG-LYS-ASP-VAL-TYR-COR′

wherein R and R′ are terminal groups on said polypeptide which do not substantially affect the biological capability thereof, and the pharmaceutically acceptable salts, and wherein R and R′ are selected from the groups consisting of:

R	R′
Hydrogen	OH
C_1—C_7 alkyl	NH_2
C_5—C_{12} aryl	NHR_7
C_6—C_{20} alkaryl	$N(R_7)_2$
C_6—C_{20} aralkyl	OR_7
C_1—C_7 alkanoyl	VAL
C_2—C_7 alkenyl	GLN
C_2—C_7 alkynyl	LEU
GLN	TYR
GLU	VAL-GLN
GLY	VAL-LEU
GLU-GLN	
GLY-GLN	VAL-TYR
GLY-GLU	GLN-LEU
GLY-GLU-GLN	GLN-TYR
	GLN-VAL
	LEU-TYR
	LEU-LEU
	TYR-LEU
	VAL-GLN-LEU
	VAL-GLN-LEU-TYR

wherein R_7 is C_1–C_7 alkyl, C_2–C_7 alkenyl, C_2–C_7 alkynyl, C_6–C_{20} aryl, C_6–C_{20} aralkyl, or C_6–C_{20} alkaryl.

4,190,647

POLYPEPTIDES AND METHODS

Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 851,778, Nov. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,176, Nov. 11, 1975, abandoned. This application Jan. 26, 1979, Ser. No. 6,894

Int. Cl.² A61K *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **32 Claims**

1. A polypeptide having the biological capability of inducing the differentiation of both T-lymphocytes and of complement receptor (CR+) B-lymphocytes, said polypeptide having the following sequence:

R-NH-X-Y-Z-GLN-LYS-COR′

X is TYR or ALA, Y is ASN is ALA, and Z is ILE or ALA, and R and R′ are terminal groups on said polypeptide which do not substantially affect the biological capability thereof, and the pharmaceutically acceptable salts, wherein R and R′ are selected from the groups consisting of:

R	R′
Hydrogen	OH
C_1–C_7 alkyl	NH_2
C_5–C_{12} aryl	NHR_7
C_6–C_{20} alkaryl	$N(R_7)_2$
C_6–C_{20} aralkyl	OR_7
C_1–C_7 alkanoyl	GLU
C_2–C_7 alkenyl	SER
C_2–C_7 alkynyl	THR
ASP	LEU
SER	HIS
LEU	VAL
SER-ASP	ARG
LEU-SER ASP	GLU-SER
LEU-ASP	GLU-THR
LEU-SER	

R′
GLU-SER-LEU
GLU-SER-THR
GLU-SER-THR-LEU
GLU-SER-THR-LEU-HIS
GLU-SER-THR-LEU-HIS-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU-ARG

wherein R_7 is C_1–C_7 alkyl, C_2–C_7 alkenyl, C_2–C_7 alkynyl, C_6–C_{20} aryl, C_6–C_{20} aralkyl, or C_6–C_{20} alkaryl.

4,190,648

PEPTIDES HAVING SOMATOSTATIN ACTIVITY

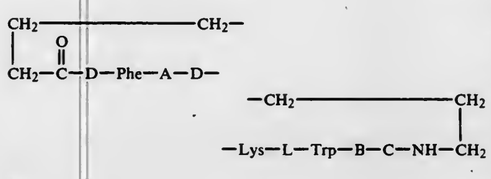
Daniel F. Veber, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 13, 1979, Ser. No. 20,148

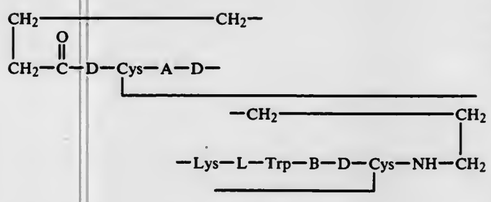
Int. Cl.² A61K *37/100;* **C07C** *103/52*

U.S. Cl. 424—177 **3 Claims**

1. Compounds of the formula:



and



wherein

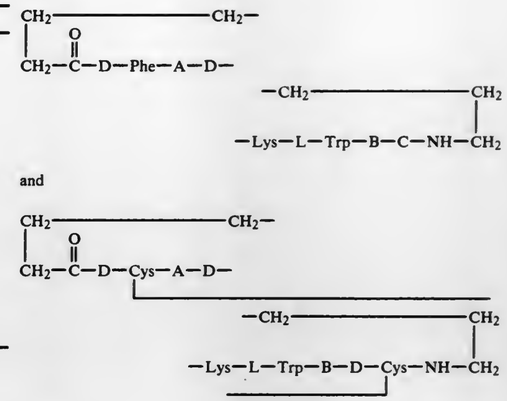
A is D—Thr, D—Val;

B is D—Phe, D—Tyr;

C is D—Phe, D—Tyr, O—Me—D—Tyr;

wherein the ring formed by the peptide backbone contains 26 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof.

3. A composition comprising a therapeutically effective amount of the peptides having the structure:



and

wherein

A is D—Thr, D—Val,

B is D—Phe, D—Tyr,

C is D—Phe, D—Tyr, O—Me—D—Tyr

wherein the ring formed by the peptide backbone contains 26 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof in a pharmaceutically acceptable excipient.

4,190,649

POLYRIBONUCLEOTIDES CAPABLE OF PROMOTING THE GENESIS OF LEUCOCYTES AND BLOOD PLATELETS

Mirko Beljanski, 46 Bd de Port Royal, Paris, France (75005)

Filed May 25, 1977, Ser. No. 800,435

Claims priority, application France, Jun. 3, 1976, 76 16875

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **7 Claims**

1. A pharmaceutical composition in dosage unit form for treating leucocyte and platelet deficiencies, comprising from 2 to 100 mg of single-stranded chain polyribonucleotides having 20 to 80 ribonucleotide units and in which the sequence units G-A predominate, the overall ratio of purine bases to pyrimidine bases [(G+A)/(C+U)] in said polyribonucleotides being between 1.0 and 2.5 associated with a pharmaceutically acceptable vehicle.

7. A method of treating a leucocyte or platelet deficiency, comprising administering to a subject suffering from such a deficiency an effective dose of single-stranded chain polyribonucleotides having 20 to 80 ribonucleotide units and in which the sequence units G-A predominate, the overall ratio of purine bases to pyrimidine bases [(G+A)/(C+U)] in said polyribonucleotides being between 1.0 and 2.5.

4,190,650

PHOSPHONYL VINYL PHOSPHORUS COMPOUNDS AS PESTICIDES

Karl Kiehs, Lampertheim; Hans J. Schrepfer, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

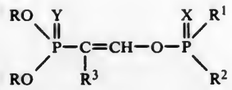
Filed Mar. 24, 1978, Ser. No. 889,834

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715924

Int. Cl.² A01N *9/36;* **C07F** *9/40*

U.S. Cl. 424—204 **6 Claims**

1. A phosphoric acid derivative of the formula



I,

where R denotes linear or branched alkyl of a maximum of 6 carbon atoms, R^1 denotes linear or branched alkyl or alkoxy of a maximum of 6 carbon atoms, linear or branched alkynyloxy of a maximum of 4 carbon atoms, phenyl, phenyl mono- or polysubstituted by halogen or alkyl of 1 to 4 carbon atoms, or benzyloxy, R^2 denotes alkoxy, alkylthio, alkylamino or dialkylamino (alkyl in these radicals being linear or branched and of a maximum of 6 carbon atoms), linear or branched alkynyloxy of a maximum of 4 carbon atoms, or benzyloxy, R^3 denotes hydrogen or linear or branched alkyl of a maximum of 3 carbon atoms, X denotes oxygen or sulfur, and Y denotes oxygen or sulfur.

6. A process for combatting pests, wherein the pests or the objects to be protected against pest attack are treated with an effective amount of a phosphoric acid derivative of claim 1.

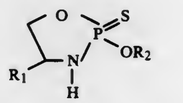
4,190,651

CYCLIC PHOSPHORIC ACID AMIDE ESTERS, AND AN INSECTICIDE CONTAINING THE SAME AS ACTIVE INGREDIENT

Morifusa Eto; Shinkichi Tawata, both of Fukuoka, and Kohei Oshima, Tama, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1978, Ser. No. 884,527
Claims priority, application Japan, Mar. 16, 1977, 52/29103
Int. Cl.[2] C07F *9/08;* A01N *9/36*
U.S. Cl. 424—209 **18 Claims**

1. Compounds of the general formula:



I

wherein R_1 is one member selected from the class consisting of alkyl, alkenyl, alkynyl, aralkyl, aralkenyl and aralkynyl groups and R_2 is an alkyl group.

5. A method of preventing or inhibiting the growth of proliferation of insects which comprises applying to a site infested with or susceptible to infestation by insects an effective amount of a compound of formula I as defined in claim 1.

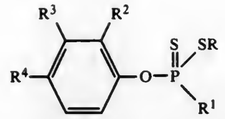
4,190,652

COMBATING PESTS WITH O-PHENYL-THIONOTHIOLALKANEPHOSPHONIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Rolf Schröder, Velbert; Bernhard Homeyer, Leverkusen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,234
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714771
Int. Cl.[2] A01N *9/36;* C07F *9/40*
U.S. Cl. 424—222 **14 Claims**

1. An O-phenyl-thionothiolalkanephosphonic acid ester of the formula



wherein

R is butyl, or alkenyl or halogenoalkyl each with up to 6 carbon atoms,

R^1 is alkyl with 1 to 6 carbon atoms,

R^2 is hydrogen, cyano, nitro, chlorine, bromine, phenyl, or alkyl, carbalkoxy, alkoxy or alkylthio each with 1 to 4 carbon atoms in the alkyl or alkoxy moiety,

R^3 is hydrogen, chlorine, methoxy or ethoxy, and

R^4 is hydrogen, chlorine, cyano, nitro, methoxy, ethoxy, methylthio, ethylthio, methylsulphonyl, ethylsulphonyl or alkyl with 1 to 4 carbon atoms.

2. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

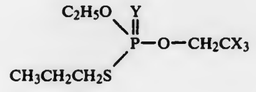
4,190,653

PESTICIDALLY ACTIVE O-ETHYL-S-N-PROPYL-O-2,2,2-TRIHALOETHYL-PHOSPHORO(THIONO)THIOLATES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsuboi, both of Tokyo, all of Japan, assignors to Nihon Takushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jul. 19, 1977, Ser. No. 816,980
Claims priority, application Japan, Jul. 27, 1976, 51/88639
Int. Cl.[2] A01N *9/36;* C07F *9/165*
U.S. Cl. 424—224 **9 Claims**

1. An O-ethyl-S-n-propyl-O-2,2,2-trihaloethylphosphoro-(thiono)thiolate of the formula



I

wherein

Y is oxygen or sulfur, and

X is fluorine, chlorine or bromine.

8. A method of combating insect, acarid or nematode pests which comprises applying to the pests or a habitat thereof an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent or carrier.

4,190,654

PHARMACEUTICAL COMPOSITION COMPRISING ANXIOLYTIC DRUGS AND BETA-ADRENERGIC RECEPTOR BLOCKING AGENTS

Paolo Gherardi, and Giorgio Ferrari, both of Milan, Italy, assignors to Simes Societa Italiana Medicinali e Sintatici S.p.A., Milan, Italy

Filed Aug. 21, 1978, Ser. No. 935,721
Claims priority, application Belgium, Aug. 29, 1977, 180506
Int. Cl.[2] A61K *31/33, 31/135*
U.S. Cl. 424—244 **6 Claims**

1. A pharmaceutical composition in a form suitable for oral administration for the therapeutic treatment of anxiety and neurodystonic states comprising the benzodiazepine anxiolytic dimethylcarbamoyloxy-1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one and the beta-adrenergic receptor blocking agent 1-(o-methoxyphenoxy)-3-isopropylamino- propan-2-ol, the ratio of the benzodiazepine anxiolytic to beta-adrenergic receptor blocking agent being from 5 to 75 parts by weight: 10 to 100 parts by weight.

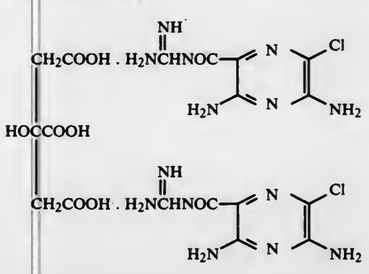
4,190,655

AMILORIDE CITRATE

Joseph DeMarco, Hatfield, and Gerald S. Brenner, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 28, 1978, Ser. No. 937,245
Int. Cl.[2] A61K *31/495;* C07D *241/16*
U.S. Cl. 424—250 **4 Claims**

1. A compound of the formula:



2. A pharmaceutical composition useful in the treatment of edema and hypertension which comprises a pharmaceutically acceptable amount of amiloride citrate and a pharmaceutically acceptable carrier.

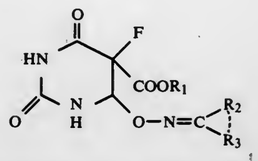
4,190,656

URACIL DERIVATIVES AND PRODUCTION THEREOF

Koichi Matsumura, Ibaraki; Osamu Miyashita, Osaka; Hiroshi Shimadzu, Settsu, and Naoto Hashimoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 22, 1978, Ser. No. 944,769
Claims priority, application Japan, Sep. 22, 1977, 52/114193
Int. Cl.[2] C07D *239/10*
U.S. Cl. 424—251 **29 Claims**

1. A compound of the formula



wherein R_1 represents a lower alkyl group; and



represents an alkylidene radical in which at least one of R_2 and R_3 is a lower alkyl group which may be substituted by phenyl, a phenyl group, a furyl group, a thienyl group, or a pyridyl group, no more than one of R_2 and R_3 being hydrogen; or

a cycloalkylidene radical of up to 6 carbon atoms, to which a benzene ring may be fused.

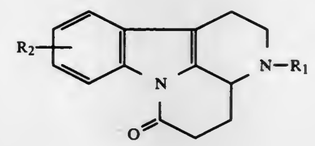
4,190,657

NAPHTHYRIDINE DERIVATIVES

Gabor I. Koletar, Le Plessis-Robinson; Henry Najer, Paris; Jean P. G. LeFevre, Paris; Régis Dupont, Paris; Don Pierre R. L. Giudicelli, Fontenay-sous-Bois, and Claude C. H. Morel, Massy, all of France, assignors to Synthelabo, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,557
Claims priority, application France, Mar. 11, 1976, 77 07248; Apr. 13, 1976, 76 10773; Jun. 1, 1976, 76 16445; Oct. 27, 1976, 76 32319; Dec. 24, 1976, 76 39035; Mar. 11, 1977, 77 07249
Int. Cl.[2] A61K *31/445;* C07D *471/12*
U.S. Cl. 424—256 **13 Claims**

1. A compound of the formula:



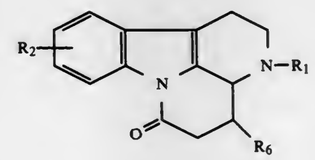
wherein

R_1 is $-(C_{1\text{-}2}\text{alkylene})COO(C_{1\text{-}2}\text{alkyl})$ or $-(C_{1\text{-}2}\text{alkylene})\text{-}CO(C_{1\text{-}2}\text{alkyl})$; or hydrogen;

R_2 is hydrogen, halogen, methyl, or methoxy;

provided that when R_1 is hydrogen, R_2 is neither hydrogen nor 10-methoxy in the form of a racemate or optical isomer thereof, or a pharmaceutically acceptable salt of said compound.

2. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, 3-oxobutyl, 3-hydroxybutyl, 2-oxopropyl, 2-hydroxypropyl or methoxycarbonylethyl;

R_2 is hydrogen, halogen, methyl or methoxy; and

R_6 is methoxycarbonyl, ethoxycarbonyl or cyclopropylaminocarbonyl;

in the form of a racemate or optically active form thereof, or a pharmaceutically acceptable salt of said compound.

9. A method of providing a subject with an anti-anoxia effect which comprises treating said subject with an amount of a compound of claim 1 capable of providing said anti-anoxia effect.

10. A method of providing a subject with psychotropic effect which comprises treating said subject with an amount of a compound of claim 1 capable of providing said psychotropic effect.

11. A method of providing a subject with an anti-anoxia effect which comprises treating said subject with an amount of a compound of claim 2 capable of providing said anti-anoxia effect.

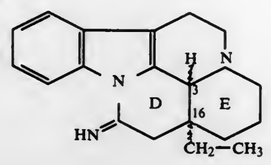
4,190,658

14-IMINO-(15H)-EBURNAMINE COMPOUNDS, COMPOSITIONS, METHODS OF USE AND PROCESS OF SYNTHESIS

Julien Warnant, Neuilly-sur-Seine; André Farcilli, Rosny-sous-Bois, and Italo Medici, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 17, 1978, Ser. No. 925,103
Claims priority, application France, Jul. 25, 1977, 77 22747
Int. Cl.[2] A61K *31/475;* C07D *471/22*
U.S. Cl. 424—256 **13 Claims**

1. A compound selected from the group consisting of a compound of the formula



in the form of racemic mixtures or optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts.

11. A method of increasing blood oxygen levels and cerebral blood flow in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim **1** sufficient to increase blood oxygen content and cerebral blood flow.

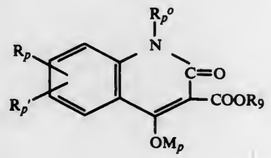
4,190,659

PHARMACEUTICAL PREPARATION AND USE OF 4-HYDROXY-2-QUINOLINONE-3-CARBOXYLIC ACID ESTERS

Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 662,148, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,984, Mar. 12, 1975, abandoned, which is a division of Ser. No. 454,070, Mar. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 303,099, Nov. 2, 1972, abandoned, and Ser. No. 392,082, Aug. 27, 1973, abandoned.
This application Jun. 20, 1977, Ser. No. 807,898
Claims priority, application Switzerland, Oct. 23, 1973, 14933/73
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 **69 Claims**

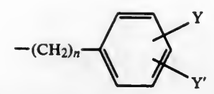
1. The method of treating allergic conditions due to histamine release comprising administering to a mammal in need of such treatment an allergy treating effective amount of a compound of the formula:



wherein

R_9 is alkyl of 1 to 4 carbon atoms,

$R_p{}^o$ is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms, or



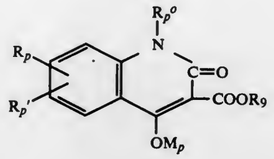
M_p is hydrogen or a pharmaceutically acceptable cation,

n is 0 or 1,

Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

R_p and R_p' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl, with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

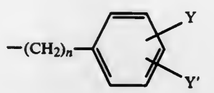
33. A pharmaceutical composition comprising in unit dosage form a pharmaceutically acceptable carrier and an amount effective to relieve allergic conditions due to histamine release of a compound of the formula:



wherein

R_9 is alkyl of 1 to 4 carbon atoms,

$R_p{}^o$ is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 or 2 carbon atoms, or



M_p is hydrogen or a pharmaceutically acceptable cation,

n is 0 or 1,

Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

R_p and R_p' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl, with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

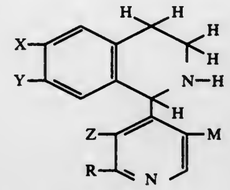
4,190,660

ANTI-DRUG WITHDRAWAL SYNDROME COMPOSITION AND METHOD OF USE

Patrick M. Siu, 103 Sheffield St., Silver Spring, Md. 20910

Filed Aug. 11, 1978, Ser. No. 932,940
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 **4 Claims**

1. A pharmaceutical composition in dosage unit for alleviating the withdrawal syndrome created in an individual undergoing drug withdrawal comprising a dosage unit in the form of a powder, tablet, capsule or sterile isotonic solution for injection containing an effective but non-toxic quantity in a pharmaceutically acceptable carrier of a compound having the following general formula:



ps wherein:

X is H, OH, or halogen group;

Y is OH, amino or halogen group;

Z is OH, amino or halogen group;

M is CH_2OH, CH_2PO_4, CH_2Cl, CH_2Br, Ch_2Fl, or CH_2l group,

R is H_2 or an alkyl group having 1 to 5 carbon atoms.

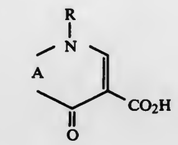
4,190,661

PYRAZOLO-QUINOLINES, COMPOSITIONS AND PHARMACEUTICAL PREPARATIONS

P. Le Hao Dong, Montpellier, and Claude Coquelet, St. Gely du Fesc, both of France, assignors to Laboratoires Chauvin-Blache, Montpellier, France

Filed May 16, 1978, Ser. No. 906,410
Claims priority, application France, May 20, 1977, 77 15573
Int. Cl.[2] A61K *31/47;* C07D *471/04*
U.S. Cl. 424—258 **6 Claims**

1. A compound selected from the group consisting of compounds of the formula



(I)

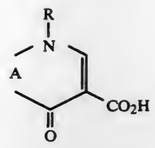
in which:

R is selected from $C_{1\text{-}6}$ alkyl and $C_{1\text{-}6}$ alkenyl,

A is selected from indazol-4,5-diyl, indazol-6,7-diyl, and the same groups substituted on the nitrogen atoms at 1- or 2-position with a substituent selected from $C_{1\text{-}6}$ alkyl and phenyl-($C_{1\text{-}6}$)alkyl

and a salt thereof with a pharmaceutically acceptable base.

5. Therapeutic composition having an antibacterial activity, comprising an antibacterial effective amount of a compound selected from the group consisting of compounds of the formula



(I)

in which:

R is selected from $C_{1\text{-}6}$ alkyl and $C_{1\text{-}6}$ alkenyl,

A is selected from indazol-4,5-diyl, indazol-6,7-diyl, and the same groups substituted on the nitrogen atoms at 1- or 2-position with a substituent selected from $C_{1\text{-}6}$ alkyl and phenyl-($C_{1\text{-}6}$)alkyl,

and a salt thereof with a pharmaceutically acceptable base.

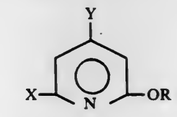
4,190,662

HALOMETHYL SUBSTITUTED DIALKOXYPYRIDINES

Myk R. Fenstermacher, Baton Rouge, La., and Robert L. Noveroske, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

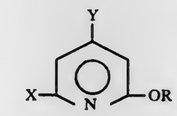
Filed Mar. 23, 1978, Ser. No. 889,179
Int. Cl.[2] A01N *9/22;* C07D *213/61, 213/64*
U.S. Cl. 424—263 **38 Claims**

1. A substantially pure compound corresponding to the formula



wherein X and Y represent OR', trichloromethyl, trifluoromethyl, dichloromethyl, dichlorofluoromethyl or chlorodifluoromethyl with the proviso that one of X or Y must be OR' and the other of X and Y is other than OR'; and R and R' each independently represent alkyl of 1 to 12 carbon atoms or alkenyl of 3 or 4 carbon atoms.

12. A fungicidal composition comprising a fungicidally-effective amount of a compound corresponding to the formula



wherein X and Y represent OR', trichloromethyl, trifluoromethyl, dichloromethyl, dichlorofluoromethyl or chlorodifluoromethyl with the proviso that one of X or Y must be OR' and the other of X and Y is other than OR'; and R and R' each independently represent alkyl of 1 to 12 carbon atoms or alkenyl of 3 or 4 carbon atoms, in intimate admixture with an inert adjuvant therefor.

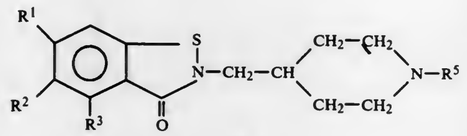
4,190,663

ANTI-THROMBOTIC 1,2-BENZISOTHIAZOLIN-3-ONES

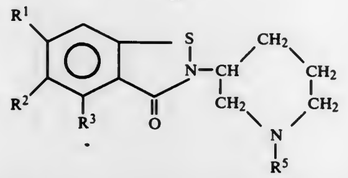
Horst Böshagen, Haan; Ulrich Hörlein, Wupperthal, both of Fed. Rep. of Germany; Karl-August Meng, deceased, late of Wuppertal, Fed. Rep. of Germany (by Ilse H. F. Meng, heiress), and Friedel Seuter, Velbert, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 760,555, Jan. 19, 1977, Pat. No. 4,156,729.
This application Apr. 28, 1978, Ser. No. 901,191
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602643
Int. Cl.[2] A61K *31/445;* **C07D** *417/06, 417/04*
U.S. Cl. 424—267 **15 Claims**

1. A compound selected from the group consisting of 6-substituted 7-unsubstituted 1,2-benzisothiazolin-3-ones depicted by the formula:



or



and the pharmaceutically acceptable acid addition salts thereof wherein

R^1 when taken independently of R^2 is chloro, bromo, fluoro, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or an aromatic substituent selected from the group consisting of phenoxy, benzyloxy and phenylthio which aromatic substituent is unsubstituted or substituted with alkyl of 1 to 4 carbon atoms or halo;

R^2 when taken independently of R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^1 and R^2 taken together are trimethylene, tetramethylene or pentamethylene;

R^3 is hydrogen, halo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; and

R^5 is alkyl of 1 to 4 carbon atoms.

15. The method of achieving an antithrombotic effect in a human or other warm blooded animal in need thereof which comprises administering thereto an antithrombotically effective amount of a compound according to claim **1**.

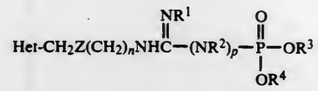
4,190,664

AMIDINO AND GUANIDINO PHOSPHONATES

Graham J. Durant, Welwyn Garden City; Rodney C. Young, Bengeo, both of England, and Zeav Tashma, Jerusalem, Israel, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

Filed Jun. 6, 1978, Ser. No. 913,180
Int. Cl.[2] C07D *277/20*
U.S. Cl. 424—270 **17 Claims**

1. A compound of the structure



in which

Het is a 5- or 6-membered fully unsaturated heterocycle containing at least one nitrogen atom, said heterocycle being imidazole, thiazole, isothiazole, oxazole, isoxazole or thiadiazole, and optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen, hydroxy or lower alkoxy;

Z is sulphur or methylene;

n is 2 or 3;

R^1 is hydrogen, lower alkyl or Het—$CH_2Z(CH_2)_n$—;

p is 0 or 1;

R^2 is hydrogen or lower alkyl;

or R^1 and R^2 together form a $(CH_2)_2$ or $(CH_2)_3$ group;

R^3 is lower alkyl, phenyl or phenyl(lower alkyl), and

R^4 is hydrogen when p is 0 and hydrogen, lower alkyl, phenyl or phenyl(lower alkyl) when p is 1.

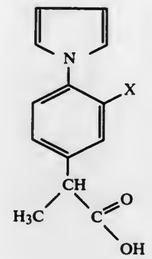
4,190,665

SUBSTITUTED ARYLALIPHATIC ACIDS

Etienne Szarvasi, Charbonnieres-Les Bains, and Didier Festal, Ecully, both of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

Filed Nov. 28, 1977, Ser. No. 855,361
Claims priority, application France, Nov. 30, 1976, 76 35993
Int. Cl.[2] A61K *31/40;* **C07D** *207/24*
U.S. Cl. 424—274 **8 Claims**

1. A substituted arylaliphatic acid represented by the formula



in which X is a nitro or amino group.

6. A method of treating patients with pain or inflammation comprising orally administering to the patient an analgesic or anti-inflammatory amount of the arylaliphatic acid of claim **1**.

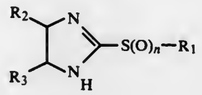
4,190,666

ANTI-INFLAMMATORY 4,5-DIARLY-2-(SUBSTITUTED-THIO)IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

Saul C. Cherkofsky, Wilmington, Del., and Thomas R. Sharpe, Fort Salonga, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 779,805, Mar. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,282, Jun. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 603,650, Aug. 11, 1975, abandoned. This application Feb. 10, 1978, Ser. No. 876,864
Int. Cl.[2] A61K *31/415;* **C07D** *233/84, 233/86*
U.S. Cl. 424—274 **82 Claims**

1. A compound of the formula



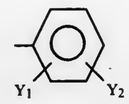
where

n=0, 1, or 2;

R_1=C_1—C_8 alkyl; allyl; vinyl; —CH_2COCH_3; —CH_2-

$S(O)_m$ CH_3, where m=0, 1, or 2; mono— or polyhalo— C_1–C_8 alkyl;

R_2 and R_3, the same or different=



Y_1 and Y_2, the same or different=hydrogen, C_1–C_4 alkoxy, acetoxy, C_1–C_4 alkyl, Cl, F, CF_3, $N(CH_3)_2$, NO_2, CH_3S—, CH_3SO_2—, or Y_1 and Y_2 taken together forming a dioxymethylene bridge;

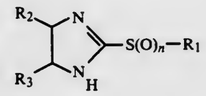
provided, when n=0, 1 or 2 and Y_1 and Y_2 both=hydrogen, R_1 cannot be vinyl;

provided, when R_1=C_1–C_8 alkyl, C_3–C_8 haloalkyl with halogen substituted at the 3 through 8 position, allyl or —CH_2COCH_3, both Y_1 and Y_2 cannot be H;

provided further, when n=O and R_1=CH_3, both Y_1 and Y_2 cannot be p-Cl or p-OCH_3;

its pharmaceutically suitable acid addition salt where N=O or its pharmaceutically suitable metal salt where n=1 or 2.

56. A method of treating arthritis in a mammal which comprises administering to the mammal an effective anti-arthritic amount of a compound of the formula

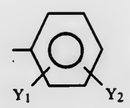


where

n=0, 1, or 2;

R_1=C_1–C_8 alkyl; allyl; vinyl; —CH_2COCH_3; —$CH_2S(O)_m$ CH_3, where m=0, 1, or 2; mono- or polyhalo- C_1–C_8 alkyl;

R_2 and R_3, the same or different =



Y_1 and Y_2, the same or different=hydrogen, C_1–C_4 alkoxy, acetoxy, C_1–C_4 alkyl, Cl, F, CF_3, —$N(CH_3)_2$, NO_2, CH_3S—, CH_3SO_2—, or Y_1 and Y_2 taken together forming a dioxymethylene bridge;

provided, when R_1=C_1–C_8 alkyl, C_3–C_4 haloalkyl with the halogen substituted at the 3 through 8 position, allyl, or —CH_2COCH_3 both Y_1 and Y_2 cannot be H;

its pharmaceutically suitable acid addition salt where n=0 or its pharmaceutically suitable metal salt where n=1 or 2.

4,190,667
Patent Not Issued For This Number

4,190,668

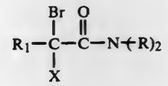
STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, and Charles A. Wilson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,497
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—304 **19 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

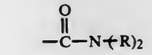


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:

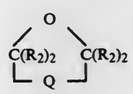


wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of a 5- or 6-membered saturated cyclic ether or an inertly substituted 5- or 6-membered saturated cyclic ether, said stabilizing amount being an amount sufficient to measurably reduce the decomposition of the halogenated amide antimicrobial in the aqueous composition and said cyclic ether corresponding to the formula:



wherein Q represents divalent organic radical of the formula —$C(R_2)_2$—$C(R_2)_2$—, —$C(R_2)_2$—O—, —$C(R_2)_2$—$C(R_2)_2$—$C(R_2)_2$—, —$C(R_2)_2$—O—$C(R_2)_2$—, —$C(R_2)_2$—$C(R_2)_2$—O—, —O—$C(R_2)_2$—O—, or —$C(R_2$-

)$_2$—N(R_2)—C(R_2)$_2$—and wherein each R_2 is individually hydrogen or a monovalent saturated hydrocarbon radical containing from 1 to about 8 carbon atoms.

4,190,669

METHOD FOR TREATING PSORIASIS

John J. Voorhees, Ann Arbor, Mich.; Sven R. Hammarström, Djursholm, Sweden; Mats A. Hamberg, Lidingö, Sweden, and Bengt I. Samuelsson, Danderyd, Sweden, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 664,652, Mar. 8, 1976, abandoned. This application May 2, 1977, Ser. No. 793,099

Int. Cl.^{2} A61K *31/215, 31/185*

U.S. Cl. 424—305 **11 Claims**

1. A method for treating psoriasis which comprises administering to the afflicted human or animal a composition containing as its active component at least one compound having the formula

$$CH_3(CH_2)_4—(C{\equiv}C—CH_2)a_1—(CH_2)b_1CO_2H$$

wherein a_1 stands for an integer of from 3 to 5 and b_1 stands for an integer of form 0 to 8, and the alkyl esters of such compounds, said compound being in association with a pharmaceutical carrier, wherein said active component is present in an amount which is effective to alleviate psoriasis in the range of about 0.1% to about 15% w/v.

4,190,670

PROSTAGLANDIN DERIVATIVES

Arthur F. Marx, Delft, and Jean Doodewaard, Schipluiden, both of Netherlands, assignors to Gist Brocades N.V., Netherlands

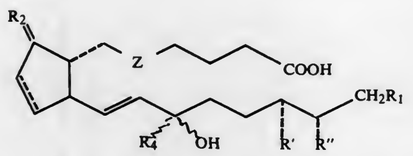
Division of Ser. No. 561,895, Mar. 25, 1975, Pat. No. 4,054,595. This application Sep. 9, 1977, Ser. No. 831,949

Claims priority, application United Kingdom, Mar. 26, 1974, 13399/74; Mar. 26, 1974, 13400/74

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 424—305 **24 Claims**

1. The 18ξ- and 19ξ-hydroxy-prostaglandin compounds of the formula



wherein the waved lines indicate that the substituents at the represented bonds are either in the α or β position,

Z represents —CH_2CH_2— or cis —CH=CH—,

R_1 represents a hydrogen atom or methyl or ethyl group,

R_2 represents an oxygen atom or a hydrogen atom and an α or β hydroxyl group,

R_4 represents a hydrogen or a methyl group and

one of R′ and R″ represents a hydroxyl group and the other a hydrogen atom, with the proviso that Z cannot be —CH=CH— when R_2 is oxygen, and

the pharmaceutically acceptable salts or the aliphatic esters thereof.

4,190,671

CHALCONE DERIVATIVES

Anthony E. Vanstone, Whitton, and Graham K. Maile, Harlow, both of England, assignors to Biorex Laboratories Limited, London, England

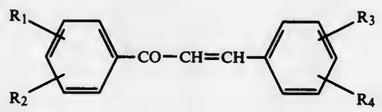
Filed Mar. 3, 1978, Ser. No. 883,252

Claims priority, application United Kingdom, Mar. 17, 1977, 11339/77; Aug. 26, 1977, 35925/77

Int. Cl.^{2} C07C *65/22;* **A61K** *31/19;* **C07C** *65/20*

U.S. Cl. 424—317 **13 Claims**

1. A compound of the general formula:



wherein R_1 is a carboxyalkoxy radical, R_2 and R_3, which may be the same or different, are hydrogen or halogen atoms, hydroxyl groups or alkoxy radicals and R_4 is carboxylalkoxy or a carboxyalkylcarbonyloxyalkyl radical or a carboxylic acid group; and the non-toxic inorganic and organic salts thereof.

13. A pharmaceutical composition for treating inflammatory and allergic conditions and for treating ulcerous conditions of the gastro-intestinal tract in humans which comprises an effective amount of a compound of claim 1 in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,190,672

METHOD AND COMPOSITIONS OF TREATING PARKINSONISMS WITH LEVODOPA AND 3′,4′-DIHYDROXY-2-METHYLISOPROPIOPHENONE

Stanley Fahn, 155 Edgars La., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 1, 1978, Ser. No. 939,036

Int. Cl.^{2} A61K *31/12, 31/195*

U.S. Cl. 424—319 **8 Claims**

1. A method of treating a central nervous system dopamine deficiency disease (CNS-DADD) in a human suffering from said CNS-DADD which comprises:

(1) systemically administering to said human an amount on the order of 6–10 grams per day intravenously, or an equivalent dosage by routes other than intravenous administration, of 3′,4′-dihydroxy-2-methyl-isopropiophenone (DHMPP), an amount of DHMPP effective to inhibit in vivo the conversion of levodopa to 3-O-methyldopa by catechol-O-methyl transferase (COMT); and

(2) concomitantly systemically administering to said human an amount of levodopa effective to control the symptoms of said CNS-DADD.

4,190,673

COLCHICINE OPHTHALMIC COMPOSITION AND METHOD OF USE

Kenneth E. Eakins, Sparkill, and Parimal Bhattacherjee, Nyack, both of N.Y., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 10, 1978, Ser. No. 904,586

Int. Cl.^{2} A61K *31/165*

U.S. Cl. 424—324 **8 Claims**

1. A method for reducing intraocular pressure in humans and animals comprising topically administering to the eye of a human or animal having increased intraocular pressure an effective, intraocular pressure reducing amount of Colchicine together with a suitable ophthalmic pharmaceutical carrier.

4,190,674

3-FLUORO-N-CYCLOPROPYLCINNAMIDE

Eugene M. Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 712,134, Aug. 6, 1976, abandoned, and a continuation-in-part of Ser. No. 820,300, Jul. 29, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,275

Claims priority, application United Kingdom, Jan. 27, 1977, 4168/77

Int. Cl.^{2} C07C *103/76;* **A61K** *31/165*

U.S. Cl. 424—324 **19 Claims**

1. Trans 3-fluoro-N-cyclopropylcinnamamide.

11. A method for the treatment or prophylaxis of increased muscle tone of a mammal which comprises administration to said mammal of a non-toxic effective tone decreasing amount of trans-3-fluoro-N-cyclopropylcinnamamide.

4,190,675

METHOD FOR THE PREPARATION OF VERBENONE, MYRTENAL AND PINOCARVEOL AND THEIR THERAPEUTICAL USE

Davide Vegezzi, Massagno, Switzerland, assignor to Enrico Corvi Mora, Piacenza, Italy

Division of Ser. No. 801,260, May 27, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,424

Claims priority, application Switzerland, Jun. 3, 1976, 7042/76

Int. Cl.^{2} A61K *31/12*

U.S. Cl. 424—331 **1 Claim**

1. The process of treating inflammation of the bronchia comprising administering from 10 to 100 milligrams/day of verbenone to a patient having inflammation of the bronchia.

4,190,676

COMPOSITE FRUIT GEL AND ICE CONFECTION

Hans Göringer, Norderstedt, Fed. Rep. of Germany; Thomas R. Kelly, Wellingborough, England; Dieter Ries, and Hermann Silberzahn, both of Hamburg, Fed. Rep. of Germany, assignors to Thomas J. Lipton, Englewood Cliffs, N.J.

Filed Mar. 17, 1978, Ser. No. 887,937

Claims priority, application United Kingdom, Mar. 17, 1977, 11469/77

Int. Cl.^{2} A23G *9/04*

U.S. Cl. 426—100 **4 Claims**

1. A process for preparing a composite food product, which comprises:

(a) dosing an incipiently gelling material selected from the group consisting of calcium alginate and calcium low-methoxy pectate into a mold, and

(b) dosing a portion of an ice confection onto the incipiently gelling dosed material, thereby forming a depression in the incipiently gelling dosed material in which the ice confection can sit.

4,190,677

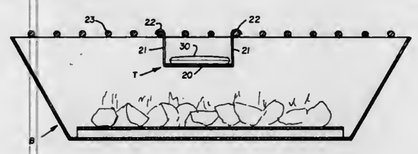
METHOD FOR PRODUCING WOOD SMOKE ON A CHARCOAL GRILLE

John S. Robins, 1250 S. Monaco, Denver, Colo. 80222

Filed Sep. 8, 1975, Ser. No. 611,142

Int. Cl.^{2} A23L *1/01;* **A23B** *4/04*

U.S. Cl. 426—315 **1 Claim**



1. A method for generating wood smoke in a broiler wherein fuel is ignited to flame and burn and meat is placed for cooking, to impart smoke flavor to meat cooked therein, including the steps of:

(a) placing the meat within the broiler to provide surfaces of the meat which are separated from the flames of the burning fuel;

(b) placing upon such surfaces a bed of wood flour which is ground and milled to a fineness of at least 40 mesh; and

(c) igniting the wood flour bed to permit the same to smoulder and emit smoke to permeate the meat as it is being cooked.

4,190,678

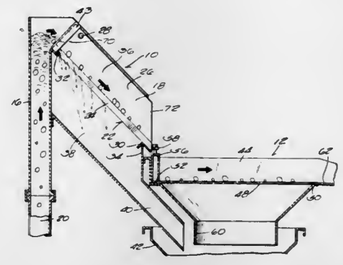
METHOD AND APPARATUS FOR DEWATERING VEGETABLES AND THE LIKE

Edwin F. Pleus, Sun Prairie, Wis., assignor to Aunt Nellie's Foods, Inc., Clyman, Wis.

Continuation of Ser. No. 683,028, May 4, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 934,893

Int. Cl.^{2} A23N *1/00;* **B07B** *1/30*

U.S. Cl. 426—478 **9 Claims**



1. A method of dewatering and inspecting a water-vegetable mixture comprising the steps of:

(a) forcing a water-vegetable mixture into the bottom portion of a vertical compartment having an open top to cause the mixture to flow upwardly in the compartment and out over a top edge of the compartment;

(b) removing a substantial portion of the water in the mixture by causing the mixture to flow downwardly from the open top of the vertical compartment over a screen member, said screen member positioned at an angle to the horizontal;

(c) removing a final portion of the water from the mixture by depositing the mixture on a vibrating screen member; and

(d) inspecting the dewatered vegetables by passing the dewatered vegetables over a vibrating inspection table.

4. A combination dewatering and inspection apparatus comprising:

a frame structure;

a pre-dewatering unit fixedly mounted on said frame structure, said pre-dewatering unit including a vertically extending receiving compartment having an inlet in the lower portion thereof and an open top having a top edge, said receiving compartment adapted to receive a mixture of liquid and solid material at the inlet thereof for flow upwardly therethrough to the open top thereof and then out of the open top over said top edge of the compartment, said pre-dewatering unit further including a pre-dewatering chute located adjacent said top edge of said open top of said receiving chamber and adapted to receive the mixture flowing from the open top of said receiving chamber, said pre-dewatering chute including an upper chamber and a lower chamber separated by a screen member mounted in said pre-dewatering chute, said screen member being inclined downwardly from its receiving end and positioned so that the solid material in the mixture will pass over the top surface of the screen member and a

substantial portion of the liquid material will pass through said screen member into said lower chamber; and

a final-dewatering and inspection table unit mounted adjacent said pre-dewatering unit, said final-dewatering and inspection table unit including a final-dewatering section movably mounted on said frame structure and a horizontal impervious inspection table section movably mounted on said frame structure, said final-dewatering and inspection table unit further including a vibratory means mounted on said frame structure for imparting a vibratory movement to said final-dewatering and inspection table sections, said final-dewatering section including a horizontal screen member mounted therein and positioned adjacent the lower end of said inclined screen member mounted in said pre-dewatering chute to receive the mixture flowing from said pre-dewatering chute of said pre-dewatering unit with the solid material in the mixture passing over the top surface of said horizontal screen member due to the vibration thereof and with a final portion of the water in the mixture passing through said horizontal screen member, said impervious inspection table section positioned adjacent said final-dewatering section to receive the dewatered material passing from said final de-watering section with said dewatered material passing through said inspection table section due to the vibration thereof.

4,190,679

MEATY TEXTURED PET FOOD

Harold R. Coffee, Baltimore; Gordon G. Varcoe, Cobourg, both of Canada; Ronald J. Triani, Brookfield Center, and George S. Hayden, New Fairfield, both of Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,099
Int. Cl.² A23K *1/00*
U.S. Cl. 426—623 **1 Claim**

1. A pet food comprised of resilient, textured, meat-like chunks having an expanded structure internally and an external substantially-continuous, fibrous, highly-irregular skin, having a moisture content in the range of from greater than 16% up to 20%, an A_w of from 0.50 to 0.75, a resilience within the range of from 30% to 50%, a bulk density of from 18 to 25 lb/ft^3, and from above 25 to about 60% farinaceous material and from 2 to 15% of a polyhydric alcohol in combination with a dry crunchy portion having an A_w substantially the same as the meatlike chunks and a firmness of at least 1400 lb/in^3.

4,190,680

ADHERENT CONTROLLED RELEASE PESTICIDES

Robert W. Young, New York, N.Y.; Samuel Prussin, Carmel, Calif., and Norman G. Gaylord, New Providence, N.J., assignors to Young, Prussin, Mgk, J. V., New York, N.Y.

Continuation of Ser. No. 868,685, Jan. 11, 1978, abandoned, which is a continuation of Ser. No. 696,360, Jun. 15, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,515
Int. Cl.² A61K *31/00*
U.S. Cl. 427—4 **11 Claims**

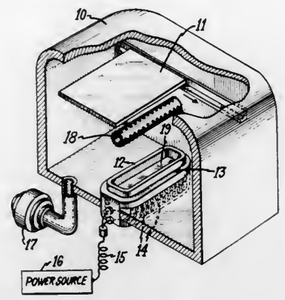
1. A composition consisting essentially of (a) a hydrolyzable titanium compound or a partial hydrolyzate thereof, said titanium compound being selected from the group consisting of tetraesters, tetraanhydrides, tetraamides and chelates of glycols, hydroxy acids, dicarboxylic acids, diketones, ketoesters and alkanolamines, and (b) an insecticide, said composition being capable of forming a polymeric coating.

4,190,681

METHOD OF COATING A POLYCARBONATE SUBSTRATE WITH GLASS

Walter L. Hall, Mt. Vernon, Ind., and James S. Humphrey, Jr., Clemmons, N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 13, 1978, Ser. No. 959,883
Int. Cl.² B05D *3/06*
U.S. Cl. 427—45.1 **15 Claims**



1. A method of producing a shaped non-opaque polycarbonate article having improved mar, abrasion, scratch and organic solvent resistance comprising the steps of:

(i) applying onto a polycarbonate substrate in ultraviolet light curable primer composition containing at least one polyfunctional acrylic monomer represented by the general formula

$$\left[H_2C{=}CH{-}\overset{\overset{O}{\|}}{C}{-}O{-}\right]_n R$$

wherein n is an integer having a value of from 2 to 4, and R is an n valent hydrocarbon radical, n valent substituted hydrocarbon radical, n valent hydrocarbon radical containing at least one ether linkage, or an n valent substituted hydrocarbon radical containing at least one ether linkage, and a photoinitiator;

(ii) exposing said polycarbonate substrate containing said primer composition to ultraviolet light for a period of time sufficient to effectuate a cure of said primer composition, thereof producing a cured primer layer on said polycarbonate substrate; and

(iii) vapor depositing, under vacuum conditions, and using radio frequency induction heating means, a thin layer containing SiO_2 onto said primed polycarbonate substrate.

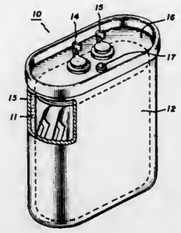
4,190,682

PROCESS FOR IMPREGNATING A CAPACITOR WITH A NON-HALOGENATED IMPREGNANT

David G. Shaw, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 784,144, Apr. 4, 1977, abandoned, which is a division of Ser. No. 669,755, Mar. 24, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,409
Int. Cl.² B05D *5/12*; H01G *4/04*
U.S. Cl. 427—79 **5 Claims**

1. In a process for impregnating capacitors with a gas absorbing impregnant including the steps of purifying a phthalate ester impregnant by adsorptive filtering said impregnant to remove impurities and impregnating the capacitor with the purified impregnant, the improvement comprising the additional step of adding 5 to 30% by volume of an alkene having from 10 to less than about 20 carbon atoms and 0.1 to 10% by



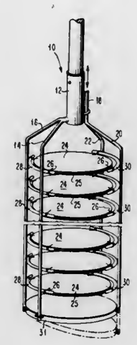
volume of an epoxide stabilizer to said purified phthalate ester impregnant prior to impregnating the capacitor.

4,190,683

METHOD FOR FORMING A LIQUID PHASE EPITAXIAL FILM ON A WAFER

John E. Davies, San Francisco, and Guido Galli, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,243
Int. Cl.² H01F *10/02*
U.S. Cl. 427—130 **4 Claims**



1. A method of forming an improved liquid phase epitaxial film on a plurality of wafers comprising the steps of:

positioning a plurality of wafers in a wafer holding means whereby the wafers are arranged in a stacked manner and where the spacing between the wafers is substantially the same;

inserting the wafer holding means into a liquid melt whereby the wafers are completely immersed in the liquid melt;

growing a film on the wafers while said wafers are positioned in the wafer holder in a horizontal plane in the liquid melt;

tilting the wafers in the wafer holder from 5° to 90°;

removing the wafer holder from said melt while said wafers are in a tilted position to drain the melt from said wafers;

positioning said wafers in a horizontal plane in the wafer holder; and

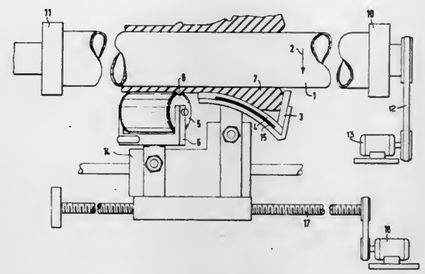
rotating the wafer holder to remove the remaining melt droplets from the edges of said wafers.

4,190,684

METHOD AND APPARATUS FOR APPLYING A RUBBER LAYER TO A CYLINDRICAL WORKPIECE

John H. Barwell, 13 Cranmer Rd., Cambridge, and Aleksander Wielesiuk, 27 Whitton Close, Swavesey, Cambridgeshire, both of England

Filed Jul. 28, 1978, Ser. No. 928,780
Claims priority, application United Kingdom, Aug. 3, 1977, 32621/77
Int. Cl.² B05D *3/02, 3/12*
U.S. Cl. 427—194 **17 Claims**



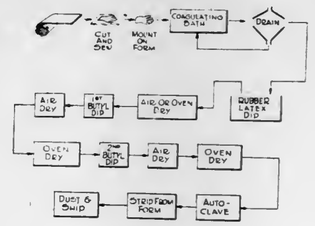
1. A method of applying a layer of rubber to a cylindrical workpiece having a longitudinal axis therethrough comprising the steps of: locating a feed surface adjacent to and spaced from the workpiece with the feed surface converging towards the workpiece to form a nip with the workpiece, rotating the workpiece about its axis, delivering rubber into the nip between the workpiece and feed surface, and moving the feed surface along the length of the workpiece in a direction parallel to the axis of the workpiece, thereby compressing and rendering the rubber in the nip between the feed surface and workpiece plastic to form a layer of rubber around the workpiece having a generally uniform thickness determined by the size of the nip.

4,190,685

CHEMICAL RESISTANT ARTICLE

John A. Hart, Kanata, and John C. Collyer, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Feb. 27, 1978, Ser. No. 881,533
Claims priority, application Canada, Dec. 8, 1977, 292702
Int. Cl.² B05D *1/38, 1/20*; A41D *19/00*
U.S. Cl. 427—302 **14 Claims**



1. A method for producing an article of clothing which is resistant to toxic chemicals in liquid and vapor form, comprising the steps of:

a. providing a former for said article of clothing;

b. coating said former with a latex coagulating agent;

c. dipping the coated former into a latex dispersion of resilient elastomer selected from the group consisting of natu-

ral rubber, polyacrylate, polybutadiene, styrene-butadiene copolymer, acrylonitrile-butadiene and polychloroprene and drying to produce an elastomer coated former;

d. coating said elastomer coated former with a solution of a butyl rubber in a suitable volatile organic solvent;

e. drying the butyl rubber coating so formed; and

f. simultaneously curing said elastomer coating and said butyl rubber coating in situ at elevated temperature;

wherein said rubber coating exhibits a high affinity for a toxic chemical vapor and is impermeable to said toxic chemical vapor, and wherein said butyl rubber coating is substantially impermeable to a liquid toxic chemical and exhibits low toxic chemical vapor permeability.

4,190,686

PROTECTIVE COMPOSITION AND METHOD

Louis H. Muis, 8527 Tampa Ave., Northridge, Calif. 91324

Filed Aug. 4, 1978, Ser. No. 930,891

Int. Cl.[2] B27K *3/52, 5/04;* **B29J** *5/02*

U.S. Cl. 427—317 **18 Claims**

1. An improved protective liquid-containing composition, for high temperature corrosion resistant coatings, said composition comprising a mixture of:

a. about 18–22 parts by volume of ceramic glaze material in powder form, said material comprising a mixture of the oxides of silicon, aluminum, sodium and calcium, together with the oxides of at least one of magnesium, iron, titanium, potassium, lead and boron;

b. about 90–110 parts by volume of adhesive comprising thermosetting phenolic resin in a solvent;

c. about 9–11 parts by volume of high temperature paint powder comprising thermosetting resin selected from the group consisting of polyester resin, epoxy resin, acrylic resin and a mixture of epoxy resin and polyester resin, and a coloring agent; and,

d. about 10.8–13.2 parts by volume of leveling agent comprising at least one of organo-modified clay and thermosetting silicone-containing resin.

4,190,687

METHOD FOR TREATING LEATHER

Takahisa Sugiura, Takatsuki; Sadaharu Abeta, Toyonaka; Takashi Kato, Amagasaki, and Hiroshi Hotta, Muko, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 690,181, May 26, 1976, abandoned, which is a continuation of Ser. No. 357,658, May 7, 1973, abandoned. This application Oct. 20, 1977, Ser. No. 844,126

Claims priority, application Japan, May 9, 1972, 47-46041; Oct. 4, 1972, 47-100115; Oct. 5, 1972, 47-100207

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—389 **36 Claims**

1. A method for treating a colored leather, which comprises treating a colored leather with a copolymer (I) consisting essentially of as the principal components (B) a monoethylenically unsaturated ester compound having 4 to 22 carbon atoms and (A) an aliphatic olefin having 3 to 20 carbon atoms.

4,190,688

SILICONE PAPER RELEASE COMPOSITIONS

Frank J. Traver, and Timothy J. Cietek, both of Troy, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,985

Int. Cl.[2] B05D *3/02;* **C08L** *43/04, 91/00*

U.S. Cl. 427—391 **28 Claims**

28. A process for coating paper with a silicone paper release coating with excellent release properties to pressure sensitive adhesives comprising (1) emulsifying a mixture of (A) 100 parts by weight of a vinyl-containing polymer of the formula,



where Vi is vinyl, R is aliphatically saturated monovalent hydrocarbon radical, R′ is a monovalent hydrocarbon radical and x, y vary such that the polymer has a viscosity varying from 1500 to 24,000 centipoise at 25° C. in which the polymer has a silanol content that varies from 650 to 2,400 parts per million and a vinyl content that varies from 0.1 to 2% by weight; (B) from 1 part per million to 2 parts by weight of a catalyst selected from the class consisting of platinum catalysts and tin soaps of carboxylic acids; (C) from 50 to 300 parts of water; and (D) from 5 to 80 parts by weight of emulsifying agents; (2) emulsifying a hydride polysiloxane; (3) adding the emulsion of the hydride polysiloxane to the emulsion of the vinyl-containing polymer such that there is present from 1 to 30 parts by weight of the hydride polysiloxane for 100 parts of the vinyl-containing polymer to form an emulsion mixture; (4) applying the emulsion mixture to paper; and (5) allowing the foregoing emulsion mixture to cure.

4,190,689

POLYMERIC-SHAPED ARTICLE

Saburo Fujita, Otsu; Masahiko Motegi, Hikone; Satoru Okamoto, Otsu; Atsuhiko Soda, Otsu, and Masakazu Inoue, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 878,837

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—20 **11 Claims**

1. A polymeric shaped article comprising means for increasing the slip characteristics of said article without causing any significant increase in the haze of said article, said means comprising a plurality of small isolated nodules or spots of TiO_2 which are bonded to a surface of said article, said nodules or spots being independently bonded to said surface, and having the form of a circle or an ellipse, the diameters of said TiO_2 nodules or spots being on the order of from about 0.01 to about 10 μm when microscopically observed in a flat condition, the thickness of each said nodule or spot being from about 0.01 to about 0.5 μm, and the area ratio of said nodules or spots to the total surface area being about 0.01 to about 50%.

4,190,690

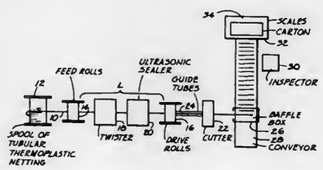
MANUFACTURE OF SEALED-END TUBULAR THERMOPLASTIC NET BAGGING

Kenneth H. Rabeneck, Louisville; Jerry R. Kantlehner, and David E. Gallaher, both of Prospect, all of Ky., assignors to Gallaher, Kantlehner & Associates, Inc., Louisville, Ky.

Filed Sep. 22, 1978, Ser. No. 945,020

Int. Cl.[2] B29C *17/00;* **B29D** *31/00;* **B29E** *27/00*

U.S. Cl. 428—35 **16 Claims**



1. A method for manufacturing sealed end unfilled tubular thermoplastic net bagging from a continuous rope-like feedstock of tubular thermoplastic net bagging material, comprising performing the following steps, repetitively, in alternation:

(a) axially advancing said feedstock through a snug-fitting aperture of a twisting station, intermittantly pausing, gripping, and angularly twisting said feedstock at said twisting station, sufficiently to substantially fully radially condense said feedstock in the vicinity of said twisting station; and

(b) at a sealing station which also is in the vicinity of said twisting station, following step (a), melting an axially short segment of said radially condensed feedstock into a single, massive integral seal nugget incorporating substantially all strands of said feedstock within said segment,

thereby producing a converted feedstock of tubular thermoplastic net bagging having a respective said seal nugget incorporated therein every so often.

4,190,691

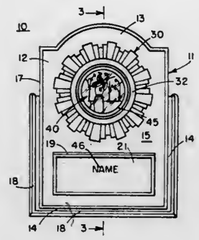
TROPHY PLAQUE

Marvin Kramer, Glenview, Ill., assignor to The Alenite Corporation, Glenview, Ill.

Filed Oct. 27, 1978, Ser. No. 955,364

Int. Cl.[2] B44C *5/04;* **G09F** *7/02*

U.S. Cl. 428—67 **11 Claims**



1. A plaque comprising a base having an obverse surface, said obverse surface having a recess formed therein, a decorative member having a front face and a rear face and including mounting means extending rearwardly from said rear face, said mounting means being adapted to be press-fitted into said recess for mounting said decorative member on said base with said rear face of said decorative member against said obverse surface of said base and with said front face of said decorative member exposed to view, said decorative member having a second recess formed in said front face thereof, and indicia means disposed in said second recess.

4,190,692

HIGH STRAND COUNT PLASTIC NET

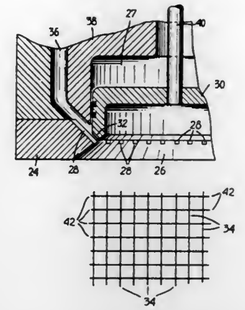
Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Division of Ser. No. 785,862, Apr. 8, 1977, Pat. No. 4,123,491, which is a continuation-in-part of Ser. No. 653,474, Jan. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 653,541, Jan. 29, 1976, Pat. No. 4,152,479, which is a continuation of Ser. No. 697,492, Jan. 12, 1968, abandoned. This application Nov. 7, 1977, Ser. No. 849,449

Int. Cl.[2] B32B *5/00*

U.S. Cl. 428—107 **8 Claims**

1. An extruded porous tubular structure comprising a first plurality of extruded strands that intersect at an angle and are joined to a second plurality of extruded strands to form a tubular structure, the strands in said porous structure being



compacted to provide a net hole density equivalent to a balanced-net hole density of at least 1200.

4,190,693

COATING METHOD USING COMPOSITIONS COMPRISING ACRYLIC OLIGOMERS, HIGH POLYMERS AND CROSSLINKERS

Richard Martorano, Marlton, N.J., and William H. Brendley, Hatboro, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 587,775, Jun. 17, 1975, Pat. No. 4,126,595. This application May 15, 1978, Ser. No. 905,904

Int. Cl.[2] B32B *15/08;* **B05D** *1/28*

U.S. Cl. 428—209 **22 Claims**

1. A method of decorating a substrate comprising (a) roller coating said substrate with a composition comprising a binder consisting essentially of an aqueous alkaline blend of:

(A) a copolymer of (1) 3% to about 30% by weight of an olefinically unsaturated monomer containing a carboxyl group or a mixture thereof, (2) at least one ester of acrylic or methacrylic acid and, optionally, (3) other vinyl monomers, the total of (1), (2) and (3) being 100%, the weight average molecular weight of the copolymer being between 10,000 and 500,000, the copolymer being in the form of a solution or a colloidal solution in the aqueous blend as a salt of a volatile amine or ammonia;

(B) an oligomeric copolymer of (1) at least one ester of acrylic or methacrylic acid, (2) 9% to about 50% of an olefinically unsaturated monomer having at least one carboxyl group and, optionally, (3) other vinyl monomers, the total of (1), (2) and (3) being 100%, the weight average molecular weight of the oligomeric copolymer being between 400 and 6,000, the molecular weight distribution is such that the heterogeneity index is 3 or less, the oligomeric copolymer being in the form of a solution in the aqueous blend; and

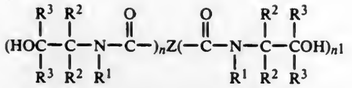
(C) a crosslinking agent selected from the group consisting of:

(a) an alcohol-modified aminoplast resin comprising the condensation product of an aldehyde and a compound selected from the group consisting of ureas, polyamides and triazines;

(b) a polyepoxide containing at least two vic-epoxy groups in which the epoxy oxygen atom is attached to adjacent carbon atoms;

(c) a polyaziridine containing at least two aziridinyl groups; and

(d) a β-hydroxyalkylamide of the formula:



containing at least two β-hydroxyalkylamide groups wherein

Z is a bond, hydrogen, a monovalent or polyvalent organic radical derived from a saturated or unsaturated alkyl containing from 1 to 60 carbon atoms, aryl, tri-lower alkylene amino or an unsaturated radical;

R^1 is hydrogen, lower alkyl or hydroxyalkyl;

R^2 and R^3 are selected from hydrogen, straight or branched chain lower alkyl, or an R^2 and an adjacent R^3 can be taken together to form a saturated cycloalkyl;

n is an integer of 1 or 2; and

n^1 is an integer of 0 to 2, and when n^1 is 0 and n has a value greater than 1, a polymer of copolymer formed from the β-hydroxylakylamide when Z is an unsaturated radical,

in the form of a dispersion or solution in water; in the blend, on a solids basis, (C) being from 5 to 50 percent by weight, (A) plus (B) being from 95 to 50 percent by weight, with (A) being from 95 to 25 percent and B being from 5 to 75 percent by weight of the total of (A) plus (B), and the blend having a volatile aqueous phase comprising 70 to 95 percent by volume of water, and 5 to 30 percent by volume of volatile organic solvents, the composition having between 15 and 70 percent solids by weight, with a viscosity between 25 and 150 seconds measured in a Number 4 Ford Cup at 25° C. and (b) heating the coating until it is thermoset.

4,190,694

FIBERED SHEET MATERIAL IMITATING NATURAL LEATHER AND METHOD FOR CONTINUOUS MANUFACTURE THEREOF

Eduard Mück; Zdenek Hrabal, both of Otrokovice; Ludvik Ambroz, Brno, and Josef Horak, Gottwaldov, all of Czechoslovakia, assignors to Vyzkumny ustav kozedelny, Gottwaldova, Czechoslovakia

Continuation-in-part of Ser. No. 718,372, Aug. 27, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,303

Claims priority, application Czechoslovakia, Aug. 29, 1975, 5908-75

Int. Cl.² B32B *7/02, 27/00*

U.S. Cl. 428—212 **4 Claims**

1. Artificial leather comprising fibrous sheet material provided on a surface thereof with a coating formed of at least two discrete continuous layers of polyurethane elastomer, the layers of coating successively increasing from the fibrous sheet material to the uppermost coating in their respective elasticity modulus E such that the elasticity modulus E_1 of the layer adjacent to the fibered sheet material is lower than the elasticity modulus E_2, E_3 . . . E_{p-1} of any of the following layer or layers, and at the same time lower than the elasticity modulus E_p of the uppermost finish coating layer according to the relation

$$E_1 < E_2 < E_3 < \ldots < E_{p-1} < E_p,$$

the values of the elasticity modulus E_1-E_p being in the range of from 12 to 170 MPa.

4,190,695

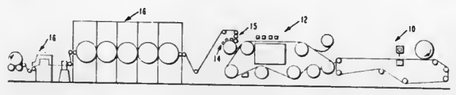
HYDRAULICALLY NEEDLING FABRIC OF CONTINUOUS FILAMENT TEXTILE AND STAPLE FIBERS

Donald O. Niederhauser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1978, Ser. No. 965,072

Int. Cl.² D04H *3/08*

U.S. Cl. 428—234 **8 Claims**



1. A lightweight composite fabric comprising: a substrate of continuous filaments formed into an ordered cross-directional array, said continuous filaments being well spread and having a spaced-apart relationship throughout the array in at least one direction of the array, said filaments being well spread provided that the average spacing between any bundles of filaments is no larger than the average width of said bundles of filaments, said filaments having a spaced-apart relationship provided that in the densest observed area of the filament bundle cross section the sum of the areas of the filament cross sections occupies less than 30% of the densest observed area of the cross section, said substrate being combined with staple fibers of less than 0.3 tex per filament and from about 0.5 cm to about 1 cm in length in the amount of from 20 to 50% of the weight of the composite fabric, said staple fibers extending through and entangled with said continuous filaments and having more than about 2 reversals in direction between the faces of the fabric per cm of staple fiber length; said composite fabric having an edge strength of from about 15 to 30 newtons and experiencing a loss of no more than 3% of its fiber contents during initial laundering.

4,190,696

FLAME RESISTANT, GAS RESISTANT FOAM MATERIAL

John A. Hart, Kanata, and Rolland P. Fuoco, Hull, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Nov. 7, 1978, Ser. No. 958,495

Claims priority, application Canada, Dec. 30, 1977, 294163

Int. Cl.² B05D *5/00;* **B32B** *3/26*

U.S. Cl. 428—306 **20 Claims**

16. A laminated fabric material comprising an air and water vapour-permeable open cell solid resin foam resistant to passage therethrough of noxious chemicals in liquid or vapour form, said foam containing a particulate adsorbent material for the noxious chemicals dispersed therein, the particulate adsorbent material being bonded in said foam by an organic binder and a fire-retarding agent selected from the group consisting of ammonium orthophosphate dibasic, ammonium orthophosphate monobasic, sodium orthophosphate dibasic, ammonium polyphosphate and calcium orthophosphate monobasic impregnated therein, wherein said binder and said fire-retarding agent are substantially free from substances which would substantially deactivate said adsorbent material, and an air-and water vapour-permeable fabric backing to which the foam is bonded.

4,190,697

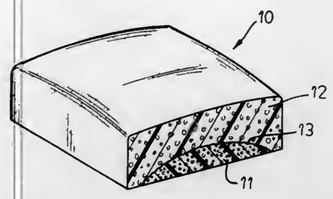
MULTIDENSITY FOAM ARTICLE AND METHOD OF PREPARATION

John R. Ahrens, Dousman, Wis., assignor to Milsco Manufacturing Company, Brown Deer, Wis.

Filed Jan. 15, 1979, Ser. No. 3,374

Int. Cl.² B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—315 **10 Claims**



6. A multidensity foam article suitable for use as a vehicle cushion which includes a firm polyurethane foam layer and a soft polyurethane foam layer, said firm and soft layers being bonded and knitted together along their common boundary without the use of adhesives.

4,190,698

LIGHT-TRANSMITTING FIRE SCREENING PANEL

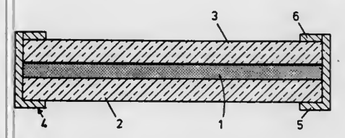
Marcel De Boel, Fontaine l'Eveque, and Pol Baudin, Chatelineau, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jul. 28, 1978, Ser. No. 929,203

Claims priority, application United Kingdom, Aug. 3, 1977, 32579/77

Int. Cl.² B32B *17/06*

U.S. Cl. 428—334 **18 Claims**



1. A light-transmitting fire screening panel comprising at least one sheet of glass and at least one layer of intumescent material having a thickness between 0.1 and 8 mm, the improvement which comprises said layer containing a hydrated alkali metal silicate as intumescent material and one or more adjuvants selected from the group consisting of: urea, polyhydric alcohol, monosaccaride, polysaccharide, sodium phosphate, sodium aluminate, aluminum phosphate, borax, boric acid and colloidal silica, said adjuvant being present in a proportion of less than 20% by weight of the layer.

13. A light-transmitting fire screening panel comprising at least one sheet of glass and at least one layer of intumescent material having a thickness between 0.1 and 8 mm, the improvement which comprises said layer containing a hydrated alkali metal silicate as intumescent material in combination with one or more adjuvants selected to allow accelerated drying of the layer selected from the group consisting of glycerine and ethylene glycol, said adjuvant being present in a proportion of less than 20% by weight of the layer.

4,190,699

METHOD FOR THE IMPROVEMENT OF SURFACE HARDNESS OF ARTICLE BY COATING

Hiroyuki Kanazawa, and Mikio Futagami, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited and Nippon Sheet Glass Co., Ltd., both of Osaka, Japan

Filed May 3, 1978, Ser. No. 902,736

Claims priority, application Japan, May 10, 1977, 52-53946

Int. Cl.² B05D *1/36;* **B32B** *27/08, 27/32, 15/08*

U.S. Cl. 428—412 **12 Claims**

1. A method for the improvement of the surface hardness of a base material which comprises coating the surface of the base material with a coating composition which comprises:

(A) 100 parts by weight of partially hydrolyzed silicon compounds consisting essentially of co-partial hydrolyzates of a tetraalkoxysilane of the formula $Si(OR^1)_4$ wherein R^1 is an alkyl having 1 to 4 carbon atoms and an organic silicon compound of the formula: $R_n^2Si(OR^3)_{4-n}$ wherein n is an integer of from 1 to 3, R^2 is a hydrocarbon group having 1 to 6 carbon atoms and R^3 is an alkyl having 1 to 4 carbon atoms and/or a mixture of partial hydrolyzates of each tetraalkoxysilane and organic silicon compound, said partially hydrolyzed silicon compounds containing said partially hydrolyzed tetraalkoxysilane, calculated as SiO_2, and said organic partially hydrolyzed silicon compound calculated as $R_n^2 SiO_m$ wherein $m=(4-n)/2$) in the ratio of 5/95 to 95/5 by weight, and the weight (100 parts by weight) of said partially hydrolyzed silicon compounds being also calculated as SiO_2 for said partially hydrolyzed tetraalkoxysilane and as $R_n^2SiO_m$ for said partially hydrolyzed organic silicon compound,

(B) 10 to 400 parts by weight of at least one member selected from the group consisting of a copolymer of at least one of an N,N-di-alkylaminoalkyl acrylate an N,N-dialkylaminoalkyl methacrylate, an N,N-dialkylacrylamide and an N,N-dialkyl-methacrylamide and at least one of a hydroxyalkyl acrylate, a hydroxyalkyl methacrylate, an alkyl acrylate and an alkyl methacrylate; and a monomer or oligomer having two or more hydroxy groups, and

(C) 0 to 300 parts by weight of an etherified methylolmelamine, provided that when the component (B) is the monomer or oligomer having two or more hydroxy groups, said etherified methylolmelamine is contained in an amount of 0.5 to 1.5 gram equivalent per 1 gram equivalent of the monomer or oligomer, which are dissolved in a solvent.

4,190,700

HIGH SOLIDS THERMOSETTABLE COATING COMPOSITIONS CONTAINING 1,4-DIMETHYLOLCYCLOHEXANE AND POLYOXYPROPYLENE POLYOL

George J. Anderson; J. Owen Santer, both of East Longmeadow, and Timothy F. Desmond, Winchester, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 15, 1978, Ser. No. 905,700

Int. Cl.² C08L *61/24*

U.S. Cl. 428—524 **23 Claims**

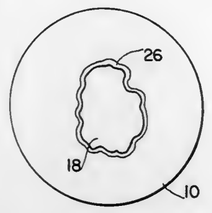
1. A liquid composition comprising 1,4-dimethylolcyclohexane, a polyoxypropylene polyol containing from about 3 to about 6 hydroxyls per molecule, of molecular weight in the range of about 500 to about 1000 and an alkylated urea-formaldehyde condensate of average degree of condensation of about 3 or less, alkylated with a C_1 to C_4 alcohol, wherein the molar ratio of urea:formaldehyde:alcohol of the alkylated ureaformaldehyde condensate is in the range of about 1:2-3:1-2.5, wherein the weight ratio of polyoxypropylene polyol to 1,4-dimethylolcyclohexane is less than about 6:1, and wherein the ratio of hydroxyl groups of the 1,4-dimethylolcyclohexane and the polyoxypropylene polyol to alkoxymethyl groups of the alkylated urea-formaldehyde condensate is in the range of about 1:0.7 to about 1:2.5.

4,190,701

V_3GA COMPOSITE SUPERCONDUCTOR

David G. Howe, Greenbelt, Md., and Donald U. Gubser, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 6, 1979, Ser. No. 27,691
Int. Cl.[2] H01L *39/00;* H01B *12/00;* H01V *11/00*
U.S. Cl. 428—662 14 Claims



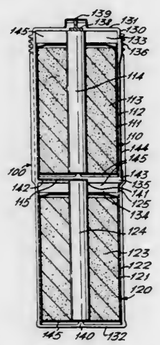
1. A composite supreconductor which comprises;
a core of an alloy consisting of a vanadium-base ternary alloy having from about 1 to 9.5 atomic percent of gallium, and from about 0.1 to about 2.5 atomic percent of titanium, the remainder being vanadium;
a matrix of an alloy consisting of about 12 to about 20 atomic percent of gallium and about 0.2 to about 6 atomic percent of aluminum, the remainder being copper; and
an interfacial layer of V_3Ga.

4,190,702

BATTERIES

Ching W. Pun, and Ching C. Poon, both of On Shing Industrial Bldg. 9th Fl., Fo Tan, S.T.T.L. #7, Shatin, New Territories, Hong Kong

Filed Aug. 2, 1978, Ser. No. 930,166
Claims priority, application United Kingdom, Aug. 11, 1977, 33775/77
Int. Cl.[2] H01M *2/00, 6/42*
U.S. Cl. 429—4 7 Claims



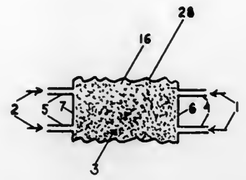
1. An electrical battery comprising a plurality of substantially cylindrical unsealed dry cells enclosed in a single sealed container comprising at least two parts made of a substantially rigid plastics material joined together along at least one plane parallel to the axes of the cells.

4,190,703

FLUIDIZED-BED ELECTRODES AND RELATED APPARATUS AND METHODS

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 813,483, Jul. 7, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,731
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—15 10 Claims



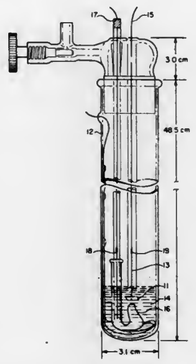
1. Apparatus comprising a fluidized-bed electrode, and pairs of opposing jets of fluid impinging against each other and thereby imparting swirling motions to the particles of the fluidized bed.

4,190,704

PROTECTED CALCIUM ANODE

Melvin H. Miles; Aaron N. Fletcher, and Dwight A. Fine, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1979, Ser. No. 8,997
Int. Cl.[2] H01M *4/36*
U.S. Cl. 429—103 9 Claims



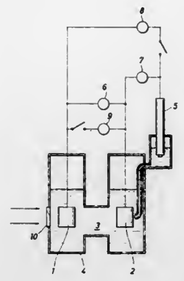
1. An electrochemical cell, comprising:
an electrolyte consisting of molten nitrate;
a cathode immersed in said electrolyte;
an anode consisting of calcium immersed in said electrolyte; and
a controllable passivating layer of CaO on said anode for restricting the corrosive reaction of said molten nitrate electrolyte with said anode.

4,190,705

PHOTOGALVANIC CELL COMPRISING COMPLEXING AGENTS

Josephina C. M. Brokken-Zijp, and Foppe J. Reinders, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 24, 1978, Ser. No. 936,449
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 11 Claims



1. A reversible photogalvanic cell for use in the conversion of light energy into electricity containing a set of electrodes immersed in an acidic aqueous electrolyte solution, said set of electrodes comprising at least one electrode which is adapted to be maintained in a light-irradiated portion of the solution and at least one electrode which is adapted to be maintained in a dark portion of the solution, and said solution comprising (a) at least one photo-reducible dyestuff, (b) both higher and lower valent ions of at least one redox couple of metals, and (c) at least one complexing agent for the higher valent ion of the redox couple selected from the class consisting of fluoride ion, phosphate ion, citrate ion, oxalate ion, and 2-aminopropionate ion.

4,190,706

SOLID STATE CELL WITH ALKALI METAL HALO-ALKALI THIOCYANATE ELECTROLYTE

Bhaskara M. L. Rao, Fanwood, and Bernard G. Silbernagel, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 1, 1979, Ser. No. 16,492
Int. Cl.[2] H01M *10/36*
U.S. Cl. 429—191 11 Claims

1. An electric current-producing cell, comprising:
(a) an alkali metal-containing anode;
(b) a cathode; and,
(c) a solid electrolyte consisting essentially of one or more compounds of the formula:

$(AX)_nA'SCN$

wherein A and A′ are alkali metals and may be the same or different, wherein X is one or more halogens and wherein n is a value such that $0.1 \leqq n \leqq 10$.

4,190,707

ALKALINE BATTERY SEPARATOR

Yoshinao Doi, Kawasaki; Mitsuo Kohno, Yokohama, and Katsumi Yoshitake, Yokosuka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1978, Ser. No. 948,162
Claims priority, application Japan, Oct. 3, 1977, 52-117860
Int. Cl.[2] H01M *2/16*
U.S. Cl. 429—254 36 Claims

1. An alkaline battery separator made of a porous film which consists substantially of a polyolefin having a weight average molecular weight of less than 300,000 and a number average molecular weight of 15,000 or more and which has a thickness of 0.025 to 1 mm, a porosity of 50 to 80%, an average pore diameter of 0.05 to 0.5μ, an average ratio of the larger dimension to the smaller dimension of the pore opening of not more than 2 and an electrical resistance of 0.00005 to 0.0005Ω dm^2/0.1 mm.

4,190,708

PRODUCTION OF UROKINASE

Mau-Jung Kuo, Creve Coeur; Margaret J. Reents, Chesterfield, and Joseph Feder, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 24, 1978, Ser. No. 909,137
Int. Cl.[2] C07G *7/026*
U.S. Cl. 435—215 4 Claims

1. In a process for the production of urokinase by the culture of live kidney cells in an aqueous nutrient medium, the improvement which comprises adding phenylalanine in an elevated amount of from about 0.3 to about 0.7 weight percent to the said nutrient medium to thereby increase the yield of urokinase.

4,190,709

MERCURY AND COPPER SELECTIVE METAL CHELATING RESINS

Jonathan H. Hodgkin, Burwood, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

Filed May 23, 1978, Ser. No. 908,820
Claims priority, application Australia, Jun. 2, 1977, PD0336
Int. Cl.[2] B01D *15/04;* C06G *14/06*
U.S. Cl. 521—39 12 Claims

1. A cross-linked, metal-chelating resin, selective for mercury and copper consisting of a polymer produced by the condensation of a phenolic component comprising one or more phenols, formaldehyde, and a diamino component consisting essentially of one or more di-(secondary amino) compounds under neutral conditions.

4,190,710

BLOWING AGENTS BASED ON UREA DICARBOXYLIC ACID ANHYDRIDE

Kurt Ley, Odenthal-Gloebusch; Hermann Hagemann, Cologne, and Helmut Hurnik, Opladen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 616,523, Sep. 25, 1975, Pat. No. 4,104,195. This application Mar. 22, 1978, Ser. No. 889,063
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1974, 2452740
Int. Cl.[2] C08J *9/10*
U.S. Cl. 521—89 4 Claims

1. A process for the production of a foamed thermoplastic mass comprising mixing a thermoplastic with a blowing agent comprising urea dicarboxylic acid anhydride, and heating the resulting mixture to a temperature from about 150° to 350° C. thereby to effect foaming.

4,190,711

THERMOPLASTIC POLYETHER POLYURETHANE ELASTOMERS

Richard J. Zdrahala, and Frank E. Critchfield, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 838,017
Int. Cl.[2] C08G *18/48;* C07C *125/04;* C08G *18/14*
U.S. Cl. 521—112 36 Claims

1. A process for producing a solid or microcellular polyether polyurethane elastomer which comprises reacting a reaction mixture containing:
(a) a liquid polyurethane quasi-prepolymer having a free NCO content of from about 16 percent to about 25 per-

cent in an amount that provides from 0.8 to 1.1 isocyanato groups per active hydrogen group in the reaction mixture, produced by reacting a poly(oxypropylene-oxyethylene)-diol having a molecular weight of at least 500 with an aromatic diisocyanate,

(b) a poly(oxypropylene-oxyethylene) diol having a molecular weight of at least 1000, having terminal oxyethylene groups, and having a primary hydroxyl content of at least 50 mole percent,

(c) from 5 to 75 parts by weight of a diol extender selected from the group consisting of short-chain alkane diols and short-chain oxyalkylene glycols per 95 to 25 parts by weight of (b), and

(d) a catalytic amount of catalyst for curing

the reaction mixture to produce the elastomer.

33. A liquid polyurethane quasi-prepolymer having a free NCO content of from about 16 percent to about 25 percent that is produced by reacting a poly(oxypropyleneoxyethylene) diol having a molecular weight of at least 500 with an aromatic diisocyanate.

4,190,712

LOW DENSITY ENERGY MANAGEMENT URETHANE FOAM

Kirby E. L. Flanagan, Rochester, N.H., assignor to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 746,826, Dec. 2, 1976, Pat. No. 4,116,893, which is a continuation-in-part of Ser. No. 481,498, Jun. 21, 1974, abandoned. This application Aug. 25, 1978, Ser. No. 936,815

Int. Cl.[2] **C08G** *18/63, 18/65*

U.S. Cl. 521—137 **2 Claims**

1. An impact energy-absorbing urethane foam made from the following formulation:

	Parts by Weight
Polymer polyol	70 to 90
Polybutadiene polymer	10 to 120
Crosslinker	10 to 40
Water	1 to 5
Prepolymer	To yield 90–115% Index
Catalyst	0 to 2

wherein:

said polymer polyol has a molecular weight in the range of 4000 to 8000 and comprises in the range of 2 to 6 parts of a poly (C_2–C_4 oxyalkylene) triol reacted with one part of a vinyl aromatic/olefinic C_3–C_7 nitrile monomer mixture;

said polybutadiene polymer is a hydroxy terminated polybutadiene homopolymer having a molecular weight in the range of 2000 to 4000, a functionality in the range of 2 to 3, and an equivalent weight in the range of 750 to 1750;

said crosslinker is a polyol having a functionality in the range of 2 to 6 and an equivalent weight in the range of 50 to 150;

said prepolymer is a reaction product of (a) an aromatic diisocyanate having one isocyanato group per aromatic nucleus and (b) a polyol having a molecular weight in the range of 100 to 1000, a functionality in the range of 2 to 6, an equivalent weight in the range of 30 to 150, and said prepolymer has a free isocyanate content in the range of 20 to 35 percent; and

said urethane foam being prepared in a closed mold and having a density in the range of 4 to 15 lbs./ft.^{3}, a specific energy at 50% C/D greater than 15 in.-lbs./in.^{3} at 70° F. and 7 PCF, a temperature index −20°/125° F. of less than 5 and suffering less than a 3% impact set when impacted to a strain of 75% at 70° F. after allowing recovery for 30 minutes at 70° F.

4,190,713

PEARL POLYMER CONTAINING HOLLOW PEARLS

Dieter Kraemer, Mainz; Hermann Plainer, and Waldemar Schleier, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 905,892

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722751

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 521—149 **12 Claims**

1. A pearl polymer product composed of hollow pearl particles having a diameter from 5 to 1000 microns and consisting of a cross-linked polymer which is a cross-linked homopolymer or copolymer comprising at least one member selected from the group consisting of acrylamide, methacrylamide, methylene-bis-acrylamide and methylene-bis-methacrylamide, said polymer containing at least 5 percent by weight of a monomer having at least two carbon-carbon double bonds which are activated by a neighboring phenyl group or carbonyl group, said polymer further being of a composition such that $x+3y \geqq 40$, where x is the percent by weight in the polymer of acrylamide and methacrylamide and y is the percent by weight in the polymer of methylene-bis-acrylamide and methylene-bis-methacrylamide.

4,190,714

POWDER COATING RESIN PROCESS CONTAINING AN AROMATIC CARBONAMIDE CONDENSATE

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 715,486, Aug. 18, 1976, Pat. No. 4,133,843, which is a continuation-in-part of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,732, which is a continuation-in-part of Ser. No. 318,292, Dec. 26, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,892

Int. Cl.[2] **C08L** *61/32*

U.S. Cl. 525—163 **5 Claims**

1. A process for preparing a curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120° to 220° C., comprising:

(A) Condensing a methylolamino compound with an aliphatic alcohol and an aromatic carbonamide of number average molecular weight less than 500 to produce an aminoplast condensate with a glass transition temperature in the range of −10° C. to 100° C., wherein the methylolamino compound is selected from the group consisting of methylolureas and methylolaminotriazines and contains no more than one unmethylolated N—H bond per molecule, wherein the aliphatic alcohol contains from 1 to 4 carbon atoms, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aromatic carbonamide, wherein the molar ratio of the aliphatic alcohol to the methylolamino compound is at least 2, and wherein the molar ratio of the methylolamino compound to the aromatic carbonamide is from about 1:0.5 to about 1.2 when the aromatic carbonamide contains one reactive group per molecule and is from about 1:0.5 to about 1:1.5 when the aromatic carbonamide contains 2 or more reactive groups per molecule,

(B) Blending from about 15 to about 30 parts by weight of the aminoplast condensate with from about 85 to 70 parts by weight of a polyester resin or an acrylic resin, wherein the resin has a glass transition temperature in the range of from 60° to 100° C. and a number average molecular weight in the range of 500 to 25,000 and contains alcoholic hydroxyl groups, carboxyl groups or amide groups heat reactive with the aminoplast condensate, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 weight percent of hydroxyl, carboxyl or amide groups, and

(C) Crushing the blend to form a powder of average particle size in the range of 20 to 150 microns.

4,190,715

POWDER COATING RESIN COMPOSITION CONTAINING A DICARBONAMIDE OR POLYCARBONAMIDE CONDENSATE

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 715,488, Aug. 18, 1976, Pat. No. 4,102,943, which is a continuation of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,733, which is a continuation-in-part of Ser. No. 317,901, Dec. 26, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,898

Int. Cl.[2] **C08L** *61/32*

U.S. Cl. 525—163 **5 Claims**

1. A curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120° to 220° C., comprising:

(A) from about 15 to 30 parts by weight of a condensate of a methylolamino compound, an aliphatic alcohol containing from 1 to 4 carbon atoms and a reactive aliphatic dicarbonamide or polycarbonamide of number average molecular weight less than 500; wherein the methylolamino compound is a methylolurea or methylolaminotriazine containing no more than one unmethylolated N-H bond per molecule, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolamino compound to the aliphatic dicarbonamide or polycarbonamide is from about 1:0.5 to about 1:1.5, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aliphatic dicarbonamide or polycarbonamide and wherein the glass transition temperature of the condensate is in the range of from −10° C. to 100° C.; and

(B) from about 85 to 70 parts by weight of a polyester resin or an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100° C., and a number average molecular weight in the range of 500 to 25,000, and contains alcoholic hydroxyl groups, carboxyl groups or amide groups, heat reactive with the condensate of the methylolamino compound, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 percent by weight of hydroxyl, carboxyl, or amide groups.

4,190,716

POLYMERIC AGENT FOR RELEASING 5-AMINOSALICYLIC ACID OR ITS SALTS INTO THE GASTROINTESTINAL TRACT

Thomas M. Parkinson; Joseph P. Brown, and Robert E. Wingard, Jr., all of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Dec. 20, 1978, Ser. No. 971,609

Int. Cl.[2] **C08F** *8/32;* **A61K** *31/785;* **C08G** *63/76, 85/00*

U.S. Cl. 525—334 **10 Claims**

1. A polymeric compound which comprises a pharmacologically acceptable organic polymer backbone comprising a plurality of aromatic rings and having a molecular size which precludes the backbone's absorption from the intestinal lumen and a plurality of salicylic acid or salicylate salt groups covalently bonded to said backbone via azo groups that are intermediate backbone aromatic carbons and salicylic acid or salicylate salt 5-position carbons.

4,190,717

PROCESS FOR PRODUCING POLYMER FROM QUATERNIZED ACRYLATE MONOMER

Naoyuki Suzuki; Yoji Wada; Akihisa Furuno, all of Yokohama, and Masao Ishii, Tokyo, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

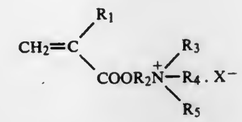
Division of Ser. No. 687,298, May 13, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,157

Claims priority, application Japan, May 16, 1975, 50/57434; May 24, 1975, 50/61474

Int. Cl.[2] **C08F** *2/02, 2/16*

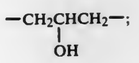
U.S. Cl. 526—62 **28 Claims**

1. A process for producing a cationic polymer, which consists essentially of polymerizing in bulk a vinyl monomer represented by the general formula,

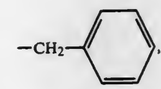


(I)

wherein R_1 represents —H or —CH_3; R_2 represents —CH_2CH_2— or



R_3 and R_4 represent —CH_3 or —CH_2CH_3; R_5 represents —C_nH_{2n+1} in which n is an integer from 0 to 4,



or —CH_2COOH; and X^- represents Cl^-, $CH_3SO_4^-$, $CH_3SO_3^-$, or $\frac{1}{2}$ SO_4^{--}, either alone or in admixture with up to 25% by weight, based on the total weight of the monomers, of other polymerizable vinyl monomers by use of polymerization initiator in the presence of 7 to 18% by weight, based on the weight of the polymerization system, of water, in the presence of crystals of the monomer (I), effecting the final stage of the polymerization at 110° to 150° C., thereby obtaining the water-soluble cationic polymer in the form of a lump.

4,190,718

PROCESS FOR INCREASING MOLECULAR WEIGHT OF VINYLPYRROLIDONE POLYMER

Donald H. Lorenz, Basking Ridge, N.J.; Earl P. Williams, Pen Argyl, Pa., and Herman S. Schultz, Lexington, Mass., assignors to GAF Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,375

Int. Cl.[2] **C08F** *26/10*

U.S. Cl. 526—207 **15 Claims**

1. In a process for the polymerization of N-vinylpyrrolidone in a liquid medium with a free radical polymerization initiator in a reaction zone, the improvement which comprises: forming a liquid mixture comprising N-vinylpyrrolidone monomer, at least an equivalent amount up to 3.5 parts by weight per part of monomer of a saturated aliphatic hydrocarbon of 5 to 20 carbon atoms as a suspension medium, a suspension aid, and a controlled amount between about 1% by weight and about 35% by weight of water per weight of monomer in the mixture; agitating said liquid mixture to form a suspension of N-vinylpyrrolidone liquid globules and reacting said N-vinylpyrrolidone in suspension to produce a solid polymer of N-

vinylpyrrolidone having a number-average molecular weight of at least 200,000.

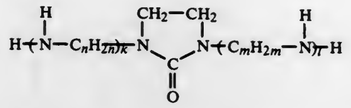
4,190,719

IMIDAZOLIDONE POLYAMINES AS EPOXY CURING AGENTS

Hiroshi Samejima, and Kaoru Kanayama, both of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jul. 5, 1978, Ser. No. 922,251
Claims priority, application Japan, Jul. 4, 1977, 52-79023
Int. Cl.² C08G *59/54*
U.S. Cl. 528—103 **30 Claims**

1. A curable epoxy resin composition comprising (a) an epoxy resin and (b) an epoxy resin curing agent, wherein the epoxy resin curing agent is an epoxy resin curing agent represented by the formula (I):



(I)

wherein k, m and n, which may be the same or different, each is an integer of 1 to 6, and l is an integer of 0 to 6, and/or a modified product thereof.

4,190,720

ISOMORPHIC COPOLYMERS OF ϵ-CAPROLACTONE AND 1,5-DIOXEPAN-2-ONE

Shalaby W. Shalaby, Lebanon, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Dec. 26, 1978, Ser. No. 972,757
Int. Cl.² C08G *63/08*
U.S. Cl. 528—354 **12 Claims**

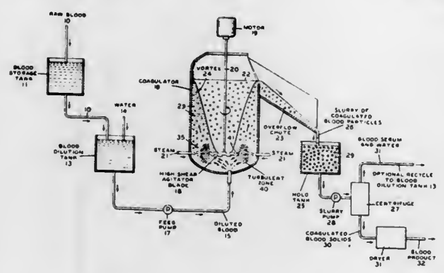
1. An isomorphic copolymer of ϵ-caprolactone with from about 3 to 15 percent by weight 1,5-dioxepan-2-one.

4,190,721

PROCESS FOR RECOVERING PROTEINS AND POLYMERS FROM LIQUIDS CONTAINING SAME

Douglas L. Hertel, Strongsville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Division of Ser. No. 795,932, May 11, 1972, abandoned, which is a continuation of Ser. No. 590,826, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 440,196, Feb. 6, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,850
Int. Cl.² C08J *3/16*
U.S. Cl. 528—486 **6 Claims**



1. In a process for coagulating a polymeric latex which comprises treating the latex with a coagulating agent for the latex:

the improvement which comprises agitating a mass of liquid with a high shear agitator blade operating at a tip speed of about 1500 to 6500 feet per minute to produce in the liquid a localized toroidal turbulent zone at and concentric with the tip of the agitator blade, said localized toroidal turbulent zone having an annular outer boundary and a concentric annular inner boundary below said agitator blade; introducing a first continuous stream of said latex into said localized toroidal turbulent zone through one of said boundaries; introducing a second separate and continuous stream containing said coagulating agent for said latex and an anionic surfactant into said localized toroidal turbulent zone through the remaining one of said boundaries so that said streams initially contact and mix in said turbulent zone to produce a slurry of finely divided coagulated polymer particles; and continuously withdrawing said slurry of polymer particles from said turbulent zone.

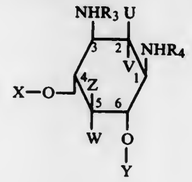
4,190,722

4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, PROCESS FOR THEIR PRODUCTION AND THEIR USE

Eckart Voss, Cologne; Peter Stadler, Haan; Uwe Petersen; Hans-Joachim Kabbe, both of Leverkusen, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,135
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726197; Jun. 10, 1977, 2726208
Int. Cl.² A61K *31/71*; C07H *15/22*
U.S. Cl. 536—17 R **14 Claims**

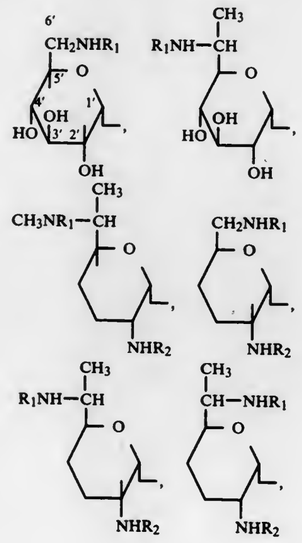
1. A member selected from the group consisting of a selectively protected diaminocyclitol and its pharmaceutically acceptable salts of the following formula (I),



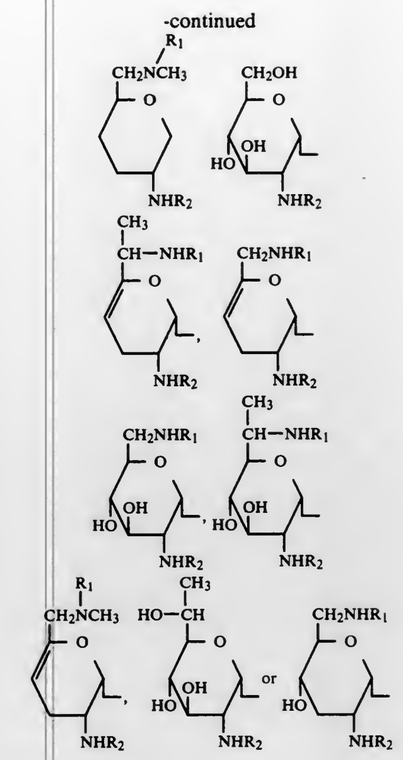
(I)

in which

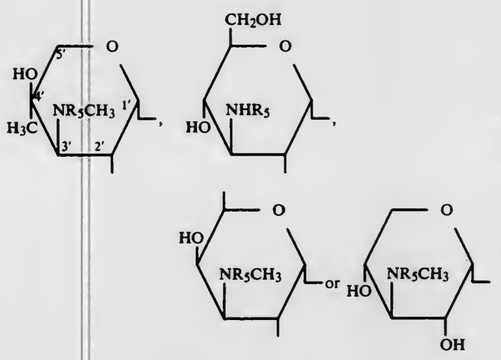
X represents a radical of the formula



-continued



Y designates a radical of the formula



U, V and W are the same or different and each is hydrogen or hydroxyl; Z is hydrogen, hydroxyl or amino;

(1) R_1, R_2, R_3, R_4 and R_5 are each hydrogen or a radical —SR′ with at least one being other than hydrogen, wherein R′ is phenyl substituted by from one to three substituents each of which is nitro, C_1 to C_4-alkyl, C_1 to C_4-alkoxy, C_1 to C_4-alkoxycarbonyl, phenyl, by from 1 to 5 halogen atoms, diphenylmethyl or triphenylmethyl or

(2) wherein R_5 is hydrogen and R_1, R_2, R_3 and R_4 are ethoxycarbonyl or acetyl.

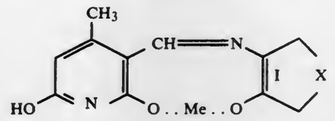
4,190,723

SUBSTITUTED PYRIDINES AND PROCESS FOR MAKING THEM

Horst Tappe, Dietzenbach, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

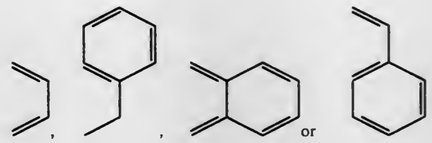
Division of Ser. No. 819,756, Jul. 29, 1977, Pat. No. 4,157,446. This application Oct. 25, 1978. Ser. No. 954,441
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635205; Aug. 5, 1976, 2635206
Int. Cl.² C07D *213/53*
U.S. Cl. 542—422 **5 Claims**

1. Metal complex compounds of the formula



wherein

X is



and the benzene or naphthalene ring formed by X and the remaining portion of the molecule is unsubstituted or substituted with one or two substituents selected from the group consisting of methyl, methoxy, chloro, bromo, trifluoromethyl, nitro, cyano, —$CONR_1R_2$ and —$COOR_3$ substituents, wherein R_1 and R_2 are the same or different and each is hydrogen or alkyl having 1 to 4 carbon atoms, R_3 is alkyl having 1 to 4 carbon atoms, and Me is nickel, copper, zinc or cobalt.

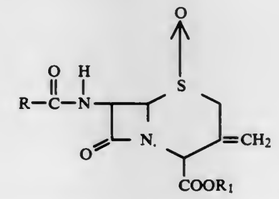
4,190,724

PROCESS FOR 3-EXOMETHYLENECEPHAM SULFOXIDES

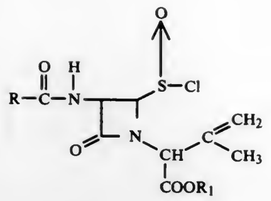
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 13, 1978, Ser. No. 960,346
Int. Cl.² C07D *501/02*
U.S. Cl. 544—16 **10 Claims**

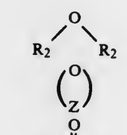
1. In the process for preparing a 3-exomethylenecepham sulfoxide ester of the formula

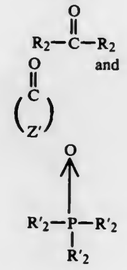


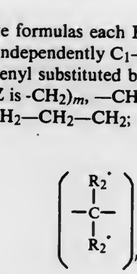
wherein R is the residue of a carboxylic acid and R_1 is a carboxylic acid protecting group, which comprises the steps, (a) adding to a solution of a 2-chlorosulfinylazetidin-4-one of the formula



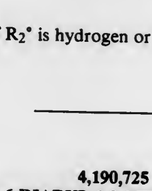
in an inert organic solvent under anhydrous conditions at a temperature between about −15° C. and about 45° C., between about 2 and about 3 moles of stannic chloride per mole of said azetidinone; (b) separating the complex formed; and (c) decomposing said complex; the improvement which comprises adding the stannic chloride to said azetidinone solution in the presence of between about 1 and about 1.5 moles per mole of said azetidinone of an oxo compound selected from the group consisting of

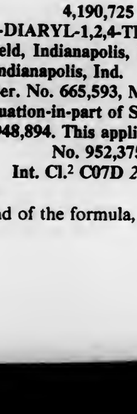
a 

a' 

b 

and

b' 

c 

wherein the above formulas each R_2 is independently C_1–C_4 alkyl; each R'_2 is independently C_1–C_4 alkyl, C_5 to C_6 cycloalkyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, or halogen; Z is $-CH_2)_m$, $—CH_2—CH_2—O—CH_2—CH_2$, or $—CH_2—O—CH_2—CH_2—CH_2$; m is 4 or 5; and Z' is

wherein each of R_2^* is hydrogen or C_1–C_4 alkyl, and n is 3 to 6.

4,190,725

5,6-DIARYL-1,2,4-TRIAZINES

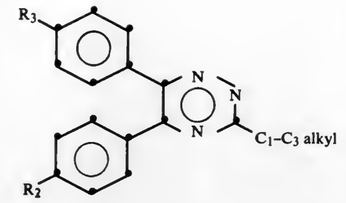
William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 665,593, Mar. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 438,156, Jan. 31, 1974, Pat. No. 3,948,894. This application Oct. 18, 1978, Ser. No. 952,375

Int. Cl.[2] C07D *253/06*

U.S. Cl. 544—182 **5 Claims**

1. The compound of the formula,



wherein

R_2 and R_3 independently are C_1–C_3 alkoxy or di(C_1–C_3 alkyl)amino; and the pharmaceutically-acceptable acid addition salts of basic members thereof.

4,190,726

POLYCYCLIC DYESTUFFS

Detlef-Ingo Schütze, Bergisch-Gladbach, and Klaus Wunderlich, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,020

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726902

Int. Cl.[2] C07D *471/22*

U.S. Cl. 546—27 **4 Claims**

1. Polycyclic dyestuff of the formula

wherein R_1 and R_3 are hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkyl, benzyl, phenylethyl, C_1–C_{20}-alkoxy-C_1–C_{20}alkyl, hydroxy-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkoxy-C_1–C_{20}alkyl, C_1–C_{20}-alkoxycarbonyl, hydroxy-C_1–C_{20}-alkoxy carbonyl, cyano-C_1–C_{20}-alkoxycarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxy carbonyl, halo-C_1–C_{20}-alkoxycarbonyl, C_1–C_{20}-alkoxycarbonyl, C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}alkyl, hydroxy-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}alkyl, cyano-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}alkoxycarbonyl-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}-alkyl, phenyl, C_1–C_4-alkylphenyl,C_1–C_4-alkoxyphenyl, halophenyl, or nitrophenyl; R_2 and R_4 are C_1–C_{20}-alkylcarbonyl, hydroxy-C_1–C_{20}-alkylcarbonyl, cyano-C_1–C_{20}-alkylcarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkylcarbonyl, halo-C_1–C_{20}-alkylcarbonyl, phenylcarbonyl, C_1–C_4-alkylphenylcarbonyl, C_1–C_4-alkoxyphenylcarbonyl, halophenylcarbonyl, nitrophenylcarbonyl, C_1–C_{20}-alkoxycarbonyl, hydroxy-C_1–C_{20}-alkoxycarbonyl, cyano-C_1–C_{20}-alkoxycarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxycarbonyl, halo-C_1–C_{20}-alkoxycarbonyl, cyano, or $CONX_1X_2$ wherein

X_1 is hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkyl, benzyl, phenylethyl, phenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, halophenyl, nitrophenyl, or cyclohexyl; and

X_2 is hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkyl, or halo-C_1–C_{20}-alkyl.

4,190,727

DITHIOLES

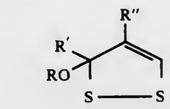
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 156,985, Jun. 25, 1971, abandoned. This application May 13, 1976, Ser. No. 686,093

Int. Cl.[2] C07D *339/04*

U.S. Cl. 549—36 **20 Claims**

1. Dithioles, and mixtures thereof, soluble in organic solvents and aqueous systems, of the formula



where R is alkyl, cycloalkyl, aryl, alkaryl, aralkyl, alkenyl, alkynyl, cycloalkenyl, $R°(OA)_z$,

where

R° is alkyl, cycloalkyl,aryl, alkaryl, aralkyl, alkenyl, alkynyl or cycloalkenyl,

A is ethylene, propylene, butylene, octylene, styrene or mixtures thereof, or phenyl, phenyl-x-phenyl,

where X is $—(CH_2)_n—$,

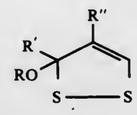


or —S— or -phenyl-phenyl,

Z is 1–100 and n is 1–20, an "Oxo" alcohol radical, glyceryl, pentaerythrityl, dipentaerythrityl or mannityl, and

R' and R" are alkyl, aryl, cycloalkyl, alkenyl, alkynyl, alkaryl, aralkyl, or heterocyclic groups.

5. Dithioles, and mixtures thereof, soluble in organic solvents and aqueous systems, of the formula



where R' and R" are t-butyl and neopentyl, respectively, when R is CH_3, C_2H_5, CH_3



or $CH≡C—CH_2—$, are phenyl and phenyl, respectively, when R is CH_3, C_2H_5 or $CH≡C\text{-}CH_2$, and are phenyl and CH_3, respectively, when R is CH_3 or $CH≡C\text{-}CH_2$.

4,190,728

PROCESS FOR THE PRODUCTION OF LOWER ALKYL 2-CHLORO-2-HYDROXYIMINOACETATES

Ikuo Adachi, Suita; Teruo Yamamori, and Yoshiharu Hiramatsu, both of Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 11, 1978, Ser. No. 895,476

Claims priority, application Japan, May 2, 1977, 52-50939

Int. Cl.[2] C07C *131/00*

U.S. Cl. 560—168 **9 Claims**

1. A process for the production of a lower alkyl 2-hydroxyiminoacetate which comprises reacting chloral with a lower alkanol and a hydroxylamine salt in the presence of a Lewis acid selected from the group consisting of calcium chloride, magnesium chloride, aluminum chloride, stannic chloride, zinc chloride, titanium tetrachloride and ferric chloride or a metal oxide which is convertible into said Lewis acid during the course of the reaction selected from the group consisting of magnesium oxide and zinc oxide.

4,190,729

CARBONYLATION PROCESS WITH STABILIZED CATALYST

Denis Forster, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 19, 1977, Ser. No. 834,074

Int. Cl.[2] C07C *67/36*

U.S. Cl. 560—232 **17 Claims**

1. In the process for the carbonylation of methanol with carbon monoxide and hydrogen in liquid phase at temperatures in the range of 150° to 250° C. and pressures in the range of 1500 to 15,000 psi in the presence of a cobalt carbonyl catalyst, the improvement which comprises conducting the carbonylation in the presence of a tertiary phosphine oxide, so as to have the tertiary phosphine oxide present as a catalyst stabilizer for product recovery, the tertiary phosphine oxide being a pentavalent phosphorus compound with three hydrocarbyl substituents on the phosphorus bonded by carbon-to-phosphorus bonds and separating the carbonylation products from the carbonylation reaction mixture by distilling in the presence of said tertiary phosphine oxide.

4,190,730

PREPARATION OF 1,1,1-TRIHALOGENO-4-METHYL-3-PENTEN-2-OL

Fumio Mori, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

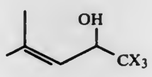
Division of Ser. No. 786,587, Apr. 11, 1977, Pat. No. 4,117,247, which is a continuation-in-part of Ser. No. 616,999, Sep. 26, 1975, abandoned. This application Mar. 28, 1978, Ser. No. 891,049

Claims priority, application Japan, Oct. 3, 1974, 49-114114; Oct. 3, 1974, 49-114115; Dec. 28, 1974, 49-2064; Dec. 28, 1974, 49-2065; Jun. 30, 1975, 50-80600

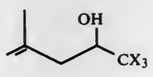
Int. Cl.[2] C07C *33/10*

U.S. Cl. 568—845 **9 Claims**

1. A process for preparing a 1,1,1-trihalogeno-4-methyl-3-penten-2-ol of the formula:



wherein each X represents Cl or Br, which comprises catalytically thermally isomerizing a 1,1,1-trihalogeno-4-methyl-4-penten-2-ol of the formula:



wherein each X is as defined above, at a temperature ranging from 50° C. to 250° C. in the presence of about 0.1 to 30% by weight, based on the weight of said 1,1,1-trihalogeno-4-methyl-4-penten-2-ol, of an acid catalyst.

4,190,731

PROCESS FOR WORKING UP DISTILLATION RESIDUES FROM THE HYDROFORMYLATION OF PROPENE

Rudolph Nehring; Manfred zur Hausen, and Werner Neumann, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

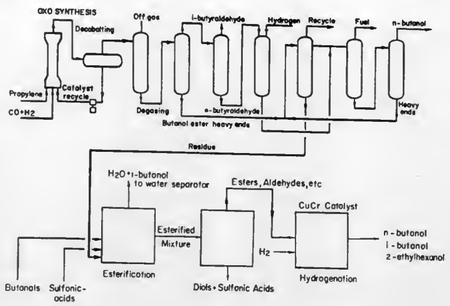
Filed Sep. 7, 1978, Ser. No. 940,294

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740216

Int. Cl.[2] C07C *29/24*

U.S. Cl. 568—914 **8 Claims**

1. In an oxo process wherein propene is hydroformylated and then distilled to separate n-butyraldehyde, iso-butyraldehyde, n-butanol, iso-butanol, n-butyl formate, iso-butyl formate and distillation residues having an acid number of about 80 to 130, the improvement comprising adding to the distillation residues molar to twice molar amounts, relative to the acid content, of n-butanol, iso-butanol or mixtures thereof, carrying out an esterification in the presence of catalytically active amounts of aryl or alkaryl sulphonic acids at temperatures from about 50° to 200° C., separating off the water of reaction, distilling the esterification reaction product and hydrogenating



the distillate thereof with a copper-chromite catalyst to obtain n-butanol, isobutanol and 2-ethylexanol.

ELECTRICAL

4,190,732

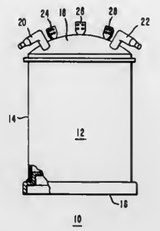
ELECTRICAL APPARATUS

Dudley L. Galloway, and Robert E. Donoghue, both of Jefferson Township, Cole County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1977, Ser. No. 831,461

Int. Cl.[2] H01F *27/02*

U.S. Cl. 174—17 LF **5 Claims**



1. Electrical transformer apparatus comprising:
a housing;
a liquid dielectric disposed in said housing;
an electrically conductive element disposed within said housing, in said liquid dielectric, which is adapted for connection to an electrical potential;
said housing including at least a bottom member and a cylindrical side member each formed of metallic sheet material having a uniform thickness, said bottom member and cylindrical side member being concentrically disposed about a vertically extending axis, said side member having first and second ends,
said bottom member including first, second and third concentric, annular bends,
said first annular bend defining a horizontally oriented circular base portion, and a depending first annular flange portion, said circular base portion being disposed within said side member, adjacent to its second end;
said first annular flange portion extending axially from said circular base portion to said second bend, which is disposed proximate with the second end of said side member;
said second bend providing a second annular flange portion which extends outwardly from said first annular flange portion at a predetermined angle, with at least a portion thereof being disposed below the second end of said side member and further with at least a portion of the second end of said side member being in contact with said second annular flange portion to center said circular base portion of said bottom member within said side member, and to define a joint between said bottom member and said cylindrical side member on the outside of the resulting assembly with respect to the vertically extending axis;
said third annular bend providing a third annular flange portion which extends axially downward from said second annular flange portion and having a lower edge upon which said housing is supported; and
joining means disposed to join, and to seal the joint between, said side member and said second annular flange portion of said bottom member, said joining means being a weld bead.

4,190,733

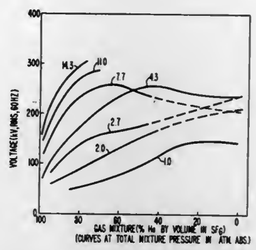
HIGH-VOLTAGE ELECTRICAL APPARATUS UTILIZING AN INSULATING GAS OF SULFUR HEXAFLUORIDE AND HELIUM

Roy E. Wootton, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 21, 1977, Ser. No. 808,571

Int. Cl.[2] H01B *3/56*

U.S. Cl. 174—28 **6 Claims**



1. High-voltage electrical apparatus comprising:
an outer housing at low potential having conducting particles contaminating the interior thereof;
an inner electrode at high potential disposed within said outer housing;
support means for insulatably supporting said inner electrode within said outer housing; and
an insulating gas disposed within said outer housing and electrically insulating said inner electrode from said outer housing, said insulating gas being at a pressure within the range from about 4.3 to about 14.3 atmospheres absolute, said insulating gas comprising:
sulfur hexafluoride at a partial pressure within the range 2.9 to 3.4 atmospheres absolute; and
helium at a partial pressure within the range from about 1.1 to 11.4 atmospheres absolute.

4,190,734

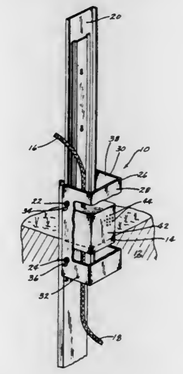
CABLE PEDESTAL RODENT GUARD SYSTEM, METHOD OF CONSTRUCTING SAME, AND KIT AND COMPOSITION

John A. Dressler, Jr., Bloomfield, Iowa, assignor to Dee-Jay Independent Services Group, Inc., Bloomfield, Iowa

Filed Sep. 6, 1977, Ser. No. 830,439

Int. Cl.[2] H02G *9/02;* **A01N** *17/00*

U.S. Cl. 174—38 **11 Claims**



1. In combination, a pedestal enclosure for enclosing above ground extensions of underground cables, which defines a cable holding chamber having an open bottom adapted for

extension into the ground for access to underground cables, and

in said holding chamber, and blocking the bottom thereof a rigid, foamed, cell-developed, insulating, polymeric, thermosetting, plastic material, in which a substantial number of said cells contain encapsulated therein an effective gaseous rodent retardant.

3. A method of retarding rodent access to the interior cable holding chamber of a cable pedestal having an open bottom, said method comprising:

installing a cable pedestal having an open bottom;

mixing at least two normally liquid organic chemical ingredients capable upon exothermic reaction of providing a rigid, thermosetting, foamed, cell-developed, polymer, at least one of said ingredients containing therein a normally liquid rodent retardant capable of volatilization to a gaseous state upon the exothermic, thermosetting reaction of said other ingredients, and

pouring said mixed ingredients into said holding chamber of said pedestal at a location so as to block access to the interior thereof through said open bottom.

6. A rigid, foamed, cell-developed, thermally set, polymeric material, and encapsulated in a substantial number of the cells thereof,

a gaseous state rodent retardant for release to the environment upon rupture of said cells.

9. A kit for forming a rigid, foamed, cell-developed, polymeric, plastic material in which a substantial number of the cells encapsulate an effective volatilized rodent retardant for release upon rupture of said cells, comprising:

a first container with liquid isocyanate,

a second container with a poly ether,

at least one of said containers having a blowing agent therein, and at least one of said containers having a normally liquid rodent retardant therein which is capable of volatilization upon mixing of the ingredients of said containers, and

a flexible shipping bag containing said first and second containers.

10. A method of encapsulating, in a gaseous state, a normally liquid rodent retardant in the cell structure of a rigid, foamed, cell-developed, thermosetting, material formed by mixing two normally liquid chemical ingredients which react exothermally to provide a thermoset material, comprising:

adding to one of said chemical ingredients used in the preparation of said foamed material a normally liquid rodent retardant which is miscible therewith, and which is capable of volatilization at the exothermic reaction temperature achieved by mixing said two normally liquid ingredients;

adding said one ingredient containing said rodent retardant to the other of said ingredients;

whereby said exothermic reaction forms said rigid, foamed, cell-developed, thermosetting material, and said retardant volatilizes and is trapped in said cells of material for release upon subsequent cell rupture.

4,190,735

SEMICONDUCTOR DEVICE PACKAGE

Angelo Checki, Jr., Lyndhurst, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,700
Int. Cl.² H05K *5/06*
U.S. Cl. 174—52 FP **18 Claims**

1. A semiconductor device package comprising:

a base member having first and second sides and a pellet mounting surface on said first side;

hermetic wall means extending from said base member on said first side;

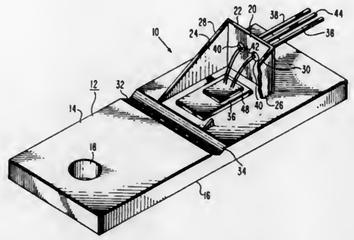
a hermetic lid-receiving surface comprising a portion of said wall means;

said wall and lid-receiving surface together surrounding said pellet mounting surface in such a manner that hermetically sealing a hermetic lid to said lid-receiving surface will enclose said pellet mounting surface in a hermetically sealed container comprising said base member, said wall means and said lid;

said lid receiving surface lying in a first geometric plane;

said pellet mounting surface lying in a second geometric plane;

said first geometric plane and said second geometric plane intersecting at an included angle of less than 90°;



at least one electrically conductive lead passing through said wall means and hermetically sealed thereto;

a semiconductor device pellet having first and second surfaces and having said first surface thereof affixed to said pellet mounting surface; and

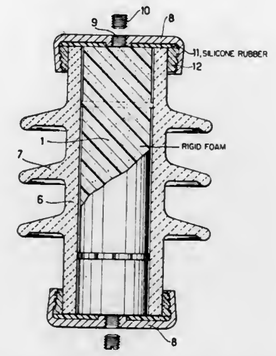
said at least one electrically conductive lead connected to said second surface of said semiconductor pellet.

4,190,736

ELECTRICAL INSULATOR AND METHOD OF MAKING SAME

Henri Warnet, Laloubere, and Paul Fouinat, Tarbes, both of France, assignors to Societe Anonyme Dite: Ceraver, Paris, France

Filed Jul. 6, 1977, Ser. No. 813,388
Claims priority, application France, Jul. 9, 1976, 76 21088
Int. Cl.² H01B *17/02, 19/00*
U.S. Cl. 174—209 **6 Claims**



1. An electrical insulator comprising an independently manufactured outer tube of a dielectric material selected from the group consisting of ceramic material and wound glass fibers set in a synthetic resin, a filling of at least partially rigid independently manufactured dielectric foam material, sealing means at each end of said tube, and an adhesive interface material connecting said filling to the inner surface of the tube along the length thereof and providing a good electrical and mechanical connection between the material of the tube and that of the filling, said filling comprising at least one block of said dielectric foam material machined to a diameter close to the internal diameter of said tube, said block being stuck to the wall of said tube by a synthetic resin constituting said adhesive interface material, said block having radially projecting, integral guide

means for centering it in said tube, and said radially projecting guide means being provided with longitudinal passages about the periphery thereof for permitting the synthetic resin constituting said adhesive interface material to pass between said guide means and the inner surface of the tube.

6. A method of manufacturing an electrical insulator including the steps of:

providing an independently manufactured insulator tube,

providing at least one independently manufactured block of at least partially rigid synthetic resin foam,

machining said block to a diameter near to the internal diameter of the tube,

centering and inserting said block into said tube,

degassing a hardenable synthetic liquid polymer into a flexible resin mixed with a hardening catalyst in the liquid phase,

feeding the hardenable synthetic liquid polymer into the insulator tube via one of its ends under the effect of an applied pressure differential between the ends,

isolating said flexible resin within the interior of the insulator tube from the flexible resin being fed to the tube,

maintaining communication with a source of reduced pressure of said flexible resin within said tube after the interior of the insulator tube has been isolated for several minutes in order to complete degassing, and

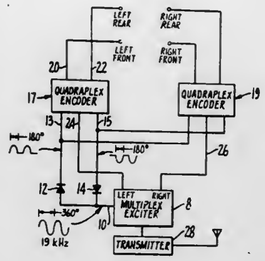
finally hardening said hardenable synthetic liquid polymer.

4,190,737

COMPATIBLE FOUR CHANNEL FM SYSTEM

Louis Dorren, Millbrae, Calif., assignor to Matsushita Electric Corp. of America, Secaucus, N.J.

Continuation of Ser. No. 482,415, Jun. 24, 1974, Pat. No. 3,967,069, which is a continuation of Ser. No. 319,939, Dec. 29, 1972, Pat. No. 3,822,365, which is a continuation of Ser. No. 32,989, Apr. 29, 1970, Pat. No. 3,708,623, which is a continuation-in-part of Ser. No. 13,902, Feb. 25, 1970, abandoned. This application Jan. 14, 1976, Ser. No. 649,153
The portion of the term of this patent subsequent to Jan. 2, 1988, has been disclaimed.
Int. Cl.² H04H *5/00*
U.S. Cl. 179—1 GH **4 Claims**



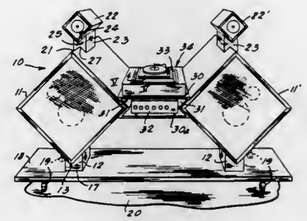
1. A four channel FM system which is fully compatible with existing mono and stereo standards comprising means for producing a first combination of audio signals of a lower frequency band, means for producing a pilot signal having a frequency higher than the highest frequency of said audio signals, means for producing a second combination of said audio signals amplitude modulating a first subcarrier signal at a frequency double the frequency of said pilot signal, means for producing at least one of third and fourth combinations of said audio signals, said third combination of signals amplitude modulating a second subcarrier at a frequency double the frequency of said pilot signal and in quadrature with said second subcarrier signal, said fourth combination of said audio signals amplitude modulating a third subcarrier signal at a frequency related to the frequency of the pilot signal and different from the frequency of said first and second subcarrier, means for combining said first and second combinations of audio signals, said pilot signal and at least one of said third and fourth combinations of audio signals to produce a composite signal for use in the four channel FM system.

4,190,738

MODULAR FURNITURE STRUCTURE

George A. Samuels, 8350 S. Bennett, Chicago, Ill. 60617

Filed Feb. 6, 1978, Ser. No. 875,698
Int. Cl.² H04R *1/20;* **A47B** *47/00*
U.S. Cl. 179—1 E **19 Claims**



1. In combination in modular furniture structure:

a modular pillar block having top and bottom load bearing surfaces;

at least one of said surfaces having a recessed seat for supporting engagement with complementary surface area of a modular article of furniture;

a base;

said pillar block having its bottom load bearing surface in engagement with said base and said one surface being at the top;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat;

a second modular pillar block having top and bottom load bearing surfaces and having its bottom load bearing surface on said base spaced from said first pillar block;

the top load bearing surface of said second pillar block having a recessed seat;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat of the second pillar block;

supporting means mounted on and between said modular articles of furniture;

said modular articles of furniture having corners projecting toward one another in spaced relation;

and said supporting means carried on and between said articles comprising a shelf structure having means in supportive engagement with said corners.

7. In combination in modular furniture structure:

a modular pillar block having top and bottom load bearing surfaces;

at least one of said surfaces having a recessed seat for supporting engagement with complementary surface area of a modular article of furniture;

a base;

said pillar block having its bottom load bearing surface in engagement with said base and said one surface being at the top;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat;

a second modular pillar block having top and bottom load bearing surfaces and having its bottom load bearing surfaces on said base spaced from said first pillar block;

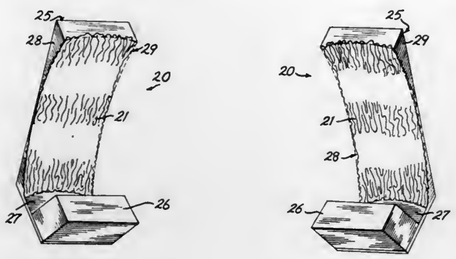
the top load bearing surface of said second pillar block having a recessed seat;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat of the second pillar block;

supporting means mounted on and between said modular articles of furniture;

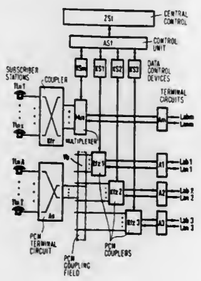
a sound reproducing unit;
and vibration isolating cushioning means mounting said sound reproducing unit on said supporting means carried on and between said modular articles of furniture.

4,190,739
HIGH-FIDELITY STEREO SOUND SYSTEM
Marvin Torffield, 50 Greene St., New York, N.Y. 10013
Continuation-in-part of Ser. No. 791,473, Apr. 27, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,895
Int. Cl.[2] H04R *5/02*
U.S. Cl. 179—1 GA **11 Claims**



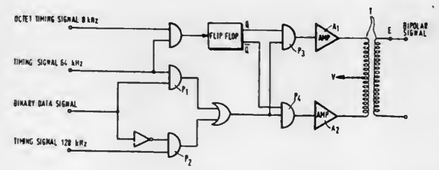
2. A sound reflector for use with a sound source spaced therefrom and directing sound thereto, the reflector having a sound dispersive surface forming an expanse larger than the sound source in area, and continuously roughened across its surface by peaks and valleys of varying height and depth occurring in all directions from any point within the roughened surface, said peaks and valleys that occur in all directions on the roughened surface defining a surface being adapted to disperse at least a portion of the audible frequency range impingent thereon widely through a listening area from substantially the entire roughened surface.

4,190,740
CIRCUIT ARRANGEMENT FOR RECEIVING AND TRANSMITTING SWITCHING DATA IN TELECOMMUNICATION EXCHANGES
Max Schlichte, and Karlheinz Neufang, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 671,738, Mar. 30, 1976, abandoned, which is a continuation of Ser. No. 441,942, Feb. 13, 1974, abandoned, which is a continuation of Ser. No. 218,971, Jan. 19, 1972, abandoned. This application Mar. 24, 1977, Ser. No. 780,835
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1971, 2102397
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 AT **3 Claims**



1. A circuit arrangement for an exchange switching center in a telecommunication system for the transmission between exchanges of switching data signals related to communication signals, each said exchange having central control means, said communication signals being transmitted as pulse code modulated signals, the circuit arrangement comprising:
a plurality of communication signal receiving/transmitting means,
a plurality of switching data receiving/transmitting means individually allocated to each of said communication signal receiving/transmitting means,
means coupling individual ones of said switching data receiving/transmitting means, respectively to individual ones of said communication signals receiving/transmitting means and
means connecting said switching data receiving/transmitting means to said central control means for controlling the operation of said exchange.

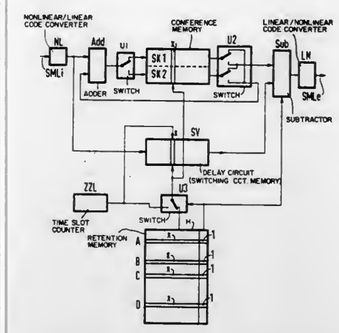
4,190,741
METHOD AND DEVICE FOR RECEIVING AN INTERFACE SIGNAL
Denis F. Cointot, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France
Filed Oct. 25, 1978, Ser. No. 954,536
Claims priority, application France, Oct. 28, 1977, 77 32576
Int. Cl.[2] H04J *3/06;* **H04L** *7/02*
U.S. Cl. 179—15 BS **2 Claims**



1. A method of receiving a codirectional interface digital signal coded in bipolar form, each data bit being represented by means of four bits (1,1,0,0) for a binary "1" and (1,0,1,0) for a binary "0", a polarity alternation being effected every bit with a violation of polarity at each octet, comprising the steps of: separating the interface signal into its positive and negative components; producing a rectified signal from the said components; deriving from the rectified signal a bit timing signal; deriving the decoded data signal from the rectified signal and the timing signal; deriving from said components a signal representing the alternations of polarity; deriving from this latter signal and from the bit timing signal an octet timing signal; and comparing in phase the bit timing signal and the polarity alternation signal, a pulse for rephasing the bit timing signal being produced when the states of these two signals do not coincide at the time of a polarity alternation.

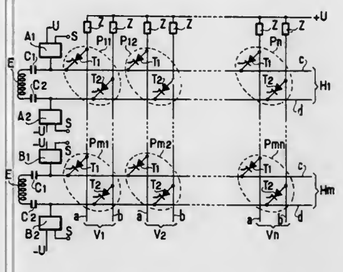
4,190,742
PROCESS AND APPARATUS FOR PRODUCING CONFERENCE CONNECTIONS IN A PCM TIME MULTIPLEX SWITCHING SYSTEM
Gary D. Southard, Marlton, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 5, 1978, Ser. No. 912,440
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—18 BC **5 Claims**

1. A process for establishing conference connections in a pulse code modulation time multiplex switching system in which total code words are constructed from code words supplied by conference parties and then transmitted to the conference parties, comprising the steps of:
receiving code words from the conference parties during their respective time slots;
delaying each received code word by one pulse frame;
adding each received code word to a previous code word and storing the result as an intermediate code word and repeating adding and storing as each code word is received;
subtracting the delayed code word each frame from the stored result of addition to form the total code words; and



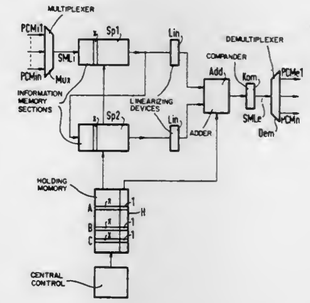
transmitting each total sum code word during the respective time slot to the conference party whose delayed code word was subtracted to obtain the respective total code word.

4,190,743
THYRISTOR SWITCHING MATRIX
Philippe Hugel, Illkirch Graffenstaden; Henri Kraess, Strasbourg; Remi Louis, Limersheim, and Louis Vidonne, Sallanches, all of France, assignors to Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic, Strasbourg, France
Filed Jun. 20, 1978, Ser. No. 917,229
Claims priority, application France, Jun. 30, 1977, 77 20076
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 GF **3 Claims**



1. A thyristor switching matrix comprising horizontal lines, vertical lines and thyristor connection points between the horizontal lines and the vertical lines, each vertical line and each horizontal line comprising at least one wire, the vertical lines being connected to one polarity of a DC source, each wire of each horizontal line being connected to the other polarity of said source via a protective device, each thyristor being controlled by trigger means, a protective device and trigger means of a thyristor connected to the horizontal line connected to said protective device being responsive to the presence of a mark signal and connecting said horizontal line to a vertical line, said protective device having connecting means for isolating the horizontal line to which it is connected in the absence of a mark signal and for bringing said horizontal line to a potential when a mark signal is applied to the protective device, said trigger means of the other thyristors connected to said horizontal line having their trigger voltage reduced by said potential of said horizontal line to a value that does not allow the firing of said thyristors, protective devices of the other horizontal lines and trigger means of the thyristor connected between said vertical line and the other horizontal lines being able to establish a connection with said horizontal line by said vertical line upon receipt of a mark signal.

4,190,744
CIRCUIT ARRANGEMENT AND PROCESS FOR PRODUCING CONFERENCE CONNECTIONS BETWEEN THREE CONFERENCE PARTIES IN A PCM TIME MULTIPLEX SWITCHING SYSTEM
Richard J. Frank, Marlton, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 5, 1978, Ser. No. 912,399
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—18 BC **9 Claims**

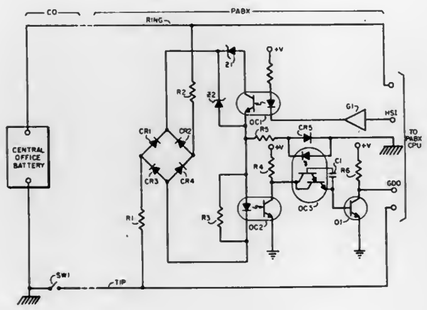


1. A process for establishing conference connections between first, second and third parties (A,B,C) in a pulse code modulation time multiplex switching system in which each of the parties (A,B,C) supplies a pulse code modulated code word, and in which in each case, sum code words (A+B,B+C,A+C) which are formed of pulse code modulated code words supplied by two of the parties are transmitted to the remaining party of the conference, comprising the steps of:
receiving the pulse code modulated words supplied by the conference parties (A,B,C);
writing the received pulse code modulated words into a memory cell of a first memory section during the respective time slots of the parties (A,B,C) in which such words occur;
during the writing into the first memory section, reading the pulse code modulated word already stored at that location to an adder as a first magnitude and writing the read pulse code modulated into a memory cell of a second memory section;
during writing into the second memory section, reading the pulse code modulated word already stored at that location to the adder as a second magnitude;
adding the first and second magnitudes to obtain the sum code words (A+B, B+C, A+C); and feeding the sum code words (A+B), (B+C), (A+C) to the respective conference parties (C),(A),(B) whose pulse code modulated word does not appear in the respective sum code words.

4,190,745
CALL FOR SERVICE AND CONTINUITY SENSOR CIRCUIT

Julius Jusinskas, Jr., Glen Ellyn, Ill.; David Q. Lee, Boca Raton, Fla., and Richard M. Rovnyak, Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 1, 1978, Ser. No. 965,713
Int. Cl.[2] H04M *7/14*
U.S. Cl. 179—18 AH 10 Claims



1. A call for service and continuity sensor circuit for use in a trunk circuit of a telephone system including at least first and second switching centers connected via said trunk circuit in ground start configuration, said trunk circuit having first and second leads connecting said switching centers, said call for service and continuity sensor circuit comprising:

current direction means connected between said first and said second leads of said trunk circuit;

circuit switching means connected between said current direction means and said second switching center and including gating means connected to said second switching center and a first optical coupler device connected between said current direction means and said gating means, operated in response to an input signal from said second switching center to disable said call for service and continuity sensor circuit;

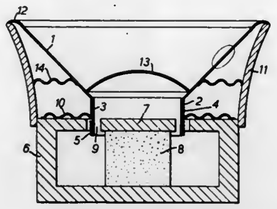
continuity detection means for detecting a non-continuous loop between said first and second switching centers, connected between said current direction means and said circuit switching means, said continuity detection means including a second optical coupler device connected between said current direction means and said first optical coupler device, operated in response to a non-continuous open loop circuit connection of said first lead at said first switching center to produce a first output signal; and

polarity detection means for detecting a negative potential on said second lead, representing a call for service, and connected between said continuity detection means and said second switching center, said polarity detection means operated in response to said negative potential to produce a second output signal representative of said negative potential and operated to combine said first and said second output signals to produce and to transmit a third output signal to said second switching center.

4,190,746
DIAPHRAGM MATERIAL FOR MOVING COIL LOUDSPEAKER, MAY BE LAMINATED OR INTEGRAL WITH SURROUND

Hugh D. Harwood, 84 Beechwood Rd., Sanderstead, Surrey; Joseph Y. C. Pao, "Mei-Lan", Coombe Park, Kingston-upon-Thames, and David W. Stebbings, 1 Downswood, Reigate, Surrey, England

Filed Mar. 18, 1977, Ser. No. 779,221
Claims priority, application United Kingdom, Mar. 19, 1976, 11057/76
Int. Cl.[2] H04R *7/12, 7/20, 9/02*
U.S. Cl. 179—115.5 R 9 Claims

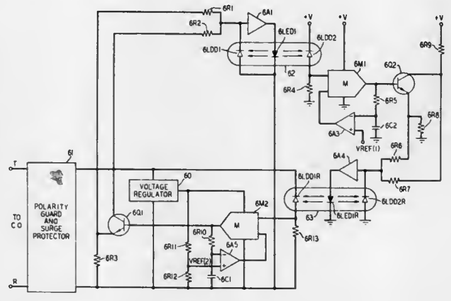


1. A diaphragm for a moving coil loudspeaker, the diaphragm being of conic section, of exponential section or having a cross-section over the major part thereof which is of conic section or of exponential section form, which diaphragm, in order to impart internal damping characteristics thereto, is formed of, or includes a layer of, a diaphragm-forming material selected from the group consisting of polypropylene, polyethylene and ethylene-propylene copolymers, the ethylene being present in copolymerized form in minor amount with respect to the propylene, said material having a mechanical "Q" value of from 7 to 12, a Young's modulus of from 8.5 to 17.5×10^5 KN/M^2 and a density of from 0.85 to 1.05 g/cc.

4,190,747
SIGNAL CORRECTED OPTOCOUPLED DEVICE

Alexander Feiner, Rumson; Chao Kai Liu, Matawan, and Sigurd G. Waaben, Princeton, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1978, Ser. No. 893,795
Int. Cl.[2] H04B *1/58, 9/00*
U.S. Cl. 179—170 NC 5 Claims



1. A remote gain controlled optocoupled transmission circuit having an input terminal and an output terminal, said terminals separated by a photocoupled barrier, the input side of said barrier containing phototransmitting means operable for providing modulated phototransmission across said barrier in accordance with input transmission signals, and the output side of said barrier containing photodetecting means operable under control of received modulated phototransmission for providing an output transmission signal linearly representative of said input transmission signal,

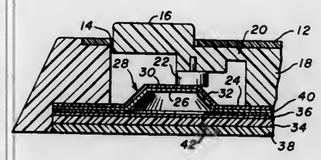
means for remotely establishing a reference DC voltage level, and

means for controlling the gain of said output transmission signal in accordance with the relative levels between any said established reference DC voltage and a DC voltage derived from said photodetecting means as a result of received phototransmission.

4,190,748
KEYBOARD SWITCH ASSEMBLY

Gordon B. Langford, Chandler, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jan. 31, 1977, Ser. No. 763,925
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A 22 Claims



1. A keyboard assembly including:

hinged key means for delivering an input signal, said key means normally being in one position and being movable to a second position;

first insulating means spaced from said key means, said insulating means having first conductive means on a side thereof spaced from said key means;

flexible switch means projecting from said first insulating means toward said key means, said switch means having an inclined annular side surface extending to a flat top surface, at least part of said first conductive means being on the underside of said flat top surface;

second insulating means on the side of said first insulating means opposite to said key means, said second insulating means having second conductive means facing but out of contact with said first conductive means; and

securing means to fix the position of said first insulating means against lateral movement relative to said key means;

said key means contacting said flat top surface of said switch means at an off center location and causing said switch means to move with snap action from its normal state to an operated position to establish contact between said first conductive means on the underside of said flat top surface and second conductive means upon movement of said key means toward its second position, said switch means returning to its normal state upon return of said key means to its first position;

each of said switch means moving through a plane inclined to the plane of said first insulating means, said inclined plane extending in direction from approximately an intersection of said side surface and said first insulating means to a diametrically opposed intersection of said side surface and switch means top surface.

13. Flexible switch means including:

a sheet of flexible insulating material;

conductive patterning means on at least one side of said sheet of insulating material; and

an array of protrusions formed in and extending from the other side of said sheet of insulating material;

each of said protrusions having an inclined annular side surface extending to a flat top surface, each of said protrusion flat top surfaces normally being parallel to the plane of said sheet and having an area less than the base area of the protrusion as defined by the junction of said side surfaces and said sheet;

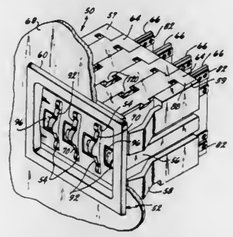
at least part of said conductive patterning means being on the underside of the flat top surface of each of said protrusions;

each of said protrusions being movable with snap action from the normal position thereof to a depressed operated position through a plane inclined at an angle to the plane of said sheet, said inclined plane extending in a direction from approximately an intersection of said side surface and said sheet to a diametrically opposed intersection of said side surface and protrusion top surface.

4,190,749
ROTARY THUMBWHEEL SWITCH ASSEMBLY

Richard W. Erickson, Glendora; James Pallaske, Covina, and Stephen B. Talbert, Pasadena, all of Calif., assignors to Becton, Dickinson Electronics Company, Pasadena, Calif.

Filed Jun. 27, 1977, Ser. No. 810,153
Int. Cl.[2] H01H *19/58*
U.S. Cl. 200—11 TW 28 Claims



6. A rotary switch assembly capable of assembly in fixed relation to an instrument panel having a front face and a rear face, comprising:

switch module means including at least one switch module, for providing selectable switched circuit connections, said switch module means being capable of insertion within an opening in the panel from either face of the panel, each switch module comprising:

a brush set having a plurality of electrically conductive and connected contact brushes,

circuit means for presenting multiple circuit combinations to contacts of the brush set,

a rotatable element adapted to be rotated about its center and comprising indicia means for visually presenting an indication of the rotary position of the rotary element, and including means for securing at least one said contact brush set, and

solid state integrated illuminating means positioned within said indicia means for illuminating the presented indicator; and

a bezel adapted for insertion through the opening in the panel from its front face for partially covering the switch module means, said bezel including a plurality of front face openings through which a rotatable element may protrude and through which said indicators may be presented, said bezel further including means for securing a predetermined number of switch module means to said bezel and to the panel.

17. A kit comprising at least two elements capable of assembly into a rotary switch assembly, the kit comprising:

a first element comprising at least one switch module having brush sets having a plurality of electrically conductive and connected contact brushes, circuit means for presenting multiple circuit combinations to contacts of each brush set, a rotatable wheel element adapted to be rotated about its center, said rotatable wheel element comprising indicator means for visually presenting an indication of the rotary orientation of said rotatable wheel element, said rotatable wheel element further comprising means for securing at least one said contact brush set, said switch

module further comprising a solid state integrated illuminating means positioned within said indicator presenting means for illuminating the presented indication; and

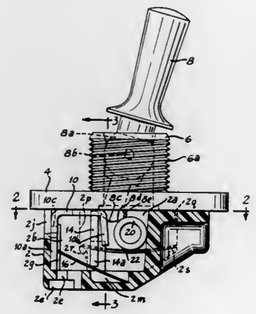
a second element comprising a bezel for receiving, by snap-in mounting, a plurality of said switch modules, said bezel including a plurality of front face openings through which actuating means for rotating said rotatable wheel element may protrude upon assembly, and through which said indication may be viewed after assembly, said bezel further including combining means for securing the bezel to the switch modules and means for securing the bezel to an instrument panel having an unfinished opening therethrough.

4,190,750

SNAP-ACTION SWITCH OF THE ROLLER CONTACT TYPE

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1978, Ser. No. 905,286
Int. Cl.[2] H01H *21/04, 15/18, 1/16*
U.S. Cl. 200—67 AA **16 Claims**



1. A snap-action electric switch comprising:

an insulating housing having an open-top base closed by a cover providing a switch compartment with parallel side walls therein;

a pair of stationary contacts;

means for receiving said stationary contacts vertically down into said base for mounting in laterally spaced apart relation in said switch compartment;

a single-piece laterally-arranged elongated movable contact having ends complementary to said parallel side walls of said switch compartment whereby it is received vertically down into said base and guided for bridging said stationary contacts and having a curved surface whereby it is actuated;

an elongated leaf spring;

and means in said base for receiving said leaf spring vertically down thereinto to be supported at its ends above the bottom of said switch compartment for supporting and biasing said movable contact for movement into and out of bridging engagement with said stationary contacts;

actuator means movably mounted on said cover of said housing and comprising a double-incline apex movable over said curved surface of said movable contact while depressing said movable contact down against the force of said leaf spring to cause downward flexure of the latter to effect snap-action closure or opening of said movable contact with respect to said stationary contacts;

apertures in said housing located with respect to said stationary contacts;

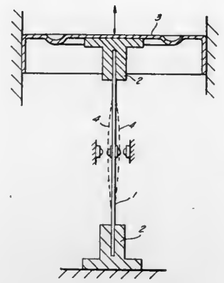
and connector means accommodated by said apertures for connecting said stationary contacts to an external circuit.

4,190,751

ELECTRICAL CONTACT SWITCH WITH AN EXTREMELY SMALL ACTUATING MOVEMENT

Jac M. Roth, and Veronika Roth nee Werner, both of Sandbuechel 26a, D-506 Bensberg-Refrath, Fed. Rep. of Germany

Filed Oct. 21, 1976, Ser. No. 734,639
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547257
Int. Cl.[2] H01H *5/20*
U.S. Cl. 200—67 DB **5 Claims**



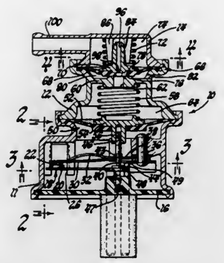
1. A movable leaf spring contact engageable with a fixed contact for switching the same, said leaf spring comprising a normally straight leaf spring body having two end portions and an intermediate portion therebetween; two rigid and laterally immovable anchors each rigidly embracing a different end portion of said spring so as to prevent all lateral movements of said end portions; and means connected to at least one of said anchors for directing through said one anchor and the respective end portion fastened thereto a compressive force which acts lengthwise of said spring body and towards the center of the same and for inducing a consequent transgression of bending stress of said intermediate portion of said leaf spring body which intermediate portion then suddenly bends and engages a fixed contact.

4,190,752

VACUUM ACTUATED SWITCH

David W. Rogers, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 963,002
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—81.5 **4 Claims**



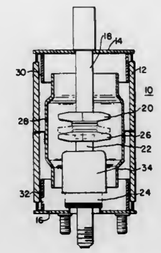
1. A vacuum actuated snap action switch comprising; a pair of electrical switch contacts, a snap action spring having two positions to engage and disengage said contacts, a variable level vacuum source, first and second vacuum motors connected to said vacuum source, fixed restriction means intermediate said first vacuum motor and said vacuum source, means connecting said first vacuum motor to said snap action spring for moving the same between its two positions to operate said switch in response to a change in the level of said vacuum source between first and second vacuum levels, an atmospheric bleed orifice for said first vacuum motor, and valve means operated by said second vacuum motor responsive to variations in the level of said vacuum source above said second level for connecting and disconnecting said first vacuum motor and said atmospheric bleed orifice to shift the vacuum operating range of said first vacuum motor during variations in the level of said vacuum source above said second level.

4,190,753

HIGH-DENSITY HIGH-CONDUCTIVITY ELECTRICAL CONTACT MATERIAL FOR VACUUM INTERRUPTERS AND METHOD OF MANUFACTURE

Robert E. Gainer, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1978, Ser. No. 895,832
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



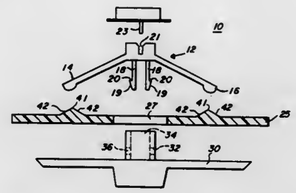
1. A vacuum interrupter contact which exhibits high electrical conductivity, and has a high density of greater than about 95% of the theoretical density, which contact is manufactured by the process consisting of admixing copper and chromium powder wherein the copper is present in an amount of greater than 65 wt.% and up to 90 wt.%, cold pressing the admixed powder to form a compact of high intermediate density, and vacuum-sintering the compact at a temperature below the melting point of the copper to achieve the density of greater than about 95%, without further hot densification.

4,190,754

SLIDE SWITCH ACTUATING APPARATUS

Joseph H. Kilar, Rolling Meadows, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1978, Ser. No. 962,271
Int. Cl.[2] H01H *3/02*
U.S. Cl. 200—329 **3 Claims**



1. An improved slide switch actuating apparatus comprising:

a housing;

a slide switch device to be actuated located interior to said housing;

an elongated flexible retaining member engaging said slide switch device;

said retaining member having flexible hooking means extending towards the exterior of said housing;

said housing having a slot formed therein; and

a button member positioned exterior to said housing in overlying relation with said slot and having a socket portion to receive said hooking means in a snap fit;

wherein said housing includes at least one boss portion formed by inclined surfaces positioned on the interior thereof adjacent to said slot to contact said retaining member upon sliding movement thereof;

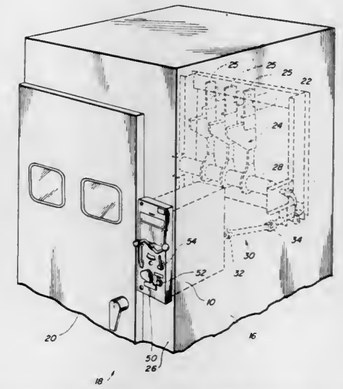
wherein said retaining member includes a plurality of flexible arm members each said arm member contacting said inclined surfaces during relative movement therebetween to effect a detent action in the operation thereof.

4,190,755

SWITCH OPERATOR UNCOUPLING MECHANISM

Edward J. Rogers, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed May 31, 1978, Ser. No. 911,124
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—334 **8 Claims**



1. An improved mechanism for operating a switch comprising:

switch operating means having an output shaft, said switch operating means being operable to cause the output shaft to rotate through a predetermined rotation in first and second directions;

mounting means for demountably supporting said switch operating means in a coupled position;

switch drive linkage means operably connected to the switch to be operated; and

coupling means for engaging said switch drive linkage means with the output shaft of said switch operating means and thereby causing said switch drive linkage means to rotate conjointly with the output shaft to operate the switch when said switch operating means is inserted into the coupled position in said mounting means, said coupling means disengaging said switch drive linkage means from the output shaft of said switch operating means when said switch operating means is withdrawn from the coupled position.

4,190,756

DIGITALLY PROGRAMMED MICROWAVE COOKER

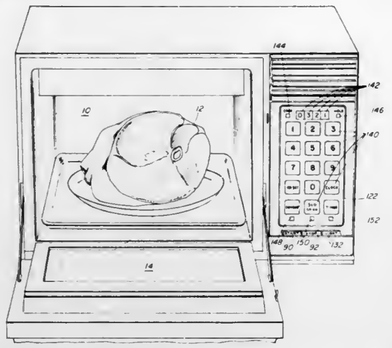
Richard A. Foerstner, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Continuation of Ser. No. 671,468, Mar. 29, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,531
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **6 Claims**

1. A microwave heating system comprising:

means comprising a magnetron for supplying microwave

energy to a multimode cavity having a movable closure member;
a power supply for said magnetron;
means for supplying power to said power supply from an alternating current source comprising a switch mechanically actuated by closure of said movable closure member;
means comprising a semiconductor switch connected in series with said mechanically actuated switch for controlling the supply of power to said magentron from said



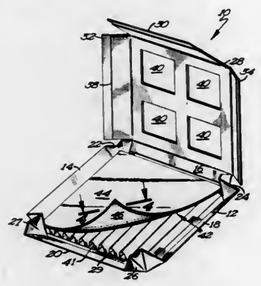
power supply in sequences of different average microwave power levels comprising means for pulsing the supply of power to said magnetron at different pulse repetition rate duty cycles;
said controlling means further comprising a clock having a frequency substantially higher than the frequency of said power source; and
means for manually selecting at least one of said different pulse repetition rate duty cycles.

4,190,757

MICROWAVE HEATING PACKAGE AND METHOD

Charles H. Turpin, and Thomas C. Hoese, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 730,873, Oct. 8, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,906
Int. Cl.[2] H05B *9/06;* **B65B** *25/22*
U.S. Cl. 219—10.55 E **12 Claims**



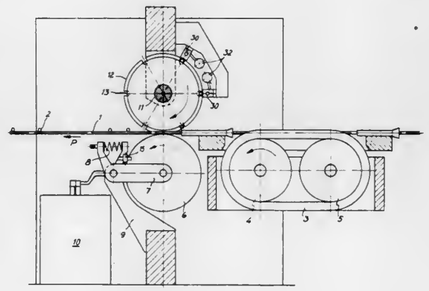
1. A food heating package adapted to contain a food product comprising a package body formed from microwave transparent non-lossy dielectric sheet material having a cellulosic or plastic resinous base defining a container body and a lossy microwave absorptive heating body connected to the package and associated in heat conductive relationship with said food, said heating body being in sheet form and the thickness of said sheet being at least about 0.016 inch thick and being substantially within the range wherein the sheet thickness and the temperature response during microwave heating are positively correlated, said sheet being of the minimum thickness that will reach but not exceed a preselected equilibrium operating temperature, a metal sheet in overlying relation to one side of and adjacent to the heating body, said heating body being characterized by heating when exposed to microwave radiation within a microwave oven to a sufficient temperature to sear, brown or crisp the food and cooling in 30 seconds or less after the oven is turned off to the temperature of the food whereby the package can be used as a dish from which the food can be directly eaten without burning the fingers.

4,190,758

GRID WELDING MACHINE

Hans Gött; Gerhard Ritter; Klaus Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH., Steiermark, Austria

Filed Mar. 24, 1978, Ser. No. 889,747
Claims priority, application Austria, Apr. 18, 1977, 2699/77
Int. Cl.[2] B23K *11/06*
U.S. Cl. 219—56 **9 Claims**



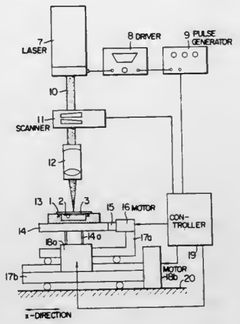
1. A machine for welding grids of longitudinal and cross-wires, comprising in combination:
means for feeding said longitudinal wires continuously through said machine;
means defining a feed-path for the longitudinal wires, and a feed-course for the cross-wires substantially transverse thereto;
a plurality of rotary electrodes disposed on one side of said feed-path for the longitudinal wires,
an equal plurality of counter electrodes arranged on the other side of said feed-path, both said electrodes and said counter electrodes comprising rollers, each of said counter electrode rollers being disposed substantially coplanar with a respective electrode roller, and on the opposite side of the feed-path thereof, said electrode rollers being spring loaded towards said counter-electrode rollers;
a plurality of cross-wire feed-discs, each of said cross-wire feed discs being substantially circular, and being mounted substantially coaxially with said counter electrode rollers, and having a plurality of grooves passing therethrough, said grooves being provided at angular intervals along the periphery of each of said feed discs for receiving said cross-wires;
a plurality of cross-wire feed-ways, said cross-wire feed-ways being disposed radially outside said cross-wire feed-discs at angular intervals corresponding to the angular intervals of said grooves in said cross-wire feed-discs;
means associated with said cross-wire feed-ways for simultaneously feeding said cross-wires radially inwardly into said grooves and
a driving shaft having said cross-wire feed-discs secured thereto for rotation therewith, said counter electrode rollers being mounted on, and rotatable relative to said driving shaft.

4,190,759

PROCESSING OF PHOTOMASK

Mikio Hongo, and Junichi Nakabayashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 717,375, Aug. 24, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,369
Claims priority, application Japan, Aug. 27, 1975, 50-103031
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **8 Claims**



1. A method of removing and correcting remaining defects in a photomask comprising the steps of:
(a) preparing a photomask comprising a transparent glass substrate, a desired circuit pattern of a thin metal film deposited on one surface thereof and having at least one defective portion of the thin metal film existing on said substrate apart from said circuit pattern after forming said circuit pattern:
(b) positioning the defective portion of the photomask in a scanning area of a pulsed laser beam;
(c) irradiating a pulsed laser beam onto an inner surface of the defective portion of the thin metal film which contacts said substrate through the transparent glass substrate, said laser beam being focussed to provide a beam spot not greater than 5 μm in diameter;
(d) relatively scanning the pulsed laser beam with respect to said photomask in two-dimensional directions so as to scan over said defective portion of the photomask;
(e) controlling the oscillation frequency of the pulsed laser beam as well as the scanning speed of the laser beam on the defective portion of the thin metal film, and providing beam spots of said laser beam partially superimposed with a super position number in the range of from 1.2 to 15; and
(f) removing the defective portion of the thin film while maintaining roughness and pit depths of the processed surface portion underlying the removed thin film portion to less than λ/4, where λ is the wavelength of light for exposure through the photomask in use.

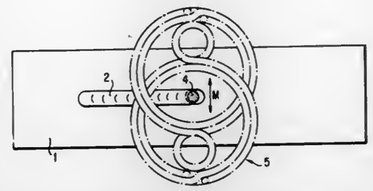
4,190,760

WELDING APPARATUS WITH SHIFTING MAGNETIC FIELD

Motomi Kano, Fujisawa; Keiichiro Hirakoso, Tokyo, and Katsuhiko Nomura, Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 16, 1977, Ser. No. 797,630
Claims priority, application Japan, May 14, 1976, 51/56233; Oct. 28, 1976, 51/130117
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—128 **5 Claims**

1. A welding apparatus for controlling shapes of molten metal pools, which comprises means for supplying heat energy for welding, means for moving said energy supplying means relatively to a base metal to be welded, means for generating in the vicinity of a molten metal pool a magnetic field making a periodical electromagnetic change and means for moving said magnetic field generating means relatively to the base metal wherein said means for generating a magnetic field includes a



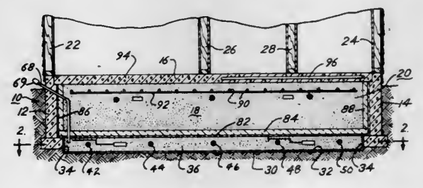
pair of driving coils and said driving coils are disposed so that their centers are staggered from each other by a distance corresponding to the radius of at least one of said driving coils.

4,190,761

HEAT LOSS CONTROL SYSTEM FOR BUILDING HEAT SUMPS

Jerrold L. Colten, Lakeville, Ind., assignor to Bristol Products Inc., Bristol, Ind.

Filed Feb. 28, 1979, Ser. No. 16,286
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—213 **12 Claims**



1. A heat sump system for building structures, comprising side walls defining an inner area with earth beneath said area, heat absorbing and releasing fill material in said space, an insulating layer of porous material disposed between said fill material and the earth, means for removing moisture from said layer and maintaining said layer in an effective heat insulating condition, layer means substantially impervious to water separating said fill material from said insulating layer, a floor above said fill material, and an electrical heating means for heating said fill material.

4,190,762

ADJUSTABLE GAP ELECTRODE ARRANGEMENT FOR ELECTROLYTICALLY HEATED STEAM IRON

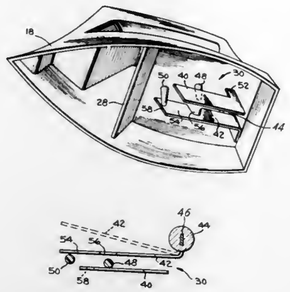
Romeo S. Santiago, San Marino, and Llewellyn Decker, Upland, both of Calif., assignors to General Electric Company, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 924,911
Int. Cl.[2] H05B *3/60;* **D06F** *75/16;* **F22B** *1/30*
U.S. Cl. 219—245 **7 Claims**

1. In a lightweight electrolytic steam iron having a handle and a soleplate with steam distributing means for distributing steam therefrom, a casing of electrically non-conducting material forming the walls of an internal water tank coextensive with and over the soleplate, spaced electrodes supported within said tank for immersion in the water therein for generating steam from the water, and insulated steam conduit extending from the soleplate upwardly into said tank for directing saturated steam from said tank to said steam distributing means, the improvement wherein the spaced electrodes comprise,
a pair of adjacent parallel electrode plates disposed in said tank and spaced from the tank walls and each other, said plates being movable relative to each other to adjust the spacing therebetween,

means connected with said plates for selectively adjusting the spacing between said plates from the iron handle,

separate spaced stop means on said tank walls limiting movement of each plate toward the other to avoid contact therebetween,



one of said plates being shorter than the other so that an extension is defined on said other plate for contacting said stop means limiting the other plate movement, and a cut-out notch on said other plate opposite the stop means of said shorter plate preventing arcing from mineral deposits on said stop means of said shorter plate.

4,190,763

ELECTRICAL CIGAR LIGHTER FOR AUTOMOTIVE VEHICLE WITH SNAP DISC BIMETALLIC SWITCH MEANS

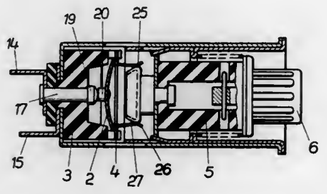
Georg Seibel, and Günther Mues, both of Dreieich, Fed. Rep. of Germany, assignors to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,798

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652857

Int. Cl.² F23G *7/02*

U.S. Cl. 219—265 **6 Claims**



1. An electrical assembly for motor vehicles primarily adapted for use as a lighter for tobacco articles, comprising: a socket assembly; electrical circuit means having a contact member extending to within said socket assembly and including a source of electrical energy to effect energization of an electrical element placed in circuit therewith; a plug assembly adapted to be connected with said electrical circuit means thereby to effect electrical energization of an electrical element, said plug assembly including plug electrical contact means adapted to effect an electrical connection within said socket assembly; electrical connector means fixedly mounted within said socket assembly including first interconnection means adapted to have said plug electrical contact means placed into and out of electrical contact therewith and second interconnection means adapted to be electrically interconnected with said electrical circuit means; a bimetallic switching element shaped in the form of a disc and operating to snap between an ambient-temperature position and an elevated-temperature position in response to temperature levels within said socket assembly; and mounting means operatively maintaining said switching element within said socket assembly between said contact member of said electrical circuit means and said second interconnection means of said electrical connector means, said switching element being thereby mounted to make and break electrical interconnection between said contact member and said second interconnection means solely by means of said switching element snapping to said ambient-temperature position and to said elevated-temperature position, respectively, due to its innate temperature responsiveness; said electrical assembly being thereby operative to energize individually a plurality of different plug assemblies which are capable of being fitted into said socket assembly and which include plug electrical contact means operative to effect electrical connection with said first interconnection means of said electrical connector means.

4,190,764

CONTROL SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR

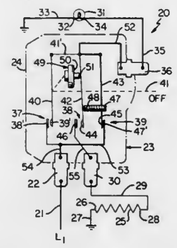
Cloyd E. Decker, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 795,403, May 9, 1977, Pat. No. 4,110,601, which is a continuation of Ser. No. 550,456, Feb. 18, 1975, abandoned. This application Dec. 1, 1977, Ser. No. 856,353

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.² H05B *1/02*

U.S. Cl. 219—506 **15 Claims**



1. A control system comprising a source of energy means, heater means, indicator means, and thermostatically operated control means having selector means for setting said control means in a heater means non-temperature producing "off" setting or in a heater means temperature producing "on" setting, said control means having a single temperature responsive device operatively interconnected to said means to interconnect said heater means to said energy means when the output temperature effect of said heater means is below a predetermined "on" setting of said control means and to disconnect said heater means from said energy means when the output temperature effect of said heater means is above said predetermined "on" setting of said control means, said single temperature responsive device of said control means operating said indicating means to indicate that the output temperature effect of said heater means is above a certain value only when said control means is in said "off" setting thereof, said control means having switch means continuously operating said indicating means independently of said temperature responsive device and regardless of the output temperature effect of said heater means to indicate that said selector means is set in said "on" setting thereof only when said selector means is set in said "on" setting thereof.

4,190,765

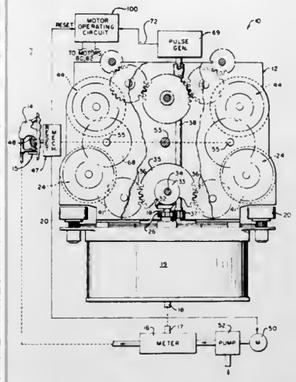
COUNTER OPERATING SYSTEM

Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Division of Ser. No. 832,553, Sep. 12, 1977, Pat. No. 4,127,767, which is a continuation-in-part of Ser. No. 772,943, Feb. 28, 1977, Pat. No. 4,132,887. This application May 30, 1978, Ser. No. 910,688

Int. Cl.² G06M *1/04*

U.S. Cl. 235—92 C **5 Claims**



1. A method of angularly indexing a rotary counting register having at least one rotary register wheel, at a variable register counting rate to register an incoming count having a variable incoming counting rate, with an electrical stepping motor electrically operable in individual steps at a variable stepping rate for indexing the rotary register at a variable register counting rate, the method of angularly indexing the rotary register comprising the steps of accumulating an incoming count at a variable incoming counting rate and electrically operating the stepping motor at a variable stepping rate so that the registered count of the rotary register lags said accumulated count by a variable plurality of individual steps of the motor which varies generally proportionally with one of said variable rates.

4,190,766

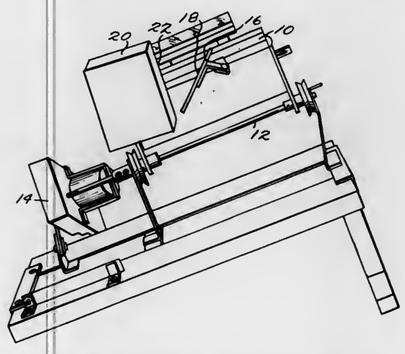
SUN TRACKING SYSTEM

Danny J. Young, Tyler, Tex., assignor to James W. Fair, Tyler, Tex.

Filed Aug. 22, 1977, Ser. No. 826,833

Int. Cl.² G01J *1/20*

U.S. Cl. 250—203 R **30 Claims**



15. A sun tracking system for aligning a body with the sun comprising:

reflector means for reflecting sunlight to illuminate a discrete area disposed along a path, the position of said illuminated area along said path being indicative of the alignment of said reflector means with the sun, said reflector means being fixedly disposed with respect to said body;

motor means for, when not inhibited, rotating said body, and said reflector means in a direction in accordance with the relative motion of the sun and said body; and

photo-sensor means, disposed on said path at a position indicative of alignment between said body and sun, for generating a signal to inhibit said motor means when illuminated by said reflected sunlight.

4,190,767

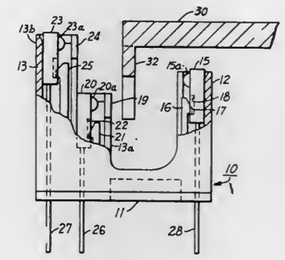
OPTICAL ENCODER APPARATUS

Ronald J. Crouse, McKinney, Tex., assignor to TRW Inc., Los Angeles, Calif.

Filed Jun. 26, 1978, Ser. No. 919,394

Int. Cl.² G01D *5/34*

U.S. Cl. 250—231 SE **7 Claims**



1. Encoder apparatus comprising

(a) a radiant energy source,

(b) first and second radiant energy sensors responsive to the radiant energy emitted by said radiant energy source, and

(c) mounting means for supporting said sensors in spaced relation with said radiant energy source, said mounting means comprising

(i) a base member with substantially parallel first and second hollow spaced apart leg members extending therefrom in the same direction,

(ii) means for supporting said radiant energy source within said first leg member to direct radiant energy toward said second leg member.

(iii) first and second optical apertures in said second leg member opposite said first leg member, and

(iv) means for supporting said first and second radiant energy sensors within said second leg member substantially opposite said radiant energy source whereby radiant energy emitted by said radiant energy source may pass through said first and second optical apertures and strike said first and second radiant energy sensors, respectively.

4,190,768

DETERMINING THE WATER CUT AND WATER SALINITY IN AN OIL-WATER FLOW STREAM BY MEASURING THE SULFUR CONTENT OF THE PRODUCED OIL

Dan M. Arnold, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,569

Int. Cl.² G01V *5/00*; G01N *23/00*

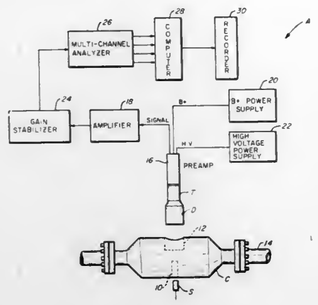
U.S. Cl. 250—270 **26 Claims**

1. A method for analysis of a liquid flowstream, containing oil and water and flowing in a conduit, to determine the water cut of the liquid, comprising the steps of:

(a) bombarding the liquid with fast neutrons which are

slowed down and thereafter engage in thermal neutron capture reactions with materials in the liquid:

(b) obtaining gamma ray energy spectra of the materials in response to the capture of thermal neutrons by the materials in the liquid;



(c) obtaining a measure of the concentration of chlorine, hydrogen and sulfur in the liquid from the gamma ray energy spectra; and

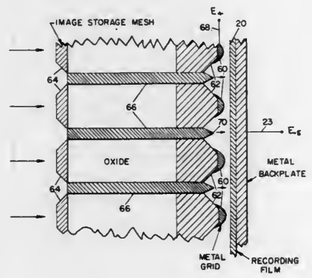
(d) obtaining from the measure of the concentration of chlorine, hydrogen and sulfur, a measure of the water and oil cuts of the liquid.

4,190,769

THERMAL IMAGE CAMERA WITH STORAGE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1978, Ser. No. 913,412
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—332 **14 Claims**



1. In a thermal image camera comprising an area detecting cathode having a front and a back face, means for focusing thermal images on said front face, means for generating and guiding a coherent thermal signal to illuminate said front face, means for generating an electron image at said back face, and means for focusing said electron image, the improvement comprising:

(a) means within said area cathode for converting the different frequencies between the thermal image and the coherent thermal signal to said back face electron image,

(b) storage means in said camera receiving and storing said electron from said back face,

(c) first focusing means for focusing said electron image on said storage means,

(d) means for transferring said electron image from said back face to said storage means,

(e) viewing means for said electron image,

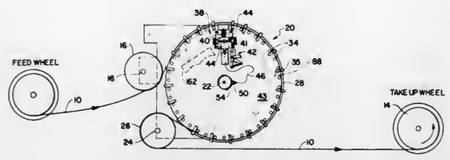
(f) second focusing means for said electron image emitted by said storage means onto said viewing means.

4,190,770

BACKSCATTER INSTRUMENT HAVING INDEXING FEATURE FOR MEASURING COATING THICKNESS OF ELEMENTS ON A CONTINUOUSLY MOVING WEB OF SUBSTRATE MATERIAL

James Saunders, Pleasantville; William D. Hay, Peekskill; Jacques Weinstock, Flushing, and Derek Lieber, North Merrick, all of N.Y., assignors to Unit Process Assemblies, Inc., Syosset, N.Y.

Filed Nov. 15, 1977, Ser. No. 851,735
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—308 **9 Claims**



1. In a backscatter measuring device for measuring the thickness of a coating on an element of substrate material forming a portion of a web, the web having indexing means along an edge thereof and being moved continuously from a feed supply to a take-up location the improvement comprising:

a probe head having a probe means for irradiating the coating on the coated substrate material and detecting the backscatter radiation during a measurement period and having locating means for engaging the indexing means;

the probe means and the locating means being positioned on the probe head in the same relation as the element to be measured and the indexing means are positioned on the web;

a probe holding assembly for holding the probe head in adjacent relation with the web during the measurement period and being mounted to move the probe head along the longitudinal axis of the web;

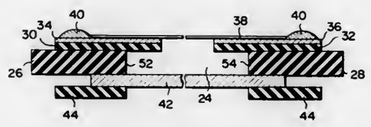
means for causing the probe holding assembly to move the probe head along the longitudinal axis of the web just prior to the measurement period until the locating means engages the indexing means whereby the probe means is properly aligned with the coated element to be measured.

4,190,771

RADIATION DETECTION ELEMENT

Hisashi Kamei, Tokyo; Shimpey Shirayama, Yokohama; Tsuneo Nakakita, Kawasaki; Moriyoshi Murata, and Yushichi Kikuchi, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 23, 1978, Ser. No. 936,085
Claims priority, application Japan, Aug. 24, 1977, 52/100605
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—385 **8 Claims**



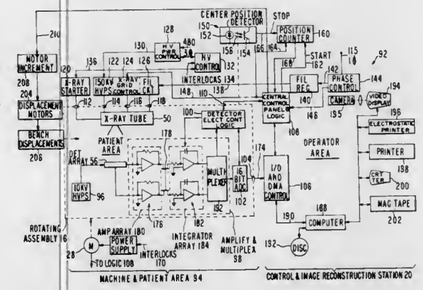
1. A radiation detection element comprising an insulating base frame having a pair of leg portions with a spacing left therebetween; a pair of electroconductive members each disposed along one surface of the corresponding leg portions; an electrode plate disposed on the rear surface of the insulating base frame to cover the spacing between the leg portions; a plurality of signal electrode wires disposed between the electroconductive members such that they confront the electrode plate; and an insulating member disposed at least between the insulating base frame and the electroconductive member or between the insulating base plate and the electrode plate and having its longitudinal edge portion overhung beyond the inner wall surface of the insulating base frame into the spacing between the leg portions of the base frame.

4,190,772

TOMOGRAPHIC SCANNING APPARATUS HAVING DETECTOR SIGNAL DIGITIZING MEANS MOUNTED TO ROTATE WITH DETECTORS

Kendall L. Dinwiddie, Palo Alto; Robert G. Friday, Portola Valley; Janos A. Racz, San Jose, and Edward J. Seppi, Menlo Park, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 19, 1976, Ser. No. 677,958
Int. Cl.[2] A61B *6/00*
U.S. Cl. 250—445 T **13 Claims**



1. Apparatus for examining a bodily portion of a human being by means of penetrating radiation and providing a digital output signal for use in reconstruction of a two-dimensional representation of the bodily structure residing in a thin section taken through said body portion; said apparatus comprising:

an assembly rotatable about an axis extending along a central opening defined therein;

means for positioning the portion of said body to be examined within said central opening, whereby said axis of assembly rotation is substantially perpendicular to said section;

a source of penetrating radiation being mounted on said assembly toward one side thereof and providing radiation in the form of a fan beam;

detector means for said radiation positioned on said assembly opposite said source for detecting radiation progressing laterally across said section and not absorbed by said body portion;

means for rotating said assembly whereby said fan beam impinges upon said body portion at a plurality of incident directions;

signal processing and conditioning means mounted on said assembly and movable therewith, for receiving the output signals from said detector means and amplifying and converting said signals to digital form; and

first interconnection means for receiving the outputs from said signal processing and conditioning means and enabling interfeed of said digitalized output signals to a data receiving station.

4,190,773

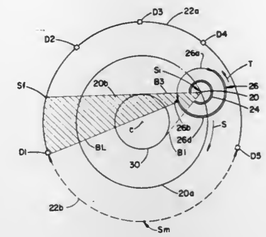
SHUTTER FOR ROTATING SOURCE CT SCANNER

Arthur B. Braden, 6263 Gatewood Dr., Mentor, Ohio 44060; John J. Kuwik, 411 E. 322nd St., Willowick, Ohio 44094; Samuel K. Taylor, Taylor Wells Rd., Chardon, Ohio 44024, and John Covic, 1581 Mapledale, Wickliffe, Ohio 44092

Filed Jul. 1, 1977, Ser. No. 812,317
Int. Cl.[2] A61B *6/02;* **G01N** *23/08*
U.S. Cl. 250—445 T **51 Claims**

41. A radiation aperture system for a CT scanner having a rotating source of radiation and a detector array including a series of stationary radiation detectors at least partially encircling the path of the source in the same plane, comprising:

a radiation blocking body having at least one radiation passing aperture mounted for rotation about the source; and



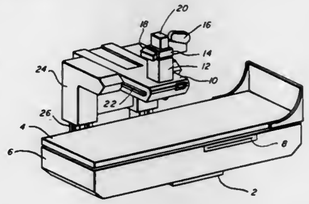
drive means for causing counter-rotation of said body about the source as the source rotates.

4,190,774

RADIOGRAPHIC TABLE SYSTEM

Cedomir S. Marinkovich, Chicago, and William M. Crimmins, Vernon Hills, both of Ill., assignors to Litton Industrial Products Inc., Beverly Hills, Calif.

Filed Mar. 9, 1978, Ser. No. 884,906
Int. Cl.[2] A61B *6/04*
U.S. Cl. 250—446 **14 Claims**



1. In a radiographic system of the type typically including a table for supporting the radiographed subject,

means for producing and directing radiographic beams to the area of the subject to be radiographed,

beam receiving means for producing and displaying the radiographic image of the radiographed area,

means for supporting the beam-directing means and beam-receiving means on opposite sides of the table,

means for moving the beam-directing and beam-receiving means in alignment in generally transverse and longitudinal directions, and

means for moving at least one of the beam-directing and beam-receiving means generally vertically while generally maintaining their alignment

the improvement comprising:

first carriage means mounted within the table body for generally longitudinal movement and adapted to support one of the beam-directing means and beam-receiving means as the lower beam means, the first carriage means including first guide means for permitting generally transverse movement of the lower beam means;

a generally vertically extending support member coupled to the first carriage means for longitudinal movement therewith and extending outward from the table;

second carriage means mounted for guided generally vertical movement and adapted to support a housing contain-

ing the other of the beam-directing and beam-receiving means in alignment with the lower beam means and including second guide means for permitting generally transverse movement of said housing and

means for synchronizing the transverse movement of the beam-directing and beam-receiving means.

4,190,775

OPTICAL MEMORY PLAYBACK APPARATUS

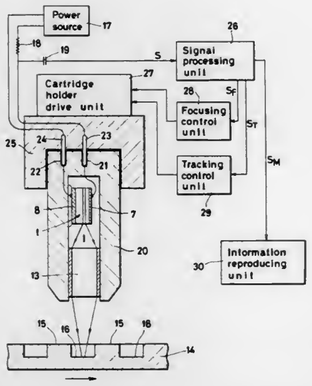
Kenjiro Sakurai; Junichi Shimada, both of Tokyo; Takitaro Morikawa, Sayama; Yoshinobu Mitsuhashi, Tokyo; Satoshi Ishihara, Tanashi; Atsuya Seko, Higashi-Murayama, and Tetsutaro Yasuhira, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 658,770, Feb. 17, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,275

Claims priority, application Japan, Feb. 18, 1975, 50-19472; Apr. 28, 1975, 50-50732

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—570 **3 Claims**



1. An optical memory playback apparatus, which comprises:

a medium having information stored therein in the form of an arrangement of reflective regions and nonreflective regions,

an electroluminescent semiconductor element adapted to emit a light through one end surface thereof for reading out the information from the medium,

a rod lens serving to lead the light emitted from the electroluminescent semiconductor element onto the medium and return the light reflected from the medium to the end surface of the electroluminescent semiconductor element,

a cartridge having the electroluminescent semiconductor element and the rod lens incorporated therein with their optical axes coinciding with each other, a cartridge holder drive means having the cartridge held in a state freely movable in the lateral direction and the perpendicular direction with respect to the medium,

a signal processing unit serving to detect the change of terminal voltage of the electroluminescent semiconductor element due to the self-coupling effect brought about by the returned light from the medium,

an information reproduction means for reproducing the information in accordance with the signal received from the signal processing unit,

a focusing control means serving to issue a signal to the cartridge holder drive means in accordance with the signal from the signal processing unit for thereby controlling the focal point of the light being sent to the medium, and

a tracking control means serving to issue a signal to the cartridge holder drive means in accordance with the signal from the signal processing unit for thereby controlling the tracking of the light being sent to the medium.

4,190,776

MULTIPOINT MEASURING DEVICE

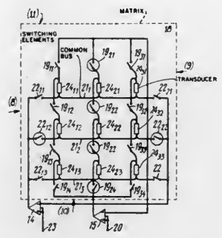
Boris P. Podboronov, ulitsa Molodezhnaya, 30, kv. 50, Zhukovsky Moskovskoi oblasti; Sergei S. Sokolov, ulitsa Vavilova, 513, kv. 137, Leningrad, and Anatoly V. Furman, ulitsa Chkalova, 21, kv. 6, Zhukovsky Moskovskoi oblasti, all of U.S.S.R.

Filed Jan. 11, 1978, Ser. No. 868,630

Claims priority, application U.S.S.R., Jan. 18, 1977, 2443394

Int. Cl.[2] H01H *0/00*

U.S. Cl. 307—112 **1 Claim**



1. A multipoint measuring device, comprising

a measuring circuit;

switch means having switching elements;

a plurality of transducers, each converting the measurand to an electric signal and each having two terminals, said transducers forming, in conjunction with said switching elements, a matrix having columns formed by said switching elements connected in series, and rows, each of said rows comprising a common bus, each of said buses having a beginning and a spaced opposite end and having connected thereto one of said switching elements at the beginning and one of said switching elements at the end, each of said transducers having one of the terminals thereof connected to a respective switching element forming the corresponding column of the matrix and the other terminal thereof connected to the common bus of a respective row of said matrix;

a first compensator for the rows of said matrix; and

a second compensator for the columns of said matrix, said compensators compensating for the resistances of the connecting lines of said transducers and the intrinsic resistances of said switching elements, said compensators connecting said matrix to said measuring circuit so that both rows and columns of said matrix are connected in parallel with said compensators.

4,190,777

POSITION SENSOR FOR ROTATABLE LAMP CHANGER TURRET

Dan G. Luce; William R. Klein, both of Houston, and Richard D. Krenke, Katy, all of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Aug. 2, 1978, Ser. No. 930,308

Int. Cl.[2] H01H *3/00;* **H05B** *39/10*

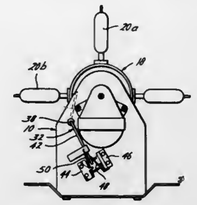
U.S. Cl. 307—139 **2 Claims**

1. A position sensor for a rotatable lamp changer turret having having a plurality of lamps which are controllably rotated by a motor in sequence to an operating position as circuit means senses when at least one of the lamps burn out comprising,

a circular cam positioned on the turret, said cam including first position indicating portion for each of the lamps for indicating when each of the lamps is in the operating position,

said cam including a second position indicating portion for indicating that all of the lamps have been rotated past the operating position,

a cam follower engaging said cam and actuated by said first and second position indicating portions as the turret rotates,



electrical switch means connected to the cam follower and actuated for controlling the motor, and

a third cam portion positioned between each of the first cam portions for actuating said cam follower and said switch means for actuating the motor until one of said first cam portions is engaged by the cam follower.

4,190,778

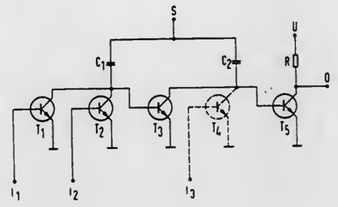
A.C. SUPPLIED INTEGRATED SEMI-CONDUCTOR LOGIC CIRCUIT

Gerhard Krause, Rosenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 647,856, Jan. 9, 1976. This application Jun. 12, 1978, Ser. No. 914,842

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—254 **1 Claim**



1. A circuit arrangement comprising:

first, second, third and fourth transistors each including a base, an emitter and a collector,

said emitters connected to a common reference potential,

said bases of said first and second transistors adapted to receive d.c. logic control signals,

said base of said third transistor connected to said collectors of said first and second transistors,

said base of said fourth transistor connected to said collector of said third transistor,

a resistor,

said collector of said fourth transistor serving as an a.c. and d.c. output and connected to a d.c. supply potential via said resistor, and

a.c. supply means adapted to receive a high frequency a.c. signal, said supply means connected to said collectors of said first, second and third transistors,

blocking of said first and second transistors by said control signals causing conduction of said third transistor to shunt the a.c. signal from said fourth transistor to maintain it blocked and provide a d.c. output via the d.c. supply and said resistor,

conduction of either of said first and second transistors shunting the a.c. signal from said third transistor causing conduction of said fourth transistor at the frequency of the a.c. signal to provide a d.c. and a.c. output.

4,190,779

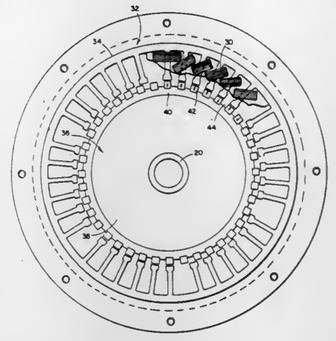
STEP MOTORS

Ernest Schaeffer, 6234 Kent Land Ave., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 683,180, May 4, 1976, abandoned. This application May 23, 1977, Ser. No. 799,302

Int. Cl.[2] H02K *41/02*

U.S. Cl. 310—12 **31 Claims**



1. A motor for encouraging relative motion between a rotor assembly and a stator assembly comprising:

a rotor assembly presenting at a rotor surface a plurality of rotor poles equally spaced at a predetermined pitch, each said pole having the opposite polarity of the immediately adjacent rotor poles;

a stator assembly presenting a plurality of pole groups adjacent said rotor surface, each of said pole groups having an equal plurality of poles with the same pitch as said poles on said rotor assembly, said pole groups being staggered adjacent said surface of said rotor so that when said poles in any of said pole groups is aligned with the adjacent said poles of said rotor assembly, said poles in adjacent said pole groups are offset from said poles on said rotor assembly by a fraction of said predetermined pitch of said rotor poles, said fraction being any ratio of two unequal integers such that the product of said fraction and a predetermined number of said pole groups is an integer, whereby said pole groups are equally spaced adjacent said rotor surface; and

means for controllably polarizing said plurality of poles in any of said plurality of pole groups so that adjacent poles in the respective said pole groups have different polarity.

4,190,780

LIQUID COOLED DISC MACHINES

Eric Whiteley, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Nov. 21, 1977, Ser. No. 853,180

Claims priority, application Canada, Dec. 30, 1976, 268889

Int. Cl.[2] H02K *5/20*

U.S. Cl. 310—59 **10 Claims**

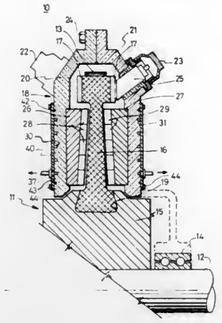
1. A cooling system for an axial air gap dynamoelectric machine having a discoidal rotor and at least one stator, comprising

a plate having one surface conforming to an exterior portion of surface of said stator,

a groove in said exterior portion of surface of said stator forming a passageway when said plate is in engagement with said stator,

means for removably securing said plate to said stator whereby removal of said plate exposes said groove for cleaning,

inlet and outlet means communicating with said passageway, and



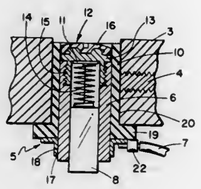
means for introducing a cooling liquid through said inlet means and conducting it from said outlet means.

4,190,781

BRUSH SYSTEM FOR A PORTABLE ELECTRIC TOOL

William D. Sauerwein, Joppa, and Richard E. Walton, II, Fallston, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 24, 1977, Ser. No. 827,144
Int. Cl.[2] H02K *39/38*
U.S. Cl. 310—239 **5 Claims**



1. In a brush system for a portable electric tool equipped with a metal motor housing and an electric motor mounted in the housing, the brush system including:

an annular insulating body mounted in the motor housing;

a conductive tubular sleeve mounted in said body so as to cause an end portion of said sleeve to protrude out from one end of said body;

a carbon brush for contacting the commutator of the electric motor, said carbon brush being slideably disposed in and electrically connected to said tubular sleeve;

resilient biasing means for resiliently biasing said carbon brush to extend beyond said sleeve and to resiliently hold said carbon brush against the commutator; and wherein the improvement according to the invention comprises:

a terminal for holding an electric lead, said terminal being made of ductile material having substantially the characteristics of half-hard brass and including an uninterrupted annular portion said annular portion being press-fitted onto and completely surrounding said protruding end portion of said sleeve; and,

the inner diameter of said annular portion and the outer diameter of said end portion being selected so as to cause said annular portion to be stressed into the plastic range of said material when the annular portion is press-fitted onto said end portion of said sleeve;

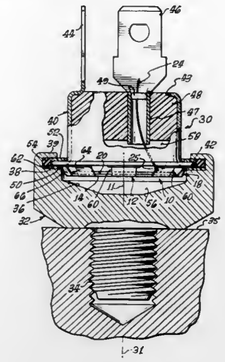
said annular portion defining a smooth cylindrical inner wall in press-fitting engagement with said protruding end portion of said sleeve.

4,190,782

PIEZOELECTRIC CERAMIC RESONANT TRANSDUCER WITH STABLE FREQUENCY

Joe F. Guess, Cedar Rapids, Iowa, assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Jul. 24, 1978, Ser. No. 927,546
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—324 **2 Claims**



1. Temperature compensated piezoelectric transducer including a diaphragm member having a peripheral mounting portion and a central sensing portion, a circular piezoelectric ceramic element concentrically mounted on at least one face of said sensing portion and forming therewith a diaphragm assembly, clamping means for rigidly supporting said mounting portion of the diaphragm member, housing means for spacedly enclosing said diaphragm assembly to allow normal mode vibratory flexure thereof at resonant frequency, and electrode means electrically coupled to the faces of said ceramic element and responsive to flexure thereof; further characterized in that

said diaphragm member is formed of a material having thermal properties selected to be closely similar to those of said ceramic element, whereby variability of the resonant frequency of said diaphragm assembly due to differential temperature response of diaphragm member and ceramic element is reduced to a small residual variation,

said clamping means is formed of a material having thermal properties which differ from those of said diaphragm member and produce radial stress in said mounting portion of the diaphragm member in a direction to cause variation of said resonant frequency larger and opposite to said residual variation,

said diaphragm member including an integrally formed radially flexible section interposed between said mounting portion and said sensing portion, which section partially isolates the diaphragm portion from radial stress in the mounting portion,

the configuration of said flexible section being selected to transmit to the sensing portion an amount of said radial stress which approximately compensates said residual frequency variation.

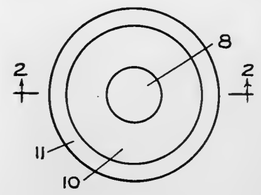
4,190,783

ELECTROACOUSTIC TRANSDUCERS OF THE BI-LAMINAR FLEXURAL VIBRATING TYPE WITH AN ACOUSTIC DELAY LINE

Frank Massa, Randolph, Mass., assignor to The Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, Cohasset, Mass.

Filed Jul. 25, 1978, Ser. No. 927,893
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—324 **10 Claims**

1. In combination in an electroacoustic transducer, a flexurally vibratile plate assembly comprising a plurality of bonded plates at least one of which is capable of changing its dimensions upon being subjected to the influence of an electrical signal, suspension means for supporting said vibraplate assembly, said suspension means characterized in that the flexural stiffness of said suspension means is less than the flexural stiffness of said vibratile plate assembly whereby said suspension means does not significantly impede the free flexural displacement of the vibratile plate assembly when it is operated at its fundamental free flexural resonant mode of vibration, said suspension means further characterized in that it provides an acoustic seal at the peripheral edge ofsaid vibratile plate to prevent the flow of sound vibrations between the opposite peripheral faces of said vibratile plate assembly when it is operating at its fundamental free resonant mode of vibration, said vibratile plate assembly further characterized in that when



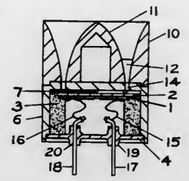
it is operating at its fundamental free resonant frequency mode, the displacement of the peripheral area of the vibratile surface of said vibratile plate assembly is of opposite phase compared with the displacement of the central area of said plate assembly, a second plate member having a center opening, said second plate member is positioned in close proximity to the vibratile surface of said vibratile plate assembly and positioned so that the center of the opening in said second plate is in alignment with the central portion of said vibratile plate assembly, said second plate member further characterized in that the area of the center opening does not exceed 50% of the total vibrating area of said vibratile plate assembly, the area of said vibratile plate assembly characterized in that the transverse dimensions of said vibratile plate assembly are greater than $\frac{1}{2}$ wavelength and less than $1\frac{1}{2}$ wavelength of sound in the medium at the frequency of operation.

4,190,784

PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCERS OF THE BI-LAMINAR FLEXURAL VIBRATING TYPE

Frank Massa, Randolph, Mass., assignor to The Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, Cohasset, Mass.

Continuation-in-part of Ser. No. 927,893, Jul. 25, 1978. This application Sep. 15, 1978, Ser. No. 942,481
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—324 **12 Claims**



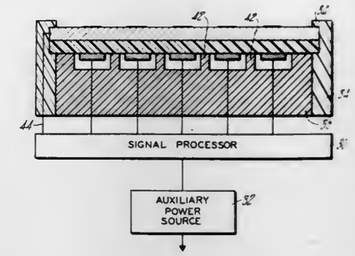
1. In combination in an electroacoustic transducer, a flexurally vibratile plate assembly comprising a plurality of bonded plates at least one of which is capable of changing its lateral dimensions upon being subjected to the influence of an electrical signal, support means for supporting said vibratile plate assembly, said support means characterized in that it does not significantly impede the free flexural displacement of the vibratile plate assembly when it is operated at its fundamental free flexural resonant mode of vibration, said vibratile plate assembly characterized in that when it is operating at its fundamental free resonant frequency mode, the displacement of the peripheral area of the vibrating surface of said vibratile plate assembly is of opposite phase compared with the displacement of the central area of said vibratile plate assembly, a cup-shaped housing structure having a closed bottom portion and an axially-aligned open end portion, said housing structure adapted for enclosing said vibratile plate assembly, said support means characterized in that it holds said vibratile plate assembly in axial alignment with said housing structure when it is enclosed in said housing, a lid, means for attaching said lid to said open end of said housing structure whereby to close said open end, said lid characterized in that it has an opening, and further characterized in that said opening is concentric with the axis of said cup-shaped housing when said lid is attached to close said housing, spacing means for locating the vibratile surface of said vibratile plate assembly in close spaced proximity to the inner wall surface of said lid when said lid is attached to said housing structure, said spacing means characterized in that the total contact area of said spacing means is negligibly small compared with the surface area of said vibratile disc, said spacing means further characterized in that it includes at least three separate small surfaces located in a plane perpendicular to the axis of said cup-shaped housing, said spacing means further characterized in that the central axis of said vibratile plate assembly is held in alignment with the central axis of said housing structure, said opening in said lid further characterized in that the area of the opening does not exceed 50% of the total area of said vibratile plate assembly, said lid further characterized in that the radial dimension between the outer peripheral edge of the opening in said lid and the outer peripheral edge of said closely spaced vibratile plate assembly is greater than approximately $\frac{1}{4}$ wavelength and less than approximately $\frac{3}{4}$ wavelength of the sound in the medium at the frequency of operation whereby said lid acts as an acoustic delay line for reversing the out-of-phase acoustic vibrations generated by the outer peripheral area of the vibratile disc before they reach the opening in said lid whereby the delayed peripheral vibrations add constructively to the vibrations generated by the central area of said vibratile disc.

4,190,785

PRESSURE SENSITIVE SIGNAL GENERATOR USING PIEZOELECTRIC COATING

Harry W. Kompanek, Santa Barbara, Calif., assignor to Essex Transducers Corporation, Carpinteria, Calif.

Continuation-in-part of Ser. No. 748,993, Dec. 9, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,998
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—330 **15 Claims**



1. An electrical signal generator comprising:

a substrate of conductive material which forms a first electrode;

a coating of piezoelectric material including an interbonded mixture containing phosphorous, zirconium, titanium and

chromium chemically bonded to one side of the substrate by the attachment of phosphate ions in the mixture to the substrate due to ionic bonding;

a region of conductive material which is joined to the exposed surface of the piezoelectric material and forms a second electrode; and

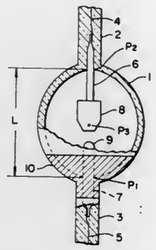
electrical conduction means attached to the first electrode and the second electrode to conduct away as useful electrical signals, electric pulses established across the piezoelectric material due to force applied to the substrate.

4,190,786

DISCHARGE LAMP

Takehiro Kira, Akashi, Japan, assignor to Ushio Denki Kabushikikaisha, Japan

Filed Mar. 29, 1978, Ser. No. 891,460
Claims priority, application Japan, Dec. 23, 1977, 52-153515
Int. Cl.[2] H01J *61/16, 61/20, 61/30*
U.S. Cl. 313—184 **29 Claims**



1. A source of ultraviolet radiation comprising:

a sealed bulb, at least a portion of said bulb being transmitting to wavelengths below 3000 angstroms,

a pair of electrodes sealed in said bulb,

mercury sealed within said bulb in amount from 1 to 13 mg. per cc. of volume of said bulb, and

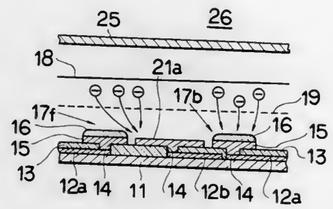
at least one rare gas sealed within said bulb at a pressure from 2 to 10 atm. at 25° C.

4,190,787

PHOSPHORUS LUMINESCENT DISPLAY TUBE

Takao Kishino; Yoichi Mera; Satoru Makita, and Tsutomu Morooka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Chiba, Japan

Filed Jun. 12, 1978, Ser. No. 914,948
Claims priority, application Japan, Jul. 7, 1977, 52-80439
Int. Cl.[2] H01J *63/02, 63/06*
U.S. Cl. 313—494 **5 Claims**



1. A phosphorus luminescent display tube comprising:

a vacuum casing made up of a substrate and a light transparent front bulb bonded to each other;

an insulating layer formed on said substrate;

a filamentary cathode provided in said vacuum casing for emitting thermions when energized and heated;

a control electrode provided in said vacuum casing for accelerating and controlling the thermions emitted from said filamentary cathode;

a plurality of pattern display sections, mounted on said insulating layer, each composed of a plurality of segment anodes each coated with a phosphor layer for emitting light when the thermions impinge thereon, said segment anodes being selectively given an anode potential; said control electrode being located between said cathode and said display sections and,

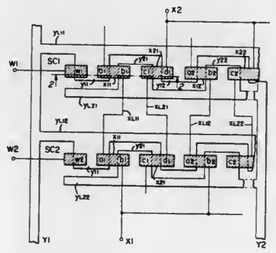
auxiliary anode conductors mounted on said insulating layer in the vicinity of and substantially on the same level with the segment anodes of said pattern display sections and having a bias voltage that is kept positive with respect to said filamentary cathode so as to absorb electron oscillations occuring in the vicinity of said segment anodes to which the anode potential is not given.

4,190,788

GAS DISCHARGE PANEL

Kazuo Yoshikawa, and Shizuo Andoh, both of Kobe, Japan, assignors to Fujitsu Limited, Japan

Filed Jul. 7, 1977, Ser. No. 813,627
Claims priority, application Japan, Jul. 9, 1976, 51-82410
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169.4 **24 Claims**



1. A gas discharge panel comprising

first and second insulating substrates arranged in parallel and separated by a discharge gap,

a discharge gas sealed within said gap,

a first electrode set on the inside surface of said first substrate and a second electrode set on the inside surface of the second substrate,

the projected area of each electrode of one of the said two sets having an area of partial overlap with the area of at least one corresponding electrode of the other of said sets, said projection being normal to the surface of said substrates,

a dielectric layer covering said electrode sets on said substrates,

said first and second electrode sets comprising the electrodes of a plurality of discharge cells, each of said cells corresponding to each said area of overlap in the discharge gap between said inside surfaces of said substrates, and

said discharge cells determining the position of at least one shift channel,

connecting conductors are provided on each of said substrates to connect said electrodes on each substrate to define groups of commonly-connected alternating electrodes on each substrate, further comprising a plurality of shift channels,

a pair of connecting conductors on the first substrate define two of said electrode groups along each of said shift channels, and

connecting conductors on the second substrate connect in common corresponding electrodes of said plurality of shift channels of said second set, said grouping extending across the direction of said shift channels,

at least two of said shift channels are connected in series as

a result of the spacing and the phase of a adjacent discharge cells at the ends of each of said shift channels to result in at least one longer shift channel, and

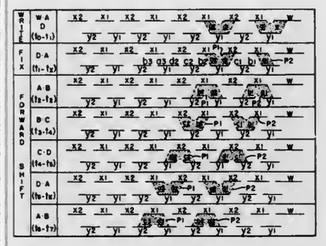
a write electrode is provided at one end of said longer shift channel.

4,190,789

DRIVING SYSTEM FOR A SELF-SHIFT TYPE GAS DISCHARGE PANEL

Toyoshi Kawada; Hisashi Yamaguchi, both of Kobe, and Hirofumi Kashiwara, Kasai, all of Japan, assignors to Fujitsu Limited, Japan

Filed May 16, 1978, Ser. No. 906,342
Claims priority, application Japan, May 17, 1977, 52-57210; May 19, 1977, 52-57989
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169.4 **23 Claims**



1. A system for driving a multi-row self shift type gas discharge panel for displaying information in the form of discharge spots, said panel having a plurality of shift rows, each of said shift rows comprising at least one shift channel, each said shift channel having a regular and periodic arrangement of discharge cells, said discharge cells being defined by a plurality of electrode groups, said system comprising:

means for selecting at least one of said shift rows;

means for applying shift operation voltages to the electrode groups defining the discharge cells of the shift channels of said selected shift rows(s) for shifting the discharge spots in said selected shift row(s) in a predetermined one of forward and backward directions; and

means for applying sway operation voltages to the electrode groups defining the discharge cells of the shift channels of the non-selected one(s) of said plurality of shift rows for swaying the discharge spots in the shift channels of said non-selected shift rows within a predetermined number of adjacent discharge cells of said shift channels of said non-selected shift rows during said shift operation of discharge spots in said selected shift rows;

whereby the information in said selected shift row(s) is shifted while the information in said non-selected shift row(s) is displayed in predetermined locations by said sway operation.

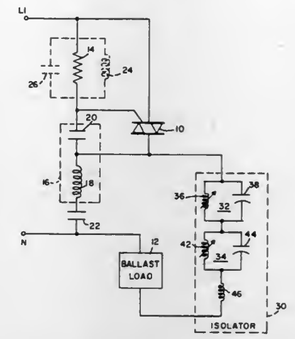
4,190,790

ISOLATOR CIRCUIT FOR USE WITH FREQUENCY SENSITIVE SWITCHING CIRCUIT

John L. Plumb; Sheppard Cohen, both of Danvers, and Paul H. Ingalls, Swampscott, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 29, 1978, Ser. No. 974,278
Int. Cl.[2] H04Q *1/45;* **H05B** *41/36*
U.S. Cl. 315—313 **12 Claims**

1. An isolator circuit for use in a power system including a ballasted load, a power circuit comprising first and second electrically energized conductors carrying power for the load, a frequency generator for applying a first control signal to the power circuit remotely of the load, and a frequency sensitive switching circuit coupled between the first conductor and one side of the load for controlling the energization of said ballasted load in response to said first control signal applied to the power circuit, the second side of the load being connected to the second conductor, said isolator circuit comprising, circuit



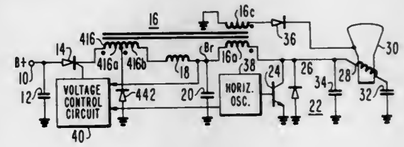
means tuned to block said first control signal, and means for connecting said tuned circuit means between said switching circuit and said one side of the ballasted load.

4,190,791

SWITCHING REGULATOR FOR TELEVISION DEFLECTION CIRCUIT WITH IMPROVED ULTOR VOLTAGE REGULATION

James E. Hicks, New Palestine, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 2, 1978, Ser. No. 957,221
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—408 **9 Claims**



1. A regulator drive arrangement for a television display apparatus, comprising:

a controllable switch, a filter inductor, a first winding and a deflection switch coupled across a source of unregulated direct voltage for providing a path for the flow of an increasing current through said inductor during those intervals in which said controllable switch is closed;

a rectifier coupled to a terminal of said source and with said inductor for providing a path for the flow of a decreasing current through said inductor during those intervals in which said controllable switch is open;

a capacitor coupled with said inductor and to a terminal of said source for integrating said increasing and decreasing current through said inductor to form an operating voltage across said first winding and said deflection switch;

a control circuit coupled to said controllable switch and to a source of voltage representative of said operating voltage for controlling said controllable switch and stabilizing said operating voltage;

a deflection winding and retrace capacitance means coupled across said deflection switch for providing a path for the flow of deflection current during recurrent trace and retrace intervals, said retrace intervals being dependent upon the inductance in parallel with said retrace capacitance means;

an ultor generator coupled to said first winding for generating an ultor voltage, variations in said ultor voltage resulting from variations in the ultor current and from variations in the duration of said retrace interval; and

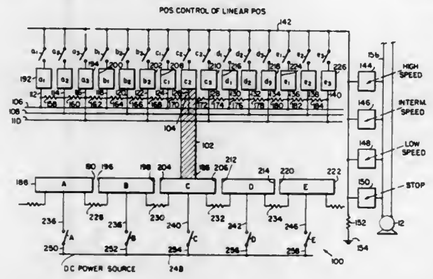
a second winding serially coupled with said inductor for providing a path for the flow of said increasing and decreasing currents, said second winding being coupled with said first winding for coupling said inductor in parallel with said deflection winding for altering the inductance in parallel with said retrace capacitance means and for altering said duration of said retrace interval in a manner tending to compensate for said variation in said ultor voltage resulting from variations in the ultor current.

4,190,792

POSITIONING CONTROL SYSTEM

Vincent Chan, 24 Chang An W. Rd., 6th Fl., Rm 601, Taipei, Taiwan

Filed Mar. 9, 1978, Ser. No. 884,754
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—663 **4 Claims**



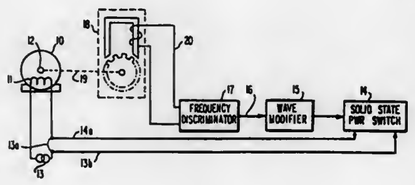
1. A position control systme for subjecting an object to motion in a controlled manner comprising a base, a universal electric moter mounted a said base, gear box means having input and output means, with gear box means providing a selected ratio of speed between motion of said input and said output means, driving connection means connection said universal electric motor and said gear box means, connecting means for connecting said object to said output means of said gear box means, control circuit means with said control circuit means comprising a plurality of voltage sensitive motor controls connected to said universal electric motor, a first plurality of spaced electrical conductors, a second plurality of spaced electrical conductors with said second plurality of spaced electrical conductors disposed opposite said first plurality of spaced electrical conductors, a movable conductive brush disposed for motion responsive to motion of said object and disposed to connect opposite conductors of said first and said second pluralities of spaced electrical conductors, first electrical resistance means connecting said first plurality of spaced electrical conductors, second electrical resistance means connecting said second plurality of spaced electrical conductors circuit connection means connecting said first and said second electrical resistance means, a source of direct current power connected to said circuit connection means, a plurality of switch means disposed one each, connecting said first plurality of conductors with said first electrical resistance means and connecting said second plurality of conductors with said second electrical resistance means so that closing selected switches of said plurality of said switch means causes selected resistance resistance values to be electrically connected within said control circuit resulting in selected voltages being sensed by said boltage sensitive motor controls thereby causing said universal electric motor to drive said object to a position corresponding to said selected switches, a pulley mounted on said input means on said gear box means, a drive belt connecting said pulley and said universal electric motor, comprising a pair of plates, a slip-friction layer disposed between said plates and fastened to a first of said pair of plates and fastened to a first of said pair of plates, with said first plate connected to said drive belt and with said second plate connected to said input means on said gear box means and spring loading means disposed to urge said pair of plates into contact so that roque in excess of a predetermined value causes said pair of plates of slip relative to each other thereby preventing damage to said position control system.

4,190,793

ENERGY ECONOMIZER FOR INDUCTION MOTORS

Louis W. Parker, 2040 N. Dixie Hwy., Ft. Lauderdale, Fla. 33300, and Rhey W. Hedges, Ft. Lauderdale, Fla., assignors to Louis W. Parker, Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 839,945, Oct. 6, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,698
Int. Cl.[2] H02P *7/36*
U.S. Cl. 318—800 **20 Claims**



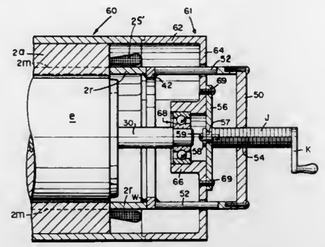
1. An energy economizing AC power control system operative to reduce the iron and copper losses in a conventional induction motor by varying the form and magnitude of the energization voltage coupled thereto, comprising a conventional AC induction motor having a stator winding and a rotor adapted to be coupled to a load, a sine wave power source for energizing said stator winding to effect rotation of said rotor, and a conditionally closed loop positive feedback control means that becomes operative to control the energization of said stator winding from said power source at a particular speed near the full speed of said motor, said closed loop positive feedback control means comprising: motor load detecting means coupled to said rotor and operative to produce a frequency modulated signal related to the load on said motor, an inverting DC amplifier coupled to said load detecting means for producing a DC control voltage which varies in magnitude in inverse relation to the speed and load of said motor, wave modifier means coupled to the output of said DC amplifier and responsive to said DC control voltage, said wave modifier means including switching means disposed between said sine wave power source and said stator winding, the conduction time of said switching means being controllable during each cycle from said power source as a function of the magnitude of said DC control voltage, said wave modifier means being operative to apply full sine waves of voltage from said power source to said stator winding during rotational start-up and speed build-up of said motor and, as said motor reaches said particular speed, then being operative to substantially maintain said particular speed by varying the electrical angle of each cycle of said power source which is actually coupled to said stator winding to provide varying fractions of each sine wave of voltage from said power source to said stator winding in accordance with the inherent electro-mechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, whereby said closed loop positive feedback control means functions to substantially reduce the iron and copper losses of said conventional motor by causing the average current supplied from said power source to said stator winding to be supplied primarily as a function of the said properties of said motor and the load on said motor as the load on said motor varies between zero and maximum rated motor load.

4,190,794

ALTERNATING CURRENT MOTOR WITH ADJUSTABLE OUTPUT TORQUE BY MEANS OF ADJUSTABLE MAGNETIC BARS

Kreso Mikulic, 1634 Crest Hill, Cincinnati, Ohio 45237

Filed Mar. 20, 1978, Ser. No. 888,331
Int. Cl.[2] H02P *7/08*
U.S. Cl. 318—831 **12 Claims**



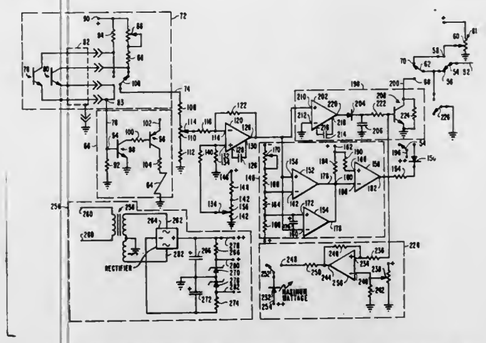
1. An alternating current motor of both single and polyphase types which include a rotor, a stator, and an air gap between adjacent peripheral surfaces of the rotor and stator which comprises:
- a plurality of radially disposed, laterally spaced, elongate slots in the stator wherein each slot terminates in an inner air gap which is in open communication with the air gap between the rotor and stator;
- a plurality of windings disposed in each stator slot so arranged as to provide an elongate open space or channelway between the windings and the said inner air gap;
- a plurality of elongate, magnetic control rods slideably receivable in the said elongate open space or channelway of a stator slot; and
- means imparting selective, uniform, simultaneous, endwise movement to said rods between fully advanced and retracted positions relative to their respective open spaces or channelways of the stator slots for changing the paths and intensity of the stator flux enroute to the rotor.

4,190,795

CONSTANT INTENSITY LIGHT SOURCE

Stephen M. Schultheis, West Covina, Calif., assignor to Coberly & Associates, Pasadena, Calif.

Filed Sep. 9, 1977, Ser. No. 831,904
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—17 **3 Claims**



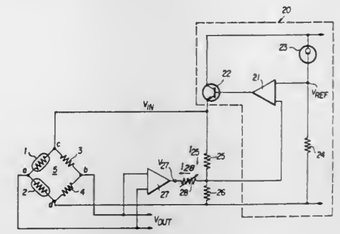
1. A power apparatus for driving a lamp at constant light intensity in photolithographic processes, including:
- an optical sensor circuit wherein a phototransistor indicates the intensity of light of a desired wavelength range incident on a surface by varying an applied voltage to yield a sensor feedback voltage corresponding to that intensity, said phototransistor positioned directly in the path of said light for exposure to the full intensity thereof;
- a switching direct current power supply capable of producing a regulated variable power output to said lamp in response to an electrical control input;
- a feedback interface circuit between said optical sensor circuit and said power supply providing said electrical control input to said power supply in response to said sensor feedback voltage to maintain the intensity of said light incident on said surface at a constant level, said interface circuit including means for automatically comparing said sensor feedback voltage to a reference voltage and varying said electrical control input and thus the power supply output to said lamp to eliminate any difference in those voltages, and
- internal calibration means for recalibrating said apparatus after the optical characteristics of said lamp have been altered, said calibration means comprising:
  - means for applying to said power supply a predetermined electrical control input causing said power supply to drive said lamp at a predetermined electrical power level;
  - means for manually adjusting said reference voltage relative to said sensor feedback voltage resulting from said predetermined electrical power level; and
  - means for automatically indicating when said reference voltage substantially equals the sensor feedback voltage resulting from said predetermined electrical power level comprising a light emitting diode and a window comparator circuit automatically analyzing the output of said automatic comparison means of said interface circuit and igniting said light emitting diode when said output of said automatic comparison means becomes substantially zero, indicating that said reference voltage substantially equals said sensor feedback voltage;
- whereby said power apparatus can be readily calibrated to operate at a constant intensity of lamp light incident on said surface by manually adjusting said reference voltage to substantially equal said sensor feedback voltage resulting from said predetermined electrical power level, said constant intensity having a value substantially equal to the intensity produced on said surface at said predetermined electrical power level.

4,190,796

PRESSURE DETECTING APPARATUS HAVING LINEAR OUTPUT CHARACTERISTIC

Akira Ishii, Machida, Japan, assignor to Tokyo Shibaura Electric Company, Limited, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,109
Claims priority, application Japan, Jun. 2, 1977, 52-65099; Sep. 10, 1977, 52-109130
Int. Cl.[2] G01L *9/06*
U.S. Cl. 323—75 N **10 Claims**



1. A pressure detecting apparatus comprising:
- a bridge circuit having semiconductor pressure sensitive elements;
- means for supplying a constant voltage to said bridge circuit wherein said constant voltage supplying means includes a voltage controlling amplifier having a reference voltage input, and a resistance element connected to the reference

voltage input of the voltage controlling amplifier, the resistance-temperature coefficient of the resistance element being equal to or higher than those of the semiconductor pressure sensitive elements in said bridge circuit;

an amplifier for amplifying the output of said bridge circuit; and

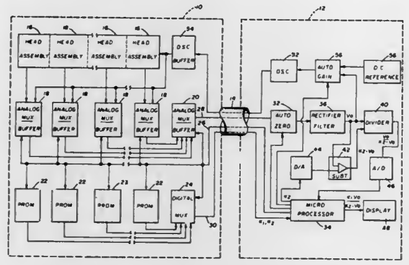
a voltage correcting means connected between the input of said amplifier and the input of said bridge circuit for feeding the output of said bridge circuit back to the input of said bridge circuit.

4,190,797

CAPACITIVE GAUGING SYSTEM UTILIZING A LOW INTERNAL CAPACITANCE, HIGH IMPEDANCE AMPLIFIER MEANS

Thomas H. Lecklider, Bishop's Stortford, England, and John J. Bowers, Medina, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1978, Ser. No. 891,957
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R **20 Claims**



1. A capacitive gauging apparatus for measuring the distance between a probe means and a work piece comprising:

a probe means positionable in proximity to a work piece to form a capacitive means therewith;

a capacitor in series with said probe means;

a voltage source in series with said capacitor and said probe means;

a low internal capacitance, high impedance amplifier means having an input connected between said capacitor and said capacitive means, said amplifier means including a FET having its gate connected to the input of said amplifier, said FET in series with a constant current source; and

processing means for processing the output of said amplifier into a representation of the distance between said capacitive probe and said work piece.

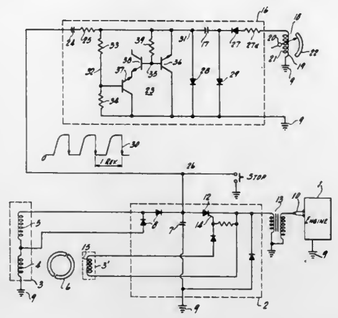
4,190,798

TACHOMETER DRIVEN FROM A CAPACITOR DISCHARGE IGNITION SYSTEM AND INCLUDING A TRANSISTORIZED SHUNT VOLTAGE REGULATOR

Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 6, 1977, Ser. No. 785,015
Int. Cl.² G01P *7/00*
U.S. Cl. 324—169 **11 Claims**

1. A tachometer apparatus adapted to be driven from a repeating voltage signal created by the charging and discharging of the ignition capacitor of a capacitive discharge ignition system for operating an internal combustion engine, comprising an ignition signal input means, a tachometer measuring capacitor means having a predetermined fixed value of capacitance, a readout meter connected in series with said tachometer measuring capacitor means for one polarity of current flow, capacitive coupling means connecting said tachometer capacitor means to said ignition signal input means, diode means to discharge the tachometer measuring capacitor means during the ignition capacitor charging cycle and to rapidly charge the measuring capacitor during the ignition capacitor discharging cycle, and a voltage regulator connected to regulate the level of the charge on said measuring capacitor means and thereby the charge flowing through said meter to an essentially constant value for each cycle, said regulator having a negative temperature coefficient and including a sensing resistor branch connected to the measuring capacitor means to sense the voltage of the measuring capacitor means and a regulating transistor means having an output means connected to shunt current



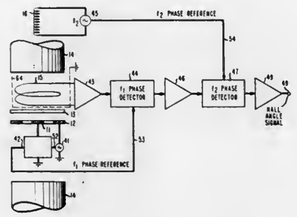
from the measuring capacitor means, said regulating transistor means having an input means, a threshold reference voltage responsive means connected between said input means of said regulating transistor means and said resistor branch to drive said regulating transistor means by the difference in voltage between the voltages of the measuring capacitor and the reference voltage responsive means and thereby regulate the charging of the measuring capacitor, said resistor branch includes a machine trimmable resistance means to control the threshold level of said regulator.

4,190,799

NONCONTACTING MEASUREMENT OF HALL EFFECT IN A WAFER

Gabriel L. Miller, Westfield, and David A. H. Robinson, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1978, Ser. No. 935,518
Int. Cl.² G01R *33/00*
U.S. Cl. 324—239 **13 Claims**



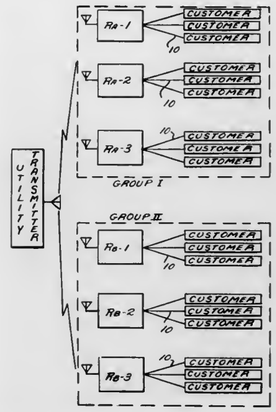
1. A method for the measurement of the Hall angle of the material of a semiconductor wafer characterized by (a) capacitively coupling a radial rf current of a first frequency and of preselected magnitude into the wafer, in the plane of the wafer; (b) imposing, on the wafer, in the region of the rf current, a magnetic field approximately normal to the wafer, thus producing a circular current at the first frequency in the plane of the wafer, (c) inductively picking up a first frequency measurement signal produced by the circular current and (d) measuring the first frequency measurement signal as a measure of the magnitude of the circular current by a method including phase sensitive detecting, thus producing an output signal related to the magnitude and sign of the Hall angle of the wafer material.

4,190,800

ELECTRICAL LOAD MANAGEMENT SYSTEM

Jack R. Kelly, Jr., Stone Mountain, and Glen P. Robinson, Jr., Atlanta, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation of Ser. No. 743,668, Nov. 22, 1976, abandoned.
This application Dec. 12, 1978, Ser. No. 968,811
Int. Cl.² H04N *7/24;* **H04M** *11/04*
U.S. Cl. 325—37 **7 Claims**



1. An improved electrical load management system comprising:

a plurality of distribution transformers each having primary and secondary windings, each of said transformers coupling an electrical power line joined to its primary winding to distribution lines connected to its secondary winding and stepping down the voltage level of the power carried by the associated power line to a level to be supplied via the distribution lines to a group of electricity users, each distribution line servicing at least one of said users;

means for transmitting by radio from a central location a coded signal having address and command information;

a receiver located proximate each of said distribution transformers for receiving said signal independently of said power lines and the transformers;

means associated with said receivers for decoding said signal;

means responsive to said decoded signal for generating a modulated carrier signal; and

means for coupling said carrier signal via the distribution lines to at least one group of users determined by the decoding of said address information.

4,190,801

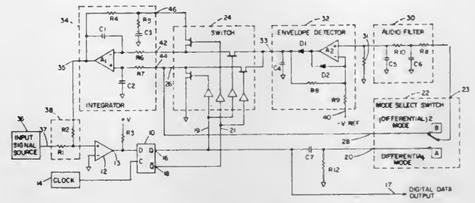
DIGITAL ENCODING CIRCUITRY

Richard E. DeFreitas, Westford, Mass., assignor to DeltaLab Research, Inc., Chelmsford, Mass.

Filed Feb. 6, 1978, Ser. No. 875,336
Int. Cl.² H03K *13/22*
U.S. Cl. 325—38 B **24 Claims**

1. In an electrical system of the type in which a digitally encoded signal is determined at least in part by the difference between a present value of an input signal and a reference signal representative of a past value of said input signal, improved circuitry for generating said reference signal, comprising

extraction means including a filter for extracting from the pattern of bits in said digitally encoded signal information relating to the time derivative of said present value to provide a corresponding control signal,



integrating means responsive to said control signal to provide said reference signal, and

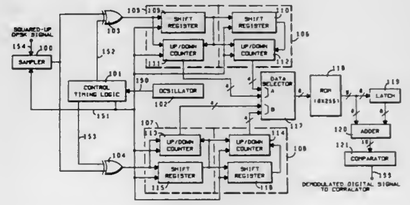
modulating means for feeding back to an input of said filter a modulated signal comprising said control signal modulated by said encoded signal.

4,190,802

DIGITAL DEMODULATOR FOR PHASE SHIFT KEYED SIGNALS

Stephen N. Levine, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1978, Ser. No. 934,299
Int. Cl.² H04L *27/22*
U.S. Cl. 325—320 **11 Claims**



11. In a digital demodulator for digital signals serially encoded according to phase shift keying (PSK) at a predetermined carrier frequency and predetermined bit frequency, said digital demodulator including an oscillator for providing a master clock signal at a multiple of the predetermined carrier frequency, timing circuitry responsive to the oscillator for providing first and second quadrature-related clock signals each at substantially the same frequency as the predetermined carrier frequency, a sampler for digitally sampling the PSK signal at the master-clock frequency and first and second multipliers for multiplying the sampled PSK signal and the first and second clock signals to provide first and second output signals, respectively, and said digital demodulator further including improvement comprising:

first one-bit integrating means receiving the first output signal of the first multiplier and continuously providing in response to the master clock signal a first weighted output signal and the first output signal delayed by one bit;

second one-bit integrating means receiving the delayed first output signal from the first one-bit integrating means for continuously providing in response to the master clock signal a second weighted output signal;

third one-bit integrating means receiving the second output signal of the second multiplier and continuously providing in response to the master-clock signal a third weighted output signal and the second output signal delayed by one bit;

fourth one-bit integrating means receiving the delayed sec-

ond output signal from the third one-bit integrating means for continuously providing in response to the master clock signal a fourth weighted output signal;

means for continuously taking at the master-clock frequency the trigonometric sine value of each of the first, second, third and fourth weighted output signals;

means for continuously multiplying at the master-clock frequency the sine values of the first and second weighted output signals and the sine values of the

third and fourth weighted output signals to provide first and second multiplied output signals, respectively;

means for continuously adding at the master-clock frequency the first and second multiplied output signals to provide a phase indication signal;

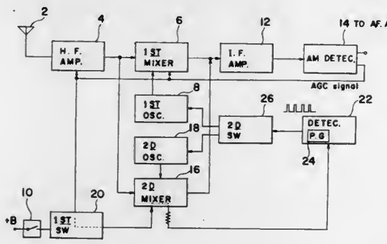
means for continuously comparing the phase indication signal to a predetermined reference signal and providing a demodulated output signal having a predetermined first state when the phase indication signal is greater than the predetermined reference signal and a predetermined second state when the phase indication signal is less than the predetermined reference signal.

4,190,803

MULTIFREQUENCY SUPERHETERODYNE RECEIVER WITH PRIORITY CHANNEL MONITORING

Eigo Imamura, Moriguchi, Japan, assignor to Sanyo Electric Company, Ltd., Moriguchi, Japan

Filed Apr. 25, 1978, Ser. No. 899,718
Claims priority, application Japan, Apr. 25, 1977, 52-48896
Int. Cl.² H04B *1/32*
U.S. Cl. 325—455 **10 Claims**



1. A receiver of the superheterodyne type for receiving radio wave signals on a predetermined number of channels, at least one of which is designated a priority channel while others are nonpriority channels, said receiver comprising in combination:

first circuit means operative to provide reception of a signal on said nonpriority channels;

second circuit means operative to provide reception of a signal on said priority channel;

means for producing an automatic gain control signal, said automatic gain control signal varying from a first controlling level during reception of any one of said signals to a second controlling level during the reception of no signal;

switching means coupled to said first and second circuit means and having at least first and second conditions of operation, the first condition being wherein the first circuit means is made operative and the second condition being wherein the second circuit means is made operative;

pulse generating means for providing to said switching means pulses having first and second output levels, said first output level causing the switching means to operate in the first condition and said second output level causing the switching means to operate in the second condition;

means for detecting the reception of a priority channel by the second circuit means in response to the variation of the automatic gain control signal to the first controlling level during a period in which the pulse generating means produces the second output level; and

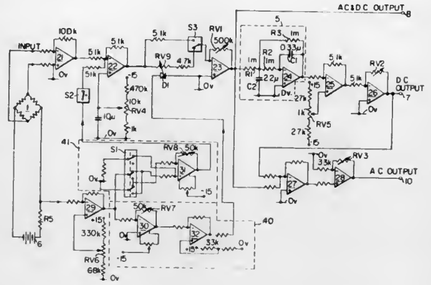
means responsive to the detection of the detecting means for locking the pulse generating means to inhibit the generation of pulses and to continually produce the second output level.

4,190,804

SIGNAL-CONDITIONING CIRCUITS

Clive R. Pyne, and Barry L. Welsh, both of Bedford, England, assignors to National Research Development Corporation, London, England

Filed Dec. 15, 1977, Ser. No. 860,776
Claims priority, application United Kingdom, Dec. 21, 1976, 53433/76
Int. Cl.² G01K *7/00*; G08B *23/00*
U.S. Cl. 328—3 **13 Claims**



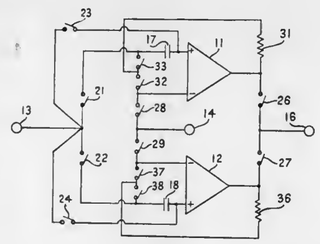
1. A signal-conditioning circuit for use in combination with a transducer of the resistance bridge type, including means for receiving an output signal from a transducer of the resistance bridge type, sensor means for sensing variations in the temperature of the transducer, sensitivity compensation means including gain control means in the path of the transducer output signal responsive to the sensor means for controlling the gain applied to the transducer output signal in dependence upon the temperature of the transducer, and offset compensation means responsive to the sensor means to apply to the transducer output signal a DC offset voltage which varies with the temperature of the transducer.

4,190,805

COMMUTATING AUTOZERO AMPLIFIER

David Bingham, Los Altos, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Dec. 19, 1977, Ser. No. 861,525
Int. Cl.² H03F *1/02*
U.S. Cl. 330—9 **7 Claims**



1. An active analog processing system comprising

first and second like signal processing circuits with each having first and second inputs,

a capacitor connected to the first input of each of said circuits,

input terminals and an output terminal,

switching means operable to alternately connect each of said

circuits between said input and output terminals through said capacitors, and said switching means also being operable to alternately disconnect said circuits from said terminals and resistively couple the output of the disconnected circuit to the first input through the said capacitor thereof and to the second input and to connect the first circuit input directly to a low impedence reference source, such as the input terminal of the system or a ground reference of the system for charging the capacitor with a voltage having a polarity to substantially cancel input low frequency noise, and

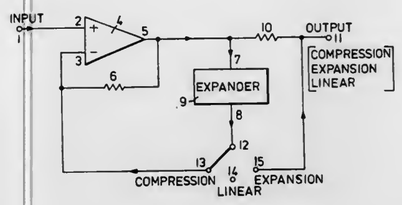
means operating said switching means at a predetermined frequency of operation whereby signals applied to the system are alternately passed by said circuits and the circuits are alternately zeroed by charging of the capacitors thereof to minimize the transmission of noise signals by the system.

4,190,806

CIRCUIT ARRANGEMENT FOR THE SELECTIVE COMPRESSION OR EXPANSION OF THE DYNAMIC RANGE OF A SIGNAL

Jürgen Wermuth, Peine-Stederdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,978
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744249
Int. Cl.² H04B *1/64*
U.S. Cl. 330—51 **9 Claims**



1. A circuit arrangement for the selective compression or expansion of the dynamic range of an input signal applied to an input terminal and for generating an output signal at a first output terminal, comprising

an amplifier having a feed-back resistor connected between its output and input,

means coupling the input of said amplifier to said input terminal and means coupling the output of said amplifier to said first output terminal,

a dynamic expander having a low resistance output circuit, the input of said expander being coupled to the output of said amplifier, and

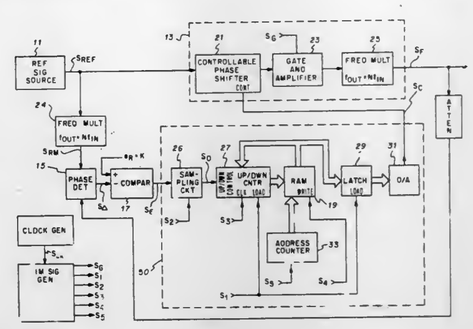
switching means having first and second positions, said switching means connecting said expander in parallel with said feed-back resistor in said first position to provide compression of the dynamic range of said input signal and connecting said expander to said first output terminal in said second position to provide expansion of the dynamic range of said input signal, said feed-back resistor being connected across said amplifier regardless of the position of said switching means.

4,190,807

SAMPLED ERROR PHASELOCK OR FREQUENCYLOCK SYSTEMS

Robert J. Weber, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 3, 1978, Ser. No. 921,676
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **15 Claims**



14. The system comprising:

angularly modulatable means for providing a carrier signal whose phase $\phi_a(t)$ is to eventually follow $\phi_b(t)$ where $\phi_b(t)$ is a prescribed function of time,

means for providing a signal which is a function of difference between $\phi_a(t)$ and $\phi_b(t)$, and

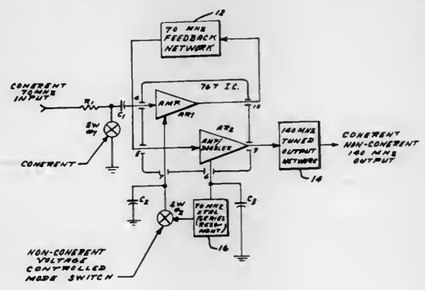
means for (i) storing all at one time, and serially outputting, 1st through Uth individual control signals for producing adjustment of said angularly modulatable means and thus of $\phi_a(t)$, U being a predetermined integer ≥ 2, and the serial outputting of 1st through Uth control signals reoccurring at predetermined times, (ii) sampling the difference indicative signal during at least one control signal adjustment of $\phi_a(t)$, and (iii) updating this control signal in accordance with the sample such that the updated control signal, at reoccurrence of the serial outputting, effects an adjustment of $\phi_a(t)$ which brings it nearer to $\phi_b(t)$.

4,190,808

AMPLIFIER-OSCILLATOR FREQUENCY MULTIPLIER APPARATUS

Lyle A. Fajen, Scottsdale, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,469
Int. Cl.² H03B *5/36*; H03F *3/195*
U.S. Cl. 331—59 **10 Claims**



1. An amplifier-oscillator frequency multiplier apparatus comprising in combination:

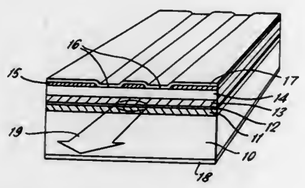
a first amplifier means having a first and second input and an output,

a second amplifier means having an input and a first and second output,
a feedback means operating at a first predetermined frequency, said feedback means being connected from said output of said first amplifier means to said input of said second amplifier means
a first switch means connected from said first input of said first amplifier means to ground, said first switch means having a first and second state,
a second switch means connected to said second input of said first amplifier means, said second switch means having a first and second state,
a crystal connected from said second output of said second amplifier means to said second switch means, said crystal operating at a predetermined frequency, and
an output network connected to said first output of said second amplifier means, said output network operating at a predetermined frequency.

4,190,809
STRIPE LASERS

Colin H. L. Goodman, Loughton, and Paul A. Kirkby, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,468
Claims priority, application United Kingdom, Oct. 13, 1976, 42611/76
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **8 Claims**

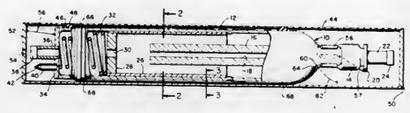


1. An injection laser comprising:
a first metal contact layer;
a first semiconductor layer disposed on and coextensive with said first contact layer;
a second semiconductor layer disposed on and coextensive with said first semiconductor layer;
an active semiconductor layer disposed on and coextensive with said second semiconductor layer;
a third semiconductor layer disposed on and coextensive with said active layer;
a fourth semiconductor layer disposed on and coextensive with said third semiconductor layer;
an insulating layer disposed on said fourth semiconductor layer to provide a pair of closely spaced parallel stripes on a surface of said fourth semiconductor layer, each of said stripes having a given width and adjacent edges of said stripes being separated from each other by an amount greater than 2.5 μm and not greater than 5.5 μm to promote real dielectric waveguiding of the zero order mode of said laser in preference to either gain-guiding or to waveguiding of the first order mode of said laser; and
a second metal contact layer disposed on and coextensive with said insulating layer and said stripes.

4,190,810
GAS LASER WITH RESISTIVE STRIP ARRANGEMENT FOR STARTING ENHANCEMENT

Allan E. Bayley, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 1, 1978, Ser. No. 901,879
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 PE **7 Claims**

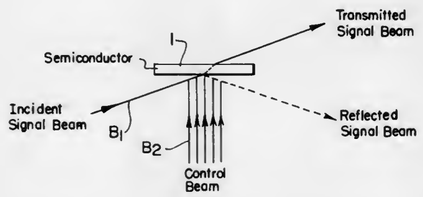


1. In a gas laser comprising a tubular member of electrically insulating material, a laser gas contained within said tubular member, a tubular cathode coaxially disposed within said tubular member, an anode disposed at one end of said tubular member, and means for applying a voltage between said anode and said cathode, the improvement for enhancing the commencement of an electrical discharge in said laser gas between said anode and said cathode comprising:
a strip of electrically conductive plastic disposed on the outer lateral surface of said tubular member and having a first portion extending longitudinally along said tubular member for most of the length of said tubular member and having a second portion extending circumferentially along the lateral surface of said tubular member in the vicinity of the end of said tubular member remote from said anode, a tape of electrically insulating material having a width greater than that of said strip overlying both said first and second portions of said strip and adhesively contacting said strip and portions of the surface of said tubular member on both sides of said strip in a manner holding said first and second portions of said strip against said tubular member, and means for electrically connecting the end of said first portion of said strip remote from said second portion to said anode.

4,190,811
LASER CONTROLLED OPTICAL SWITCHING IN SEMICONDUCTORS

A. John Alcock; Paul B. Corkum, both of Ottawa, and Douglas J. James, Kanata, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 681,586, Apr. 29, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,840
Claims priority, application Canada, May 22, 1975, 227587
Int. Cl.[2] H01S *3/101*
U.S. Cl. 331—94.5 M **18 Claims**



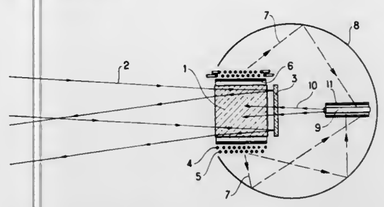
1. An apparatus for switching a signal laser beam having a predetermined infrared radiation frequency comprising:
semiconductor means normally transparent to infrared radiation of the signal beam frequency;
signal laser means for providing the infrared radiation signal beam and for directing said signal beam obliquely at a predetermined angle onto the surface of said semiconductor means; and

control laser means for providing a control beam for irradiating the surface of said semiconductor means, said control laser means beam having a radiation frequency sufficiently high to produce free carriers in said semiconductor means and having sufficient radiation intensity and time duration to produce a free carrier density greater than the critical density for the signal beam resulting in substantially complete reflection of the signal beam from said semiconductor means surface.

4,190,812
LASER HEAD

Louis Jacob, Bretigny sur Orge, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Jan. 10, 1978, Ser. No. 868,241
Claims priority, application France, Jan. 21, 1977, 77 01704
Int. Cl.[2] H01S *3/09*
U.S. Cl. 331—94.5 P **12 Claims**



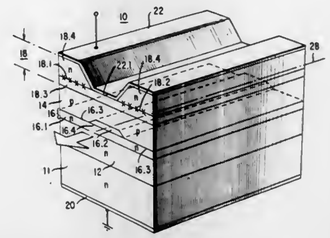
1. A laser head comprising:
a neodymium-doped active glass rod;
a light source disposed with respect to said rod such that a part of the light emitted by this source illuminates the active material of said rod in order to render it capable of amplifying a laser beam at a wavelength of 1.06 microns passing through the material and the remaining part of the light does not illuminate the active material, a portion of the active material being less illuminated than the rest;
at least one ruby crystal disposed inside a resonant optical cavity, and being coaxial with the rod;
a concave spherical reflector partially surrounding the rod and the crystal, said rod and crystal being disposed substantially symetrically about the center of the spherical reflector such that the crystal receives said remaining part of the light which does not illuminate said active material after reflection in the spherical reflector to produce laser radiation along the axis of the cavity; and
a plane mirror which reflects the laser beam and is transparent to the laser radiation of the ruby crystal, said mirror being disposed between the rod and the ruby perpendicularly to the common axis of the rod and the ruby to allow said laser radiation to pass through the mirror to illuminate said less illuminated portion of the active material.

4,190,813
STRIP BURIED HETEROSTRUCTURE LASER

Ralph A. Logan, Morristown, and Won-Tien Tsang, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1977, Ser. No. 865,237
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **21 Claims**

1. A heterostructure junction laser comprising
means forming an optical resonator having an axis along which stimulated radiation of said laser propagates,
first and second wide bandgap semiconductor cladding layers of opposite conductivity types,
a narrower bandgap semiconductor active region disposed between and contiguous with said cladding layers, and
electrode means for forward biasing said cladding layers so as to inject minority carriers into said active region and for applying pumping current to said active region in excess of the lasing threshold, thereby to cause said active region to emit said radiation along said resonator axis, characterized in that said active region includes
a waveguide layer having a bandgap smaller than that of said cladding layers, and
an active layer, wherein said radiation is generated, having the shape of a narrow strip extending along said resonator axis, said active layer being contiguous with and optically coupled to said waveguide layer,

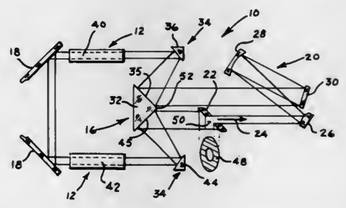


said active layer having a bandgap smaller than that of said waveguide layer and being adapted so that the difference in bandgap between said waveguide and active layers is, on the one hand, sufficiently large to confine said minority carriers to said active layer and, on the other hand, small enough to enable a significant portion of said radiation to penetrate into said waveguide layer.

4,190,814
SINGLE AXIS RESONATOR FOR LASER

John A. Van Workum, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1978, Ser. No. 882,525
Int. Cl.[2] H01S *3/081*
U.S. Cl. 331—94.5 C **8 Claims**



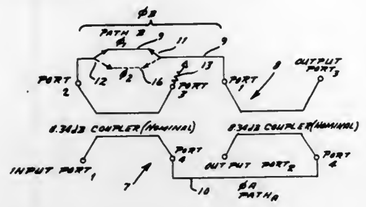
1. In a laser having an annular gain region and a resonator, the improvement therein residing in said resonator, said resonator comprising means for expanding a beam of radiant energy which impinges thereon and reflecting said expanded beam of radiant energy therefrom, means in optical alignment with said expanding and reflecting means and said gain medium for altering the shape of said expanded beam, relecting said altered beam through said gain medium, reconstructing said altered beam to said expanded shape and reflecting said expanded beam therefrom, and means in optical alignment with said shape altering and reflecting means for receiving said expanded beam therefrom, reflecting a portion of said beam out of said laser and directing the remainder of said beam back to said expanding and reflecting means, the optical axis of said resonator passing through the center of said receiving and reflecting means.

4,190,815

HIGH POWER HYBRID SWITCH

Victor J. Albanese, Valley Stream, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1978, Ser. No. 884,882
Int. Cl.[2] H01P *1/12*
U.S. Cl. 333—101 **8 Claims**



1. A high power hybrid switch comprising
first and second directional couplers,
first and second transmission line circuits connecting said first and second directional couplers in tandem to form a 3dB hybrid, and
phase shift means selectively insertable into said first transmission line circuit.

4,190,816

DIVIDER NETWORK

Gerald E. Moss, Hull, and Everett E. Stevens, Manotick, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 16, 1978, Ser. No. 870,015
Claims priority, application Canada, Feb. 11, 1977, 271563
Int. Cl.[2] H03H *7/48*
U.S. Cl. 333—131 **6 Claims**



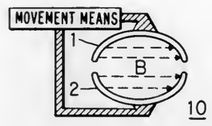
1. A divider network for dividing an HF signal into n output signals of the same power and phase, where n is a positive integer greater than 1, wherein each of said n signals is fed to an output port, each said output port having associated therewith a transformer, each said output port being connected to ground via at least one winding of said transformer, each output port being connected to a common point by a winding of said transformer so that each transformer is connected in parallel with respect to said common point; said HF signal being fed to said divider via an input port, said input port being connected to said common point and said common point being connected to the output port transformer by means providing a path length between said input port and each of said output ports which is substantially equal, said common point being connected to said input port via one winding of another transformer, said common point also being connected to ground by at least one other winding of said another transformer.

4,190,817

PERSISTENT CURRENT SUPERCONDUCTING METHOD AND APPARATUS

Mario Rabinowitz, 715 Lakemead Way, Redwood City, Calif. 94062

Filed Feb. 9, 1977, Ser. No. 767,139
Int. Cl.[2] H01F *7/22*
U.S. Cl. 335—216 **30 Claims**



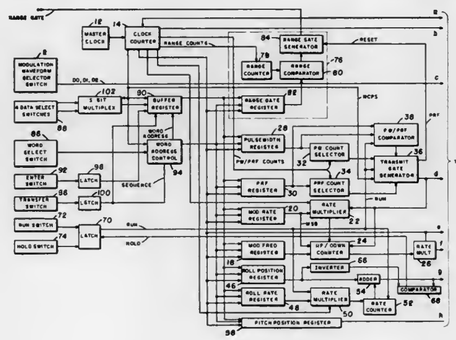
1. A magnetic device comprising: superconducting wall segments; a trapped non-solenoidal magnetic field; means mounting said wall segments at variable spaced apart locations and including structure permitting at least one of the wall segments to move along a preselected path as the spacing between said wall segments is changed to vary the said trapped magnetic field.

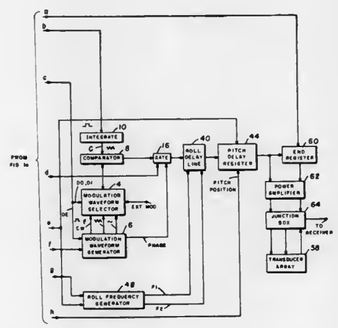
4,190,818

DIGITAL BEAMSTEERING FOR A PARAMETRIC SCANNING SONAR SYSTEM

James W. Follin, Rockville, and Robert E. Miller, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1977, Ser. No. 827,652
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—138 **24 Claims**





1. A parametric scanning sonar system which generates a desired pattern of ensonification in a fluid medium comprising:

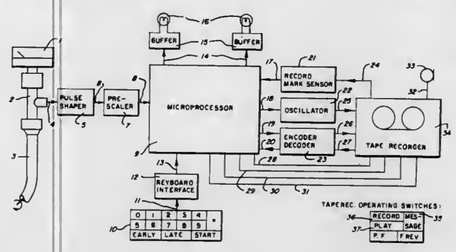
transducer means for producing sonar waves,
means for driving the transducer means, said driving means comprising:
a source of continuous wave energy comprising a selected modulation waveform generator and a carrier waveform generator, and
means, connected to the source, for appropriately switching the energy from the source on and off, said switching means comprising a comparator means for receiving waveforms from the modulation waveform generator and the carrier waveform generator as inputs and for producing a pulse duration modulation composite transducer drive output when the magnitude of the carrier waveform exceeds the magnitude of the modulation waveform, and
means for thereafter entering the composite transducer drive output waveform into the transducer means which transforms the composite transducer drive output into a sonar beam.

4,190,819

MOTOR VEHICLE AUDIO INFORMATION SYSTEM

Lajos Burgyan, Mountain View, Calif., assignor to Michael J. Femal, Arlington Heights, Ill., a part interest

Filed Jan. 31, 1977, Ser. No. 763,883
Int. Cl.[2] G08G *1/12;* **G11B** *5/00;* **G06F** *15/50*
U.S. Cl. 340—23 **7 Claims**



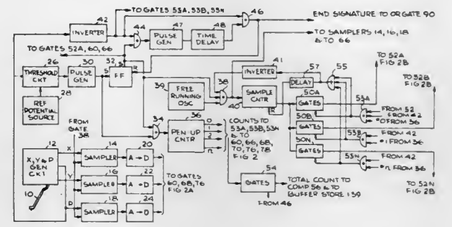
7. A method for delivering prerecorded messages concerning road information and the like at predetermined intervals related to the distance a motor vehicle travels, comprising the steps of:
utilizing a tape recorder in conjunction with an arithmetic and logic functioning microprocessor;
generating pulses that are proportional to the distance traveled by the vehicle;
accumulating the generated pulses in the microprocessor;
programming the microprocessor with preselected distance data related to each of the prerecorded messages;
dividing the accumulated pulses by pulses per a measurement of distance resulting in a quotient;
comparing the quotient with one of the preselected distances stored in the microprocessor to produce an output signal that drives the tape recorder to deliver one of the prerecorded messages related to the compared distance whenever the quotient is approximately equal to the preselected distance; and
sensing a recordmark on the tape after each prerecorded message for stopping the playback of the tape recorder until the next quotient is equal to the next preselected distance in the microprocessor, wherein the tape includes a format comprising a first distance data, the recordmark, a first message, a second distance data, the recordmark, a second message and so on in that order until the nth message on the tape is reach followed by the recordmark for stopping the playback of the tape recorder and in which the distance data on the tape programs the microprocessor with its preselected distance data related to each of the prerecorded messages.

4,190,820

SIGNAL TRAIN VERIFICATION SYSTEM USING LANDMARKS

Hewitt D. Crane, Portola Valley, and Daniel E. Wolf, Menlo Park, both of Calif., assignors to Stanford Research Institute International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 716,344, Aug. 20, 1976, Pat. No. 4,086,567. This application Apr. 21, 1978, Ser. No. 898,997
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 SG **12 Claims**



1. In a system wherein a first train of signals having landmarks is to be correlated with a second train of signals having analogous landmarks, the method of segmenting each train of signals into segments and normalizing corresponding segments, the steps comprising:
segmenting the first train of signals into segments, including a first segment which includes the signals from the start of said first train to the first landmark, and a last segment which includes the signals from the last landmark to the end of said first train;
storing the signals in each segment of said first train;
counting the number of landmarks in said first train;
segmenting the second train of signals into segments including a first segment which includes the signals from the start of said second train to the first landmark thereof, and a last segment which includes the signals from the last landmark to the end of said second train;
storing the signals in each segment of said second train;
counting the number of landmarks in said second train;
comparing the total number of counted landmarks in said first train with those in the second train and producing a signal indicative whether the numbers are equal or not; and
when said signal indicates that the two numbers are equal, normalizing each segment of said second train by varying the number of signals therein to equal the number of signals in the corresponding segment of the first train, with the values of the signals in the normalized segment being a function of their values in the corresponding non-normalized segment of the second train.

4,190,821

SELF-HEALING LOOP COMMUNICATIONS SYSTEM

Thomas R. Woodward, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1978, Ser. No. 947,854
Int. Cl.[2] H04Q *9/00;* **H04J** *3/14*
U.S. Cl. 340—147 SC **24 Claims**

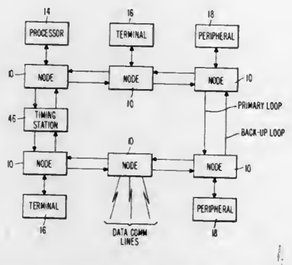
1. A self-healing loop communications system comprising:
a primary closed loop unidirectional transmission line for transmitting signals in a first direction;
a back-up closed loop unidirectional transmission line for transmitting signals in a second direction opposite to said first direction;
first means coupled to said primary and back-up lines for providing on one of said primary and back-up lines a serial data stream in a self-clocking code and further for provid-

ing on said other of said primary and back-up lines a stream of self-clocking idle data; and

a plurality of loop interface units coupled to said primary and back-up lines, each of said loop interface units including

second means connected to said one of said primary and back-up lines for detecting a first fault in said one of said primary and back-up lines,

third means connected to said other of said primary and back-up lines and said second means and responsive to said second means for switching between a first state wherein that one of said loop interface units is coupled to said other of said primary and back-up lines and a second state wherein that one of said loop interface units is uncoupled from said other of said primary and back-up lines, and



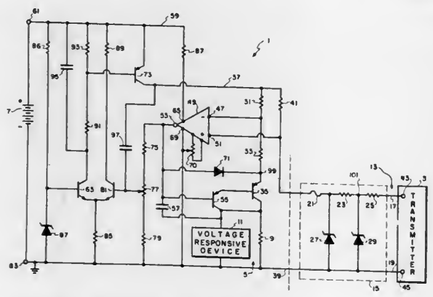
fourth means connected to said one of said primary and back-up lines and said second and third means and responsive to said second means for switching between a third state wherein that one of said loop interface units is coupled to said one of said primary and back-up lines and a fourth state wherein that one of said loop interface units is uncoupled from said one of said primary and back-up lines and said primary and back-up lines are interconnected and transferring said signals on said back-up and primary lines to the other of said back-up and primary lines, said primary and back-up lines thereby cooperating to provide a first new closed loop unidirectional transmission line to bypass said first fault.

4,190,822

CURRENT TELEMETERING INTERFACE APPARATUS

Richard Swarbrick, Glasgow, Scotland, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 5, 1978, Ser. No. 893,665
Int. Cl.² G08C *19/00*; G05F *1/10*
U.S. Cl. 340—210 **7 Claims**



6. Interface apparatus for use with a current receiver which is connected to a current transmitter by a two-wire link and an intrinsic safety barrier, said apparatus comprising

first and second terminals arranged to be connected to a source of current,

first and second transistors, each having a pair of principle electrodes and a control electrode,

first, second, and third resistors,

means connecting one of the principle electrodes of said first transistor to said first terminal,

means connecting said first resistor, said second resistor, and the principle electrodes of said second transistor in series with a current receiver, in the order stated, between the other of said principle electrodes of said first transistor and said second terminal to provide a first current loop wherein a current flows with a value controlled by said second transistor,

means connecting said third resistor, an intrinsic safety barrier, a two-wire link, and a current transmitter in series, in the order stated, between said other principle electrode of said first transistor and said second terminal to provide a second current loop wherein a current flows with a value controlled by said transmitter in accordance with the value of a condition sensed by said transmitter,

first amplifier means having an output connected to the control electrode of said second transistor and having an input connected between the junction between said first and second resistors and the junction between said third resistor and said barrier for causing said second transistor to adjust the value of said current in said first loop to maintain a predetermined ratio between the values of said loop currents, and

second amplifier means having an output connected to the control electrode of said first transistor and having an input connected between a point of reference voltage and a receiver loop point in said first loop at the junction between said second resistor and said second transistor for causing said first transistor to maintain that voltage drop between its said principle electrodes which maintains said voltage at said point in said first loop substantially constant at a predetermined value,

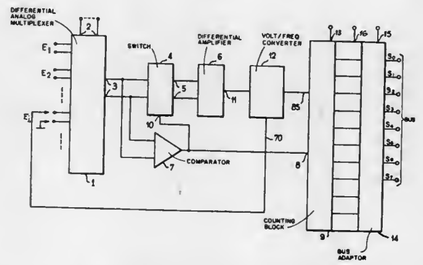
the resistance value of said second resistor establishing a transmitter loop point in said second loop at which said first transistor maintains a substantially constant voltage which corresponds to that maintained at said receiver loop point.

4,190,823

INTERFACE UNIT FOR USE BETWEEN ANALOG SENSORS AND A MICROPROCESSOR

Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 10, 1978, Ser. No. 868,448
Claims priority, application France, Jan. 11, 1977, 77 00560
Int. Cl.² H03K *13/20*; G06F *15/20*
U.S. Cl. 340—347 NT **9 Claims**



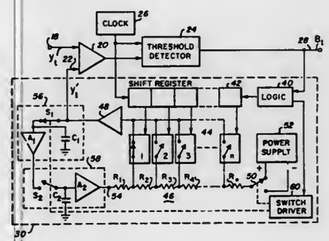
1. An interface circuit of the type for use between variable voltage analog sensors measuring physical magnitudes and a microprocessor for digital processing of the latter, said interface circuit comprising: an analog multiplexer connected to said sensors to select the output signals of the latter, an analog-to-digital converter including a voltage/frequency converter responsive to the output signals of said analog multiplexer and a counter for converting said frequency into digital data, and a bus adapter being provided for delivering corresponding digital data to the microprocessor, wherein said analog multiplexer comprises a differential analog multiplexer having two differential voltage outputs, and having a sign detector connected to the differential voltage outputs of said multiplexer, a switching block is interconnected between said differential voltage outputs of said multiplexer and said voltage/frequency converter, said switching block being connected to the output of said sign detector so as to act as a selector circuit transmitting each voltage output signal of said multiplexer with a constant sign to the voltage/frequency converter, and said counter being an up/down counter resettable to an intermediate value, whose up/down counting input is connected to said sign detector output for counting up or down depending on said sign detector output.

4,190,824

DATA TRANSMISSION SYSTEM USING A SEQUENTIAL APPROXIMATION ENCODING AND DECODING TECHNIQUE

Donald R. Weber, Saratoga, Fla., assignor to Rapicom, Inc., Fairfield, N.J.

Division of Ser. No. 645,604, Dec. 31, 1975, Pat. No. 4,107,610, which is a continuation of Ser. No. 342,854, Mar. 19, 1973, abandoned, which is a continuation of Ser. No. 66,459, Aug. 24, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,334
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 AD **9 Claims**



1. In an encoding and decoding system including; an encoding means for developing an encoded signal in response to an input signal, a decoding means for developing an output signal in response to said encoded signal, and a data linking means for transferring said encoded signal from said encoding means to said decoding means, an improved encoding means comprising:

comparator means responsive to said input signal and a feedback signal for developing an error signal commensurate with the relationship between said input signal and said feedback signal;

detecting means responsive to said error signal for developing said encoded signal;

means for developing a cross-over control signal in response to said error signal indicating a cross-over of said feedback signal and said input signal;

adaptive function generating means responsive to said encoded signal for developing said feedback signal, said feedback signal being comprised of the summation of a base signal component and a changeable reference signal component; and

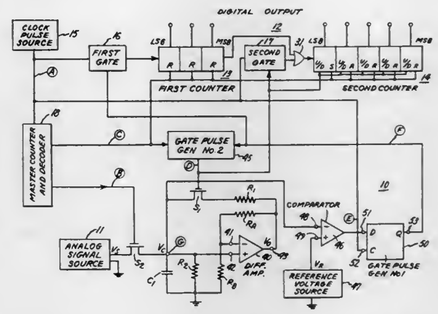
said function generating means including, voltage divider means for developing said base signal component by recirculating a sample of said feedback signal within the function generating means, which sample occurs in response to derivation of said cross-over signal, and forming the next feedback signal by sequentially dividing down the sampled signal and adding to said sampled signal a positive or negative divided down reference signal, the polarity of said reference signal changing with each cross-over signal.

4,190,825

LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Robert P. DePuy, Cherry Hill, N.J., and Arthur H. Leitten, Jr., Syracuse, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,188
Int. Cl.² H03K *13/20*
U.S. Cl. 340—347 AD **2 Claims**



1. A converter for converting an analog signal sample into a binary number corresponding to a logarithm of the analog signal sample comprising

a source of clock pulses,

a first binary counter of m stages, said first counter counting in one direction in response to clocking pulses applied to the input thereof,

a second binary counter of n stages, said second counter being controllable to count in said one and the opposite direction in response to pulses applied to the input thereof,

said first counter and said second counter constituting a composite counter of m+n stages in which the most significant stage of said first counter is coupled to the least significant stage of said second counter, and in which the least significant stage of said first counter is the least significant stage of said composite counter and the most significant stage of said second counter is the most significant stage of said composite counter,

a first gating means for controlling the transmission of clock pulses from said source of clock pulses to said first counter,

a second gating means for controlling the transmission of clock pulses from said source of clock pulses to said second counter,

a capacitor,

a source of reference voltage V_R,

means for providing said capacitor with a voltage equal to the amplitude V_S of said analog signal sample,

means responsive to a pulse from said source of clock pulses for initiating the charging of said capacitor through a charging circuit toward said reference voltage,

said charging circuit charging said capacitor in accordance with the relationship

$$V_C = V_S e^{t/\tau_1}$$

where V_C is the voltage on said capacitor, t is time measured from the occurrence of said pulse, and τ_1 is the time constant of said charging circuit,

counter controlling means responsive to said pulse for presetting the stages of said second counter, for controlling said second counter to count in said opposite direction, for opening said second gating means to allow transmission of

clock pulses therethrough to said second counter, and for presetting the stages of said first counter,

means responsive to the pulse from said source occurring after the voltage V_C on said capacitor exceeds said reference voltage V_R for terminating the charging of said capacitor by said charging circuit, for closing said second gate means and thereby inhibiting the transmission of clock pulses from said souce therethrough, for opening said first gating means to allow transmission of clock pulses therethrough, and for initiating the discharge of said capacitor through a discharging circuit, and for controlling said second counter to count in said one direction,

said discharging circuit discharging said capacitor in accordance with the relationship

$$V_C = V_1 e^{-t/\tau 2},$$

where V_1 is the voltage on said capacitor at the termination of the charging thereof, t is measured from initiation of discharge and τ_2 is the time constant of said discharging circuit,

the ratio of τ_2 to τ_1 being equal to 2^m, where m is the number of stages in said first counter,

means responsive to the voltage V_C on said capacitor during the discharging thereof equaling the reference voltage V_R for closing said second gating means and thereby inhibiting the transmission of clock pulses from said source therethrough,

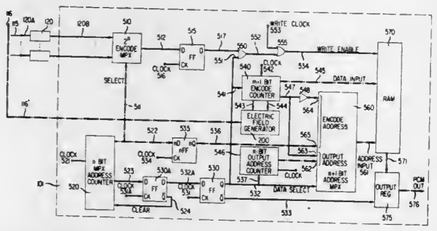
whereby the count stored in said composite counter is a number corresponding to the logarithm of said analog signal sample.

4,190,826

MULTIDEVICE POSITION DIGITAL ENCODER

Harold G. Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1977, Ser. No. 798,161
Int. Cl.² G06F *3/02*; G10H *1/00*
U.S. Cl. 340—365 S **17 Claims**



11. An arrangement for generating signals responsive to the position locations of many independently movable devices, comprising

means for generating a time-varying electric field wave which propagates in one direction along a first path at a controlled rate during a predetermined interval of time,

plural coupling devices mechanically coupled to separate respectively associated movable devices, which coupling devices are capable of movement along respective paths which are parallel and adjacent to the first path as the respective movable devices are moved, each coupling device being capable of receiving an electric signal from the elecric field wave, and

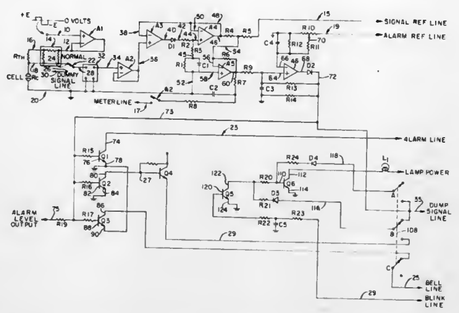
means capable of generating signals responsive to the position of each coupling device during the predetermined interval of time relative to the time-varying electric field.

4,190,827

MULTICHANNEL SALINITY METER

Joseph M. Diamond, Brooklyn, N.Y., assignor to McNab, Incorporated, Mount Vernon, N.Y.

Continuation of Ser. No. 687,613, May 18, 1976, abandoned. This application Sep. 19, 1978, Ser. No. 943,801
Int. Cl.² G08B *23/00*; G01N *27/42*; G01R *27/02*
U.S. Cl. 340—500 **9 Claims**



1. A circuit for monitoring the salinity of a solution comprising

a conductivity cell;

a temperature compensating resistor connected in series with said cell;

signal source means supplying a semi-square-wave signal to said cell and said resistor in series such that a cell output signal proportional to the conductivity of the solution is produced with said cell output signal having a peak amplitude;

amplifier means having a high input impedance receiving said cell output signal; and

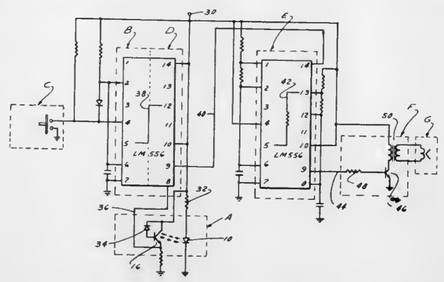
peak actuated detector means receiving said cell output signal from said amplifier means including signal storage means for receiving and storing said cell output signal, unidirectional conducting means supplying said cell output signal to said signal storage means and means responsive to the peak amplitude of said cell output signal stored by said signal storage means to generate a salinity signal proportional to the conductivity of the solution whereby said salinity ssignal is substantially unaffected by stray capacitance due to the use of said semi-square-wave signal and said peak actuated detector means.

4,190,828

MOVEMENT SENSITIVE ANTI-THEFT ALARM

Daniel H. Wolf, 370 River Rd., Bogota, N.J. 07603

Filed Jun. 19, 1978, Ser. No. 916,472
Int. Cl.² G08B *13/14*
U.S. Cl. 340—571 **12 Claims**



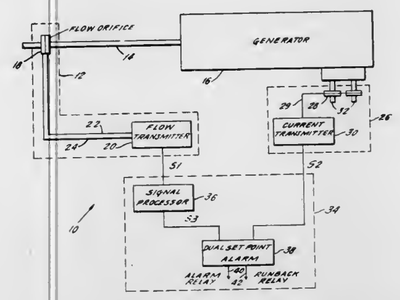
1. An alarm for preventing theft of a movable article comprising movement sensitive trigger means and means operably connected to said trigger means effective, when actuated thereby, to generate an alarm signal, said trigger means comprising a support, photosensitive signal generating means mounted on said support, light generating means and means for suspending said light generating means from said support in opposing spaced relationship with said photosensitive means, said light generating means and photosensitive means being normally substantially aligned, said photosensitive signal generating means actuating said alarm signal generating means upon substantial misalignment between said light generating means and said photosensitive signal generating means.

4,190,829

CURRENT/FLOW COMPARATOR

Nickolas Schmitt; Sterling C. Barton, both of Scotia, and Lawrence E. Jordan, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,478
Int. Cl.² G08B *19/00*; H02K *9/24*
U.S. Cl. 340—606 **9 Claims**



1. A current/flow comparator for generating an alarm signal whenever the instantaneous flow rate of a coolant liquid cooling the armature of a dynamoelectric machine falls below a predetermined percentage of a desired instantaneous flow rate, which desired instantaneous flow rate varies as the square of the actual instantaneous current flowing through said armature, said comparator comprising:

means for generating a first signal representative of the actual instantaneous value of said flow rate;

means for generating a second signal representative of the actual instantaneous value of said armature current; and

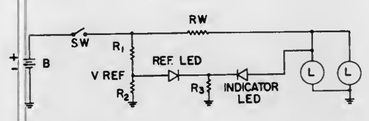
means responsive to said first and second signals for generating an alarm signal whenever said instantaneous flow rate falls below said desired instantaneous flow rate by more than said predetermined percentage.

4,190,830

LAMP OUTAGE INDICATOR CIRCUIT

Robert E. Bell, Harper Woods, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 779,662, Mar. 21, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,935
Int. Cl.² G08B *21/00*
U.S. Cl. 340—642 **4 Claims**



1. A lamp outage indicator for an incandescent lighting system having a source of direct current, a first resistance of relatively small value and a first incandescent lamp connected in series across said source, which comprises:

a voltage divider network comprising a second resistance and a third resistance connected across said source of direct current;

a first two terminal voltage sensitive indicator device and a fourth resistance connected in series, with the free terminal of the said first voltage sensitive indicator connected intermediate said second and third resistances, and the free terminal of the said fourth resistance connected in common with the incandescent lamp and the source of direct current; and

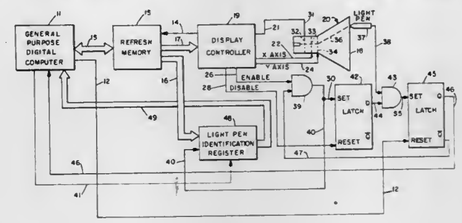
a second two terminal voltage sensitive indicator device, the first terminal of said device being connected intermediate said first two terminal voltage indicating device and said fourth resistance, the second terminal of said device being connected intermediate said first resistance and said incandescent lamp.

4,190,831

LIGHT PEN DETECTION SYSTEM FOR CRT IMAGE DISPLAY

Howard L. Stahle, Burbank, and Norman R. Grossman, Canoga Park, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed May 8, 1978, Ser. No. 904,119
Int. Cl.² G06F *3/14*
U.S. Cl. 340—707 **10 Claims**



1. A display system comprising:

a cathode ray tube having an intensity control input for an electron beam therein and having a sweep control input for deflecting said electron beam across a screen of said cathode ray tube to produce at least one luminous trace thereon;

a light pen positionable adjacent to a trace on said screen for picking up at least one light pulse from a displayed trace and producing an electrical output signal indicative thereof;

computing means including a memory for storing a plurality of code words that identify the different components of an image to be traced on said screen and for storing an identification code that identifies at least some of said code words;

display control means coupled between said computing means and said inputs to said cathode ray tube;

said display control means adapted to sequentially receive said code words from said memory and in response thereto to provide signals to said intensity control input and said sweep control input to cause the image, or portion thereof, identified by said code words to be traced on said screen of said cathode ray tube;

a register coupled to said memory and adapted to receive a said identification code as a said code word indicative of an image, or portion thereof, to be traced is transferred into said display control means; and

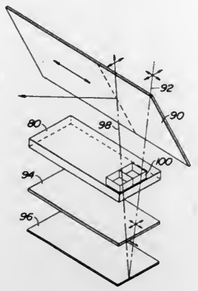
transfer means coupled to said computing means and responsive to said light pen output signal for enabling a said identifying code in said register to be transferred to said computing means.

4,190,832

POLARIZED WINDSHIELD INDICIA REFLECTION DISPLAY SYSTEM

Sailor Mohler, 5410 Lightning View, Columbia, Md. 21044

Filed Apr. 18, 1978, Ser. No. 897,251
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—705 **17 Claims**



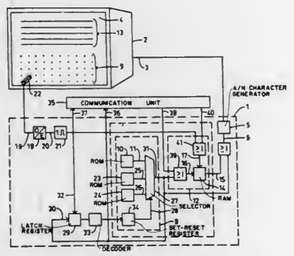
1. A windshield indicia display system comprising:
multi-segment liquid crystal display means positionally located adjacent said windshield in a manner allowing external light to pass through said windshield for impingement upon and through said liquid crystal display means;
a polarizing filter element located adjacent said liquid crystal display means, said light passing through said display means and said filter element being filtered; and,
means for reflecting said light initially passing through said liquid crystal display means and said polarizing filter element in a substantially reversed path displacement, said reflected light passing through said polarizing filter element and said multi-segment liquid crystal display means for reflection from said windshield, said reflecting means and said polarizing filter element being positioned in substantially parallel plane relation each to the other.

4,190,833

ALPHANUMERIC TERMINAL HAVING AN OPTOELECTRIC CONVERTER AND AN ASSOCIATED MONO-PULSE GENERATING CIRCUIT

Anders M. T. Bejting, 39 Vilans Väg, Danderyd, Sweden (S-182 35), and Lars Å. Wern, 65 Upplandsgatan, Stockholm, Sweden (S-113 28)

Filed Feb. 6, 1978, Ser. No. 875,658
Claims priority, application Sweden, Feb. 18, 1977, 7701861
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—707 **1 Claim**



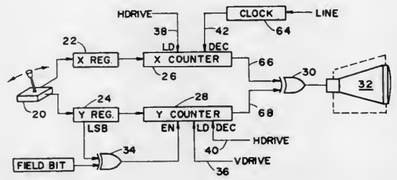
1. An alphanumeric terminal, comprising a text generator and a display unit with a signal input connected to the text generator and a cathode-ray tube screen arranged to display a plurality of lines with an alphanumeric information generated by an intensity modulation of a line raster on the cathode-ray tube screen in correspondence to a digitally coded information stored in the text generator, the text generator comprising an alphanumeric character generator with a data input and a test memory arranged to store the digitally coded information for generating said lines with alphanumeric information and connected to the data input of the character generator, the text memory in the text generator being divided into (a) a read memory that has a memory content arranged to produce a reproduction of an alphanumeric character set on a first portion of the cathode-ray tube screen and having a read output connected to the data input of the character generator and (b) a write-and-read memory that is arranged for a reproduction of an alphanumeric text on a second portion of the cathode-ray tube screen and having a read output connected to the data input of the character generator, a write input connected to the read output of the read memory and an enable input arranged to provide a writing operation via the write input, and the text generator further comprising an optoelectric converter with an optical input and an electrical output and a light transferring means that is connected to the optical input of the optoelectric converter and is arranged to be movable over the cathode-ray tube screen in order to be placed upon selected characters in the character set reproduced on said first portion of the cathode-ray tube screen, characterized by a mono-pulse generating circuit that comprises a retriggerable mono-pulse means having a pulse duration longer than the repetition period of the line raster on the cathode-ray tube screen and arranged to connect the electrical output of the optoelectric converter to the enable input of the write-and-read memory.

4,190,834

CIRCUIT AND METHOD FOR PRODUCING A FULL-SCREEN CROSS-HAIR CURSOR ON A RASTER-SCAN TYPE DISPLAY

Douglas J. Doornink, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 16, 1978, Ser. No. 951,703
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—709 **12 Claims**



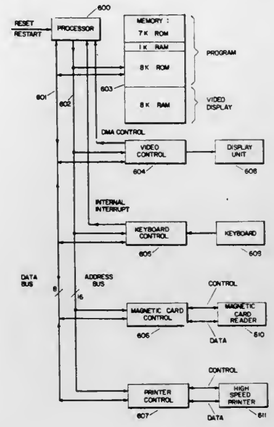
1. A circuit for producing a full-screen cross-hair cursor in a display system including a display screen and means for producing a raster-scan image thereon, said circuit comprising:
(a) positional means for producing first and second digital signals representative respectively of first and second coordinate values of a desired location on said screen of a cursor to be produced;
(b) first counter means for receiving and selectively decrementing said first digital signal and for producing a first indication when said signal has been decremented to zero;
(c) second counter means for receiving and selectively decrementing said second signal and for producing a second indication when said signal has been decremented to zero; and
(d) means responsive to said first and second indications for producing an illuminated spot on the screen of said display system whenever either, but not both, of said digital signals have been decremented to zero.

4,190,835

EDITING DISPLAY SYSTEM WITH DUAL CURSORS

William J. Buynak, Bayville, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 725,642, Sep. 22, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,372
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—750 **4 Claims**



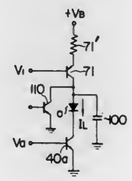
1. A microprogrammable text editing and display system comprising:
a microprogrammable controller;
a clock source;
instruction sequencer means for sequentially controlling a plurality of controller operations;
program counting means for counting program steps, said program counting means including means for storing program steps;
instruction register means for storing an instruction word;
decoder means for decoding the operation called for in the instruction stored in said instruction register;
said sequencer means including a control read-only memory having an output for generating a group of sequentially controlled signals;
means coupling said decoder means to said output of said control read-only memory dependent upon the operation called for by the instruction in said instruction register;
accumulator means;
memory means;
input-output control means for coupling data from peripheral circuitry to said controller;
bus means having input means coupled to the outputs of said instruction register, said program counter and said memory means, said accumulator means and said input-output control means;
said bus means including output means and multiplexer means for selecting the input to be passed to the output means of said bus means;
means coupling said instruction sequencer to said bus means multiplexer for selecting the input to be passed by the output of said common bus means;
means coupled to said instruction sequencer means for selectively coupling the output of said bus means to one of said memory means, said accumulator means, said instruction register means, program counter means, said accumulator means and said input-output control means selectively in accordance with the sequential control signal developed by said control read-only memory;
an address register connected to said input means of said bus means for specifying a predetermined location in said memory means;
said text editing and display system further comprising:
a random access memory;
means for storing characters pertaining to a predetermined line to be displayed in a predetermined portion of said random access memory;
means for storing a cursor location pertaining to said predetermined line a a predetermined portion of said random access memory;
means for providing access to said random access memory for reading out said stored characters and said cursor location;
a display unit connected to said means for providing access, and having a display for displaying said stored characters along lines on said display;
means connected to said means for providing access for generating at least two visible markers in predetermined locations on said display corresponding to said stored cursor location;
means for generating variable margin and tab indices on said display;
at least one of said visible markers being displayed on one of said row lines of said display where said tab indices are displayed;
the line count of said predetermined line storing one of said cursor locations being displayed on said display;
said display means having a plurality of character row lines in which images of data characters may be displayed, each of the character rows including a right-hand border character and a left-hand border character;
video control means connected to said display means for supplying signals representing characters to be displayed in said character rows, including means for generating a cursor on each of said character rows;
means for storing representations of all characters to be displayed on one line including a representation of where a cursor is to be displayed on said one line; and
said random access memory partitioned into data sets corresponding to each line of said display, each data set being partitioned into first, second, third, fourth and fifth data portions; said first portion representing the location on that line where a cursor is to be activated; said second portion being a character representing a vertical rule line to be displayed on the left-hand portion of the display line to be displayed on the left-hand portion of the display; said third portion being a region of said line where blank characters may be introduced to define a specific margin point, said fourth portion being a region of said line wherein text entered by the user for display may be introduced, said fifth portion being a character representing a vertical rule line to be displayed on the right-hand portion of the display.

4,190,836

DYNAMIC DRIVE CIRCUIT FOR LIGHT-EMITTING DIODES

Hiroyuki Kimura, Yokohama; Isao Fukushima; Shin-Ichi Ohashi, both of Fujisawa, and Yoshinori Masuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 2, 1977, Ser. No. 847,802
Claims priority, application Japan, Nov. 15, 1976, 51/136293; Nov. 15, 1976, 51/136294
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—762 **20 Claims**



1. In a dynamic drive circuit for light-emitting diodes, comprising anode drive switching means connected with the an-

odes of said light-emitting diodes, cathode drive switching means connected with the cathodes of said light-emitting diodes, and a power source connected through said anode and cathode drive switching means with said light-emitting diodes, said anode and cathode drive switching means being repeatedly turned on and off in a time-division manner to drive said light-emitting diodes with a pulsed current in a time-division manner,

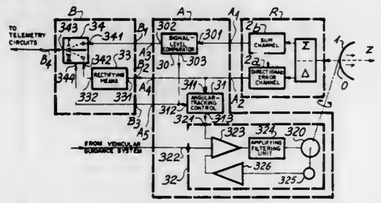
the improvement further comprising a time constant control means for delaying the rise time of pulses of the current flowing through said light-emitting diode to reduce higher harmonic components contained in the rising current portion of said pulses of current.

4,190,837

SYSTEM FOR PROTECTING A VEHICLE-BORNE TRACKING RADAR AGAINST AN OFF-TARGET JAMMER

Laurence Salvaudon, and Jean-Claude Charlot, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 16, 1978, Ser. No. 915,983
Claims priority, application France, Jun. 17, 1977, 77 18621
Int. Cl.[2] G01S *9/22, 7/36*
U.S. Cl. 343—16 M **12 Claims**



1. In a vehicle-borne tracking radar including telemetric circuitry associated with a vehicular guidance system for steering the vehicle toward a target, the radar being provided with an orientable directive antenna having an axis trainable by said guidance system upon the target in response to incoming echo signals,

the combination therewith of:

a receiver provided with a sum channel and a difference channel connected to said antenna, said difference channel emitting an error signal in the presence of radiation incoming in a direction deviating from said axis;

positioning means coupled with said antenna for rotating said axis in a predetermined plane;

switchover means for connecting said telemetric circuitry to an output of said sum channel in a normal position and to an output of said difference channel in an alternate position;

normally deactivated tracking-control means independent of said guidance system inserted between said difference channel and said positioning means; and

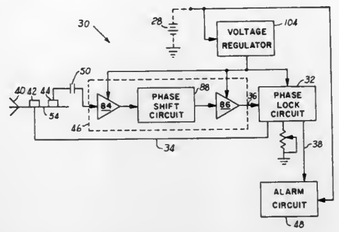
detector means connected to the output of one of said channels for ascertaining the presence of interfering signals from an off-target jammer and, in response to such interfering signals, changing said switchover means from said normal position to said alternate position while activating said tracking-control means to transmit an error signal from said difference channel to said positioning means, thereby training said axis upon said jammer.

4,190,838

RADIATION DETECTOR

James A. Kemp, Plano, Tex., assignor to R A Electronics, Inc., Richardson, Tex.

Filed Jul. 20, 1978, Ser. No. 926,509
Int. Cl.[2] G01S *7/40;* **H04B** *17/00*
U.S. Cl. 343—18 E **16 Claims**



1. A radiation detector comprising in combination:

a phase lock circuit including a modulating frequency oscillator, at least one input, and at least one output drivable by a signal of substantially the modulating frequency shifted in phase by a predetermined amount applied to the at least one input;

a radiation frequency antenna for receiving radiation;

a radiation frequency modulator for modulating the radiation received from the antenna with the modulating frequency received from the modulating frequency oscillator;

an envelope detector for detecting the modulated radiation envelope;

an amplifier-phase shift circuit coupled to the AC output of the envelope detector for amplifying and shifting the phase of the AC output of the envelope detector to the predetermined amount, wherein the at least one input of the phase lock circuit is responsive to the output of the amplifier-phase shift circuit; and

an alarm circuit for generating an alarm responsive to the phase lock circuit wherein an alarm is generated when a signal is present at the output of the amplifier-phase shift circuit whereby an alarm is generated when a radiation frequency signal is received by the radiation frequency antenna.

4,190,839

MOBILE ANTENNA INCLUDING QUICK-RELEASE MOUNTING

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,247
Int. Cl.[2] H01Q *1/32, 9/18*
U.S. Cl. 343—715 **23 Claims**

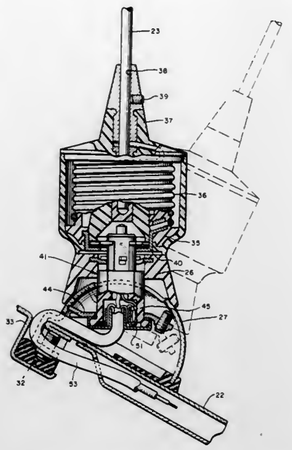
1. A mobile antenna for mounting to a body panel comprising, in combination:

a radiating element;

a base member for supporting said radiating element in a substantially vertical position, said base member including a housing defining a socket, and

means comprising a mounting pin for mounting said base member to said body panel,

said mounting pin being adapted at one end for insertion into said socket and at the other end for securement to said body panel, said base member housing including a plurality of circumferentially spaced keyways adjacent said socket, with locking means between adjacent keyways, said pin including a first plurality of projecting tabs in mating relationship with said keyways whereby insertion and twisting of said pin into said socket causes said tabs to pass through said keyways and engage said locking means



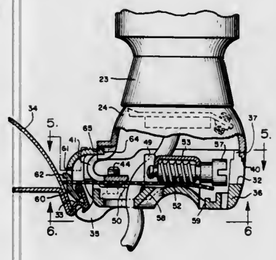
to axially lock said mounting pin and base member together.

4,190,840

ANTENNA MOUNTING ADAPTOR

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,234
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **10 Claims**



1. An adaptor for mounting a mobile antenna on a vehicle gutter or the like, said adapter comprising:

a housing adapted to receive in mating engagement the base portion of the antenna;

fastener means for mounting said housing to the gutter including an elongated band having first and second ends, said housing including a sidewall with opening means in said sidewall, the first end of said band being received within said housing through said opening means;

user-adjustable means within said housing for engaging said first end of said band to draw said first end into said housing, said second end of said band including attachment means for positioning in the interior of said gutter;

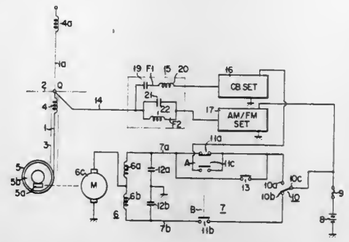
said sidewall further including a shoe for engagement with the underside of the gutter, whereupon adjustment of said user-adjustable means draws the housing and shoe tightly into engagement with said gutter.

4,190,841

CAR ANTENNA SYSTEM WITH BIMETALLIC CONTROL MEANS

Jiro Harada, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,811
Claims priority, application Japan, Dec. 27, 1977, 52-159241
Int. Cl.[2] H01Q *1/10*
U.S. Cl. 343—903 **9 Claims**



1. A car antenna system for driving an expansion type antenna element between fully expanded and fully contracted states, and for stopping the driving of the antenna element responsive only to the antenna element being in one of its fully expanded or fully contracted states, comprising:

an expansion-type antenna element having a driving end;

a driving wire having one end connected to the driving end of the antenna element;

a wire transfer mechanism for taking up and feeding the driving wire so as to contract and expand the antenna element;

a driving power supply circuit including a first power supply circuit having two terminals and a second power supply circuit having two terminals;

a motor selectively coupled to said first and second power supply circuits for driving the wire transfer mechanism to take up the driving wire when it is connected to the first power supply circuit and to feed the driving wire when it is connected to the second power supply circuit;

a first circuit breaker connected in series with the first power supply circuit and comprising a first stationary contact connected to one of the two terminals of the first power supply circuit and a first bimetal strip having a movable contact, the first bimetal strip being connected to the other terminal of the first power supply circuit, said first bimetal strip normally having the movable contact thereof kept in contact with the first stationary contact to thereby close the first power supply circuit and, when the antenna element expands fully and the motor which is connected to the first power supply circuit becomes unable to rotate, said first bimetal strip bends due to an over current flowing through it to thereby open the first power supply circuit;

a second circuit breaker circuit connected in series with the second power supply circuit and comprising a second stationary contact connected to one of the two terminals of the second power supply circuit and a second bimetal strip having a movable contact, the second bimetal strip being connected to the other terminal of the second power supply circuit, said second bimetal strip normally having the movable contact thereof kept in mutual contact with the second stationary contact to thereby close the second power supply circuit and, when the antenna element contracts fully and the motor which is connected to the second power supply circuit becomes unable to rotate, said second bimetal strip bends due to an over current flowing through it to thereby open the second power supply circuit, said first and second bimetal strips being so designed and arranged relative to each other as to be bent toward each other;

a common interlocking member associated with both the

first and second circuit breakers and disposed between the first and second bimetal strips for pushing one of the first and second bimetal strips until the movable contact of the pushed bimetal strip comes into contact with its corresponding stationary contact when the other bimetal strip is bent due to over current flowing through said other bimetal strip;

a first spring in engagement with the first bimetal strip for quickly moving the first bimetal strip to a stable point to release the movable and stationary contacts of the first circuit breaker from each other once the first bimetal strip has passed a change point and to another stable point to bring the movable and stationary contacts of the first circuit breaker into mutual contact once the first bimetal strip has passed the change point, pushed by the interlocking member;

a second spring in engagement with the second bimetal strip for quickly moving the second bimetal strip to a stable point to release the movable and stationary contacts of the second circuit breaker from each other once the second bimetal strip has passed a change point and to another stable point to bring the movable and stationary contacts of the second circuit breaker into mutual contact once the second bimetal strip has passed the change point, pushed by the interlocking member; and

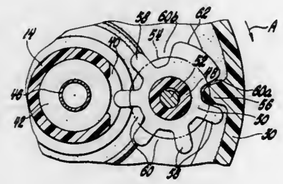
a changeover switch for selectively connecting a power source alternatively to the first and second power supply circuits.

4,190,842

ANTENNA CABLE DRIVE AND STORAGE DRUM WITH STOP MECHANISM

David T. Carolus, and Ralph W. Edwards, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 962,922
Int. Cl.² H01Q *1/10*
U.S. Cl. 343—903 **3 Claims**



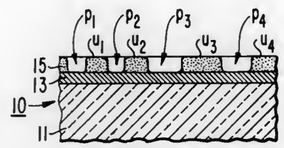
1. An antenna cable drive comprising; a stationary housing; a reversible rotatable drive and storage drum mounted on said housing; means for rotating said drum; a cable drivingly connected to said drum and being stored thereon and being extended from and retracted into said housing by rotation of said drum in one direction or the other during a predetermined number of revolutions of said drum in each respective direction; and drum rotation responsive means including gear means rotatably mounted on said housing having a number of equally spaced teeth greater than the predetermined number and a single wide tooth, and a single tooth on said drum meshing in the spaces between said equally spaced teeth to rotate said gear means one tooth space for each revolution of said drum during said predetermined number of revolutions and abutting the outer surface of said single wide tooth if said drum rotates a number of revolutions greater than said predetermined number thereby restricting further rotation of said drum.

4,190,843

RECORDING METHODS FOR A MULTILAYER OPTICAL RECORD

Fred W. Spong, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 668,495, Mar. 19, 1976, Pat. No. 4,097,895.
This application Oct. 28, 1977, Ser. No. 846,667
Int. Cl.² G01D *9/00, 15/10, 15/24*
U.S. Cl. 346—1.1 **6 Claims**



1. An optical recording method, for use with a record blank having a major surface coated with a multiplicity of layers including a layer of organic dye material of a given thickness overlying a metal layer of high reflectivity, comprising the steps of:

focusing a light beam upon the coated surface of said record blank; and

moving a succession of regions of said coated surface through the path of said focused light beam; while

causing the intensity of said focused light beam to alternate between first and second levels in accordance with information to be recorded;

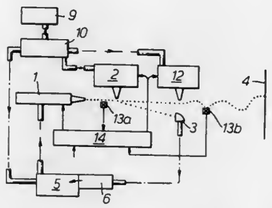
wherein the light frequency of said focused beam is maintained at a frequency at which said dye layer exhibits significant absorptivity of such a magnitude that said dye and metal layers form a multilayer optical element exhibiting, for light of said frequency directed toward said metal layer via said dye layer, variations in reflectance versus dye layer thickness in accordance with a characteristic exhibiting a plurality of reflectance minimums at respective dye layer thickness values, with the lowest of said thickness values substantially equal to said given thickness; wherein said first intensity level is of sufficient magnitude to cause ablation of at least a portion of said dye layer in a record blank region impinged by said focused beam; and wherein said second intensity level is of insufficient magnitude to cause such ablation.

4,190,844

INK-JET PRINTER WITH PNEUMATIC DEFLECTOR

Terrence F. E. Taylor, Burgess Hill, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,708
Claims priority, application United Kingdom, Mar. 1, 1977, 08546/77
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **2 Claims**



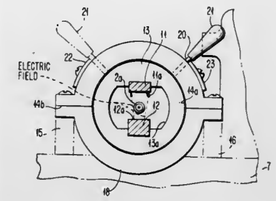
1. An ink-jet printer comprising: a print-head including a droplet generator, a first droplet deflector, and a droplet catcher, said first droplet deflector being a controlled pneumatic jet so directed at the stream of droplets which issue from said droplet generator as to deflect said stream from a first path to at least one other path whereby to vary the marking effect of said stream on a record web; an ink source interconnected to the print-head to deliver ink to said droplet generator; a supply of air under pressure to actuate said droplet generator and said first droplet deflector; sensor elements to monitor the passage and position of said stream of droplets; a central control unit to coordinate the control of said first droplet deflector with the passage and position of said droplet stream and with selective input signals relating to characters or pictures to be marked on said web; a second droplet deflector downstream from said first droplet deflector said second droplet deflector deflecting those portions of said stream which reach it in an oscillatory manner, said first droplet deflector, when appropriately controlled by signals, determining what portions of said stream reach the second droplet deflector.

4,190,845

ELECTRIC FIELD ORIENTATION FOR INK JET PRINTERS FOR VERTICAL AND HORIZONTAL PRINTING

Leon M. Cooper, and Walter J. Wipke, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1978, Ser. No. 973,056
Int. Cl.² G01D *15/16*
U.S. Cl. 346—75 **25 Claims**



1. An ink jet printing system comprising:

a nozzle for issuing a stream of ink drops;

a first electrode for charging the ink drops issuing from said nozzle in accordance with signals to be recorded;

a record receiving medium for forming images indicative of the signals imposed upon said ink drops, means for forming an electric field, means for orientating said field substantially perpendicular to said stream of ink drops, said electric field for effecting deflection of said ink drops in accordance with the amplitudes on the individual charges on said ink drops;

means for effecting relative movement between said nozzle and said record receiving medium in at least a selected one of vertical and horizontal directions, and means coupled to said means for orienting said electric field to position said electric field orthogonally to said selected one of horizontal and vertical directions.

4,190,846

INK LIQUID CONCENTRATION CONTROL IN AN INK LIQUID SUPPLY SYSTEM FOR AN INK JET SYSTEM PRINTER

Yoichi Yamamoto, Nara, and Yoichi Shimazawa, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1977, Ser. No. 857,973
Claims priority, application Japan, Dec. 6, 1976, 51-147042
Int. Cl.² G01D *15/18;* **G05D** *11/00*
U.S. Cl. 346—140 R **8 Claims**

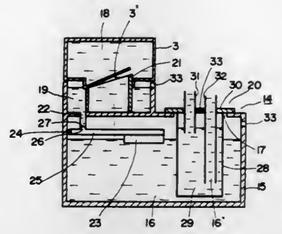
1. An ink liquid supply system for an ink jet system printer which emits ink droplets from a nozzle for performing a writing operation, said ink liquid supply system comprising:

an ink tank for containing ink liquid therein;

conduit means for connecting said ink tank with said nozzle;

a pump for supplying the ink liquid from said ink tank to said nozzle through said conduit means under a predetermined pressure; and

an ink liquid concentration controller disposed between said ink tank and said pump, said ink liquid concentration controller including:



a first reservoir for containing reference ink of a predetermined concentration therein;

a second reservoir for introducing ink liquid from said ink tank and for supplying ink liquid to said pump; and

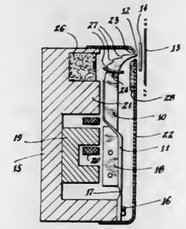
means for maintaining the concentration of the ink liquid in said second reservoir at a value identical with that of the reference ink in said first reservoir.

4,190,847

STRAY INK COLLECTOR FOR IMPACT PRINTER

Sven G. V. Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Nov. 6, 1978, Ser. No. 958,050
Claims priority, application Sweden, Nov. 9, 1977, 7712670
Int. Cl.² G01D *15/20;* **B41J** *9/00*
U.S. Cl. 346—141 **10 Claims**



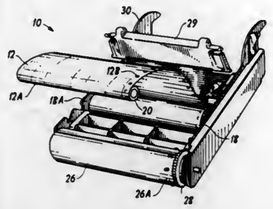
1. In a device for producing imprints on a recording medium, a member acting on said medium having an elongated arm for striking or pressing against a surface of said medium, a support having an impact surface, means mounting said arm for resilient pivotal movement on said support, an operating assembly for said device on said support, said arm, under the action of said operating assembly, being movable between a rear portion against said impact surface and a front position in which a portion of said arm strikes or presses against said medium which is the printing position, the cross-sectional area of said arm that is between the impact point and the part of the arm which coacts with said fixed impact surface being provided with at least one steep step.

4,190,848

INDUSTRIAL PROCESS RECORDER INCORPORATING IMPROVED ROLL CHART ASSEMBLY

John R. Curran, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 21, 1978, Ser. No. 879,301
Int. Cl.[2] G01D *15/00*
U.S. Cl. 346—145 **4 Claims**



1. An industrial process recording instrument of the type utilizing a moving chart record and comprising:

an elongate chassis to be mounted as part of a control room panel together with other instruments and having a front face for presenting to the control room operator a portion of the moving chart record on which at least one process variable is recorded during instrument operation;

said instrument being adapted to be mounted in said panel so as to accommodate ready pull-out of said chassis at least partially from the panel;

an elongate roll chart cassette within said chassis with at least one long side of the contained roll chart having a perforated edge portion and being disposed parallel to the longitudinal axis of said recording instrument;

means mounting said cassette within said instrument to provide for ready removal of the cassette while said instrument has been withdrawn at least partially from said control panel;

said cassette including chart record replacement means wherein in one place of said cassette a supply roll on which the bulk of said chart record is initially wound is located and in another place a take-up roll presecured to the lead end of said chart record is positioned such that when said cassette is mounted in said chassis said chart record replacement means is automatically ready to permit markings to be placed thereon during instrument operation;

said lead end of said chart record being fixedly presecured to said take-up roll with the longitudinal axis of said chart record exactly perpendicular to the axis of said take-up roll;

means for driving the roll chart such that the chart record advances at a constant speed, said drive means including a sprocketed drive drum for engaging said perforated edge portion; and,

means for rotating said take-up roll, whereby said roll chart is wound uniformly on said take-up roll.

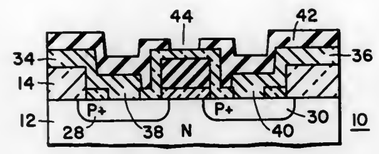
4,190,849

ELECTRONIC-BEAM PROGRAMMABLE SEMICONDUCTOR DEVICE STRUCTURE

Michael W. Powell, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1977, Ser. No. 834,081
Int. Cl.[2] H01L *29/78, 29/34, 27/10;* **G11C** *11/40*
U.S. Cl. 357—23 **1 Claim**

1. An integrated semiconductor device including an insulated gate field effect transistor capable of being selectively programmed by an electron beam for use in a memory array, said transistor comprising: an electrically isolated gate electrode overlying a gate insulator layer which overlies a semiconductor substrate of a first conductivity type and disposed spatially between a source region and a spaced apart drain region of opposite conductivity type which form a pair of PN junctions in said substrate; an insulator layer overlying said gate electrode and being of a thickness to allow penetration of electrons from an electron beam to said gate electrode; a region in said substrate underlying said gate electrode, positioned



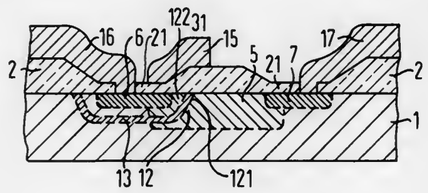
between said source and drain regions and having a conductive state responsive to electrons stored on said gate electrode from said electron beam; and means on said substrate for accurately positioning said electron beam with respect to said gate electrode.

4,190,850

MIS FIELD EFFECT TRANSISTOR HAVING A SHORT CHANNEL LENGTH

Jenõe Tihanyi, Munich, and Guido Bell, Gilching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,216
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703877
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **18 Claims**



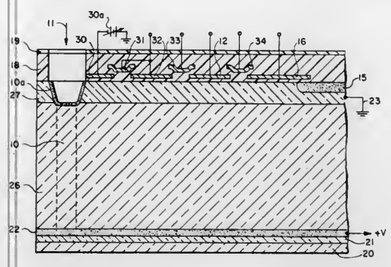
1. MIS field effect transistor having a short channel length with a semiconductor substrate, on the surface of which there is arranged an insulating layer, which is in turn provided with a gate electrode layer, wherein, in the semiconductor substrate there is provided a drain zone of the first conductivity type and a source zone which possesses the first conductivity type is strongly doped and meets the substrate surface, a second doped zone of the second conductivity type which lies below said source zone and surrounds said source zone at least in the direction of said drain zone, and meets the substrate surface spaced laterally with respect to said source zone by a third zone, a channel zone being formed by that portion of the semiconductor substrate which lies between the outer edge of said second doped zone adjoining the substrate surface and the adjacent edge of said source zone, and is located within said third zone of the first conductivity type, said third doped zone being lightly doped and adjoining said drain zone, source zone and said second doped zone containing implanted dopant particles.

4,190,851

MONOLITHIC EXTRINSIC SILICON INFRARED DETECTORS WITH CHARGE COUPLED DEVICE READOUT

Ronald M. Finnila, Costa Mesa, and Stephen C. Su, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 17, 1975, Ser. No. 614,277
Int. Cl.[2] H01L *27/14, 31/00*
U.S. Cl. 357—30 **10 Claims**



1. In an image detector of the type having at least one optical detector operable to generate an electrical charge signals in response to optical radiation, and having means for processing said signals comprising a charge coupled signal collecting device for transferring charge to a utilization circuit, the improvement comprising:

(a) a semiconductor substrate having an epitaxial layer monolithically formed thereon;

(b) an insulating layer of dielectric material formed on said epitaxial layer;

(c) at least one optical detector element formed in said substrate and having at least one surface accessible to optical radiation through an aperture extending through both said epitaxial layer and said insulating layer; and

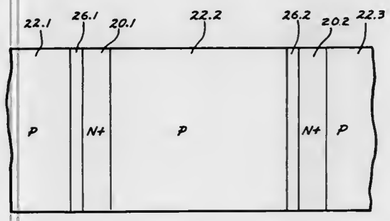
(d) a plurality of electrode means spaced from said epitaxial layer by at least a portion of said insulating layer for forming said charge coupled signal processing device in said insulating and epitaxial layers to transfer signal charge from said detector element through said epitaxial layer to said utilization circuit in response to cyclical voltages applied to said electrode means to control the potential profile in said epitaxial layer.

4,190,852

PHOTOVOLTAIC SEMICONDUCTOR DEVICE AND METHOD OF MAKING SAME

Raymond M. Warner, Jr., 5001 Arden Ave., Minneapolis, Minn. 55424

Filed Sep. 14, 1978, Ser. No. 942,152
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **22 Claims**



1. A photovoltaic semiconductor device having a plurality of photovoltaic semiconductor cells comprising:

a. relatively thick first horizontal layer of first conductivity material;

b. second horizontal layer of second conductivity material overlying said first horizontal layer of said first conductivity material;

c. third horizontal layer of first conductivity material overlying said second horizontal layer of said second conductivity material;

d. plurality of first elongate zones of second conductivity material extending entirely through said third, second, and first horizontal layers;

e. plurality of second elongate zones of heavily doped first conductivity material parallel and substantially contiguous to each of said first elongate zones of second conductivity material extending entirely through said third and second layers and at least slightly into said first layer;

f. fourth horizontal thin shallow layer of said second conductivity material overlying said third horizontal layer of said first conductivity material, and;

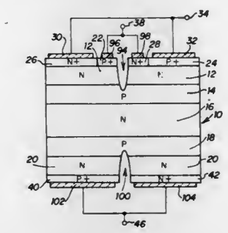
g. metallization strips extending over a portion between each of said first and second elongate zones whereby topologically continuous active photovoltaic junctions are formed by said fourth and second horizontal layers and said first elongate zone of second conductivity material on the one, and said third and first horizontal layers and said second elongate zone of said first conductivity material on the other, with metallization strips extending over a portion between said first and second elongate zones, said metallization strips serially connecting each cell to an adjacent cell of said photovoltaic semiconductor device by short circuiting inactive pn junctions which bound one side of each cell, said inactive pn junctions being formed by said first elongate zone of second conductivity material on the one and by said second elongate zone of first conductivity material and said first horizontal layer on the other.

4,190,853

MULTILAYER SEMICONDUCTOR SWITCHING DEVICES

Jearld L. Hutson, 2019 W. Valley View La., Dallas, Tex. 75234

Continuation of Ser. No. 488,789, Jul. 15, 1974, abandoned. This application Sep. 20, 1976, Ser. No. 724,916
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 **6 Claims**



1. A semiconductor switch device having symmetrical bidirectional switching characteristics but nonsymmetrical construction comprising:

a body of semiconductor material having five layers of alternating first and second opposite conductivity types to form a plurality of P-N junctions, said body having two outer layers of said first conductivity type,

a pair of spaced apart heavily doped discrete regions of said second conductivity type being formed in portions of one of said outer layers to form a sixth layer defining an exterior surface of said body,

first isolating means extending through said one of said outer layers and disposed between said regions of said second conductivity type in order to electrically isolate said regions from one another,

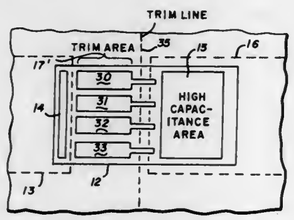
first and second electrodes contacting said heavily doped regions,
third and fourth electrodes contacting said one outer layer of opposite sides of said first isolating means,
a heavily doped discrete region of said second conductivity type formed in and covering a portion of the other conductivity type formed in and covering a portion of the other of said outer layers to form a seventh layer defining another exterior surface of said body,
second isolating means extending through said other outer layer and disposed between said heavily doped region and the exterior surface of said other outer layer,
said body thus formed including one portion having six layer of alternating opposite conductivity types and a second portion having seven layers of alternating opposite conductivity types, said switch operable in response to electrical signals applied to said electrodes to provide bidirectional symmetrical switching action at a high commutating rate,
a fifth electrode contacting said heavily doped region in said other outer layer, and
a sixth electrode contacting the exterior surface of said other outer layer on the opposite side of said second isolating means from said heavily doped region.

4,190,854

TRIM STRUCTURE FOR INTEGRATED CAPACITORS

Thomas P. Redfern, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 15, 1978, Ser. No. 877,915
Int. Cl.[2] H01L *27/00*
U.S. Cl. 357—51 **4 Claims**



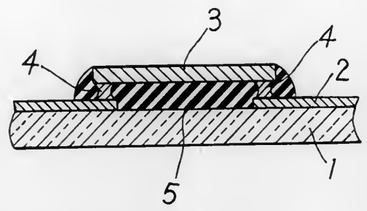
1. An integrated circuit comprising:
a semiconductor substrate;
a conductive counter electrode physically associated with said substrate, said counter electrode being formed from a conductive layer deposited on a first insulating layer located on said semiconductor substrate;
a second insulating layer located over said counter electrode, said second insulating layer having a relatively thick region and a relatively thin region;
a first conductive electrode covering said thin region of said second insulating layer;
a second conductive electrode covering a portion of said thick region of said second insulating layer, said second conductive electrode being composed of a material selected from the group consisting of silicon-chromium alloy, molybdenum tungsten, tantalum, nickel-chromium alloy, niobium, and tantalum nitride;
means for connecting said first and second conductive electrodes; and
means for making electrical connection to said counter electrode and said first conductive electrode to create a capacitor the value of which can be laser trimmed without damaging said integrated circuit.

4,190,855

INSTALLATION OF A SEMICONDUCTOR CHIP ON A GLASS SUBSTRATE

Yukihiro Inoue, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,455
Claims priority, application Japan, Aug. 11, 1976, 51/96365
Int. Cl.[2] H01L *39/02*
U.S. Cl. 357—80 **7 Claims**



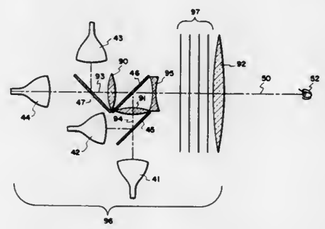
1. A semiconductor device comprising:
(a) a flipchip integrated circuit device having a specific coefficient of thermal expansion;
(b) a mechanical supporting substrate which has a coefficient of thermal expansion substantially different from that of said flipchip and bears a low mechanical resistance against thermal expansion;
(c) a wiring pattern deposited on said supporting substrate;
(d) a bonding member for bounding said flipchip integrated circuit device and said substrate, said flipchip integrated circuit device being mechanically supported by the bonding member; and
(e) an insulating resin layer deposited in such a manner so as to cover at least a junction between said flipchip integrated circuit device and said bonding member and a junction between said substrate and said bonding member, said insulating resin layer having a coefficient of thermal expansion sufficient to absorb mechanical strain caused by the differences in the coefficient of thermal expansion between said flipchip integrated circuit and said substrate, thereby ensuring the mechanical tightness of the junctions between said flipchip integrated circuit device and said bonding member and between said substrate and said bonding member against a substantial amount of thermal expansion.

4,190,856

THREE DIMENSIONAL TELEVISION SYSTEM

Dennis E. Ricks, 1166 Briar Ave., Provo, Utah 84601

Filed Nov. 21, 1977, Ser. No. 853,322
Int. Cl.[2] H04N *9/58*
U.S. Cl. 358—88 **30 Claims**



1. An apparatus for producing a three-dimensional picture suitable for use with television systems, said apparatus comprising:

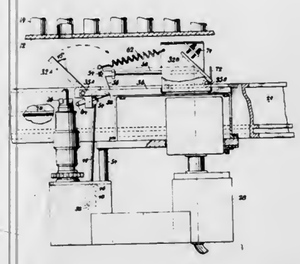
(a) one or more display screens for displaying a set of cross-sectional representations of a scene,
(b) an arrangement of beam splitters for optically stacking said cross-sectional representations along a common optical axis to form a composite three-dimensional picture for viewing by an audience, and
(c) at least one positive lens means for developing forward repositioning of the cross-sectional representations toward said audience, said lens means being positioned along said optical axis between said display screens and said audience and being separated from said display screens by an optical path distance that is greater than one focal length of said lens means.

4,190,857

PERISCOPE ASSEMBLY

Ronald B. Creek, and John P. Cook, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 8, 1978, Ser. No. 913,930
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—100 **10 Claims**



1. Apparatus for viewing the inside of tubes connected to an apertured tube sheet of a steam generator comprising track means adjacent the surface of the tube sheet, a viewing assembly including a television camera axially aligned with said tubes and mounted on said track for lateral movement relative to the surface of the tube sheet, a periscopic viewing device for said camera having a viewing mirror and an objective mirror mounted on said track to provide a line of sight between the viewing mirror and the objective mirror that is substantially parallel to said track, a tool holder mounted on said track in alignment with the objective mirror and adapted to be moved in a path normal to the line of sight between the objective and viewing mirrors, and means for moving the objective lens of the periscopic viewing device from the path of movement of the vertical tool holder thereby permitting unrestricted movement of the tool holder.

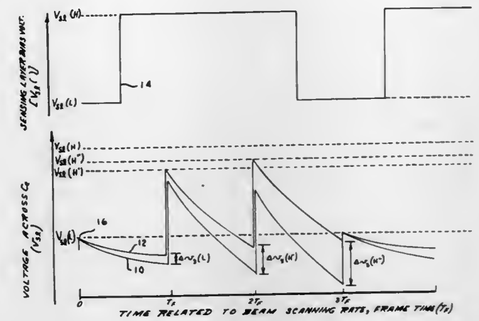
4,190,858

METHOD FOR IMPROVED PERFORMANCE OF INFRARED VIDICON CAMERAS

Edward F. Cross, Los Angeles, and Wilbur A. Garber, San Pedro, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,263
Int. Cl.[2] H04N *5/33*
U.S. Cl. 358—113 **1 Claim**

1. A method for improving performance of return beam type infra red vidicon camera tubes in a television system comprising the steps of: directing the camera window toward incident optical irradiance; fully charging each element of the vidicon image sensing layer sequentially with an electron beam; exposing the sensing layer to an image containing infra red radiation for one television frame time and allowing the irradiance to selectively discharge the sensing layer; recharging the image sensing layer a first time, to a voltage that substantially saturates the image sensing layer, sequentially with a scanning electron beam; continuing to expose the sensing layer to an image containing infra red radiation for one television frame time and allowing other irradiance to selectively discharge the sensing layer; recharging the image sensing layer a second time, to a voltage that substantially saturates the image sensing layer sequentially with a scanning electron beam; continuing to



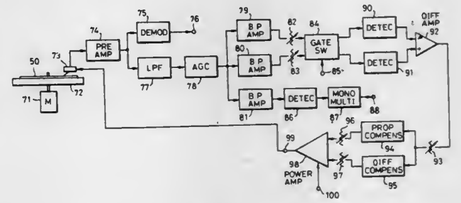
expose the sensitive layer of an image containing infra red radiation for one television time frame and allowing the irradiance to selectively discharge the sensing layer; recharging the image sensing layer a third time to a voltage fully charging said layer; measuring the current of the return charging beam and amplifying said beam by electron multiplier dynodes and directing the amplifier signal to a television display unit.

4,190,859

TRACKING CONTROL APPARATUS FOR USE IN APPARATUS FOR REPRODUCING VIDEO SIGNALS FROM A ROTARY RECORDING MEDIUM

Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 7, 1978, Ser. No. 884,142
Claims priority, application Japan, Mar. 8, 1977, 52-25260
Int. Cl.[2] G11B *21/10*
U.S. Cl. 358—128.5 **6 Claims**



1. A tracking control system in a reproducing apparatus having a transducer for reproducing signals recorded on a rotary recording medium in which a main information signal has been recorded in a plurality of adjacent tracks, first and second reference signals having different frequencies, each of said reference signals being alternately recorded at intermediate positions between longitudinal center lines of the adjacent tracks, and a third reference signal being recorded at positions corresponding to a switching of the first and second reference signals, said first, second and third reference signals being in a frequency band which is lower than the frequency band of the main information signal, said tracking control apparatus comprising:
means for controlling the reproducing transducer to correctly track along the main information signal track;
a first separating means for filtering and separating a low frequency band component including at least the first,

second and third reference signals from the signal reproduced by the reproducing transducer;

a second separating means for separating the low frequency band component into the first, second and third reference signals;

means for detecting the separated first and second reference signals;

means for selectively switching the separated first and second reference signals responsive to the separated third reference signal, said switched first and second reference signals being supplied to the detecting means;

a control signal producing means for producing a control signal in response to the outputs of the detecting means and for applying the control signal to the tracking control means; and

automatic gain control means for bringing the levels of the separated first, second and third reference signals to a predetermined level, said automatic gain control means being in a signal transmission path between the first separating means and the control signal producing means.

4,190,860

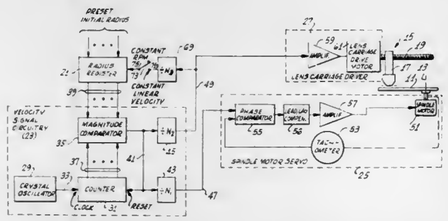
DIGITAL METHOD AND APPARATUS FOR ROTATING AN INFORMATION STORAGE DISC

Frank J. Somers, Santa Monica, and John S. Winslow, Altadena, both of Calif., assignors to MCA Discovision, Inc., Universal City, Calif.

Filed Nov. 16, 1978, Ser. No. 961,362

Int. Cl.² G11B *19/24, 19/14*

U.S. Cl. 358—128.5 **23 Claims**



1. Apparatus for rotating an information storage disc relative to a transducer, said disc having a plurality of substantially circular and concentrically arranged information tracks, wherein said transducer is radially movable relative to said disc to be positioned in a prescribed relationship relative to a selected one of said tracks, and the relative angular velocity of the information disc is controllably varied according to the radius of the selected information track, said apparatus comprising:

means for producing a digital measure of the radius of the particular information track selected;

oscillator means for producing a clock signal having a substantially constant frequency;

means, responsive to the radius measure and the clock signal, for producing a disc velocity signal that has an instantaneous frequency corresponding to the frequency of the clock signal divided by the radius measure; and

means for adjusting the angular velocity of the information disc according to the instantaneous frequency of the disc velocity signal.

4,190,861

METHOD AND ARRANGEMENT FOR REDUNDANCY-REDUCING PICTURE CODING

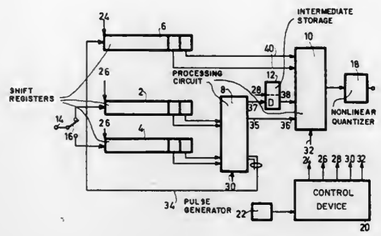
Peter Lux, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,894

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640140

Int. Cl.² H04N *7/12*

U.S. Cl. 358—135 **11 Claims**



1. A method of redundancy-reducing coding of the values of picture elements of pictures which are scanned line-by-line and which are distributed in a matrix as lines and picture elements, a difference value being formed for substantially each picture element, said difference value being the difference between the actual value of the picture element and a predictive value obtained from the values of other picture elements, comprising the steps of:

dividing the picture matrix into adjacent, equally large, square sub-pictures;

intermediate storing the values of the picture elements of the picture lines which are covered by a series of sub-pictures;

obtaining the predictive value for a picture element from the values of the other picture elements of the associated sub-picture; and

quantizing the resulting first difference values.

4,190,862

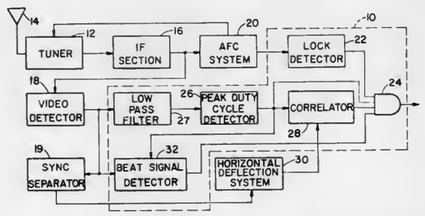
VIDEO CARRIER RECOGNITION SYSTEM

Richard W. Citta, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 6, 1978, Ser. No. 875,645

Int. Cl.² H04N *5/50*

U.S. Cl. 358—195 **9 Claims**



1. In a television receiver having a tuner responsive to a received RF television signal for developing video and audio IF subcarrier signals, an AFC system for locking one of said IF subcarrier signals to the video IF frequency of said receiver and a video detector for detecting said video IF subcarrier signals; the improved circuit for producing a recognition signal in response to said video subcarrier being locked to said video IF frequency comprising:

first detector means coupled to said AFC system for developing a first control signal in response to said AFC system being locked to an IF subcarrier signal;

filter means connected for low-pass filtering the output of said video detector;

second detector means coupled to said filter means for developing a second control signal in response to said low-pass filtered output of said video detector comprising a plurality of signal spikes whose peaks are characterized by a duty cycle having a value less than a predetermined value, said spikes having a predetermined polarity and corresponding to the horizontal synchronizing pulses of said television signal; and

coincidence gate means coupled to said first and second detectors and responsive only to the presence of said first and second control signals for producing said recognition signal.

4,190,863

REMOTE CONTROL SYSTEM FOR A TELEVISION CAMERA

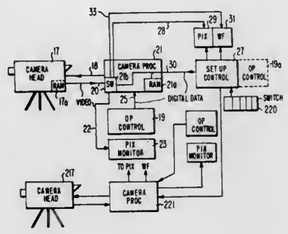
Robert A. Dischert, Burlington, and Laurence J. Thorpe, Marlton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 6, 1978, Ser. No. 894,009

Claims priority, application United Kingdom, May 23, 1977, 22805/77

Int. Cl.² H04N *5/24, 5/26*

U.S. Cl. 358—210 **6 Claims**



1. A system for providing remote control of a television camera having a source of television sync signals comprising:

a remote unit having a plurality of selective controls and analog to digital converter means coupled to each of said plurality of selective controls and responsive to said sync signals for separately and sequentially providing binary signals which are binary digital representations of the selected control values of said selective controls during each television field;

means including a digital to analog converter in said television camera responsive to the television horizontal sync signals for converting sequentially during each television field said binary signals to amplitude level signals corresponding to the binary signal,

means including a single transmission line for coupling the output signals from said analog to digital converter means to said digital to analog converter in said camera,

a plurality of separate temporary storage devices in said camera for temporarily storing the amplitude level signals between television fields, and

means in said camera responsive to the sequence of said amplitude level signals for sequentially coupling said amplitude level signals from said digital to analog converter to the appropriate temporary storage devices in the camera.

4,190,864

REMOTE IRIS CONTROL FOR TELEVISION CAMERAS

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,339

Int. Cl.² H04N *5/30*

U.S. Cl. 358—210 **3 Claims**

1. A digital control system for use with a camera having an electronically controllable light admitting means such as a motor driven iris, comprising:

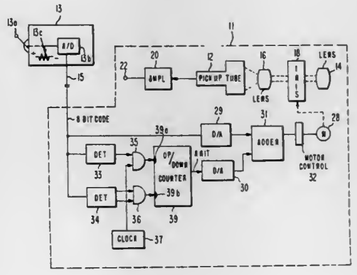
a manually adjustable control device having first and second limit positions and positions therebetween,

converting means coupled to said control device for providing binary coded signals representing the manually selected position of said device,

fine control means coupled to said converting means and said electronically controllable light admitting means and responsive to said binary coded signals representing positions between said limit positions for directly controlling in relatively small increments the opening of the iris within a relatively narrow range of the required total iris opening range, and

coarse control means coupled to said converting means and said electronically controllable light admitting means and responsive to binary coded signals representing said control device at substantially said first limit position for opening the iris at a constant rate and responsive to binary coded signals representing said control device at substantially said second limit position for closing the iris at a constant rate to thereby position the iris opening in the desired range said fine control means will operate.

3. A digital iris remote control system for remotely controlling a television camera having an electronically controllable light admitting means such as a motor driven iris comprising:



a manually adjustable control device remotely located from said camera having first and second limit positions and positions therebetween,

converting means at said remote location coupled to said device for providing binary coded signals representing a manually selected position of said device,

a fine control means located at said camera and coupled to said light admitting means and responsive to said binary coded signals representing positions between said limit positions for directly changing in relatively small increments the iris opening within a relatively narrow range of the required total iris opening range,

a coarse control means located at said camera and coupled to the light admitting means and responsive to said binary coded signal representing said control device at substantially a first of said limit positions for opening said iris at a constant rate and responsive to said binary coded signal representing said control device at substantially the other of said limit positions for closing said iris at a constant rate to thereby position the iris opening in the desired range said fine control means will operate, and

means including a transmission line coupled between said converting means and said coarse control means and said fine control means for coupling said binary digital control signals from said remote location to said camera location.

4,190,865

VIDEO IMAGE TUBE HIGHLIGHT SUPPRESSION CIRCUIT

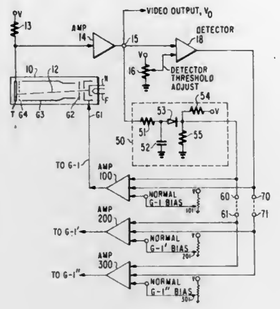
Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 763,593, Jan. 28, 1978, abandoned. This application Aug. 10, 1978, Ser. No. 932,608

Claims priority, application United Kingdom, Dec. 13, 1976, 51834/76; Jan. 25, 1977, 02933/77

Int. Cl.² H04N *5/19, 9/16*

U.S. Cl. 358—219 **2 Claims**



1. A beam control circuit for suppressing small area type illumination highlights effects in a video output signal representative of a scene being received by an image pickup tube with tube protection from large area highlights, said image pickup tube including a cathode, and a beam control element for controlling an electron beam used to scan a target electrode, said scanning producing an electrical output signal in the form of a video signal representative of the scene being received by said pickup tube by recharging said target electrode, comprising:

detector means coupled to said image pickup tube and responsive to said electrical output signal exceeding a given level indicative of highlights for providing a control signal having a leading and a trailing edge and a time duration equal to the time duration of said illumination highlights;

biasing means coupled to said image pickup tube control element for developing a steady state beam current in said image pickup tube; and

means coupled to said biasing means being responsive to said control signal for increasing said steady state beam current in the presence of said illumination highlights during said scanning so as to increase the recharge rate of said target electrode,

measuring means coupled to said image pickup tube and responsive to the video output signal therefrom for providing a second control signal representative of the average video signal level over a predetermined time period of a large area scan,

means coupled to said measuring means and responsive to said second control signal for providing a beam current disabling signal when the average video signal level exceeds a predetermined signal level indicative of a very large area overly illuminated and

means for coupling said beam current disabling signal to said beam current biasing means for disabling said beam current increase during very large area highlights.

4,190,866

SURVEILLANCE DEVICE INCORPORATING A TELEVISION CAMERA

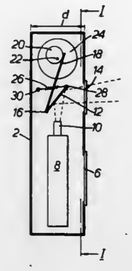
Amiel Luknar, 28 Allerton Rd., London, N.16, England

Filed Oct. 27, 1977, Ser. No. 846,201

Claims priority, application United Kingdom, Oct. 30, 1976, 45233/76

Int. Cl.² G03B *37/00;* **H04N** *5/26, 5/30, 7/18*

U.S. Cl. 358—229 **8 Claims**



1. Surveillance apparatus for the control of access to premises, the apparatus comprising a body, an intercom unit mounted in the body, a television camera mounted in the body, a lens mounted on the television camera, image reflecting means mounted in said body in front of the lens and in the optical path of the lens, and pivot means connecting the image reflecting means to the body, whereby a visitor entering the area under surveillance can use the intercom unit to request access and the image reflecting means can then be pivoted about an axis which is in a plane perpendicular to the optical axis of the lens so that the apparatus scans the area to be surveyed.

4,190,867

LASER COM WITH LINE DEFLECTION MIRROR INERTIA COMPENSATION

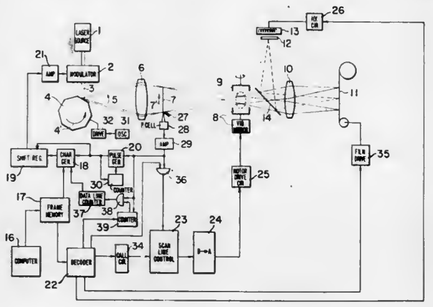
Masahiro Ohnishi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 5, 1978, Ser. No. 893,634

Claims priority, application Japan, Apr. 7, 1977, 52/39005

Int. Cl.² H04N *1/02, 1/17*

U.S. Cl. 358—285 **4 Claims**



1. In a method of two-dimensionally scanning a recording light beam intensity modulated in accordance with a data signal, including successively horizontally deflecting the light beam and simultaneously vertically deflecting it with a rotating mirror, a method of eliminating character image distortion immediately following a vertical scan stop or data line skipping operation due to the inertia of the rotating mirror, characterized by:

decreasing the intensity of the light beam to a level below a recording level immediately following a vertical scan stop or data line skipping operation for a period of time sufficient to allow the rotating mirror to reach a substantially constant rotational speed.

4,190,868

METHOD AND APPARATUS FOR AUTOMATICALLY INSCRIBING MAGNETIC MARKS ON A WIRELINE

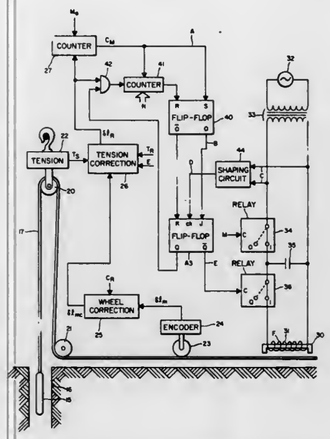
Pierre A. Moulin, Chaville, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,603

Claims priority, application France, Oct. 26, 1976, 76 32173

Int. Cl.² G11B *5/00*

U.S. Cl. 360—1 **34 Claims**



1. Method for automatically inscribing magnetic marks on a moving steel wireline used for raising and lowering borehole tools in a borehole at varying speeds, comprising:

generating an alternating magnetic field of successively alternating positive and negative polarity for application to a zone on said moving steel wireline; and

interrupting in response to a control signal said alternating magnetic field at a time synchronized to begin between said alternations of the field substantially terminating the magnetic field applied to said steel wireline and restoring said magnetic field after a mechanically coupled measurement of movement of a predetermined length of said steel wireline past said zone to inscribe said magnetic marks on said steel wireline, said interrupting of said alternating magnetic field for said predetermined length measured independent of the speed of said moving steel wireline thereby inscribing uniform magnetic marks without generating an additional magnetic field during said interrupting.

4,190,869

SLOW MOTION TAPE DRIVING SYSTEM IN A RECORDING AND/OR REPRODUCING APPARATUS

Yoshihiko Ota, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 24, 1978, Ser. No. 908,917

Claims priority, application Japan, May 31, 1977, 52-63661; Jun. 7, 1977, 52-66925

Int. Cl.² H04N *5/795;* **G11B** *19/26, 15/46*

U.S. Cl. 360—10 **10 Claims**

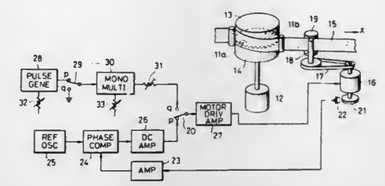
1. A tape driving system for use in a recording and/or reproducing apparatus which may be selectively operated at any of a plurality of different modes, including at least a slow-motion mode, said recording and/or reproducing apparatus having at least one rotating video signal head for tracing tracks lying obliquely on a tape and for reproducing a video signal, said tape driving system comprising:

means for driving said tape;

a DC motor for driving said tape driving means;

means for forming recurring pulse-like voltages, each of said pulses having a predetermined level and a predetermined width, said pulses recurring at a given frequency;

means for producing a continuous voltage; and



means for selectively applying either the pulse-like voltages from said forming means or the continuous voltage from said producing means to said DC motor depending on the selected reproducing mode, said pulse-like voltages being applied to said motor in a slow motion reproducing mode to rotate said motor during the pulse width and cause said tape driving means to intermittently shift said tape.

4,190,870

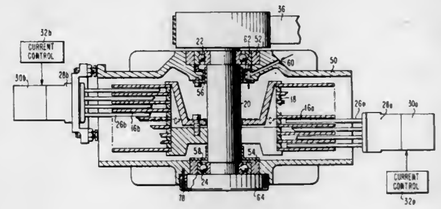
DISK DRIVE ASSEMBLY

Raymond Avina, San Jose, and Patrick F. Merrell, San Martin, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1978, Ser. No. 922,255

Int. Cl.² G11B *17/02;* **F16C** *19/52*

U.S. Cl. 360—98 **4 Claims**



1. A disk storage assembly comprising:

a multiplicity of magnetic disks;

a number of movable magnetic heads for accessing associated surfaces of said disks;

an air-tight housing enclosing said magnetic heads and disks;

a rotary spindle disposed centrally within said housing and having a longitudinal axis about which said spindle rotates;

means for mounting said disks to said spindle in an array along said axis;

means for controlling air flow into and within said housing to prevent contaminated air from circulating in said housing;

first ball bearing means located at one end of said spindle, and second ball bearing means located at the other end of said spindle; and

metal rings affixed between said housing and said spindle bearing means, wherein the coefficient of thermal expansion of said rings has a value substantially that of said spindle bearings.

4,190,871

MAGNETIC CONVERTER HAVING A MAGNETORESISTIVE ELEMENT

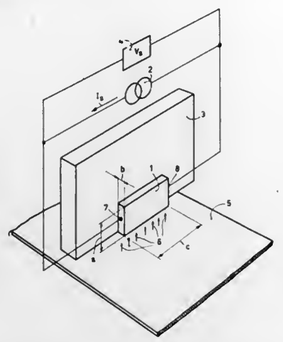
Anthonie Walraven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 682,643, May 3, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,443

Claims priority, application Netherlands, Jun. 13, 1975, 7507049

Int. Cl.² G11B *5/12, 5/22, 5/30*

U.S. Cl. 360—113 **5 Claims**



1. A magnetic converter for detecting information-representing magnetic fields on a magnetic recording medium movable relative to the converter, said converter comprising a magnetoresistive strip having one end adapted to face the recording medium and means for detecting resistance variations of said strip, said detecting means including means for applying, to two opposite sides of said strip adjacent said one end, an alternating current of a sufficiently high frequency to produce a current distribution in said strip such that the current is concentrated in a region of said strip adjacent said one end and a region adjacent the end of said strip opposite said one end due to lateral skin effect.

4,190,872

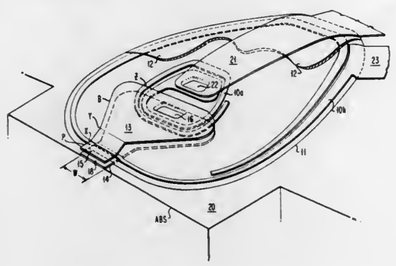
THIN FILM INDUCTIVE TRANSDUCER

Robert E. Jones, Jr., and Walther Nystrom, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,104

Int. Cl.² G11B *5/12, 5/22, 5/20*

U.S. Cl. 360—125 **10 Claims**



1. A thin film inductive transducer for recording and reading magnetic transitions on a selectable one of a plurality of tracks on a magnetic recording medium, said transducer being of the type comprising two layers of a magnetic material forming a yoke structure that is activated by a conductor coil characterized in that:

said yoke structure adjacent its one end comprises a pole tip region in which the layers are of a predetermined substantially constant width and a preselected substantially constant thickness, said predetermined width not exceeding the width of a track on the medium, and said pole tip region extending from said one end a relatively short distance normal to the magnetic medium to an "optimum transition point", thereby to maximize resolution of transitions during recording; and

said yoke structure comprises a back region which joins said pole tip region at said "optimum transition point" and in which the layers increase progressively in width from said predetermined width, said back region having a back gap substantially centered adjacent its wider end, the thickness of the layers of magnetic material in said back region being greater than said preselected constant thickness of those layers in said pole tip region, thereby to oppose saturation of the yoke structure with applied current and enhance efficiency of the transducer by increasing the cross-sectional area of the yoke structure.

4,190,873

PROTECTIVE DEVICE FOR AN ELECTRON TUBE

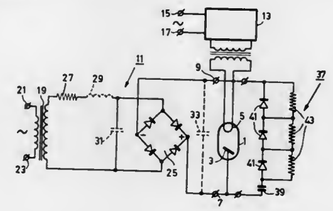
Frits H. Klokkers, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,766

Claims priority, application Netherlands, Mar. 31, 1977, 7703493

Int. Cl.² H05G *1/12*

U.S. Cl. 361—56 **12 Claims**



1. A device comprising a high voltage generator having output terminals, an electron tube having two electrodes connected to said output terminals of the high voltage generator, means connecting said two electrodes to a protection circuit which comprises a capacitor and a number of diodes connected in series with the forward direction of the diodes extending from the tube electrode of highest potential to the tube electrode of lowest potential, a parasitic capacitance being present between said two electrodes, and the capacitance of the capacitor being chosen substantially higher than said parasitic capacitance occurring between the two electrodes.

4,190,874

ANTI-STATIC DEVICE FOR CLOTHES DRYERS

Raymond Pasold, 5412 N. Sawyer, Chicago, Ill. 60616

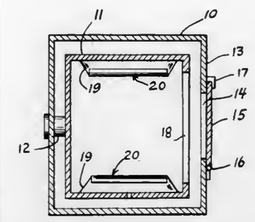
Filed Jun. 21, 1978, Ser. No. 917,452

Int. Cl.² H05F *3/00*

U.S. Cl. 361—212 **4 Claims**

1. An anti-static device for use in rotary clothes dryers having a rotatable drying drum including tumbler vanes by which clothes are tumbled in heated air comprising:

(a) a conductive member mounted upon the tumbler vanes of the clothes drying drum for contracting the clothes as they are tumbled thereby so as to induce electrical current in the



clothes thereby neutralizing static elecrical charges developed therein by friction therebetween.

4,190,875

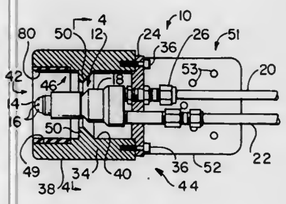
APPARATUS FOR REMOVING PARTICULATE MATTER FROM AN ATMOSPHERE

William L. Smart, Indianapolis, Ind., and Stuart A. Hoenig, Tucson, Ariz., assignors to The Ritten Corporation, Ltd., Ardmore, Pa.

Filed Oct. 4, 1976, Ser. No. 729,204

Int. Cl.² B05B *5/02;* **B03C** *3/16*

U.S. Cl. 361—228 **13 Claims**



1. Apparatus for removing contaminants from an atmosphere comprising means for dispensing atomized particles of pollution control liquid, means connecting a supply of such pollution control liquid to the dispensing means, means for inductively charging the particles of liquid as the particles are atomized to generate a charged fog of pollution control liquid particles, a power supply for energizing the charging means connected to the charging means, and a collar fabricated from an insulating material and having a generally cylindrical inner wall and open forward and rearward ends, and means for supporting both the dispensing means and the charging means interiorly of the collar in fixed spaced-apart relation.

4,190,876

VARIABLE CAPACITORS

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Feb. 3, 1978, Ser. No. 874,908

Int. Cl.² H01G *5/04*

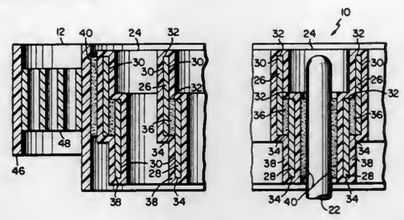
U.S. Cl. 361—278 **16 Claims**

1. A capacitor having two electrodes which are separated from one another in which the improvement comprises:

both of said electrodes comprising elongated, electrically conductive strips having sides, top and bottom edges, and ends,

dielectric means securing said electrodes together along their lengths so that the top edge of one of said electrodes is adjacent to the bottom edge of the other of said electrodes so that said electrodes are oriented vertically with respect to one another, and so that at least some portions of the sides of said electrodes do not overlap one another,

said electrodes and said dielectric means being disposed in a helical coil in which the turns are spaced outwardly from the axis of the coil from one another to a sufficient extent so as to permit relative movement between at least some adjacent turns in a direction which is axial relative to the axis of said coil,



said electrodes and said dielectric means being sufficiently flexible so as to permit such relative movement between at least two adjacent turns of said coil.

4,190,877

MINIATURE VARIABLE CAPACITOR

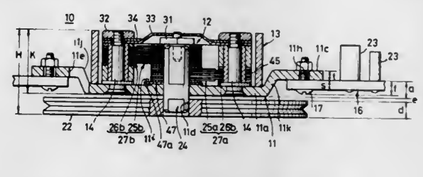
Shigeyoshi Odagiri, Machida; Yoshikatsu Iizuka, Tama, and Tugiaki Danmura, Zama, all of Japan, assignors to Mitsumi Electric Co., Ltd., Chofu, Japan

Filed Oct. 13, 1978, Ser. No. 951,295

Claims priority, application Japan, Oct. 15, 1977, 52-138518; Oct. 15, 1977, 52-138519; Mar. 27, 1978, 53-34090; Jul. 7, 1978, 53-93722; Jul. 11, 1978, 53-95438

Int. Cl.² H01G *5/06*

U.S. Cl. 361—298 **9 Claims**



1. A miniature variable capacitor comprising:

a base plate having a base plate main part having stator support poles embedded in one surface of said base plate main part and mounting plate parts extending from said base plate main part in lateral directions and adapted to be fitted to a mount member different from said miniature variable capacitor; and

a miniature variable capacitor main body comprising a rotor shaft rotatably supported at the center of said base plate main part, stator plate groups fixedly supported on said stator shafts, and rotor plate groups fixedly supported on said rotor shaft,

said base plate further having bent parts bent in the direction in which said stator poles project and formed between said base plate main part and said mounting plate parts and integral therewith, said mounting plate parts being not on the same level as said base plate main part but stepped in the stator support poles projecting direction from said base plate main part.

4,190,878

SELF-HEALING ELECTRICAL CAPACITOR

Herbert Förster, Remshalden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,431

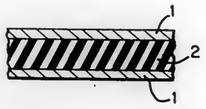
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730038

Int. Cl.² H01G *1/017*

U.S. Cl. 361—305 **6 Claims**

1. In an electrical capacitor having a dielectric and an elec-

trode aluminum coating on said dielectric and an opposed electrode, the improvement comprising a substantially evenly distributed proportion of copper in said coating, said proportion ranging between 0.5% and 10% by weight, for substantially decreasing the deterioration of said coating as a function of field strength.

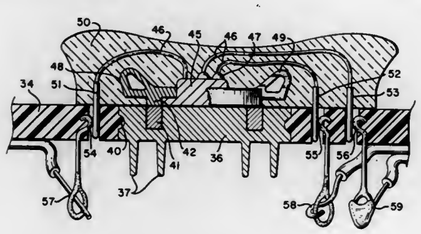


4,190,879

PLASTIC CHASSIS WITH MAGNETIC HOLDING MEANS FOR ELECTRONIC COMPONENTS

Pierre L. Tissot, 863 Via de la Paz, Pacific Palisades, Calif. 90272

Filed Aug. 21, 1978, Ser. No. 935,487
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—386 **7 Claims**



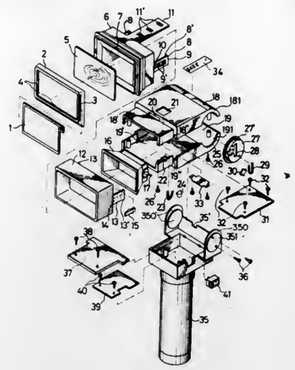
1. An electronic system including, in combination:
(a) a plastic chassis;
(b) a magnetic ring held in said plastic chassis with an exposed flat annular top surface coplanar with the top surface of said chassis;
(c) a cooperating collar member of magnetically responsive material having an exposed flat annular bottom surface congruent with said exposed flat annular top surface for magnetic securement thereby;
(d) electronic component holding means forming a part of said cooperating collar member;
(e) an electronic component secured to said means and having downwardly extending asymmetrically positioned electrical connectors passing below and outside of said flat annular bottom surface of said collar member;
(f) electrical connecting socket means embedded in said plastic chassis in corresponding asymmetrical positions outside said flat annular top surface of said magnetic ring which receive said electrical connectors,
whereby said electrical connectors are received in the corresponding socket means, said annular top surface of said magnetic ring is in full surface contact with said flat annular bottom surface of said collar member so that the connections and electronic component are securely held by said magnetic ring and cooperating collar member.

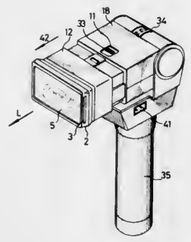
4,190,880

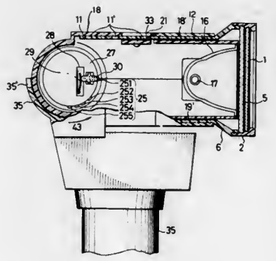
PHOTOGRAPHIC FLASH DEVICE

Koreaki Esaki, Suita, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Jul. 17, 1978, Ser. No. 925,629
Claims priority, application Japan, Jul. 27, 1977, 52/90739
Int. Cl.[2] G03B *15/02, 15/05, 7/08, 7/16*
U.S. Cl. 362—18 **3 Claims**







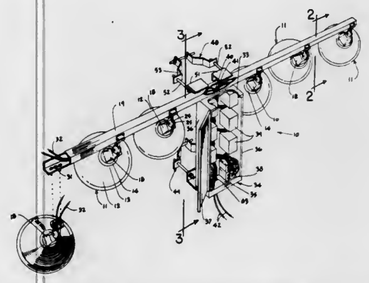
1. A photographic flash device comprising:
a first body housing a light source;
a second body rotatably connected to said first body;
a first detent mechanism for selectively positioning the first and second bodies at predetermined rotational positions with respect to one another, said detent mechanism including: a rotation guide disk which is rotatably mounted within a circular opening in said first body and secured to side wings of said second body, and first click stop means provided between said rotation guide disk and said circular opening;
a first molding slidably movable with respect to said first body, said molding supporting a fresnel lens in front of said light source; and
connection means provided with a second detent mechanism for selectively positioning the first body and the first molding at predetermined positions relative to one another whereby the distances between the light source and the fresnel lens are varied, said connection means and second detent mechanism including: click guide levers which project from said first molding and which are provided with multiple detent notches, said click guide levers being received within slots provided in said first body, a second molding surrounding the first molding and relatively movable with respect thereto to support the first molding as it is moved relative to the first body, said second molding being provided with slidable control arms adapted to pass through said slots to extend within said first body, and
second click stop means provided on said control arms and operatively related with said multiple detent notches of said first molding.

4,190,881

CROSSARM ASSEMBLY FOR HIGH INTENSITY DISCHARGE LUMINARIES

James L. Drost, and Myron K. Gordin, both of Oskaloosa, Iowa, assignors to Muscatine Lighting Manufacturing Co., Muscatine, Iowa

Filed May 12, 1978, Ser. No. 905,276
Int. Cl.[2] F21V *21/14*
U.S. Cl. 362—250 **3 Claims**



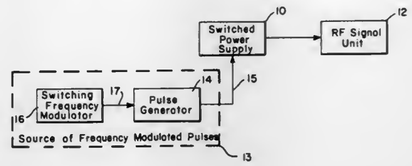
1. A preassembled and prewired crossarm assembly of spaced apart high intensity discharge luminaries mountable on a light pole, said assembly comprising:
(a) a ballast-receiving box having a top side, a bottom side, and four side walls to form an enclosure having a wire receiving aperture in one of said sides,
(b) a plurality of ballasts for said luminaries contained in said ballast box,
(c) an elongated tubular bar having a medial portion fixed to at least said one side of said ballast box, said bar formed with a wire receiving aperture in alignment with the aperture in said one side of said box,
(d) means for adjustably mounting said luminaries on said tubular bar, each of said mounting means having a wire-receiving passage means in communication with the interior of said tubular bar and an associated luminary,
(e) electrically conductive wire means disposed through the passage means of said mounting means, the interior of said tubular bar and the aligned apertures of said bar and said box for electrically connecting said luminaries to said ballasts, and
(f) means for releasably securing said ballast box to said light pole with at least one side of said ballast box adjacent said pole so that the weight of said box and the ballasts enclosed therein is centered on said pole.

4,190,882

SYSTEM FOR REDUCING THE EFFECTS OF POWER SUPPLY SWITCHING

Arthur C. Chevalier, Culver City; Arthur S. Zinkin, Rancho Palos Verdes; Robert Rosen, Granada Hills, and Richard P. McGarrity, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1977, Ser. No. 794,287
Int. Cl.[2] H02M *3/28*
U.S. Cl. 363—26 **6 Claims**



1. A DC power supply for providing power to a utilization device comprising:
a source of AC power,
rectifier means coupled to said source of AC power,
a switching regulator coupled to said rectifier means and being responsive to switching pulses applied to a terminal, said switching regulator responding to the pulse width of said switching pulses to provide a DC voltage,
a source of modulated pulses for providing modulated pulses to form said switching pulses, said modulated pulses and said switching pulses having a pulse repetition frequency that is continuously modulated over a selected frequency range,
control means coupled to the terminal of said switching regulator and being responsive to said modulated pulses and a feedback voltage to provide said switching pulses having pulse repetition frequencies determined by said modulated pulses and pulse widths determined by said feedback voltage,
a DC to AC converter coupled to said switching regulator for responding to said DC voltage,
transformer means coupled to said DC and AC converter, and
rectifier and filter means coupled between said transformer means and said utilization device and providing said feedback voltage.

4,190,883

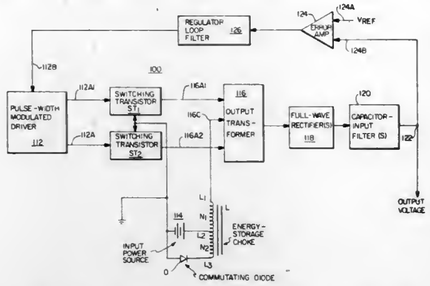
SWITCHING-REGULATED DC-TO-DC CONVERTER

Philip M. Cowett, Jr., Olney, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1977, Ser. No. 827,281
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—26 **8 Claims**

1. In a switching regulated DC-to-Dc converter circuit including pulse-width modulated driver circuit means and first and second switching means driving opposite sides of an input winding of an output transformer, said input winding having a center tap and said switching means being duty cycle modulated by said driver circuit means to reverse the voltage applied to the said input winding and having a common terminal therebetween, said switching regulated DC-to-DC converter circuit further comprising:
a choke coil connected from said common terminal of said switching means to said center tap of said transformer input winding; and
a source of direct current input voltage connected in series with one portion of said choke coil from said common terminal to said center tap, said source of direct current dividing said choke coil into two portions including said

one portion and a second portion, said one portion of said choke coil having N_1 turns, said second portion having N_2 turns thereby defining a turns ratio equal to N_1/N_2 associated with said choke coil, said turns ratio of said choke coil being so selected as to permit said duty cycles



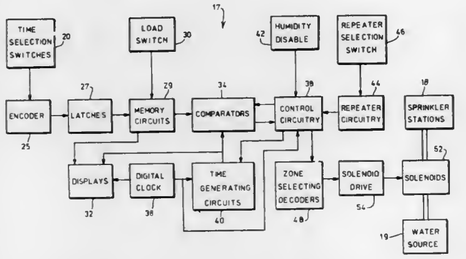
of each of said respective switching means to exceed 50% without the occurrence of a current spike at said input winding of said output transformer thereby resulting in a wide range of voltage regulation by utilization of a wide range of input power source voltages for a given output voltage.

4,190,884

AUTOMATIC DIGITAL WATER CONTROL SYSTEM

Alvaro Medina, 714 Lincoln Pl., Boulder, Colo. 80302

Filed Aug. 28, 1978, Ser. No. 937,237
Int. Cl.² G05B *1/08, 11/18;* G06F *3/05*
U.S. Cl. 364—104 **27 Claims**



1. A system for automatically controlling at least one timed operation of a controlled device, said system comprising:

at least one memory unit capable of storing timing information and providing an output indicative thereof, said memory unit including a plurality of interconnected memory circuits for providing timing information with respect to both minutes and hours;

programming means connected with said memory unit for causing predetermined timing information to be stored in said memory unit indicative of timing required for operation of a device controlled by said system;

signal generating means for generating time related signals;

comparator means for receiving said time related signals from said signal generating means and said output indicative of timing information from said memory unit and responsive thereto producing a timewise indicative output; and

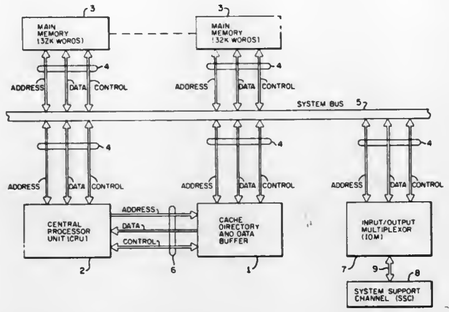
control enabling means connected with said comparator means to receive said timewise indicative output therefrom and responsive thereto producing an ouput suitable for timewise controlling the operation of a said controlled device.

4,190,885

OUT OF STORE INDICATOR FOR A CACHE STORE IN TEST MODE

Thomas F. Joyce, Burlington, and William Panepinto, Jr., Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,096
Int. Cl.² G06F *11/00, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. A data processing system comprising:

a system bus;

an addressable main memory coupled to said bus, said main memory including a plurality of sets of word locations, each set of word locations being defined by an address, and a number of said word locations storing a plurality of test and verification instructions and data words;

a central processor unit (CPU) coupled to said bus, said CPU including means for generating requests to said main memory for read out of said test and verification instructions on said system bus;

a cache coupled to said bus and said CPU, said cache including:

a data buffer having a plurality of word locations arranged in a plurality of sets of word locations defined by said column addresses for storing duplicates of said data words;

a directory having a plurality of word locations corresponding to the number of sets of word locations in said data buffer, said directory word locations being addressable by said column addresses, each word location of said directory storing a row address of one of a corresponding one of said words of said set stored in said data buffer, said data buffer and normally storing said duplicates of said data words on transfer from main memory when requested by cache requests;

said cache further including means responsive to said test and verification instructions, said means including:

mode control means coupled to said system bus; and,

no hit fault means coupled to said system bus and said mode control means;

said CPU including means operative in response to a first of said test and verification instructions, for generating a plurality of signals for transfer to said bus, a first signal of said plurality of signals switching said mode control means from a reset state to a first state;

said no hit fault means, including means responsive to said mode control means in said first state and conditioned by the remainder of said plurality of signals when properly coded for setting said no hit fault means to a first state;

said CPU including means for normally forcing successive cache request signals to a first state from a reset state for causing the transfer of each of said duplicates of data words from successive word locations in said data buffer cache to said CPU;

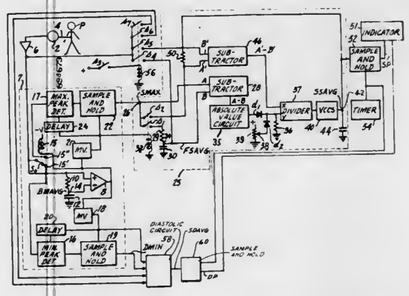
said no hit fault means in said first state being responsive to said cache request signals and to a signal indicative of the failure of said cache directory to cause a readout of a specified row address stored in a specified column address of said cache directory as specified by said CPU for generating a no memory signal, said CPU being responsive to said no memory signal for indicating a hardward failure associated with said column address of said cache directory.

4,190,886

DERIVATION OF STEADY VALUES OF BLOOD PRESSURES

Allan P. Sherman, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 10, 1978, Ser. No. 894,679
Int. Cl.² G06F *15/00;* A61B *5/04*
U.S. Cl. 364—415 **10 Claims**



8. Apparatus for processing an input signal representing the variation in blood pressure with time in which there are systolic and diastolic peaks and peaks due to noise as well as undulations due to respiration in such manner as to produce an output signal having a value representing one of the systolic and diastolic peak pressures in which the effects of noise and respiration undulations are reduced, comprising

an input to which a signal representing the variation in blood pressure with time may be applied,

first means coupled to said input for deriving a first signal approximately representing the peaks of said one of the systolic and diastolic pressures of a blood pressure signal when present in such manner that the effects of the undulations and noise may be present,

second means coupled to the output of said first means for deriving a second signal representing an average of some previous peaks represented by said first signal,

third means responsive to said first and second signals for deriving a control signal representative of the absolute value of the deviation between the first and second signals, an output from which an output signal may be derived,

fourth means responsive to said first signal and a signal at said output for providing a fourth signal representative of the difference in value between the value represented by the first signal and the value represented by the signal at said output, and

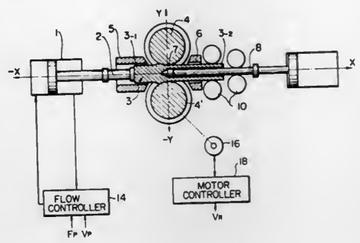
means for changing the signal at said output by a portion of the value represented by said fourth signal, the said portion increasing as said control signal gets smaller and decreasing as said control signal gets larger.

4,190,887

PRESS ROLL PIERCING METHOD

Seishiro Yoshiwara; Minoru Kawaharada, and Samon Yanagimoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 714,960, Aug. 16, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,169
Claims priority, application Japan, Aug. 22, 1975, 50-102348
Int. Cl.² G06F *15/46;* B21B *37/00*
U.S. Cl. 364—472 **11 Claims**



1. In a press roll piercing method for manufacturing a hollow shell wherein a polygonal metal billet is pushed in the axial direction thereof between a pair of rolling rolls mounted one above the other and having opposed semicircular grooves therein so as to be rolled into a circular or almost circular shape, and the piercing is effected in the core portion of the billet by means of a piercing plug supported between the rolling rolls, the improvement comprising;

setting the pushing force to a predetermined value sufficient to cause a compressive stress above the yielding stress of the polygonal metal billet which is being pushed when the reacting force acts upon the billet;

setting the peripheral speed of the rolling rolls and the pushing speed of the pusher in relation to each other so that the volume per unit time of the hollow shell being discharged from the rolling rolls after the press roll piercing has reached a stable condition after the biting and the volume per unit time of the polygonal metal billet being pushed into the rolling rolls become substantially equal; and

causing the billet pushed by the pusher at the pushing speed to be gripped between the rolling rolls rotating at the peripheral speed.

4,190,888

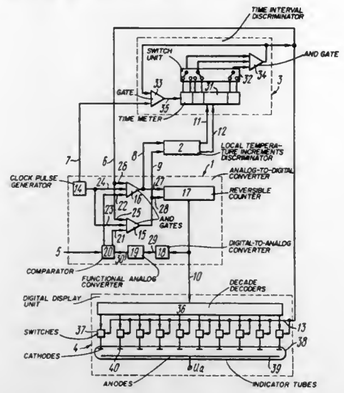
DIGITAL DEVICE FOR DETERMINING CARBON CONTENT IN IRON-CARBON MELTS

Vladimir I. Skurikhin; Leonid S. Fainzilberg, and Leonid S. Zhitetsky, all of Kiev, U.S.S.R., assignors to Institut Kibernetiki Akademii Nauk Ukrainskoi S S R, Kiev, U.S.S.R.

Filed Jun. 8, 1978, Ser. No. 913,908
Claims priority, application U.S.S.R., Jun. 13, 1977, 2496596
Int. Cl.² G06F *15/46;* G01N *25/02*
U.S. Cl. 364—497 **1 Claim**

1. A digital device for determining the carbon content in iron-carbon melts, comprising: a follow-up analog-to-digital converter, having an input with an applied signal carrying information on the actual temperature of the melt, a conversion suppression input, an synchronized clock pulse output, first and second synchronized code pulse outputs, a parallel code output, said follow-up analog-to-digital converter converting only up to a moment of temperature hold caused by crystallization of the melt; a local temperature increments discriminator, having a first input and a second input connected to said respective first and second synchronized code pulse outputs of said follow-up analog-to-digital converter, a first output and a second output of said local temperature increments discriminator; a time interval discriminator, having reset inputs connected to said first and second outputs of said local temperature increments discriminator, a count input connected to said

synchronized clock pulse output of said follow-up analog-to-digital converter, an output connected to said conversion suppresion input of said follow-up analog-to-digital converter;



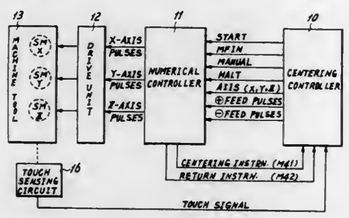
a digital display unit, having an information input connected to said parallel code output of said follow-up analog-to-digital converter, a control input connected to said output of said time interval discriminator.

4,190,889

AUTOMATIC CENTERING CONTROLLER FOR A MACHINE TOOL

Kunihiko Etoh, Toyota; Kaoru Owa, Nukata, and Kunimichi Nakashima, Anjoh, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Aug. 25, 1978, Ser. No. 936,780
Claims priority, application Japan, Aug. 26, 1977, 52-103033
Int. Cl.² G06F *15/46*
U.S. Cl. 364—474 **13 Claims**



1. In a combination of a machine tool having a tool spindle rotatably carried therein, and a plurality of servomotors for effecting movement of said tool spindle relative to an article mounted on said machine tool along orthogonal first and second axes, the improvement comprising:

drive control means connected to said servomotors for selectively controlling operations of said servomotors in accordance with feed pulses and axis designation signals applied thereto; and

an automatic centering controller comprising,

touch sensing means capable of being received in said tool spindle, with a probe thereof being in concentric relation with the axis of said tool spindle and capable of outputting a touch signal each time said probe in said tool spindle is brought into contact with a reference circumferential surface provided on said article,

a pulse generator connected to said drive control means for applying thereto said feed pulses so as to drive said servomotors,

first pulse control means connected to said pulse generator and said drive control means and responsive to said touch signal for applying said axis designation signals to said drive control means and controlling said feed pulses applied to said drive control means so as to effect the relative movement of said tool spindle along each of said first and second axes from one to the other of two points at both of which said probe in said tool spindle touches said reference circumferential surface,

second pulse control means connected to said pulse generator and said drive control means for applying said axis designation signals to said drive control means and controlling said feed pulses applied to said drive control means so as to effect said relative movement of said tool spindle from said other toward said one of said two points along each of said first and second axes, and

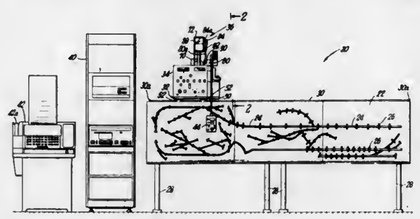
pulse counting means connected to said first and second pulse control means for counting said feed pulses applied from said first and second pulse control means to said drive control means so as to cause said second pulse control means to stop applying said feed pulses to said drive control means when receiving from said second pulse control means said feed pulses of a number of corresponding to half of said feed pulses applied from said first pulse control means.

4,190,890

PROGRAMMABLE LIGHT DIRECTOR SYSTEM

Warren G. Marx, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, NY

Filed Nov. 16, 1977, Ser. No. 852,076
Int. Cl.² H05K *13/00*; G06F *15/20*
U.S. Cl. 364—491 **21 Claims**



1. A programmable light director system for randomly routing wires on a harness board comprising:

(i) light source means for generating a light beam;

(ii) two-axis control means operative with said light source means for controlling the projection of said light beam on said harness board;

(iii) central processor means operatively coupled to said two-axis control means to generate command signals thereto from predetermined wire path data base to cause said two-axis control means to move the light beam continuously along a wire path in response thereto, said central processor means including scanning wand input means for automatically identifying each of said wires to be routed, said central processor means further including digitizing means for assigning coordinates to the points comprising said wire path.

4,190,891

SYSTEM HAVING A FIXED EXCITATION AND PROVIDING A VARIABLE RATIO OUTPUT

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed May 9, 1978, Ser. No. 904,355
Int. Cl.² G06J *1/00*; G06G *7/16*
U.S. Cl. 364—606 **12 Claims**

1. A system having a fixed excitation and providing a variable ratio output, comprising:

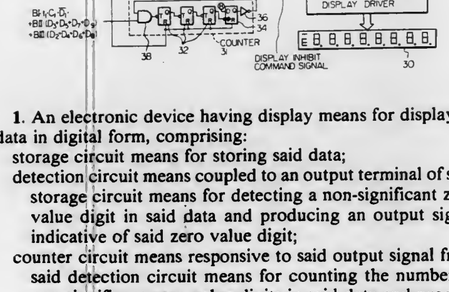
a signal source for providing a fixed reference signal;

first means connected to the signal source for measuring the amplitude of the reference signal relative to system ground;

means for providing a variable ratio command signal;

first combining means for combining the measured signal from the first means and the variable ratio command signal to provide a signal at a commanded variable ratio amplitude relative to the amplitude of the reference signal;

second means connected to the signal source and the first combining means and responsive to the signals therefrom for providing a feedback signal;



means for multiplexing the measured signal and the feedback signal and providing a multiplexed signal;

second combining means for combining the multiplexed signal and the signal at the commanded variable ratio amplitude relative to system ground; and

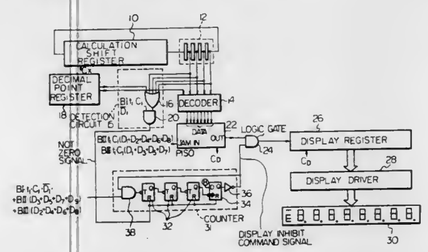
means connected to the second combining means and responsive to the combined signal therefrom for providing an output signal at a variable ratio amplitude relative to the amplitude of the reference signal.

4,190,892

ZERO SUPPRESSING SYSTEM FOR ELECTRONIC DEVICE

Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,553
Claims priority, application Japan, Jun. 7, 1977, 52-66967
Int. Cl.² G06F *3/14*
U.S. Cl. 364—711 **7 Claims**



1. An electronic device having display means for display of data in digital form, comprising:

storage circuit means for storing said data;

detection circuit means coupled to an output terminal of said storage circuit means for detecting a non-significant zero value digit in said data and producing an output signal indicative of said zero value digit;

counter circuit means responsive to said output signal from said detection circuit means for counting the number of non-significant zero value digits in said data and producing a display inhibit command signal indicative of said zero value digit; and

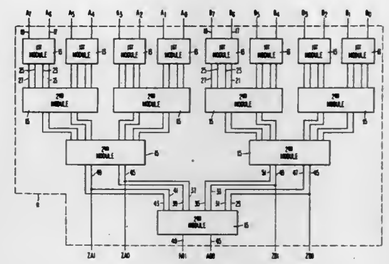
gate circuit means operative to transfer said data to said display means which consequently display said data and responsive to said display inhibit command signal for inhibiting transfer of parts of said data corresponding to said zero value digit to said display means for thereby causing said display means to suppress display of said non-significant zero value digits.

4,190,893

MODULAR MODULO 3 MODULE

Daniel D. Gajski, Campaign, Ill., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1977, Ser. No. 852,445
Int. Cl.² G06F *7/48, 7/50*
U.S. Cl. 364—746 **1 Claim**



1. A modular modulo 3 module having a plurality of input terminals for receiving in parallel binary coded numerical data and a plurality of output terminals for outputting the modulo 3 residue of received data, said modulo 3 module comprising:

a plurality of modular first means, each first means therein having a first and a second input line for receiving data binary coded data designable X_0 and X_1 and a first, second, third and fourth line for individually outputting Y_0, $\overline{Y}_0$, Y_1 and $\overline{Y}_1$ wherein $Y_1=X_1\overline{X}_0$ and $Y_0=\overline{X}_1X_0$;

a logrithmic array of modular second means, each second means therein having eight input lines for receiving binary coded data designable X_0, $\overline{X}_0$, X_1, $\overline{X}_1$, X_2, $\overline{X}_2$, X_3 and $\overline{X}_3$ and four output lines for individually outputting Y_0, $\overline{Y}_0$, Y_1 and $\overline{Y}_1$ wherein

$$Y_1=X_2X_0+\overline{X}_3\overline{X}_2X_1+\overline{X}_3X_1\overline{X}_0$$

and

$$Y_0=\overline{X}_3\overline{X}_2X_0+\overline{X}_2\overline{X}_1X_0+X_3X_1$$

and

connecting means for connecting said plurality of input terminals of said modular modulo 3 with the inputs of said plurality of modular first means, the outputs of said plurality of modular first means with the inputs of said logrithmic array of modular second means, and the outputs of said logrithmic array of modular second means with said plurality of output terminals of said modulo 3 module.

4,190,894

HIGH SPEED PARALLEL MULTIPLICATION APPARATUS WITH SINGLE-STEP SUMMAND REDUCTION

J. Craig Mudge, Weston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 10, 1978, Ser. No. 885,229
Int. Cl.² G06F *7/52*
U.S. Cl. 364—758 **9 Claims**

1. In a data processing system, apparatus for producing the multiplication product of a multiplier and a multiplicand wherein both the multiplier and the multiplicand represent the

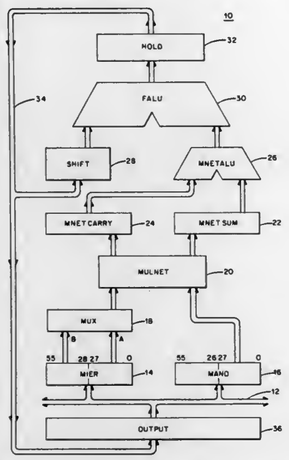
fractional portion of a floating point number, said apparatus comprising:

A. first storage means for storing the multiplier;

B. second storage means for storing the multiplicand;

C. a plurality of multiplier means each having at least one input coupled to the first storage means and at least one input coupled to the second storage means and each having a plurality of outputs, each multiplier means producing a summand at the outputs thereof comprised of a plurality of binary bits wherein each binary bit represents a power of the number 2 and each is comprised of an electrical signal having a first value representing binary 1 and a second value representing binary ϕ and wherein the cumulative total of the summands produced by the plurality of multipler means is equal to the product of the multiplier and the multiplicand;

D. a plurality of counter means each having a first output and a second output and each having a plurality of inputs individually connected to the outputs of selected multiplier



means, and each counter means arranged to count the number of binary bits in each of the summands generated by the multiplier means, representing the same power of the number 2 and having an electrical signal thereon with said first value, for producing at the first output thereof a number which may be combined with the numbers produced at the first outputs of the other counter means to form a sum number and, for producing at the second output thereof a number which may be combined with the numbers produced at the second outputs of the other counter means to form a carry number wherein the summation of the sum number and the carry number equals the multiplication product of the multiplier and the multiplicand; and

E. summing means having a plurality of inputs coupled to the first outputs of the counter means and a plurality of inputs coupled to the second outputs of the counter means for adding the carry number and the sum number and producing at the output thereof the multiplication product of the multiplier and the multiplicand.

4,190,895

METHOD AND APPARATUS FOR ROTATING CARTESIAN COORDINATE SIGNALS

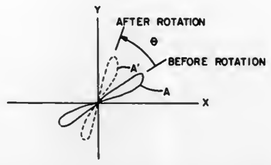
Thomas J. Davis, Richland, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 27, 1978, Ser. No. 890,478
Int. Cl.² G06G *7/22*
U.S. Cl. 364—815 **11 Claims**

1. Apparatus for rotating cartesian coordinate signals x, y about an angle θ where $x=f(t)$, $y=f'(t)$, and θ is a pre-determined angle, comprising:

(a) means for converting the cartesian coordinate signals x, y into a wave form $F(\sigma,\phi,t)=\sigma \sin(2\pi ft-\phi)$ where σ and ϕ are polar coordinate values defined by $\sigma=\sqrt{x^2+y^2}$ and $\phi=$arc tan y/x and where $F(\sigma,\phi,t)$ is a polar coordinate signal;

(b) means connected to the converting means for varying the phase of the polar coordinate signal $F(\sigma,\phi,t)$ by a pre-determined angle θ; and



(c) phase sensitive amplitude detecting means connected to the varying means for converting the resulting polar coordinate signal $F(\sigma,\phi,\theta t)=\sigma \sin(2\pi ft-\phi-\theta)$ back into cartesian coordinate signals x', y' where

$$x'=x\cos\theta-y\sin\theta$$

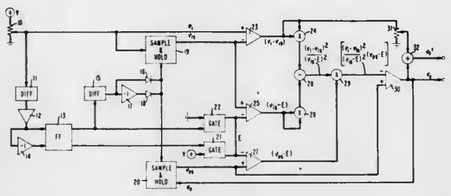
$$y'=y\cos\theta+x\sin\theta$$

4,190,896

CIRCUITS HAVING SUBSTANTIALLY PARABOLIC OUTPUT VERSUS LINEAR INPUT CHARACTERISTICS

Kenneth C. Knowlton, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 5, 1978, Ser. No. 939,266
Int. Cl.² G06G *7/26*
U.S. Cl. 364—859 **6 Claims**



1. A circuit responsive to an input voltage for producing an output voltage nonlinearly related thereto, said circuit comprising

first means (**11** through **22, 25, 27**) responsive each time said input voltage begins to increase, after the previous change was a decrease, for producing, until the next change is a decrease, the differences between a voltage substantially equal to the maximum possible amplitude of said input voltage and said input voltage and a first voltage, respectively, at the time said input voltage begins to increase, and, furthermore, responsive each time said input voltage begins to decrease, after the previous change was an increase, for producing, until the next change is an increase, the differences between a voltage substantially equal to the minimum possible amplitude of said input voltage and said input and first voltages, respectively, at the time said input voltage begins to decrease.

second means (**23**) responsive to said input voltage and to the amplitude of said input voltage at the time said input voltage begins to change amplitude in a direction opposite to that in which it last changed direction for producing the difference therebetween,

third means (**24, 26, 28**) responsive to said second means difference output and said first means difference output involving said input voltage for producing an output equal to the square of said second means output divided by the square of said first means output involving said input voltage,

fourth means (**29**) responsive to said first means difference output involving said first voltage and said third means output for producing an output equal to the product thereof, and

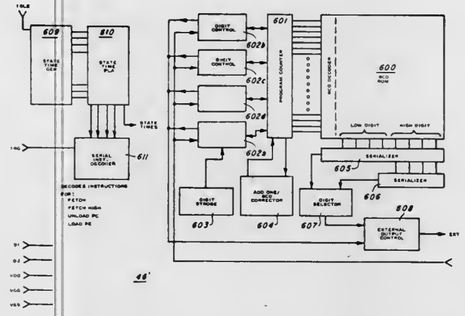
fifth means (**30**) responsive to the amplitude of said first voltage at the time said input voltage begins to change amplitude in a direction opposite to that in which it last changed direction and also to said fourth means product output for producing the difference therebetween as both said first voltage and said circuit output voltage.

4,190,897

BINARY CODED DECIMAL ADDRESSED READ-ONLY-MEMORY

Ashok H. Someshwar, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 1, 1977, Ser. No. 783,516
Int. Cl.² G11C *8/00, 17/00*
U.S. Cl. 364—900 **4 Claims**



1. A binary coded decimal read-only-memory system comprising:

(a) an array having rows and columns of memory cells,

(b) row lines and column lines associated with said array,

(c) an address register,

(d) a one bit adder and binary coded decimal corrector for incrementing the address in said address register in response to a control signal and for automatically maintaining said address in binary coded decimal format, and

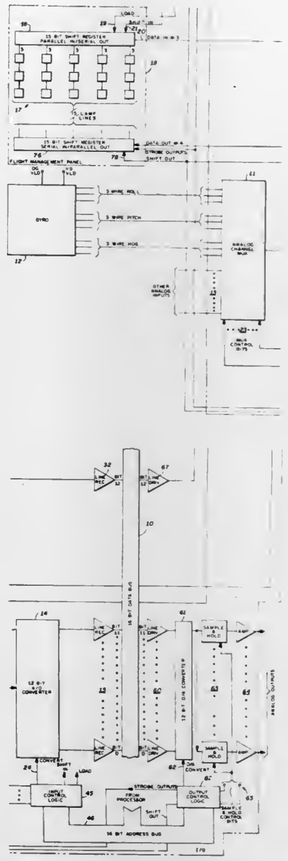
(e) means for addressing said array via said row and column lines with the address in said address register, said addressing means being responsive to the binary coded decimal address in said address register for addressing selected row and column lines in said array and being non-responsive to non-binary coded decimal addresses for addressing any selected row and column lines thereby, said addressing means comprising a plurality of decoders, said decoders being cascaded in a plurality of levels, the decoders in any given level being responsive to a preselected portion of the binary coded decimal address in said address register.

4,190,898

DIGITAL PROCESSOR INPUT/OUTPUT APPARATUS FOR ANALOG, DIGITAL AND DISCRETE DATA

David L. Farnsworth, Ft. Collins, Colo., and Ronald E. Thomas, Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,545
Int. Cl.² G06F *3/05, 5/04;* **H03K** *3/02*
U.S. Cl. 364—900 **10 Claims**



1. Input/output apparatus for a digital processor having a parallel bit data input/output bus for entering digital and analog data signals into said processor and for receiving digital and analog data signals from said processor comprising:

multiplexer means responsive to said analog data signals for sequentially providing said analog signals on an output thereof,

analog-to-digital converter means coupled between said multiplexer means and said data bus for converting said sequentially provided analog signals to parallel bit digital signals and for providing said parallel bit digital signals to first predetermined bits of said data bus,

parallel-to-serial shift register means coupled to receive at least one of said digital data signals in bit parallel fashion for providing said digital data signal in bit serial fashion to a second predetermined bit of said data bus simultaneously with said signals applied to said first predetermined bits,

thereby simultaneously entering said digital and analog data signals into said digital processor,

digital-to-analog converter means coupled to said first predetermined bits of said data bus for sequentially providing

analog data signals corresponding to parallel digital data signals sequentially provided to said first predetermined bits by said digital processor,

a plurality of sample and hold means coupled to said digital-to-analog converter means for sequentially sampling and holding said sequentially provided analog data signals, respectively, thereby providing said analog data signals from said digital processor, and

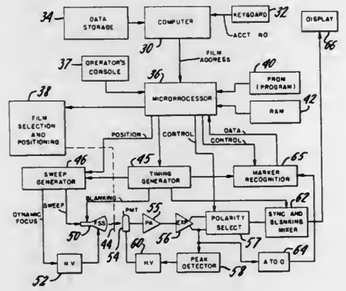
serial-to-parallel shift register means coupled to said second predetermined bit of said data bus for receiving at least one of said digital data signals provided in bit serial fashion, by said processor, to said second predetermined bit of said data bus simultaneously with said parallel digital data signals provided to said first predetermined bits, for providing said digital data signals in bit parallel fashion,

thereby simultaneously receiving said digital and analog data signals from said digital processor.

4,190,899
CARD RETRIEVAL DEVICE

Dwight H. Smith, and David L. Smith, both of Atlanta, Ga., assignors to Computer Microfilm International Corporation, Atlanta, Ga.

Filed Apr. 10, 1978, Ser. No. 894,764
Int. Cl.[2] G11B *13/00*
U.S. Cl. 364—900 **2 Claims**



1. In a storage and retrieval apparatus wherein a plurality of card type items are arranged on a storage rack which is movable for positioning an item with respect to an item retrievel arm, wherein each of said items has an edge arranged to be engaged by said retrieval arm after said rack is positioned, each of said edges having a projecting end, and wherein said apparatus includes control means to cause said arm to retrieve a selected one of said items from said rack, the improvement wherein there is provided a switch arranged to be activated by said projecting end as said selected item is withdrawn by said retrieval arm, and wherein said control means responds to activation or non-activation of said switch to either continue operation or to reattempt card retrieval, said control means includes a microprocessor having a program for controlling operation of said storage and retrieval device, and wherein said program includes two sets of instructions, one or the other of which controls operation of said device dependent upon the condition of said switch at a selected time during said device operation.

4,190,900
MAJOR/MINOR LOOP BUBBLE MEMORY WITH TIMING LOOP

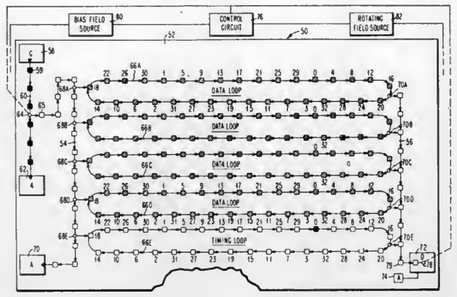
David C. Van Voorhis, Campbell, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,157
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 **6 Claims**

1. A bubble domain memory system having a major/minor loop array suitable for the storage and guided movement of bubble domains, the system comprising;

a plurality of minor loops in said array adapted for the storage of data encoded as the presence or absence of bubble domains,

a major loop positioned adjacent to the minor loops, said major loop including sensing means for detecting the presence or absence of bubbles, and

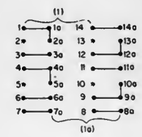


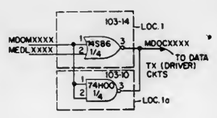
a minor loop having a single bubble therein adapted for timing purposes and positioned adjacent to said major loop and closer to said sensing means than said data storage minor loops, and said timing minor loop adapted for retaining the rotational position of bubble domains in said data storage minor loops to provide gap-free serial access to the stored data.

4,190,901
PRINTED CIRCUIT BOARD APPARATUS WHICH FACILITATES FABRICATION OF UNITS COMPRISING A DATA PROCESSING SYSTEM

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 1, 1977, Ser. No. 856,433
Int. Cl.[2] G11C *5/02, 5/06*
U.S. Cl. 365—72 **17 Claims**





1. Apparatus for constructing a number of different memory subsystems including a number of different features which define the type of memory subsystem, said apparatus comprising:

a plurality of integrated circuit packages;

a two layer printed circuit board comprising a number of sections, each section having a number of groups of first sets of holes defining a number of positions included thereon for mounting a corresponding number of said plurality of integrated circuit packages, each package having a number of pins;

first and second layers of said two layer board each having a number of horizontal and vertical conductors respectively for applying electrical signals to said pins of each of said integrated circuit packages mounted on said board;

at least one of said number of sections including second sets of holes parallel to and offset from a plurality of said number of groups of said first sets of holes, each group of said second set of holes arranged to have the same position for electrically connecting the pins of certain ones of said plurality of integrated circuit packages mounted on said board to predetermined ones of said horizontal and vertical conductors required for the inclusion of one of a pair of said features for construction of one of said different memory subsystems.

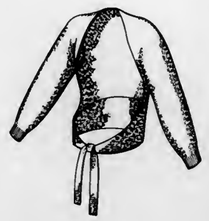
DESIGNS

FEBRUARY 26, 1980

254,276
SWEATER

Helga I. Behrmann, 1545 W. Chase Ave., Chicago, Ill. 60626

Filed Oct. 19, 1977, Ser. No. 843,739
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—44



254,277
COMBINED CLEANING AND POLISHING BRUSH

Richard L. DePamphilis, 38 Sterling Rd., Hyannis, Mass. 02601

Filed Aug. 21, 1978, Ser. No. 935,323
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—06



254,278
CHAIR

Robert L. Wilson, Senatobia, Mich., assignor to Chromcraft Corporation, Amsterdam, N.Y.

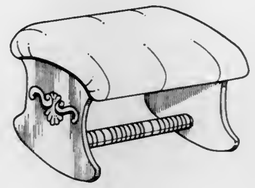
Filed Aug. 22, 1977, Ser. No. 826,786
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



254,279
OTTOMAN

P. Lewis Phillips, Hickory, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.

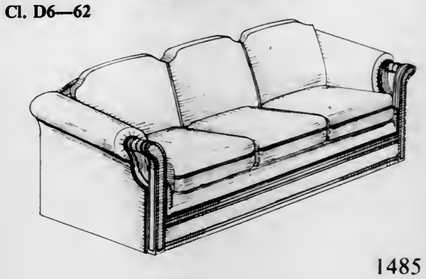
Filed Dec. 5, 1977, Ser. No. 857,722
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



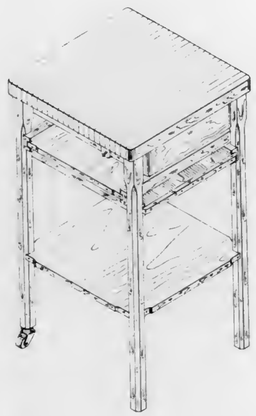
254,280
SEAT

Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.

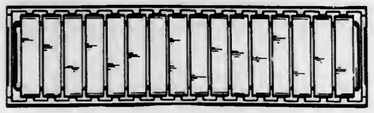
Filed Nov. 18, 1977, Ser. No. 852,890
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



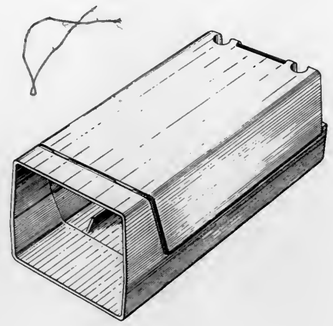
254,281
COMBINED CUTTING BOARD AND PORTABLE FOOD PREPARATION TABLE
Joe M. Kayfes, 6431 Stockton Ave., El Cerrito, Calif. 94530
Filed Jan. 30, 1978, Ser. No. 873,162
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



254,282
STORAGE RECEPTACLE FOR TAPE CARTRIDGES AND CASSETTES
Vaughn Aprahamian, Rego Park, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,604
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



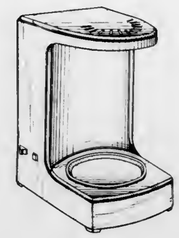
254,283
CABINET FOR A CARD FILE DRAWER
Gary A. Dolphin, Sr.; James F. Hampshire, and Greg P. Terek, all of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 1, 1977, Ser. No. 856,322
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



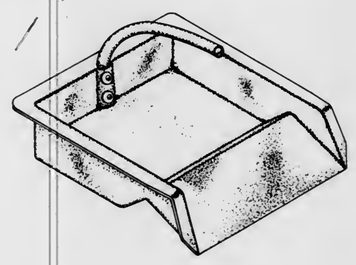
254,284
DECAL FOR CULINARY WARE OR THE LIKE
Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 21, 1977, Ser. No. 779,945
Term of patent 14 years
Int. Cl. D19—*08;* D7—*01*
U.S. Cl. D7—39



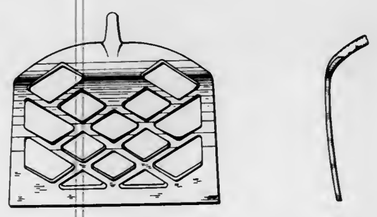
254,285
COFFEEMAKER
Ernest Lee, Park Ridge, and Robert O. Ernest, Oak Park, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 16, 1978, Ser. No. 869,552
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—41



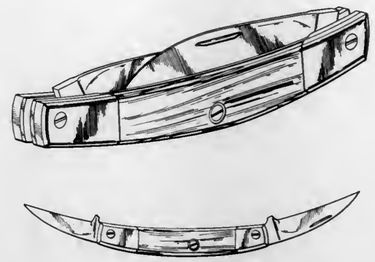
254,286
DEBRIS RECEPTACLE
Hugh O. Daniel, 3136 Birdsall Ave., Oakland, Calif. 94619
Filed May 2, 1977, Ser. No. 793,079
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—186



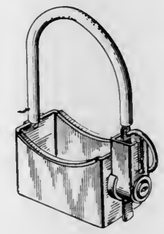
254,287
BLADE FOR A MORTAR HOE
John Polc, 18 Hemlock St., Bairdford, Pa. 15006
Filed Dec. 26, 1978, Ser. No. 972,836
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11



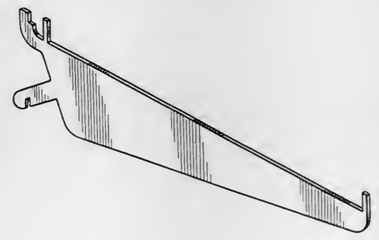
254,288
POCKET KNIFE
Cecil O. Pharr, Jr., 2272 La Vista Woods Dr., Tucker, Ga. 30084
Filed Jul. 11, 1977, Ser. No. 814,332
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



254,289
IGNITION SWITCH LOCK
Martin N. Farbstein, 20 Pickwick Dr. West, Syosset, N.Y. 11791, and Leon Schaffer, 25 Rolling Dr., Brookville, N.Y. 11545
Filed Dec. 30, 1977, Ser. No. 866,178
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—333



254,290
SHELF BRACKET
Richard C. Smith, Bloomington, Minn., assignor to R. C. Smith Company, Bloomington, Minn.
Filed Feb. 1, 1978, Ser. No. 874,272
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—381

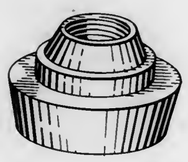


254,291
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 682,899, May 4, 1976, Pat. No. D. 247,698. This application Aug. 31, 1977, Ser. No. 829,280
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

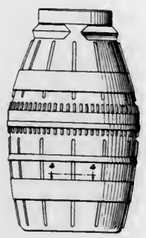




254,292
LOCKING WHEEL NUT
Thomas F. Kruger, 15 Redlein Dr., Lancaster, N.Y. 14086, assignor to Kintex, Inc., Buffalo, N.Y.
Filed Nov. 7, 1978, Ser. No. 958,538
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



254,293
PLASTIC CONTAINER FOR LIQUIDS OR THE LIKE
Vincent E. Fortuna, and Matt Lerner, both of Coleman, Mich., assignors to Vercon Inc., Coleman, Mich.
Filed Apr. 18, 1977, Ser. No. 788,289
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



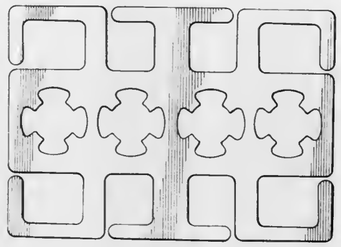
254,294
CONTAINER FOR FOOD PRODUCTS OR THE LIKE
William G. Reynolds, and Horst F. W. Arfert, both of Richmond, Va., assignors to Reynolds Metals Company
Continuation of Ser. No. 720,494, Sep. 3, 1976. This application Nov. 3, 1978, Ser. No. 957,794
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



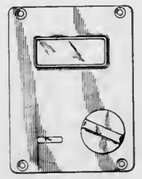
254,295
CONTAINER FOR FOOD PRODUCTS OR THE LIKE
William G. Reynolds, and Horst F. W. Arfert, both of Richmond, Va., assignors to Reynolds Metals Company
Division of Ser. No. 720,494, Sep. 3, 1976. This application Nov. 3, 1978, Ser. No. 957,796
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



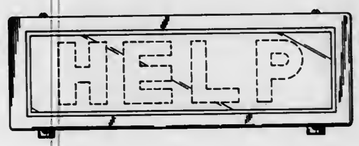
254,296
NIPPLE AND BOTTLE CAP RETAINER
Robert G. Doneaux, 1137 E. Orange, Tempe, Ariz. 85281
Filed Apr. 13, 1977, Ser. No. 787,044
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—294

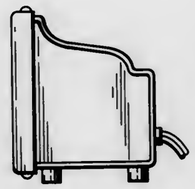


254,297
TACHOMETER
Richard W. Staiert, Geneseo, and Eugene J. Krukow, Cordova, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Mar. 2, 1978, Ser. No. 882,837
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98

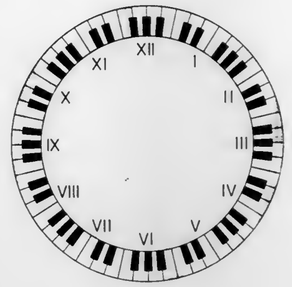


254,298
EMERGENCY FLASHER
William H. Sexton, and Judy C. Sexton, both of 2675 Elliott Ave., Columbus, Ohio 43204
Filed May 17, 1978, Ser. No. 907,243
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D10—114

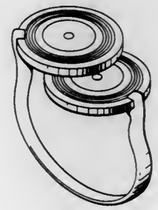




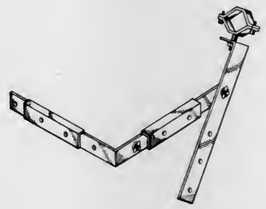
254,299
FACE FOR A CLOCK OR SIMILAR ARTICLE
Roger E. Hutchinson, 111 N. 75th, Seattle, Wash. 98103
Filed Sep. 12, 1977, Ser. No. 832,433
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



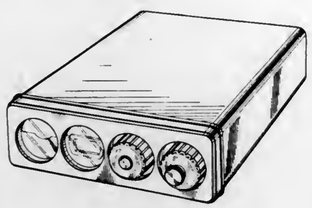
254,300
RING
Gary E. Minassian, 465 S. Ranchview Cr., Apt. 50, Anaheim, Calif. 92807
Filed Oct. 18, 1977, Ser. No. 843,354
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—28



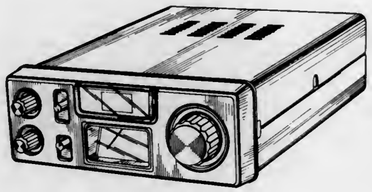
254,301
REVERSIBLE MOTORCYCLE BRACKET FOR PICKUP TRUCK BED
Thomas J. Combo, 1136 Mellor Dr., Lakeport, Calif. 95453
Filed Oct. 31, 1977, Ser. No. 847,115
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—115



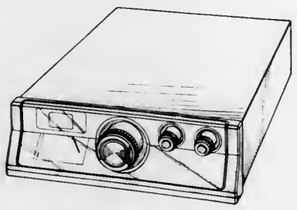
254,302
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Kikuo Ohta, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Oaza-Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,293
Claims priority, application Japan, Jan. 20, 1977, 52-1479
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



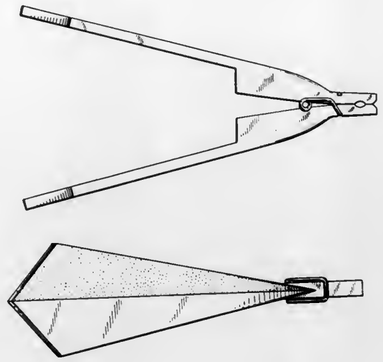
254,303
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Toshio Igo; Kikuo Ohta, both of Katano; Tsutomu Murakami, Tokyo, and Shuhei Taguchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,294
Claims priority, application Japan, Jan. 20, 1977, 52-1474
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



254,304
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Toshio Igo, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 20, 1977, Ser. No. 817,295
Claims priority, application Japan, Jan. 20, 1977, 52-1478
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



254,305
ANTENNA SUPPORT FOR MODEL AIRPLANE RADIO TRANSMITTORS
William J. Colish, 121 Bates Rd., Harrison, N.Y. 10528
Filed Aug. 10, 1977, Ser. No. 823,548
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—91

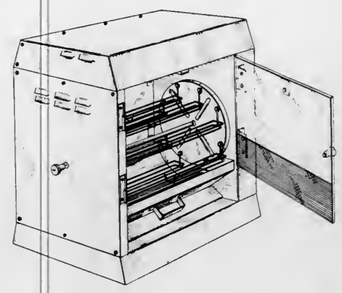


254,306
GARDEN PLOW WITH SEED AND FERTILIZER DISTRIBUTOR
William H. Carter, Rte. 1, Brundidge, Ala. 36010
Filed Dec. 19, 1977, Ser. No. 862,226
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

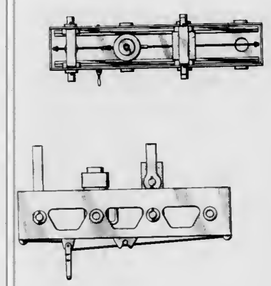
254,307
MATERIAL SPREADER AND DISTRIBUTOR
James E. Thayer, 423 Franklin St., and Keith Shader, 610 N. Taft Hill Rd., both of Ft. Collins, Colo. 80521
Filed Aug. 25, 1977, Ser. No. 827,828
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—13



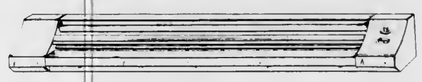
254,308
FOOD WARMER
Joseph S. Polak, Cicero, and Joseph J. Sidlo, Barrington, both of Ill., assignors to Prince Castle, Inc., Addison, Ill.
Filed Dec. 27, 1977, Ser. No. 865,008
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—108



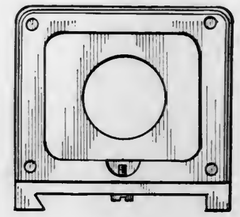
254,309
AXLE BENDING DEVICE
William N. Easom, Jr., 3234 San Marcus, Dallas, Tex. 75228
Filed Jun. 30, 1977, Ser. No. 811,490
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123



254,310
DIAZO DEVELOPER APPARATUS
David L. Zick, Johnson City, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Dec. 21, 1977, Ser. No. 863,336
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



254,311
MICROSCOPE ILLUMINATOR HOUSING
Richard L. Morgan, Cincinnati, Ohio, and Richard E. Feinbloom, New York, N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Aug. 3, 1977, Ser. No. 821,548
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—57





254,312
BANJO RESONATOR FLANGE
Geoffrey H. Stelling, 8815 Kenwood Dr., Spring Valley, Calif. 92077
Filed Apr. 27, 1977, Ser. No. 791,593
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

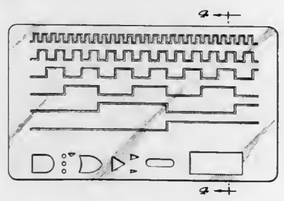


254,313
DRAFTING PARALLEL
Mark B. Dundore, 12 Westbrook Dr., Akron, Pa. 17501
Filed Nov. 21, 1977, Ser. No. 853,628
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35





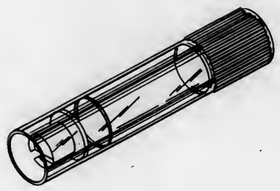
254,314
ELECTRONIC TIMING AND LOGIC DRAFTING TEMPLATE
John M. Denslow, 10833 Braddock Dr., Culver City, Calif. 90230
Filed Apr. 28, 1978, Ser. No. 900,936
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—39



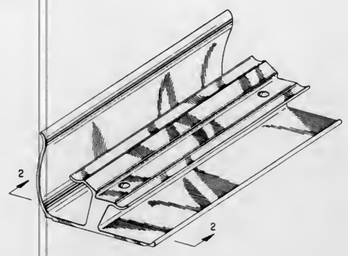
254,315
PEN
Alain Carre, 30, Avenue du Docteur Arnold Netter, Paris, France, assignor to Waterman S.A.
Filed Apr. 7, 1977, Ser. No. 785,761
Claims priority, application France, Oct. 14, 1976, 76 75144
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51



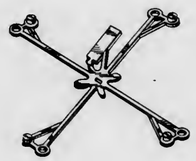
254,316
INK CARTRIDGE WITH RUPTURABLE SEALING ELEMENT
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Apr. 27, 1978, Ser. No. 900,629
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—54



254,317
DESK CADDY
Carmen P. Chicone, 6767 Tanglewood Dr., Youngstown, Ohio 44512
Filed Mar. 3, 1978, Ser. No. 887,801
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



254,318
TOY PARACHUTE FRAME
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed May 31, 1977, Ser. No. 801,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—91



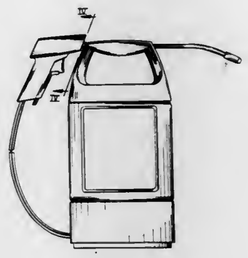
254,319
SIMULATIVE TOY TYPEWRITER
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 14, 1977, Ser. No. 860,486
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127



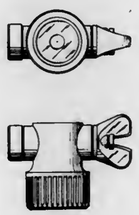
254,320
TOY TRUCK CAB
Barry S. Herstein, Spring Valley, N.Y., assignor to Buddy L Corporation, New York, N.Y.
Filed Oct. 3, 1977, Ser. No. 838,925
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



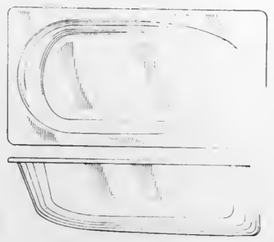
254,321
PORTABLE POWERED SPRAYER
William E. Sidor, Jenison; Russell O. Blanchard, Marshall, both of Mich., and William E. Bartasevich, Jr., Kent, Ohio, assignors to Leigh Products, Inc., Coopersville, Mich.
Filed Jul. 11, 1977, Ser. No. 814,153
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



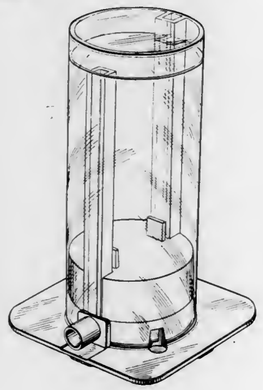
254,322
VOLUME-CONTROL VALVE
Jerome Koenig, 3 Kadesh Barnea, Tel Aviv, Israel
Filed Jul. 29, 1977, Ser. No. 820,327
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

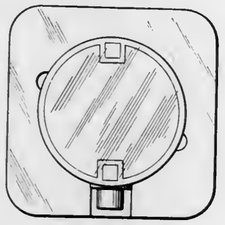


254,323
BATHTUB
William N. Powell, 317 Oakway Mall, Eugene, Oreg. 97401
Filed Sep. 13, 1978, Ser. No. 942,175
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

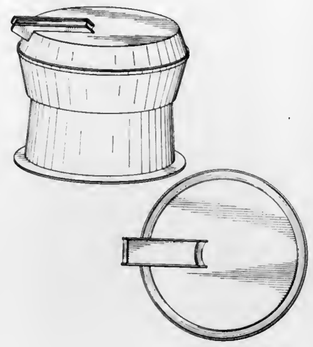


254,324
RESPIRATORY EXERCISER AND THE LIKE
William H. Thead, Jr., 2259 Marann Dr., NE., Atlanta, Ga. 30345
Filed Sep. 2, 1977, Ser. No. 830,368
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

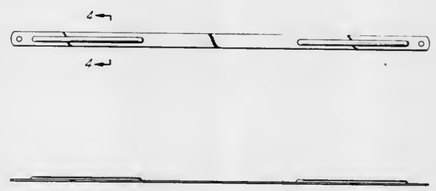




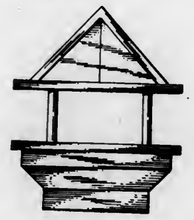
254,325
HOUSING FOR CENTRIFUGAL CASTING MACHINE
William F. Goodrich; Robert C. Ingersoll, both of Adrian, Mich., and Donald W. Doman, Janesville, Wis., assignors to Dick Blick Company
Filed Apr. 22, 1977, Ser. No. 789,935
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D24—22



254,326
TONGUE CLEANING DEVICE
Venkatesh R. Nevrekar, 805 E. Midland, Shawnee, Okla. 74801
Filed Jun. 16, 1977, Ser. No. 807,049
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—28



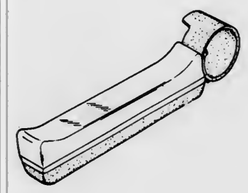
254,327
KIOSK
Jose R. P. Tasse, P.O. Box 1842, Carolina, P.R. 00630
Filed Oct. 13, 1978, Ser. No. 951,280
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—26



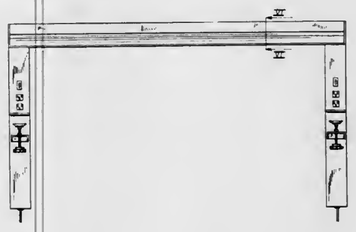
254,328
HAIR DRYER
John L. Benty, Sands Point, N.Y., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 11, 1977, Ser. No. 814,792
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



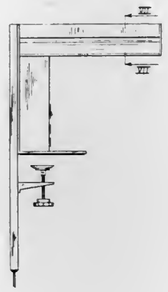
254,329
FINGERNAIL POLISHING TOOL
Moriko Tsukamoto, 2-3 chome, and Chihiro Tsukamoto, 1-3 chome, both of Toyotama-kita, Nerima-ku, Tokyo, Japan
Filed Sep. 27, 1977, Ser. No. 836,934
Claims priority, application Japan, Mar. 29, 1977, 52-11044
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—59



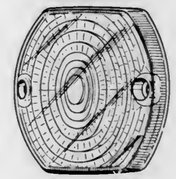
254,330
FLUORESCENT DESK LAMP
Sylvan R. Shemitz, 145 Orange Ave., West Haven, Conn. 06516
Filed Jul. 11, 1977, Ser. No. 814,471
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



254,331
FLUORESCENT DESK LAMP
Sylvan R. Shemitz, 145 Orange Ave., West Haven, Conn. 06516
Filed Jul. 11, 1977, Ser. No. 814,786
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



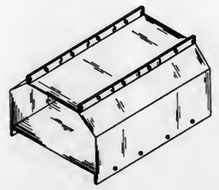
254,332
LENS FOR A LAMP
Koji Nakano, Kawasaki, and Yoshikazu Maeda, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Apr. 12, 1978, Ser. No. 895,783
Claims priority, application Japan, Oct. 19, 1977, 52-041542
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



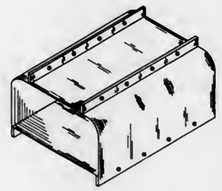
254,333
PAPER TISSUE
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 19, 1977, Ser. No. 826,105
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



254,334
COMBINED NEWSPAPER DELIVERY BOX AND MAILBOX SUPPORT
Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643
Filed Oct. 21, 1977, Ser. No. 844,513
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



254,335
COMBINED NEWSPAPER DELIVERY BOX AND MAILBOX SUPPORT
Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643
Filed Oct. 21, 1977, Ser. No. 844,514
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1980

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Ackley, Charles E., Jr.: *See—*
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Acraloc Corporation: *See—*
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.
Acuity Systems, Incorporated: *See—*
Body, Richard H.; and Evers, Edwin W., 4,190,332, Cl. 351-13.000.
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, to Shionogi & Co., Ltd. Process for the production of lower alkyl 2-chloro-2-hydroxyiminoacetates. 4,190,728, Cl. 560-168.000.
Adam, Alain C., to Du Pont de Nemours, E. I., and Company. Method of packaging unvulcanized neoprene. 4,190,156, Cl. 206-447.000.
Adolphi, Heinrich: *See—*
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Adrian, Werner. Device for measuring concentration of a gas. 4,190,363, Cl. 356-246.000.
AEG-Kanis Turbinenfabrik GmbH: *See—*
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Agers, Brian M.; and Todd, Maurice C., to Du Pont de Nemours, E. I., and Company. Jet for fluid texturing yarn. 4,189,812, Cl. 28-272.000.
Agfa-Gevaert AG: *See—*
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AGFA-Gevaert, A.G.: *See—*
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Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.
Thate, Kurt, 4,190,185, Cl. 226-172.000.
Ahlgren, Stig B., to Prisma Neon AB. Device at display arrangement. 4,189,859, Cl. 40-505.000.
Ahrens, John R., to Milsco Manufacturing Company. Multidensity foam article and method of preparation. 4,190,697, Cl. 428-315.000.
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., to Acraloc Corporation; and Rheem Manufacturing Company. High speed evacuation chamber packaging and clipping machine. 4,189,897, Cl. 53-434.000.
Airco, Inc.: *See—*
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Aisin Seiki Co., Ltd.: *See—*
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Aktiengesellschaft Gebruder Loepfe: *See—*
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Akzona Incorporated: *See—*
Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.
Alard, Joseph; and Derroitte, Jean-Louis, to Solvay & Cie. Process for the extrusion of compositions based on alpha-olefin polymers. 4,190,624, Cl. 264-146.000.
Albanese, Victor J., to United States of America, Air Force. High power hybrid switch. 4,190,815, Cl. 333-101.000.
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Albuquerque Patents, Ltd.: *See—*
Powers, Samuel T., 4,190,263, Cl. 280-242.0WC.
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Alcan Research and Development Limited: *See—*
Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., to Canadian Patents and Development Limited. Laser controlled optical switching in semiconductors. 4,190,811, Cl. 331-94.50M.
Aleman-Mucino, Pedro. Toilet seat. 4,189,794, Cl. 4-237.000.
Alenite Corporation, The: *See—*
Kramer, Marvin, 4,190,691, Cl. 428-67.000.
Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Container and closure construction for resisting tampering. 4,190,175, Cl. 220-270.000.
Allen Organ Company: *See—*
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Allied Chemical Corporation: *See—*
Bedell, John R., 4,190,095, Cl. 164-87.000.
Cachia, Joseph M., 4,190,212, Cl. 242-107.000.
Cachia, Joseph M., 4,190,266, Cl. 280-802.000.
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Masilamani, Divakaran; and Rogic, Milorad M., 4,190,612, Cl. 585-378.000.
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Allis-Chalmers Corporation: *See—*
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Allsop, James D. Ski pole mounting assembly and method. 4,190,166, Cl. 211-60.00R.
Almeida, June D., to Burroughs Wellcome Co. Rotavirus inner capsid subunit preparations. 4,190,645, Cl. 424-89.000.
Almer, Bengt O.; and Gidlof, Karl G. Device in concrete blocks. 4,190,380, Cl. 404-6.000.
Alpha-Omega Services, Inc.: *See—*
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Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.
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AM International, Inc.: *See—*
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Amanat, Sharif: *See—*
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Amberg, Arthur A.; and Zetterlund, Ture R., to International Harvester Company. Vehicle cab temperature control system. 4,189,987, Cl. 98-2.140.
Ambrose, Charles J. Container for delicate articles. 4,190,158, Cl. 206-522.000.
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American Antenna Corporation: *See—*
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American Can Company: *See—*
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Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.

American Cyanamid Company: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.

American Home Products Corporation: *See—*
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Siegmund, Walter P., 4,190,347, Cl. 355-1.000.

American Safety Razor Company: *See—*
Iten, Clemens A.; and Campbell, Christopher J., 4,189,829, Cl. 30-151.000.

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Amero, Clifford L., to Bird Machine Company, Inc. Solids liquid separating centrifuge with solids classification. 4,190,194, Cl. 233-7.000.

Amminger, William L. Regenerative turbine. 4,190,399, Cl. 415-116.000.

AMP Incorporated: *See—*
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AMSTED Industries Incorporated: *See—*
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Andersen, John A.; and Cole, James K., to United States of America, Energy. Accident resistant transport container. 4,190,160, Cl. 206-591.000.

Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., to Monsanto Company. High solids thermosettable coating compositions containing 1,4-dimethylolcyclohexane and polyoxypropylene polyol. 4,190,700, Cl. 428-524.000.

Anderson, Lloyd D., to United States of America, Navy. Vector acoustic mine mechanism. 4,189,999, Cl. 102-18.00R.

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Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., to Vsesojuzny Nauchno-Isslekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv. Apparatus for pulling single crystals from melt. 4,190,630, Cl. 422-249.000.

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B. F. Goodrich Company, The: *See—*
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Tucker, Harold A., 4,190,582, Cl. 260-239.30R.
Westerman, Ira J., 4,190,562, Cl. 260-17.4UC.

Bachand, Ernest C., to Pioneer Cover-All, Inc. Portable screening plant. 4,190,526, Cl. 209-245.000.

Backus, Harold A., to NL Industries, Inc. Adjustable hinge installation. 4,189,805, Cl. 16-130.000.

Baermann, Max. Plastic bonded permanent magnet and method of making same. 4,190,548, Cl. 252-62.540.

Bahl, Surinder K.; and Leach, Gale L., to Mead Corporation, The. Gold etchant composition and method. 4,190,489, Cl. 156-664.000.

Bailey, Lonnie E. Light display means. 4,190,312, Cl. 350-4.200.

Bailey, Paul F. Trephine instrument for use in cornea removal and transplant. 4,190,050, Cl. 128-305.100.

Bains, Gurdip S.; and Martin, Niles J., to Westinghouse Electric Corp. Panel joint. 4,189,890, Cl. 52-584.000.

Baker International Corporation: *See—*
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.

Baldwin, Charles W.: *See—*
Stewart, William F.; and Baldwin, Charles W., 4,189,865, Cl. 47-14.000.

Baldwin, John R., to Mustang Services Company. Pipe thread gauge. 4,189,843, Cl. 33-199.00R.

Ball, Rowland E., to Borg-Warner Corporation. Multiple stage pump. 4,190,395, Cl. 415-61.000.

Ballin, Gene. Combination mounting frame and film for a window. 4,189,880, Cl. 52-202.000.

Bally Manufacturing Corporation: *See—*
Burnside, Walter M., 4,190,066, Cl. 133-4.00R.

Barabash, Valery F.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Barfield, Charles R., Jr.: *See—*
Cunningham, Bruce B.; and Barfield, Charles R., Jr., 4,190,360, Cl. 355-89.000.

Barnett, George H.: *See—*
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Barr, Douglas R.: *See—*
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.

Barry, John D. A. Bread baking. 4,189,992, Cl. 99-327.000.

Bartels, Harold U., to Bourns Medical Systems, Inc. Noise reducing exhalation valve and diaphragm. 4,190,045, Cl. 128-205.240.

Bartley, Francis A.: *See—*
Goodbary, Edgar R.; and Bartley, Francis A., 4,190,265, Cl. 280-716.000.

Barton, Hugh M., Jr., to Phillips Petroleum Company. Introduction and selective removal of debilitating agent for permeability correction. 4,190,109, Cl. 166-270.000.

Barton, Sterling C.: *See—*
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.

Baruffa, Olindo, to Mefina S.A. Zigzag stitch sewing machine. 4,190,008, Cl. 112-158.00B.

Barwell, John H.; and Wielesiuk, Aleksander. Method and apparatus for applying a rubber layer to a cylindrical workpiece. 4,190,684, Cl. 427-194.000.

BASF Aktiengesellschaft: *See—*
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, 4,190,650, Cl. 424-204.000.
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, 4,190,569, Cl. 260-31.600.
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.

Bass, Merlyn D.: *See—*
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.

Basta, Thomas P., to Tektronix, Inc. Low-profile test clip adapter. 4,190,311, Cl. 339-75.0MP.

Battles, James E.: *See—*
Eberhart, James G.; and Battles, James E., 4,189,827, Cl. 29-623.100.

Baudin, Pol: *See—*
De Boel, Marcel; and Baudin, Pol, 4,190,698, Cl. 428-334.000.

Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, to C Rob Hammerstein GmbH. Device for adjusting vertical and inclined positions of a vehicle seat. 4,190,225, Cl. 248-394.000.

Bauer, Heinz: *See—*
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.

Bauer, Kurt; and Molleken, Reiner, to Haarmann & Reimer GmbH. Process for the preparation of 3,4-methylenedioxymandelic acid. 4,190,583, Cl. 260-340.50R.

Bauer, Robert, to Miles Laboratories, Inc. Device for detecting serum bilirubin. 4,190,419, Cl. 23-230.00B.

Bauer, William J. Method and apparatus for controlling flow of liquid in gravity flow conduits. 4,190,070, Cl. 137-15.000.

Baum, Jorg P., to Verfahrenstechnik Dr. Ing. Kurt Baum. Apparatus for treating refinery waste gases. 4,190,237, Cl. 266-80.000.

Baum, Werner; and Munding, German, to Messerschmitt-Bolkow-Blohm GmbH. Thermal drilling device. 4,190,121, Cl. 175-14.000.

Baumann, Gert F.: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.

Bausch, Hans M. Pellet dispenser for dental purpose. 4,190,177, Cl. 221-56.000.

Bausch & Lomb Incorporated: *See—*
Clark, James A., 4,190,154, Cl. 206-438.000.

Baxter Travenol Laboratories, Inc.: *See—*
Kulle, Lee K.; and Rudzena, William L., 4,190,171, Cl. 215-329.000.
Ruschke, Ricky R., 4,190,426, Cl. 55-185.000.
Virag, Robert A., 4,190,046, Cl. 128-200.210.

Bayer Aktiengesellschaft: *See—*
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.
Larbig, Wolfgang, 4,190,510, Cl. 204-180.00R.
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.
Noll, Klaus; and Pedain, Josef, 4,190,566, Cl. 260-29.2TN.
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Schutze, Detlef-Ingo; and Wunderlich, Klaus, 4,190,726, Cl. 546-27.000.
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.

Bayley, Allan E., to Hughes Aircraft Company. Gas laser with resistive strip arrangement for starting enhancement. 4,190,810, Cl. 331-94.5PE.

Beall, Nelson J.: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.

Beard, Eugene R. Screw lock for interlocking sliding door and windows. 4,190,272, Cl. 292-251.000.

Beck, Earl, to Unit Rig & Equipment Co. Dual steering system for off-highway vehicles. 4,190,130, Cl. 180-133.000.

Becker, Burckhard: *See—*
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Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.

Becker, Dieter: *See—*
Lachonius, Leif; and Becker, Dieter, 4,190,301, Cl. 308-8.200.

Becker, Larry W., to Betz Laboratories, Inc. Oligomeric ester chain condensates of substituted 1-hydroxy-1,1-diphosphonic acid. 4,190,615, Cl. 260-931.000.

Becker, Stephen P., to Fargo Manufacturing Company, Inc. Dual head fastener. 4,189,976, Cl. 85-9.00R.

Beckman Instruments, Inc.: *See—*
Chulay, Steven J., 4,190,195, Cl. 233-26.000.

Beckman, William J., Jr.: *See—*
Pederson, Jerard M.; and Beckman, William J., Jr., 4,190,543, Cl. 210-332.000.

Becton, Dickinson Electronics Company: *See—*
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.

Bedell, John R., to Allied Chemical Corporation. Chill roll casting of continuous filament. 4,190,095, Cl. 164-87.000.

Bedo, Ilona: *See—*
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.

Behringwerke Aktiengesellschaft: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.

Beilfuss, Richard J.: *See—*
Swanson, Kenneth R.; and Beilfuss, Richard J., 4,190,223, Cl. 248-68.00R.

Beirute, Robert M., to Western Company of North America, The. Method of cementing wellbores using high temperature cement mud spacer. 4,190,110, Cl. 166-291.000.

Bejting, Anders M. T.; and Wern, Lars A. Alphanumeric terminal having an optoelectric converter and an associated mono-pulse generating circuit. 4,190,833, Cl. 340-707.000.

Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., to Aeroflex Laboratories, Inc. Vibration isolator and method for manufacturing same. 4,190,227, Cl. 248-636.000.

Beljanski, Mirko. Polyribonucleotides capable of promoting the genesis of leucocytes and blood platelets. 4,190,649, Cl. 424-180.000.

Bell, Guido: *See—*
Tihanyi, Jenoe; and Bell, Guido, 4,190,850, Cl. 357-23.000.

Bell & Howell Company: *See—*
LaRue, Mervin W., Jr., 4,190,353, Cl. 355-24.000.

Bell, Robert E., to Essex Group, Inc. Lamp outage indicator circuit. 4,190,830, Cl. 340-642.000.

Bell Telephone Laboratories, Incorporated: *See—*
Alles, Harold G., 4,190,826, Cl. 340-365.00S.
Berreman, Dwight W., 4,190,330, Cl. 350-331.000.
Bruning, John H., 4,190,352, Cl. 355-19.000.
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.
Knowlton, Kenneth C., 4,190,896, Cl. 364-859.000.
Logan, Ralph A.; and Tsang, Won-Tien, 4,190,813, Cl. 331-94.50H.
Miller, Gabriel L.; and Robinson, David A. H., 4,190,799, Cl. 324-239.000.

Bellofatto, Oreste, to Snamprogetti S.p.A. Converting solar energy into electric power. 4,189,922, Cl. 60-641.000.

Ben-Dor, Monique: *See—*
Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, 4,190,642, Cl. 424-19.000.

Bendall, Wilfrid H. Automatic clutch. 4,190,138, Cl. 192-43.000.

Bendell, Sidney L., to RCA Corporation. Video image tube highlight suppression circuit. 4,190,865, Cl. 358-219.000.

Bendix Corporation, The: *See—*
Kosakowski, Henry R., 4,190,891, Cl. 364-606.000.
Taplin, Lael B., 4,190,029, Cl. 123-119.00A.

Bennet, Robert A. Liquid dispenser. 4,190,180, Cl. 222-207.000.
Bennett, George T.; and Brucken, Byron L., to General Motors Corporation. Electromagnetic clutch. 4,190,141, Cl. 192-84.00C.
Bentley, John P. Inflatable seat cushion and body support assembly. 4,190,286, Cl. 297-284.000.
Berdan, Betty L.; and Luce, Betty M., to Gould Inc. Method of making a printed circuit board having mutually etchable copper and nickel layers. 4,190,474, Cl. 156-151.000.
Berg, Clyde. Geothermal energy recovery. 4,189,923, Cl. 60-641.000.
Bergman, Janice M.: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.
Berlioux, Jacques, to Societe Anonyme Francaise du Ferodo. Torsion-damping assemblies with two-part hubs e.g. for friction clutches. 4,190,142, Cl. 192-106.200.
Berreman, Dwight W., to Bell Telephone Laboratories, Incorporated. Variable focus liquid crystal lens system. 4,190,330, Cl. 350-331.000.
Berry, George A., to International Computers Limited. Fastening device. 4,190,375, Cl. 403-7.000.
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., to Phillips Petroleum Company. Passivation of metals on cracking catalysts with an antimony tris (hydrocarbyl sulfide). 4,190,552, Cl. 252-411.00R.
Besik, Ferdinand. Apparatus for on-site renovation of sanitary waters. 4,190,539, Cl. 210-195.400.
Bethlehem Steel Corporation: *See—*
Hitzrot, Henry W., Jr., 4,190,422, Cl. 51-309.000.
Betz Laboratories, Inc.: *See—*
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Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., to Gifford-Hill & Company, Inc. Self-correcting linearly movable irrigation system. 4,190,068, Cl. 137-1.000.
Beusen, Gerardus L. Fluid heater. 4,190,035, Cl. 126-99.00A.
Bevernitz, Kurt J.: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.
Beziat, Bernard, to Societe Nouvelle des Echafaudages Tubulaires Mills. Assembly elements, inter alia for scaffolding. 4,189,810, Cl. 24-249.00R.
BFG Glassgroup: *See—*
De Boel, Marcel; and Baudin, Pol, 4,190,698, Cl. 428-334.000.
Bhattacharyya, Arup; and Wiedman, Francis W., III, to International Business Machines Corporation. Method for making a bipolar transistor structure utilizing self-passivating diffusion sources. 4,190,466, Cl. 148-1.500.
Bhattacherjee, Parimal: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,190,673, Cl. 424-324.000.
Bibby, Noel, to Noel Bibby Limited. Waterproof inwardly facing garment seams produced by high frequency welding. 4,190,010, Cl. 112-419.000.
Bickham, Euland M.: *See—*
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., 4,190,227, Cl. 248-636.000.
Bielefeldt, Ernst-August, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for converting of spin flow energy into pressure energy. 4,190,078, Cl. 137-561.00R.
Bierbaum, Dieter: *See—*
Teschner, Wolfgang; and Bierbaum, Dieter, 4,190,498, Cl. 202-262.000.
Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., to Stamicarbon, B.V. Process for the manufacture of shaped products from calcium sulphate dihydrate. 4,190,455, Cl. 106-98.000.
Bingham, David, to Intersil, Inc. Commutating autozero amplifier. 4,190,805, Cl. 330-9.000.
Bio-Rad Laboratories, Inc.: *See—*
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.
Biorex Laboratories Limited: *See—*
Vanstone, Anthony E.; and Maile, Graham K., 4,190,671, Cl. 424-317.000.
Bird Machine Company, Inc.: *See—*
Amero, Clifford L., 4,190,194, Cl. 233-7.000.
Bishop, Arthur E. Rack and pinion steering gear for automotive vehicles. 4,189,955, Cl. 74-498.000.
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Process for splitting the L-(−)-α-phenylethylamine salt of D-(−)-α-azidophenylacetic acid. 4,190,592, Cl. 260-349.000.
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S. Tank furnace for hot-dip metal coating. 4,190,017, Cl. 118-74.000.
Black & Decker Inc.: *See—*
Sauerwein, William D.; and Walton, Richard E., II, 4,190,781, Cl. 310-239.000.
Black Diamond Service Company, Inc.: *See—*
O'Neal, Winston R.; and Richardson, Stephen L., 4,190,116, Cl. 173-38.000.
Black, Robert P.: *See—*
Jenkins, Hugh N.; and Black, Robert P., 4,190,014, Cl. 116-266.000.
Blay, George A., to Celanese Corporation. Process for dehalogenation and/or prevention of halogenation. 4,190,606, Cl. 260-601.00R.
Blessington, Bruce A.: *See—*
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.
Bleyer, Franz, to Peter Wukovich OHG. Folded seam closing machine. 4,189,935, Cl. 72-452.000.
Blitzer, Jacob H., Jr. Decorative ceiling system. 4,189,888, Cl. 52-484.000.
Boast, Gordon E., to Coal Industry (patents) Limited. Mining machines with cutter chain tensioning means. 4,190,295, Cl. 299-43.000.
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, to Forschungs Institut Fuer Textiltechnologie. Radiation treatment of high-polymer textile materials. 4,190,623, Cl. 264-22.000.
BOC Limited: *See—*
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 55-58.000.
Body, Richard H.; and Evers, Edwin W., to Acuity Systems, Incorporated. Method and apparatus for controlling visual refractive state of the eye. 4,190,332, Cl. 351-13.000.
Boeing Commercial Airplane Company: *See—*
Lynn, William F.; and Walker, Gordon M., 4,190,302, Cl. 308-36.100.
Boesch, William J.; and Maurer, Gernant E., to Special Metals Corporation. Low thermal expansion nickel-iron base alloy. 4,190,437, Cl. 75-122.000.
Bohms, Herbert: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.
Boling, Norman L., to Owens-Illinois, Inc. Luminescent solar collector structure. 4,190,465, Cl. 136-89.0FC.
Bolza-Schunemann, Hans B., to Koenig & Bauer Aktiengesellschaft. Gear folder. 4,190,242, Cl. 270-50.000.
Bommart, Patrick, to Delachaux, C. Mould for the metallothermic welding of metal items. 4,190,228, Cl. 249-86.000.
Bond, Jerome S., to Dayco Corporation. Package construction for coilable material and method of packaging and dispensing same. 4,190,214, Cl. 242-138.000.
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, to Societe Francaise d'Electrometallurgie "Sofrem". Thermal processes for the production of magnesium. 4,190,434, Cl. 75-10.00R.
Booth, Charles L., to Du Pont de Nemours, E. I., and Company. Sodium ion conducting sodium aluminum borate glasses. 4,190,500, Cl. 204-1.00R.
Borg-Warner Corporation: *See—*
Ball, Rowland E., 4,190,395, Cl. 415-61.000.
Holdeman John W., 4,189,960, Cl. 74-781.00R.
Bormioli, Giorgio. Connector device for the quick coupling of floating hoses. 4,190,086, Cl. 138-89.000.
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased (by Meng, Ilse H. F., heiress); and Seuter, Friedel, to Bayer Aktiengesellschaft. Anti-thrombotic 1,2-benzisothiazolin-3-ones. 4,190,663, Cl. 424-267.000.
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., to Lever Brothers Company, Inc. Particulate absorbant material surface treated with polyether to improve dispersibility in blood. 4,190,563, Cl. 260-17.4GC.
Boston University, Trustees of: *See—*
Sears, Barry D., 4,190,628, Cl. 422-61.000.
Boucher, Raymond W., to Hedstrom Co. Foldable play gym. 4,190,283, Cl. 297-77.000.
Bourlier, Claude, to Societe Hygiaphone V.B. Counter window for use in particular in chemist's shops. 4,190,003, Cl. 109-19.000.
Bourns Medical Systems, Inc.: *See—*
Bartels, Harold U., 4,190,045, Cl. 128-205.240.
Bowen, Robert F.; and Knight, Philip A., Jr., to Raytheon Company. Microwave appliance valve. 4,190,077, Cl. 137-550.000.
Bowers, John J.: *See—*
Lecklider, Thomas H.; and Bowers, John J., 4,190,797, Cl. 324-61.00R.
Box, Theodor M. Beverage bottle case. 4,190,172, Cl. 220-21.000.
Boyd, Eugene J., to United States Tobacco Company. Snuff can and the like. 4,190,170, Cl. 215-307.000.
Brabetz, Bernhard; and Hackl, Helmut, to Siemens Aktiengesellschaft. Method of producing holes free of accretions in circuit boards made of plastic. 4,190,386, Cl. 408-1.00R.
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John. Shutter for rotating source CT scanner. 4,190,773, Cl. 250-445.00T.
Bradshaw, David R. Hot dog bun pan. 4,190,229, Cl. 249-124.000.
Brandes, Harry, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. De-curling device for printing presses. 4,190,245, Cl. 271-278.000.
Braun, Anton. Compressor. 4,189,958, Cl. 74-606.00R.
Bray, Donald T.: *See—*
Tondreau, Raymond A.; and Bray, Donald T., 4,190,537, Cl. 210-98.000.
Brendley, William H.: *See—*
Martorano, Richard; and Brendley, William H., 4,190,693, Cl. 428-209.000.
Brennan, H. George. Therapeutic bandage with removable hot or cold packs. 4,190,054, Cl. 128-402.000.
Brenner, Gerald S.: *See—*
DeMarco, Joseph; and Brenner, Gerald S., 4,190,655, Cl. 424-250.000.
Bresell, Raymond J. Sanitary protective sheath with disposable absorbent liner for tobacco pipe stem. 4,190,150, Cl. 206-244.000.

Brettle, Jack; and Jackson, Norman F., to Plessey Handel und Investments A.G. Light transmission guides. 4,190,315, Cl. 350-96.120.
Bricker, Daniel W.: *See—*
Shaffer, John W.; and Bricker, Daniel W., 4,190,413, Cl. 431-362.000.
Bridgestone Tire Company Limited: *See—*
Yabe, Toshinori, 4,190,482, Cl. 156-403.000.
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., to AMP Incorporated. Ejection device for a electronic package connector. 4,190,310, Cl. 339-45.00R.
Bristol Products Inc.: *See—*
Colten, Jerrold L., 4,190,761, Cl. 219-213.000.
British Petroleum Company Limited, The: *See—*
Kulik, Stanley; and Smith, Anthony M., 4,190,546, Cl. 252-49.600.
Treadaway, Michael F., 4,189,866, Cl. 47-58.000.
British Screw Company Limited: *See—*
Silverwood, Colin, 4,189,979, Cl. 85-74.000.
Brock, George F., Jr. Flexible rake. 4,189,908, Cl. 56-400.170.
Brock, James D.; and Mize, Erbie G., to Astec Industries, Inc. Asphalt plant with improved temperature control system. 4,190,370, Cl. 366-25.000.
Brodbeck, Robert. Motor controlled mirror positioning apparatus. 4,190,326, Cl. 350-289.000.
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., to Shell Oil Company. Photogalvanic cell comprising complexing agents. 4,190,705, Cl. 429-111.000.
Bronkema, James W.; and Hoeksema, Norman L., to Unique Tool & Die Co. Automatic loading and unloading apparatus for press. 4,190,408, Cl. 425-145.000.
Brookhyser, Byron B., to Weyerhaeuser Company. Unloading apparatus for multi-opening work station. 4,189,851, Cl. 34-236.000.
Brown, John E., to West & Son (Engineers) Limited. Bushes. 4,190,299, Cl. 308-3.500.
Brown, Joseph P.: *See—*
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.
Brown & Root, Inc.: *See—*
Fernandez, Ramon J.; and Kahl, John S., 4,190,072, Cl. 137-236.00S.
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.
Brown, Theodore G. Retainer and closure for a garbage can liner bag. 4,189,808, Cl. 24-30.50R.
Brubaker, James E., to Sheller-Globe Corporation. Remote control mirror. 4,189,956, Cl. 74-501.00M.
Brucken, Byron L.: *See—*
Bennett, George T.; and Brucken, Byron L., 4,190,141, Cl. 192-84.00C.
Bruenig, Matthias M.; and Stolle, Herbert D. Net headrest. 4,190,289, Cl. 297-391.000.
Bruening, Inai M. R. deA.: *See—*
Bruening, Wilhelm; and Bruening, Inai M. R. deA., 4,190,425, Cl. 55-67.000.
Bruening, Wilhelm; and Bruening, Inai M. R. deA., to Petroleo Brasileiro S.A.-Petrobas. Process for the preparation of silicious polymeric materials and their applications in the separation of fluids in gaseous phase. 4,190,425, Cl. 55-67.000.
Bruning, John H., to Bell Telephone Laboratories, Incorporated. Method and apparatus for continuously patterning a photosensitive tape. 4,190,352, Cl. 355-19.000.
Brunisholz, Jean; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Monoacetals or aromatic 1,2-diketones. 4,190,602, Cl. 260-590.00D.
Brunswick Corporation: *See—*
Fitzner, Arthur O., 4,190,798, Cl. 324-169.000.
Buckeye Molding Company: *See—*
Allen, David O.; and Wombold, Harry A. E., 4,190,175, Cl. 220-270.000.
Buckley, Charles G.; and Kiedrowski, James A., to Sperry Corporation. Permanent magnet torquer for free rotor flexure suspended gyroscopes. 4,189,948, Cl. 74-5.460.
Buckley, Paul K.: *See—*
Cawley, Richard E.; and Buckley, Paul K., 4,190,199, Cl. 126-419.000.
Buescher, Eugene J., to O'Meara, William R. Stationery having snap-open envelope with remailable portion. 4,190,162, Cl. 206-625.000.
Bulova Watch Company, Inc.: *See—*
Sauter, Charles A., 4,189,951, Cl. 74-440.000.
Bunker Ramo Corporation: *See—*
Makuch, John A., 4,190,317, Cl. 350-96.200.
Buras, Edmund M., Jr.: *See—*
Harper, Allan C.; and Buras, Edmund M., Jr., 4,189,832, Cl. 30-34.200.
Burckhardt, Urs; and Troxler, Richard J., to Ciba-Geigy Corporation. Process for producing desoxy-α-acids. 4,190,604, Cl. 260-592.000.
Burd, Lamar: *See—*
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.
Burgyan, Lajos, to Femal, Michael J., a part interest. Motor vehicle audio information system. 4,190,819, Cl. 340-23.000.
Burk, George A.; and Wilson, Charles A., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,190,668, Cl. 424-304.000.
Burnside, Walter M., to Bally Manufacturing Corporation. Coin and paper money payout system. 4,190,066, Cl. 133-4.00R.
Burr Oak Tool & Gauge Company: *See—*
Stroup, Steven L.; and Harman, Galen B., 4,190,407, Cl. 425-110.000.
Burroughs Corporation: *See—*
Gajski, Daniel D., 4,190,893, Cl. 364-746.000.
Woodward, Thomas R., 4,190,821, Cl. 340-147.0SC.
Burroughs Wellcome Co.: *See—*
Almeida, June D., 4,190,645, Cl. 424-89.000.
Grivsky, Eugene M., 4,190,674, Cl. 424-324.000.
Butler, John P.; and Hammerli, Martin, to Atomic Energy of Canada Limited. Apparatus for removal and recovery of tritium from light and heavy water. 4,190,515, Cl. 204-266.000.
Butler, L. Dennis, to Sperry Rand Corporation. Stack side evener. 4,190,392, Cl. 414-39.000.
Buynak, William J., to U.S. Philips Corporation. Editing display system with dual cursors. 4,190,835, Cl. 340-750.000.
Buzzell, Harold O., to Polaroid Corporation. Apparatus and method for preparing gradient dyed sheet. 4,190,418, Cl. 8-4.000.
Byerly, Robert M., to Viking Industries, Inc. Clamp. 4,189,807, Cl. 24-16.00R.
C Rob Hammerstein GmbH: *See—*
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, 4,190,225, Cl. 248-394.000.
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.
Cachia, Joseph M., to Allied Chemical Corporation. Comfort mechanism for seat belt retractor. 4,190,212, Cl. 242-107.000.
Cachia, Joseph M., to Allied Chemical Corporation. Passive seat belt system. 4,190,266, Cl. 280-802.000.
California Medical Developments, Inc.: *See—*
Olsen, C. Eric, 4,190,153, Cl. 206-362.000.
Calvert, Edward G., to Masson Scott Thrissell Engineering, Ltd. Slitter rollers. 4,189,967, Cl. 83-665.000.
Cameron, Albert R.; and Gneiding, Donald R., to Singer Company, The. Damping valve for pressure regulator. 4,190,076, Cl. 137-505.450.
Cameron Iron Works, Inc.: *See—*
Fisher, Edmund A.; and Czerewaty, Frank P., 4,190,114, Cl. 166-346.000.
Vanderford, Delbert E., 4,190,270, Cl. 285-142.000.
Cammack, Michael A.: *See—*
Fienhold, Stephen C.; and Cammack, Michael A., 4,190,207, Cl. 239-381.000.
Campbell, Christopher J.: *See—*
Iten, Clemens A.; and Campbell, Christopher J., 4,189,829, Cl. 30-151.000.
Campbell, Douglas D., to Minnesota Mining and Manufacturing Company. Soap-filled pad. 4,190,550, Cl. 252-93.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hart, John A.; and Collyer, John C., 4,190,685, Cl. 427-302.000.
Hart, John A.; and Fuoco, Rolland P., 4,190,696, Cl. 428-306.000.
Moss, Gerald E.; and Stevens, Everett E., 4,190,816, Cl. 333-131.000.
Canadian General Electric Company Limited: *See—*
Whiteley, Eric, 4,190,780, Cl. 310-59.000.
Canadian Patents and Development Limited: *See—*
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., 4,190,811, Cl. 331-94.50M.
Candor, James T. Method and apparatus for electrostatically forming a layer of material from a slurry thereof. 4,189,845, Cl. 34-1.000.
Canni Ferrari, Mario: *See—*
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Canon Kabushiki Kaisha: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.
Nozaki, Mineo; and Seki, Mitsuaki, 4,189,997, Cl. 101-93.090.
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,190,338, Cl. 354-106.000.
Takahashi, Teruomi; and Matsuo, Takehiko, 4,190,445, Cl. 430-66.000.
Carini, George F., to Clay Harden Company, The. Continuous casting mold flux powers. 4,190,444, Cl. 75-257.000.
Carl Hurth Maschinen-und Zahnradfabrik: *See—*
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.
Carl Stahl GmbH & Co. KG: *See—*
Korger, Heinz, 4,190,288, Cl. 297-488.000.
Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei: *See—*
Korger, Heinz K., 4,190,291, Cl. 297-408.000.
Carl Still, Firma: *See—*
Teschner, Wolfgang; and Bierbaum, Dieter, 4,190,498, Cl. 202-262.000.
Carlisle, Denis R., to Rolls-Royce Limited. Reflex air burner with airblast start. 4,189,913, Cl. 60-39.14R.
Carlson, Clifford R.; and Chiesa, Alan F., to General Motors Corporation. Mixture forming assembly for closed loop air-fuel metering system. 4,190,028, Cl. 123-119.0EC.
Carolus, David T.; and Edwards, Ralph W., to General Motors Corporation. Antenna cable drive and storage drum with stop mechanism. 4,190,842, Cl. 343-903.000.
Carter-Wallace, Inc.: *See—*
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Cassar, Richard D., to Suntech, Inc. Sulfur plasticization with olefins. 4,190,460, Cl. 106-287.320.

Cassella Aktiengesellschaft: *See—*
Tappe, Horst, 4,190,723, Cl. 542-422.000.
Casuga, Dennis W.; and Hauser, William C., to Lockhart Industries, Inc. Oil cooler bypass valve actuating means. 4,190,198, Cl. 236-34.500.
Caterpillar Tractor Co.: *See—*
Dezelan, Joseph E., 4,189,920, Cl. 60-420.000.
Cawley, Richard E.; and Buckley, Paul K., to Lennox Industries Inc. Combination heating system including a conventional furnace, heat pump and solar energy subsystem. 4,190,199, Cl. 126-419.000.
CEAG Ceagfilter und Entstaubungstechnik GmbH: *See—*
Winter, Karl, 4,190,423, Cl. 55-20.000.
Cecala, Gregory. Sport bench. 4,190,001, Cl. 108-161.000.
Celanese Corporation: *See—*
Blay, George A., 4,190,606, Cl. 260-601.00R.
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,190,620, Cl. 261-148.000.
Cerny, Adrian F. Ice top meat cutting apparatus. 4,189,928, Cl. 62-66.000.
Chadwick, William H., Jr., to Sherman & Reilly, Inc. Conductor transfer device. 4,189,828, Cl. 29-762.000.
Chaffin, Charles M., to Eastman Kodak Company. Electrochemical process for the removal of contaminants from aqueous medium. 4,190,509, Cl. 204-152.000.
Chalansonnet, M. Roger, to Societe Nouvelle de Roulements. Composite bearing race and method for its fabrication. 4,189,816, Cl. 29-148.40C.
Chan, Vincent. Positioning control system. 4,190,792, Cl. 318-663.000.
Chandler, Steven G. Ballast for pick-up trucks and the like. 4,190,281, Cl. 296-37.600.
Charlot, Jean-Claude: *See—*
Salvaudon, Laurence; and Charlot, Jean-Claude, 4,190,837, Cl. 343-16.00M.
Chatham, Mark S. Phonograph cover holder (cover-up). 4,190,157, Cl. 206-477.000.
Chatlien, Emilie M. Method of teaching reading. 4,189,852, Cl. 35-8.00A.
Checki, Angelo, Jr., to RCA Corporation. Semiconductor device package. 4,190,735, Cl. 174-52.0FP.
Chemap A.G.: *See—*
Schnellmann, Ferdinand; and Meier, Hanspeter, 4,190,544, Cl. 210-461.000.
Chemcut Corporation: *See—*
Goffredo, Daniel L., 4,190,481, Cl. 156-345.000.
Chemed Corporation: *See—*
Hwa, Chih M., 4,190,421, Cl. 44-4.000.
Chemetron Corporation: *See—*
Schmerling, Donald W.; and Giacobbe, Frederick, 4,190,636, Cl. 423-415.00A.
Chemische Fabrik Kalk GmbH: *See—*
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.
Chemische Werke Huls AG: *See—*
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.
Chen, Carl, to Du Pont de Nemours, E. I., and Company. Pump seal flush. 4,190,538, Cl. 210-167.000.
Chen, Chiou-Tse: *See—*
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, 4,190,440, Cl. 75-211.000.
Chen, Sow-mei L.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.
Cherian, Gabriel B.: *See—*
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., 4,190,310, Cl. 339-45.00R.
Cherkofsky, Saul C.; and Sharpe, Thomas R., to Du Pont de Nemours, E. I., and Company. Anti-inflammatory 4,5-diarly-2-(substituted-thio)imidazoles and their corresponding sulfoxides and sulfones. 4,190,666, Cl. 424-274.000.
Cherne Industries, Inc.: *See—*
Cherne, Lloyd G., 4,190,619, Cl. 261-92.000.
Cherne, Lloyd G., to Cherne Industries, Inc. Liquid aerating rotor assembly. 4,190,619, Cl. 261-92.000.
Chernenko, Nikolai P.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
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Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Chernyshev, Boris A.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Chester, Jerry D. Carburation system. 4,190,030, Cl. 123-119.00R.
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., to Hughes Aircraft Company. System for reducing the effects of power supply switching. 4,190,882, Cl. 363-26.000.
Chevron Research Company: *See—*
Miller, Stephen J.; and Hughes, Thomas R., 4,190,519, Cl. 208-79.000.
Chiesa, Alan F.: *See—*
Carlson, Clifford R.; and Chiesa, Alan F., 4,190,028, Cl. 123-119.0EC.
Chikama, Toshio, to Machida Endoscope Co., Ltd. Cleaning device for wire guide tube in an endoscope. 4,190,041, Cl. 128-4.000.
Childress, Clarence T.: *See—*
Gallant, James J.; and Childress, Clarence T., 4,189,887, Cl. 52-311.000.
Childress, Ray. Protective canopy and temporary roof support for mining machinery. 4,190,385, Cl. 405-288.000.
Chirico, Cataldo C. Method and arrangement for winding capacitors. 4,190,210, Cl. 242-56.100.
Chou, Ta-Sen, to Eli Lilly and Company. Process for 3-exomethylenecepham sulfoxides. 4,190,724, Cl. 544-16.000.
Christopher, Kenneth R.: *See—*
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Chulay, Steven J., to Beckman Instruments, Inc. Hanger design for a swinging centrifuge rotor. 4,190,195, Cl. 233-26.000.
Chung, Jackson, to Reliance Electric Company. Multiple speed gear reducer. 4,189,962, Cl. 74-802.000.
Ciba-Geigy Corporation: *See—*
Brunisholz, Jean; and Kirchmayr, Rudolf, 4,190,602, Cl. 260-590.00D.
Burckhardt, Urs; and Troxler, Richard J., 4,190,604, Cl. 260-592.000.
Falk, Robert A., 4,190,531, Cl. 210-62.000.
Hamilton, Alexander; and Nelson, Colin, 4,190,578, Cl. 260-150.000.
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.
Cietek, Timothy J.: *See—*
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Citizen Watch Co., Ltd.: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.
Citta, Richard W., to Zenith Radio Corporation. Video carrier recognition system. 4,190,862, Cl. 358-195.000.
City of Hope National Medical Center: *See—*
Tiep, Brian L., 4,190,876, Cl. 361-278.000.
Clark, James A., to Bausch & Lomb Incorporated. Sterile package. 4,190,154, Cl. 206-438.000.
Clay Harden Company, The: *See—*
Carini, George F., 4,190,444, Cl. 75-257.000.
Claycomb, Jack R. Choke for controlling the flow of drilling mud. 4,190,073, Cl. 137-238.000.
Clements, Lloyd W. Irrigation pipe gate valve. 4,190,232, Cl. 251-145.000.
Clifford, Lawrence E.: *See—*
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.
Macaluso, Paul J.; and Clifford, Lawrence E., 4,190,351, Cl. 355-15.000.
Cluett, Peabody & Co., Inc.: *See—*
Lawrence, Jackson; and Webb, Harry A., 4,189,847, Cl. 34-19.000.
Coal Industry (patents) Limited: *See—*
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Cobe Laboratories, Inc.: *See—*
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Coberly & Associates: *See—*
Schultheis, Stephen M., 4,190,795, Cl. 323-17.000.
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., to General Foods Corporation. Meaty textured pet food. 4,190,679, Cl. 426-623.000.
Cohen, Sheppard: *See—*
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.
Coil, Michael K.; and Sylvester, Robert A., to Eastman Kodak Company. Cover sheets for integral imaging receiver elements. 4,190,447, Cl. 430-214.000.
Cointot, Denis F., to Societe Anonyme de Telecommunications. Method and device for receiving an interface signal. 4,190,741, Cl. 179-15.0BS.
Cole, James K.: *See—*
Andersen, John A.; and Cole, James K., 4,190,160, Cl. 206-591.000.
Cole, Paul M., to Du Pont de Nemours, E. I., and Company. Method for producing non-woven webs of cross-laid strands. 4,189,811, Cl. 28-100.000.
Coleman, Cecil L. Multiple wire fence tightener. 4,190,234, Cl. 254-83.000.
Coles, Ernest F., to Hawker Siddeley Dynamics Engineering, Ltd. Electro-hydraulic systems. 4,190,081, Cl. 137-624.270.
Collins, Edward H., to Mt. Pitt Company, The. Pipe chock stick. 4,190,165, Cl. 211-60.00R.
Collins, Marcus H.; and Patel, Kiritkumar R., to Eaton Corporation. Coupling apparatus. 4,190,136, Cl. 188-367.000.

Collyer, John C.: *See—*
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Colognori, Aldo, to Zuppichin, Sebastian; and Colognori, Aldo. Screw, screwdriver and screw-holding attachment therefor. 4,190,091, Cl. 145-52.000.
Colonics Diversified, Inc.: *See—*
Holt, Gregory G., 4,190,059, Cl. 128-750.000.
Colten, Jerrold L., to Bristol Products Inc. Heat loss control system for building heat sumps. 4,190,761, Cl. 219-213.000.
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., to General Foods Corporation. Plant treating composition. 4,190,428, Cl. 71-29.000.
Combustion Engineering, Inc.: *See—*
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COMCO - Dravo Corporation: *See—*
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.
Commissariat à l'Energie Atomique: *See—*
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Commonwealth Scientific and Industrial Research Organization: *See—*
Hodgkin, Jonathan H., 4,190,709, Cl. 521-39.000.
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Compak Systems, Inc.: *See—*
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Compensating Tension Controls, Inc.: *See—*
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Computer Microfilm International Corporation: *See—*
Smith, Dwight H.; and Smith, David L., 4,190,899, Cl. 364-900.000.
Conti, Angelo J.; and Pile, Ira. Toilet flush valve. 4,189,795, Cl. 4-324.000.
Conti, Armond E.: *See—*
Day, Robert A.; and Conti, Armond E., 4,189,944, Cl. 73-623.000.
Conwed Corporation: *See—*
Larsen, Ronald L., 4,190,692, Cl. 428-107.000.
Cook, John P.: *See—*
Creek, Ronald B.; and Cook, John P., 4,190,857, Cl. 358-100.000.
Cook, Mary J.; and Hyche, Kenneth W., to Eastman Kodak Company. Filled hot-melt adhesives containing modified polyethylene. 4,190,565, Cl. 260-27.00R.
Cookson, Donald H.; and McCoy, Clifford W., to COMCO - Dravo Corporation; and Electric Fuels Corporation. Process for pulverizing coal using combination gas in fluid energy pulverizers. 4,190,005, Cl. 110-347.000.
Cookson, Leonard T. Rug hooking rack. 4,189,856, Cl. 38-102.400.
Cooper, George H. Tomato harvester attachment. 4,189,906, Cl. 56-327.00R.
Cooper, Larry P.: *See—*
Marek, Cecil J.; and Cooper, Larry P., 4,189,914, Cl. 60-726.000.
Cooper, Leon M.; and Wipke, Walter J., to International Business Machines Corporation. Electric field orientation for ink jet printers for vertical and horizontal printing. 4,190,845, Cl. 346-75.000.
Copal Company Limited: *See—*
Ishiguro, Yasuo; and Wakazono, Kenji, 4,190,344, Cl. 354-234.000.
Coquelet, Claude: *See—*
Dong, P. Le Hao; and Coquelet, Claude, 4,190,661, Cl. 424-258.000.
Corinth Co. Inc.: *See—*
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Corkum, Paul B.: *See—*
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Corning Glass Works: *See—*
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Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.
Cornwell, Alexander M., Jr.; and Miller, Joseph N., to Jackes-Evans Manufacturing Company. Theft preventing outdoor mailbox. 4,190,192, Cl. 232-17.000.
Corru-Seals Inc.: *See—*
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Corsmeier, Robert J.; and Rauf, James P., to General Electric Company. Gas turbine engine and means for cooling same. 4,190,398, Cl. 415-114.000.
Cousens, Michael, Jr. Bike kite. 4,190,218, Cl. 244-155.00R.
Couture, Paul A.: *See—*
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Couture, Richard B. For releasably coupling agricultural attachment to shank. 4,190,115, Cl. 172-753.000.
Covic, John: *See—*
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., to Eastman Kodak Company. Container for dispensing articles to an automated analyzer. 4,190,420, Cl. 422-63.000.
Cowett, Philip M., Jr., to United States of America, Army. Switching-regulated DC-to-DC converter. 4,190,883, Cl. 363-26.000.
Cramer, Marietta: *See—*
Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.
Crane, Hewitt D.; and Wolf, Daniel E., to Stanford Research Institute International. Signal train verification system using landmarks. 4,190,820, Cl. 340-146.3SG.
Crawford, Allan H., to Mohasco Corporation. Ottoman protecting device. 4,190,282, Cl. 297-68.000.
Creek, Ronald B.; and Cook, John P., to Combustion Engineering, Inc. Periscope assembly. 4,190,857, Cl. 358-100.000.
Crimmins, William M.: *See—*
Marinkovich, Cedomir S.; and Crimmins, William M., 4,190,774, Cl. 250-446.000.
Critchfield, Frank E.: *See—*
Zdrahala, Richard J.; and Critchfield, Frank E., 4,190,711, Cl. 521-112.000.
Crompton & Knowles Corporation: *See—*
Cyvas, Petras, 4,190,089, Cl. 139-437.000.
Cross, Edward F.; and Garber, Wilbur A., to United States of America, Air Force. Method for improved performance of infrared vidicon cameras. 4,190,858, Cl. 358-113.000.
Crossman, Philip E.; and Van Ryn, Arthur L., to American Seating Company. Beam-mounted folding chairs. 4,189,876, Cl. 52-9.000.
Crouse, Ronald J., to TRW Inc. Optical encoder apparatus. 4,190,767, Cl. 250-231.0SE.
Cunningham, Bruce B.; and Barfield, Charles R., Jr., to Lanman Lithotech, Inc. Vacuum contact reproduction apparatus. 4,190,360, Cl. 355-89.000.
Curran, John R., to Foxboro Company, The. Industrial process recorder incorporating improved roll chart assembly. 4,190,848, Cl. 346-145.000.
Curtis & Marble Machine Company: *See—*
Laing, Robert, 4,189,894, Cl. 53-399.000.
Curtiss, Roy, III, to Research Corporation. Modified microorganisms and method of preparing and using same. 4,190,495, Cl. 435-172.000.
Custom Concepts Incorporated: *See—*
Kubiatowicz, James F., 4,189,911, Cl. 58-106.000.
Cyvas, Petras, to Crompton & Knowles Corporation. Projectile launching apparatus. 4,190,089, Cl. 139-437.000.
Czerewaty, Frank P.: *See—*
Fisher, Edmund A.; and Czerewaty, Frank P., 4,190,114, Cl. 166-346.000.
Daiichi Radioisotope Laboratories, Ltd.: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.
Dainichi-Nippon Cables, Ltd.: *See—*
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.
Damme, Heinz: *See—*
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.
Dana Corporation: *See—*
Fielder, David F., 4,189,932, Cl. 72-370.000.
Danek Industries, Inc.: *See—*
Haynes, John A., 4,189,854, Cl. 37-117.500.
Danfoss A/S: *See—*
Tankred, Hans J.; and Kristensen, Erling B., 4,189,984, Cl. 92-82.000.
Dankowski, Gerhard. Heat exchange tube. 4,190,105, Cl. 165-179.000.
Danmura, Tugiaki: *See—*
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.
Dardoufas, Kimon C.: *See—*
Marshall, Robert M.; and Dardoufas, Kimon C., 4,190,545, Cl. 252-8.750.
Dassen, Bernardus H. N., to Stamicarbon, B.V. Process for biological purification of waste water. 4,190,528, Cl. 210-8.000.
Davies, John E.; and Galli, Guido, to International Business Machines Corporation. Method for forming a liquid phase epitaxial film on a wafer. 4,190,683, Cl. 427-130.000.
Davis, Carl A. Well cementing/plug drilling apparatus and improved cementing and drilling process. 4,190,111, Cl. 166-291.000.
Davis, Carl A. Pump down wipe plug and cementing/drilling process. 4,190,112, Cl. 166-291.000.
Davis, Noel: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.
Davis, Robert. Variable chamber diesel engine. 4,190,024, Cl. 123-48.00A.
Davis, Thomas J., to Electric Power Research Institute, Inc. Method and apparatus for rotating cartesian coordinate signals. 4,190,895, Cl. 364-815.000.
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A. Method of obtaining refrigeration at cryogenic level. 4,189,930, Cl. 62-502.000.
Dawidowitsch, Peter: *See—*
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.
Day, Robert A.; and Conti, Armond E., to United States of America, Energy. Hydrodynamic ultrasonic probe. 4,189,944, Cl. 73-623.000.
Dayco Corporation: *See—*
Bond, Jerome S., 4,190,214, Cl. 242-138.000.
Miranti, Joseph P., Jr., 4,189,968, Cl. 83-816.000.
Dean, Robert H.; and Dyer, Oliver Q., to International Telephone and Telegraph Corporation. Backflow prevention devices. 4,190,071, Cl. 137-115.000.
De Boel, Marcel; and Baudin, Pol, to BFG Glassgroup. Light-transmitting fire screening panel. 4,190,698, Cl. 428-334.000.
de Bruin, Frank. Apparatus for jointly examining and depositing a plurality of transparent pictures. 4,189,858, Cl. 40-158.00B.

deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., to Deere & Company. Adjustable shear bar for a harvester cutterhead. 4,190,209, Cl. 241-101.700.

Decker, Cloyd E., to Robertshaw Controls Company. Control system and method and control device therefor. 4,190,764, Cl. 219-506.000.

Decker, Llewellyn: *See—*
Santiago, Romeo S.; and Decker, Llewellyn, 4,190,762, Cl. 219-245.000.

Decker, Quintin W.; and Marcus, Erich, to Union Carbide Corporation. Production of tertiary amines by reductive alkylation. 4,190,601, Cl. 260-583.00R.

Dee-Jay Independent Services Group, Inc.: *See—*
Dressler, John A., Jr., 4,190,734, Cl. 174-38.000.

Deere & Company: *See—*
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Flenniken, John M., 4,189,875, Cl. 51-250.000.
Klope, Lawrence R., 4,190,298, Cl. 303-2.000.
Stecklein, Gary L., 4,190,378, Cl. 403-146.000.

DeForest, Laurence R., to Phillips Petroleum Co. Closure member for a container. 4,190,189, Cl. 229-5.600.

DeFreitas, Richard E., to DeltaLab Research, Inc. Digital encoding circuitry. 4,190,801, Cl. 325-38.00B.

De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., to Shell Oil Company. Dissolving barium sulfate scale with aqueous solutions of salts of carboxymethyl monocyclic macrocyclic polyamines. 4,190,462, Cl. 134-2.000.

Del Laboratories, Inc.: *See—*
Gordon, Harry W.; and Amanat, Sharif, 4,190,064, Cl. 132-7.000.

Delachaux, C.: *See—*
Bommart, Patrick, 4,190,228, Cl. 249-86.000.

Delaney, Bobby R.: *See—*
West, Harrison; and Delaney, Bobby R., 4,189,939, Cl. 73-116.000.

Delaplaine, Robert W.: *See—*
Greenleaf, John E.; and Delaplaine, Robert W., 4,190,060, Cl. 128-760.000.

Dell, William C. Fluidized bed ladle heating method and apparatus. 4,190,235, Cl. 266-44.000.

Delony, Timothy E.: *See—*
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.

Delta Materials Research Limited: *See—*
Robinson, William D., 4,190,131, Cl. 181-296.000.

DeltaLab Research, Inc.: *See—*
DeFreitas, Richard E., 4,190,801, Cl. 325-38.00B.

DeMarco, Joseph; and Brenner, Gerald S., to Merck & Co., Inc. Amiloride citrate. 4,190,655, Cl. 424-250.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.

DePuy, Robert P.; and Leitten, Arthur H., Jr., to General Electric Company. Logarithmic analog-to-digital converter. 4,190,825, Cl. 340-347.0AD.

Derroitte, Jean-Louis: *See—*
Alard, Joseph; and Derroitte, Jean-Louis, 4,190,624, Cl. 264-146.000.

Desalination Systems, Inc.: *See—*
Tondreau, Raymond A.; and Bray, Donald T., 4,190,537, Cl. 210-98.000.

Desilets, Jean-Paul. Spider thread. 4,190,132, Cl. 182-6.000.

Desmond, Timothy F.: *See—*
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.

Despois, Jacques; and Nougarede, Francis, to Commissariat a l'Energie Atomique; and Societe Nationale elf Aquitaine. Heat transfer system for the utilization of cavities dug in the subsoil as heat silos. 4,190,099, Cl. 165-45.000.

Deuel, Ronald F.: *See—*
Morreall, Donald R.; and Deuel, Ronald F., 4,189,998, Cl. 101-93.310.

Deutsch Company, The: *See—*
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Achenbach, Karl; and Turk, Gunter, 4,190,632, Cl. 423-118.000.

Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, to Western Electric Company, Incorporated. Double crucible crystal growing apparatus. 4,190,631, Cl. 422-249.000.

Dezelan, Joseph E., to Caterpillar Tractor Co. Load signal control of hydraulic motor displacement. 4,189,920, Cl. 60-420.000.

Diamond, Arthur S.: *See—*
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., 4,190,056, Cl. 128-630.000.

Diamond International Corporation: *See—*
Moulds, Frank G.; and McCord, Michael A., 4,189,898, Cl. 53-446.000.

Diamond, Joseph M., to McNab, Incorporated. Multichannel salinity meter. 4,190,827, Cl. 340-500.000.

Diamond, Steven E.; and Mares, Frank, to Allied Chemical Corporation. Process for dehalogenating the metal-halide bond in a low valent group VIII metal halide complex. 4,190,595, Cl. 260-429.00R.

DiBugnara, Raymond, to TRW Inc. Metal-silica solution for forming films on semiconductor surfaces. 4,190,458, Cl. 106-287.160.

Dickson, Ross P.: *See—*
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Dieterich, Dieter: *See—*
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.

Dieterich, Frank L.; and Abrams, Stanton, to Dieterich, Frank L. Self-centering vegetable drying apparatus. 4,189,850, Cl. 34-58.000.

Dietrich, Werner: *See—*
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.

Diggs, Jesse S.: *See—*
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.

Digital Equipment Corporation: *See—*
Mudge, J. Craig, 4,190,894, Cl. 364-758.000.

Dillon, Glenn W.; and Lindell, Albert H., to Stock Equipment Company. Method and apparatus for making closure construction. 4,189,824, Cl. 29-522.00R.

Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., to Varian Associates, Inc. Tomographic scanning apparatus having detector signal digitizing means mounted to rotate with detectors. 4,190,772, Cl. 250-445.00T.

Dischert, Robert A.; and Thorpe, Laurence J., to RCA Corporation. Remote control system for a television camera. 4,190,863, Cl. 358-210.000.

Dischert, Robert A., to RCA Corporation. Remote iris control for television cameras. 4,190,864, Cl. 358-210.000.

Doane, Patrick K., to Kimball International, Inc. Electronic expression control. 4,189,973, Cl. 84-1.270.

Dr. Johannes Heidenhain GmbH: *See—*
Holstein, Siegbert, 4,189,840, Cl. 33-125.00C.

Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Alkaline battery separator. 4,190,707, Cl. 429-254.000.

Domino Equipment Pty. Ltd.: *See—*
Strachan, John B., 4,190,629, Cl. 422-169.000.

Domtar Inc.: *See—*
Tomlinson, George H., II, 4,190,490, Cl. 162-19.000.

Donald MacMillan & Son, Inc.: *See—*
MacMillan, Kenneth T., 4,190,405, Cl. 425-20.000.

Dong, P. Le Hao; and Coquelet, Claude, to Laboratoires Chauvin-Blache. Pyrazolo-quinolines, compositions and pharmaceutical preparations. 4,190,661, Cl. 424-258.000.

Donoghue, Robert E.: *See—*
Galloway, Dudley L.; and Donoghue, Robert E., 4,190,732, Cl. 174-17.0LF.

Donohoe, Stephen C. Wheeled patient support. 4,190,280, Cl. 296-20.000.

Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank. Distributed microprocessor control system for a copier/duplicator. 4,190,350, Cl. 355-14.00R.

Doodewaard, Jean: *See—*
Marx, Arthur F.; and Doodewaard, Jean, 4,190,670, Cl. 424-305.000.

Doornink, Douglas J., to Tektronix, Inc. Circuit and method for producing a full-screen cross-hair cursor on a raster-scan type display. 4,190,834, Cl. 340-709.000.

Dorer, Gary L.; and Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Microstructured transmission and reflectance modifying coating. 4,190,321, Cl. 350-165.000.

Dorren, Louis, to Matsushita Electric Corp. of America. Compatible four channel FM system. 4,190,737, Cl. 179-1.0GH.

Doty, John S.: *See—*
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.

Dow Chemical Company, The: *See—*
Burk, George A.; and Wilson, Charles A., 4,190,668, Cl. 424-304.000.
Fenstermacher, Myk R.; and Noveroske, Robert L., 4,190,662, Cl. 424-263.000.
Flynn, James P., 4,190,471, Cl. 149-19.600.
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.

Downie, David E.: *See—*
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.

Doyle, Walter M., to Laser Precision Corporation. Refractively scanned interferometer. 4,190,366, Cl. 356-346.000.

Draiswerke GmbH: *See—*
Durr, Herbert; and Muller, Helmut, 4,190,371, Cl. 366-139.000.

Dreier, William M.: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.

Drennen, Thomas J.; and Gill, Robert A., to Rohm and Haas Company. Process for controlling pitch in papermaking. 4,190,491, Cl. 162-76.000.

Dresser Industries, Inc.: *See—*
O'Dell, Larry A., 4,190,296, Cl. 299-89.000.

Dressler, John A., Jr., to Dee-Jay Independent Services Group, Inc. Cable pedestal rodent guard system, method of constructing same, and kit and composition. 4,190,734, Cl. 174-38.000.

Drost, James L.; and Gordin, Myron K., to Muscatine Lighting Manufacturing Co. Crossarm assembly for high intensity discharge luminaries. 4,190,881, Cl. 362-250.000.

Droual, Rene: *See—*
Letournoux, Alain; and Droual, Rene, 4,190,226, Cl. 248-429.000.

Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., to United Technologies Corporation. Method and apparatus for removing inclusion contaminants from metals and alloys. 4,190,404, Cl. 425-8.000.

Drzewiecki, Tadeusz M.; and Goto, John M., to United States of America, Army. Fluidic logical pyrotechnic initiator. 4,190,083, Cl. 137-838.000.

Dubrunfaut, Gerard H., to Societe Anonyme de Telecommunications. Optical telemetering apparatus. 4,190,361, Cl. 356-5.000.

Dubrunfaut, Gerard H., to Societe Anonyme de Telecommunications. Laser telemeter. 4,190,362, Cl. 356-5.000.

Dundas, Gifford W. Swimming pool heating and cooling system. 4,189,791, Cl. 4-172.000.

Dunmire, Howard L.; and Horn, Stuart B., to United States of America, Army. Optimized cooler dewar. 4,190,106, Cl. 165-185.000.

Dunne, Anthony L.: *See—*
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Du Pont de Nemours, E. I., and Company: *See—*
Adam, Alain C., 4,190,156, Cl. 206-447.000.
Agers, Brian M.; and Todd, Maurice C., 4,189,812, Cl. 28-272.000.
Booth, Charles L., 4,190,500, Cl. 204-1.00R.
Chen, Carl, 4,190,538, Cl. 210-167.000.
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,190,666, Cl. 424-274.000.
Cole, Paul M., 4,189,811, Cl. 28-100.000.
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.
Larsen, Max J., 4,190,196, Cl. 233-26.000.
Levitt, George, 4,190,432, Cl. 71-93.000.
Niederhauser, Donald O., 4,190,695, Cl. 428-234.000.

Dupont, Regis: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, to Smith-Kline & French Laboratories Limited. Amidino and guanidino phosphonates. 4,190,664, Cl. 424-270.000.

Durbin, John A.: *See—*
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.

Durr, Herbert; and Muller, Helmut, to Draiswerke GmbH. Apparatus for discontinuous mixing of at least two materials. 4,190,371, Cl. 366-139.000.

Duvelius, Rembert: *See—*
Pohl, Andreas P. I., 4,190,484, Cl. 156-580.000.

Dyer, Oliver Q.: *See—*
Dean, Robert H.; and Dyer, Oliver Q., 4,190,071, Cl. 137-115.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.

Dynapol: *See—*
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.

Eakins, Kenneth E.; and Bhattacherjee, Parimal, to Nelson Research & Development Company. Colchicine ophthalmic composition and method of use. 4,190,673, Cl. 424-324.000.

Eastman Kodak Company: *See—*
Chaffin, Charles M., 4,190,509, Cl. 204-152.000.
Coil, Michael K.; and Sylvester, Robert A., 4,190,447, Cl. 430-214.000.
Cook, Mary J.; and Hyche, Kenneth W., 4,190,565, Cl. 260-27.00R.
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.
Fassler, Werner, 4,190,342, Cl. 354-202.000.
Frank, Lee F.; and Lee, James K., 4,190,336, Cl. 354-50.000.
Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., 4,190,446, Cl. 430-25.000.
Smith, Frank T. J., 4,189,826, Cl. 29-590.000.

Eaton Corporation: *See—*
Arnaud, Gerard, 4,190,181, Cl. 222-456.000.
Collins, Marcus H.; and Patel, Kiritkumar R., 4,190,136, Cl. 188-367.000.
Goscenski, Edward J., Jr., 4,189,919, Cl. 60-420.000.
Knapp, Kenneth K., 4,189,921, Cl. 60-445.000.
Konkle, Phillip E.; and Tinholt, Thomas H., 4,190,140, Cl. 192-82.00T.
Piber, Earl T., 4,190,750, Cl. 200-67.0AA.
Tinholt, Thomas H.; and Konkle, Phillip E., 4,190,139, Cl. 192-58.00B.

Eaton, Thomas J., Jr.: *See—*
Gray, James W., 4,189,964, Cl. 81-3.00R.

Eberhart, James G.; and Battles, James E., to United States of America, Energy. Treatment of electrochemical cell components with lithium tetrachloroaluminate ($LiAlCl_4$) to promote electrolyte wetting. 4,189,827, Cl. 29-623.100.

Ebert, Edward A. Bait carrier and driver. 4,189,860, Cl. 43-42.290.

Ebert, Edward A. Support for deformable articles and method of making the same. 4,190,480, Cl. 156-296.000.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co., Ltd. Zero suppressing system for electronic device. 4,190,892, Cl. 364-711.000.

Eckart, Manfred, to Vorwerk Interholding GmbH. Adapter. 4,190,307, Cl. 339-6.00R.

Eckert, Lewis W.; and Stewart, Olivia D., to Armstrong Cork Company. Method of producing acoustical fiberboard. 4,190,492, Cl. 162-145.000.

Ecodyne Corporation: *See—*
Halbfoster, Christopher J., 4,190,532, Cl. 210-75.000.

Edgar Pickering (Blackburn) Limited: *See—*
Mellor, Leslie, 4,190,006, Cl. 112-79.00R.

Edwards, Ralph W.: *See—*
Carolus, David T.; and Edwards, Ralph W., 4,190,842, Cl. 343-903.000.

Eggleston, Frederick C., to Essex Group, Inc. Fiber optic ribbon and cable made therefrom. 4,190,319, Cl. 350-96.230.

Eidelman, Lev G.: *See—*
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.

Electric Fuels Corporation: *See—*
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.

Electric Power Research Institute, Inc.: *See—*
Davis, Thomas J., 4,190,895, Cl. 364-815.000.

Elfgen, Reiner: *See—*
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.

Eli Lilly and Company: *See—*
Chou, Ta-Sen, 4,190,724, Cl. 544-16.000.
Lacefield, William B., 4,190,725, Cl. 544-182.000.

Ellerstein, Stuart M., to Thiokol Corporation. Thermoplastic elastic polysulfide polymers. 4,190,625, Cl. 264-176.00R.

Ellis, David M. Pressure generator. 4,189,936, Cl. 73-4.00R.

Ellis, Juanita W. Table for use in religious services. 4,190,303, Cl. 312-33.000.

Elmy, Richard A., to W. M. Cissell Manufacturing Company. Fail-safe gas feed and ignition sequence control apparatus and method for a gas-fired appliance. 4,190,414, Cl. 432-46.000.

Emmerich, Kenneth C.; and Hamlin, Ralston L., to Fansteel Inc. Drill bit and steel combination for improved fluid flow. 4,190,125, Cl. 175-410.000.

Emmerich, Kenneth C., to Fansteel Inc. Roof drill bit with hexagonal body portion. 4,190,128, Cl. 175-410.000.

Empresa Nacional de Ingenieria y Tecnologia, S.A.: *See—*
Hernandez Crespo, Mariano, 4,190,082, Cl. 137-625.170.

England, Robert C. Device for insertion, manipulation and removal of soft contact lenses. 4,190,277, Cl. 294-1.0CA.

English Clays Lovering Pochin & Co., Ltd.: *See—*
Watson, James H. P., 4,190,524, Cl. 209-213.000.

Engnell, David: *See—*
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.

Enrico Corvi Mora: *See—*
Vegezzi, Davide, 4,190,675, Cl. 424-331.000.

Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H.: *See—*
Tuson, Samuel, 4,190,090, Cl. 141-387.000.

Erdman, Victor. Pick up tine. 4,189,907, Cl. 56-400.000.

Erickson Air Crane Co.: *See—*
Smith, Harlan B., 4,189,892, Cl. 52-749.000.

Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., to Becton, Dickinson Electronics Company. Rotary thumbwheel switch assembly. 4,190,749, Cl. 200-11.0TW.

Esaki, Koreaki, to West Electric Company, Ltd. Photographic flash device. 4,190,880, Cl. 362-18.000.

Essex Group, Inc.: *See—*
Bell, Robert E., 4,190,830, Cl. 340-642.000.
Eggleston, Frederick C., 4,190,319, Cl. 350-96.230.

Essex Transducers Corporation: *See—*
Kompanek, Harry W., 4,190,785, Cl. 310-330.000.

Etess, Edward, to Monitor Labs, Inc. Sulfur monitor analyzer. 4,190,368, Cl. 356-417.000.

Ethicon, Inc.: *See—*
Shalaby, Shalaby W., 4,190,720, Cl. 528-354.000.

Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, to Kyowa Hakko Kogyo Kabushiki Kaisha. Cyclic phosphoric acid amide esters, and an insecticide containing the same as active ingredient. 4,190,651, Cl. 424-209.000.

Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, to Toyoda-Koki Kabushiki-Kaisha. Automatic centering controller for a machine tool. 4,190,889, Cl. 364-474.000.

Eutectic Corporation: *See—*
Patel, Mahesh S., 4,190,442, Cl. 75-252.000.
Patel, Mahesh S., 4,190,443, Cl. 75-252.000.

Evans, F. David, to Kimwood Corporation. Abrading apparatus and method having induced air. 4,189,872, Cl. 51-135.00R.

Evans, James L.; and Main, John A., to Kelsey-Hayes Co. Wheel rim. 4,190,092, Cl. 152-381.100.

Evers, Edwin W.: *See—*
Body, Richard H.; and Evers, Edwin W., 4,190,332, Cl. 351-13.000.

EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH.: *See—*
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.

Exxon Research & Engineering Co.: *See—*
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,190,706, Cl. 429-191.000.

Facit Aktiebolag: *See—*
Stenudd, Sven G. V., 4,190,847, Cl. 346-141.000.

Fahn, Stanley. Method and compositions of treating Parkinsonisms with levodopa and 3',4'-dihydroxy-2-methylisopropiophenone. 4,190,672, Cl. 424-319.000.

Fahnestock, Melvin R.: *See—*
Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.

Fainzilberg, Leonid S.: *See—*
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.

Fair, James W.: *See—*
Young, Danny J., 4,190,766, Cl. 250-203.00R.

Fajen, Lyle A., to United States of America, Air Force. Amplifier-oscillator frequency multiplier apparatus. 4,190,808, Cl. 331-59.000.

Falk, Robert A., to Ciba-Geigy Corporation. Method of concentrating and collecting oil spills. 4,190,531, Cl. 210-62.000.

Fangman, John S.: *See—*
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.

Fansteel Inc.: *See—*
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,190,125, Cl. 175-410.000.
Emmerich, Kenneth C., 4,190,128, Cl. 175-410.000.

Farcilli, Andre: *See—*
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.

Fargo Manufacturing Company, Inc.: *See—*
Becker, Stephen P., 4,189,976, Cl. 85-9.00R.

Farnsworth, David L.; and Thomas, Ronald E., to Sperry Corporation. Digital processor input/output apparatus for analog, digital and discrete data. 4,190,898, Cl. 364-900.000.

Fassbender, Rolf; and Lang, Armin, to Zahnradfabrik Friedrichshafen AG. Servomotor pressure control responsive to piston travel. 4,189,983, Cl. 91-400.000.

Fassbender, Rolf: *See—*
Lang, Armin; and Fassbender, Rolf, 4,189,982, Cl. 91-400.000.

Fassler, Werner, to Eastman Kodak Company. Mechanism for controlling a timed function in a camera. 4,190,342, Cl. 354-202.000.

Fathergill, Rex D.: *See—*
Martin, James O.; Fathergill, Rex D.; and Krimm, David L., 4,189,974, Cl. 84-293.000.

Faure, Jean M. Apparatus for volume measurement of liquids. 4,189,943, Cl. 73-425.600.

Fayles, Robert R.: *See—*
Tengzelius, Jan R.; and Fayles, Robert R., 4,190,441, Cl. 75-251.000.

Feder, Joseph: *See—*
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.

Feiler, William A., to Monsanto Company. Purifying phosphoric acid by extraction with an aliphatic nitrile. 4,190,634, Cl. 423-321.00S.

Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. Signal corrected optocoupled device. 4,190,747, Cl. 179-170.0NC.

Femal, Michael J.: *See—*
Burgyan, Lajos, 4,190,819, Cl. 340-23.000.

Fennimore, Jack: *See—*
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.

Fenstermacher, Myk R.; and Noveroske, Robert L., to Dow Chemical Company, The. Halomethyl substituted dialkoxypyridines. 4,190,662, Cl. 424-263.000.

Fernandez, Ramon J.; and Kahl, John S., to Brown & Root, Inc. Underwater storage assembly. 4,190,072, Cl. 137-236.00S.

Ferrari, Giorgio: *See—*
Gherardi, Paolo; and Ferrari, Giorgio, 4,190,654, Cl. 424-244.000.

Ferriss, Lincoln S.: *See—*
Hoffman, Jay; and Ferriss, Lincoln S., 4,189,946, Cl. 74-5.400.

Ferro, Jesus. Projection screen. 4,190,320, Cl. 350-129.000.

Festal, Didier: *See—*
Szarvasi, Etienne; and Festal, Didier, 4,190,665, Cl. 424-274.000.

Fibco Inc.: *See—*
Mileti, Robert A., 4,190,275, Cl. 293-102.000.

Fiedler, Jurgen; and Fricke, Klaus, to GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung. Process for the continuous production of solids, in particular protein concentrates, from aqueous solutions, and apparatus for the practice of the process. 4,189,846, Cl. 34-8.000.

Fielder, David F., to Dana Corporation. Piston pin bore and method of finishing. 4,189,932, Cl. 72-370.000.

Fienhold, Stephen C.; and Cammack, Michael A., to Teledyne Industries, Inc. Pulsating spray apparatus. 4,190,207, Cl. 239-381.000.

Fikse, Tyman H., to Robbins Company, The. Excavator for use in a tunneling shield. 4,190,294, Cl. 299-33.000.

Fine, Dwight A.: *See—*
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.

Finnila, Ronald M.; and Su, Stephen C., to Hughes Aircraft Company. Monolithic extrinsic silicon infrared detectors with charge coupled device readout. 4,190,851, Cl. 357-30.000.

Fischer, Artur. Assembly kit and a connecting element for connecting structural elements thereof. 4,189,861, Cl. 46-26.000.

Fischer, Artur. Hollow structural element and an assembly kit including the same. 4,189,863, Cl. 46-116.000.

Fischer, Klaus; and Keul, Robert, to Saint-Gobain Industries. Neutral bronze glazings. 4,190,452, Cl. 106-52.000.

Fischer, Werner. Tennis racket and method of making same. 4,190,249, Cl. 273-73.00D.

Fisher, Edmund A.; and Czerewaty, Frank P., to Cameron Iron Works, Inc. Subsea wellhead apparatus. 4,190,114, Cl. 166-346.000.

Fitzgerald, Gerald A. House roof insulation vent. 4,189,878, Cl. 52-95.000.

Fitzner, Arthur O., to Brunswick Corporation. Tachometer driven from a capacitor discharge ignition system and including a transistorized shunt voltage regulator. 4,190,798, Cl. 324-169.000.

Flambeau Products Corporation: *See—*
Mason, LeRoy W.; and Furrer, Frederick J., 4,190,173, Cl. 220-203.000.

Flanagan, Kirby E. L., to McCord Corporation. Low density energy management urethane foam. 4,190,712, Cl. 521-137.000.

Flatau, Abraham; Olson, Donald N.; and Miller, Miles C. Process of forming a projectile by folding a resilient tubular member and filling same with payload. 4,190,476, Cl. 156-218.000.

Fleischer, Donald W., to Veeder Industries Inc. Counter operating system. 4,190,765, Cl. 235-92.00C.

Fleischer, Henry. Support frames adapted for use with car seats and beds. 4,190,285, Cl. 297-254.000.

Flenniken, John M., to Deere & Company. Harvester cutterhead knife sharpening device. 4,189,875, Cl. 51-250.000.

Fletcher, Aaron N.: *See—*
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.

Fletcher, Vernon R., to Riker Laboratories, Inc. Azide and isocyanate derivatives of 2-nitro-3-phenylbenzofuran. 4,190,590, Cl. 260-346.730.

Flowerday, Dale L., to Keeler Corporation. Back plate and bail assembly. 4,189,804, Cl. 16-126.000.

Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., to Aluminum Company of America. Preparation of tube for welding. 4,190,186, Cl. 228-15.100.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., to American Cyanamid Company. Various 15-deoxy-16-hydroxy-16-ethynyl and 16-ethynylsubstituted prostaglandins. 4,190,596, Cl. 260-448.20D.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., to American Cyanamid Company. Various 15-deoxy-16-hydroxy-16-ethynyl and 16-ethynylsubstituted prostaglandins. 4,190,597, Cl. 260-448.20D.

Fluid Kinetics Corporation: *See—*
Glover, Robert C., 4,190,403, Cl. 417-543.000.

Flynn, James P., to Dow Chemical Company, The. Pyrotechnic disseminating formulations. 4,190,471, Cl. 149-19.600.

FMC Corporation: *See—*
Le Devehat, Eugene R., 4,190,080, Cl. 137-615.000.

Foerstner, Richard A., to Amana Refrigeration, Inc. Digitally programmed microwave cooker. 4,190,756, Cl. 219-10.55B.

Follin, James W.; and Miller, Robert E., to United States of America, Navy. Digital beamsteering for a parametric scanning sonar system. 4,190,818, Cl. 367-138.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Sliding lid for flanged tray. 4,190,191, Cl. 229-43.000.

Ford Motor Company: *See—*
Kearney, Dolores C.; and Matz, Bruno, 4,190,093, Cl. 164-34.000.
Moreno, Isabel L., 4,190,325, Cl. 350-253.000.

Forschungs Institut Fuer Textiltechnologie: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Forster, Denis, to Monsanto Company. Carbonylation process with stabilized catalyst. 4,190,729, Cl. 560-232.000.

Forster, Herbert, to Robert Bosch GmbH. Self-healing electrical capacitor. 4,190,878, Cl. 361-305.000.

Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., to Du Pont de Nemours, E. I., and Company. Centrifugal method and apparatus for processing fluid materials. 4,190,530, Cl. 210-31.00R.

Fory, Werner: *See—*
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.

Foti, Thomas M. Closed flow caloric test method. 4,190,033, Cl. 128-742.000.

Fouinat, Paul: *See—*
Warnet, Henri; and Fouinat, Paul, 4,190,736, Cl. 174-209.000.

Foxboro Company, The: *See—*
Curran, John R., 4,190,848, Cl. 346-145.000.

Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Piezoelectric power supply for cameras. 4,190,336, Cl. 354-50.000.

Frank, Richard J., to Siemens Aktiengesellschaft. Circuit arrangement and process for producing conference connections between three conference parties in a PCM time multiplex switching system. 4,190,744, Cl. 179-18.0BC.

Frank Speno Railroad Ballast Cleaning Co. Inc.: *See—*
Panetti, Romolo, 4,189,873, Cl. 51-178.000.

Franklin Steel Company: *See—*
Sweeney, Lawrence J., 4,190,118, Cl. 173-130.000.

Frantello, Alfred A., to Corinth Co. Inc. Attachment for drive shaft of rotary lawn mowers. 4,189,905, Cl. 56-295.000.

Freeport Minerals Company: *See—*
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

Frei, Arno, to Sulzer Brothers Limited. Heat exchanger having helically wound tube coils. 4,190,104, Cl. 165-162.000.

Fricke, Klaus: *See—*
Fiedler, Jurgen; and Fricke, Klaus, 4,189,846, Cl. 34-8.000.

Friday, Bruce W., to Xerox Corporation. Lead edge transfer switching. 4,190,348, Cl. 355-3.0TR.

Friday, Robert G.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.

Friedland, Bernard, to Singer Company, The. Nutation damper for two-axis gyroscope. 4,189,947, Cl. 74-5.500.

Fritz, Jack E., to Wolverine Aluminum Corporation. Channel member for siding construction. 4,189,885, Cl. 52-287.000.

Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., to W. R. Grace & Co. Ventilated insulated roofing system. 4,189,886, Cl. 52-302.000.

Frumin, Evgeny I.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Frumin, Isidor I.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Fuji Photo Film Co., Ltd.: *See—*
Naoi, Takashi; and Horie, Ikutaro, 4,190,449, Cl. 430-539.000.
Ohnishi, Masahiro, 4,190,867, Cl. 358-285.000.
Sera, Hidefumi; and Horie, Ikutaro, 4,190,448, Cl. 430-216.000.

Fujikawa, Tetsuzo; and Nishimura, Michio, to Kawasaki Jukogyo Kabushiki Kaisha. Cooling system for liquid-cooled type of two-cycle multicylinder engine. 4,190,023, Cl. 123-41.720.

Fujimoto, Yoshiaki, to Kuraray Co., Ltd. Centrifugal potting apparatus. 4,190,411, Cl. 425-434.000.

Fujisawa, Kenichi. Decorative article assembly. 4,189,857, Cl. 40-158.00R.

Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, to Toray Industries, Inc. Polymeric-shaped article. 4,190,689, Cl. 428-20.000.

Fujitsu Limited: *See—*
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Yoshikawa, Kazuo; and Andoh, Shizuo, 4,190,788, Cl. 315-169.400.

Fukushima, Isao: *See—*
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.

Funfschilling, Peter, to Sandoz Ltd. Tricyclo[2.2.1.$0^{2,6}$]heptan-3-ones. 4,190,603, Cl. 260-590.00B.

Fuoco, Rolland P.: *See—*
Hart, John A.; and Fuoco, Rolland P., 4,190,696, Cl. 428-306.000.

Furman, Anatoly V.: *See—*
Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V., 4,190,776, Cl. 307-112.000.

Furrer, Frederick J.: *See—*
Mason, LeRoy W.; and Furrer, Frederick J., 4,190,173, Cl. 220-203.000.

Furtado, Anthony E.: *See—*
Sesser, George L.; and Furtado, Anthony E., 4,190,391, Cl. 414-39.000.

Furuhashi, Toshio: *See—*
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.

Furuno, Akihisa: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Futagami, Mikio: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,190,163, Cl. 209-535.000.

GAF Corporation: *See—*
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.

Gainer, Robert E., to Westinghouse Electric Corp. High-density high-conductivity electrical contact material for vacuum interrupters and method of manufacture. 4,190,753, Cl. 200-144.00B.

Gajski, Daniel D., to Burroughs Corporation. Modular modulo 3 module. 4,190,893, Cl. 364-746.000.

Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, to Alza Corporation. Ocular therapeutic system for dispensing a medication formulation. 4,190,642, Cl. 424-19.000.

Gallaher, David E.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.

Gallaher, Kantlehner & Associates, Inc.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.

Gallant, James J.; and Childress, Clarence T. Coping with inlaid tile. 4,189,887, Cl. 52-311.000.

Galli, Guido: *See—*
Davies, John E.; and Galli, Guido, 4,190,683, Cl. 427-130.000.

Galloway, Dudley L.; and Donoghue, Robert E., to Westinghouse Electric Corp. Electrical apparatus. 4,190,732, Cl. 174-17.0LF.

Gamertsfelder, George R.: *See—*
Ljung, Bo H. G.; and Gamertsfelder, George R., 4,190,364, Cl. 356-350.000.

Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Retinoic acid derivatives. 4,190,594, Cl. 260-404.000.

Garber, Wilbur A.: *See—*
Cross, Edward F.; and Garber, Wilbur A., 4,190,858, Cl. 358-113.000.

Gauld, Godfrey R.: *See—*
Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.

Gausepohl, Hermann: *See—*
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, 4,190,569, Cl. 260-31.600.

Gaylord, Norman G.: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.

Gazda, Chester T.: *See—*
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.

GEA Luftkuhlergesellschaft Happel GmbH & Co. KG: *See—*
Gerz, Hans-Bernd, 4,190,102, Cl. 165-113.000.

Gebrueder Buehler AG: *See—*
Geissbuhler, Hans, 4,190,230, Cl. 251-36.000.

Geck, Joseph C.; and Hamilton, Floyd E., to Uniroyal, Inc. Apparatus for positioning and curing a pre-shaped tire carcass. 4,190,406, Cl. 425-38.000.

Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, to C Rob Hammerstein GmbH. Arrangement for arresting a seat of a vehicle. 4,189,957, Cl. 74-535.000.

Gedig, Alfred: *See—*
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, 4,190,225, Cl. 248-394.000.

GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung: *See—*
Fiedler, Jurgen; and Fricke, Klaus, 4,189,846, Cl. 34-8.000.

Geiger, Edward C. Misting control. 4,190,201, Cl. 239-65.000.

Geissbuhler, Hans, to Gebrueder Buehler AG. Scavenging air valve for cleaning tubular air filter bodies. 4,190,230, Cl. 251-36.000.

Gendron, Wilfred H., to Westvaco Corporation. Compartmented envelope. 4,190,161, Cl. 206-620.000.

General Electric Company: *See—*
Corsmeier, Robert J.; and Rauf, James P., 4,190,398, Cl. 415-114.000.
DePuy, Robert P.; and Leitten, Arthur H., Jr., 4,190,825, Cl. 340-347.0AD.
Hall, Walter L.; and Humphrey, James S., Jr., 4,190,681, Cl. 427-45.100.
Knight, J. Nelson; and Turner, Roger C., 4,190,305, Cl. 312-214.000.
Krantz, Karl W., 4,190,069, Cl. 137-13.000.
Santiago, Romeo S.; and Decker, Llewellyn, 4,190,762, Cl. 219-245.000.
Schaeffer, Robert L.; and Madan, Bhim S., 4,190,208, Cl. 241-92.000.
Schilling, Jan C.; and Gutknecht, James E., 4,190,397, Cl. 415-112.000.
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.
Shaw, David G., 4,190,682, Cl. 427-79.000.
Traver, Frank J.; and Cietek, Timothy J., 4,190,688, Cl. 427-391.000.
West, Harrison; and Delaney, Bobby R., 4,189,939, Cl. 73-116.000.

General Foods Corporation: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.
Ravallo, Robert J., 4,190,427, Cl. 71-29.000.

General Medical Company: *See—*
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., 4,190,056, Cl. 128-630.000.

General Mills, Inc.: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.

General Motors Corporation: *See—*
Bennett, George T.; and Brucken, Byron L., 4,190,141, Cl. 192-84.00C.
Carlson, Clifford R.; and Chiesa, Alan F., 4,190,028, Cl. 123-119.0EC.
Carolus, David T.; and Edwards, Ralph W., 4,190,842, Cl. 343-903.000.
Rogers, David W., 4,190,752, Cl. 200-81.500.
Sheffer, Timothy K., 4,190,618, Cl. 261-50.00R.

Gerz, Hans-Bernd, to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG. Air cooled condenser installation. 4,190,102, Cl. 165-113.000.

Geus, John W.; and Hermans, Leonardus A. M., to Stamicarbon, B.V. Process for preparing catalyst on carrier systems. 4,190,560, Cl. 252-459.000.

Gewartowski, Steve A., to UOP Inc. Hydrocarbon conversion process. 4,190,520, Cl. 208-95.000.

Geyken, Erwin: *See—*
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.

Gherardi, Paolo; and Ferrari, Giorgio, to Simes Societa Italiana Medicinali e Sintatici S.p.A. Pharmaceutical composition comprising anxiolytic drugs and beta-adrenergic receptor blocking agents. 4,190,654, Cl. 424-244.000.

Giacobbe, Frederick: *See—*
Schmerling, Donald W.; and Giacobbe, Frederick, 4,190,636, Cl. 423-415.00A.

Giamei, Anthony F., to United Technologies Corporation. Rate controlled directional solidification method. 4,190,094, Cl. 164-60.000.

Giannetti, Joseph P.; and Swift, Harold E., to Gulf Research and Development Company. Solvent refined coal process. 4,190,518, Cl. 208-8.0LE.

Gidlof, Karl G.: *See—*
Almer, Bengt O.; and Gidlof, Karl G., 4,190,380, Cl. 404-6.000.

Giersiepen, Gerhard: *See—*
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.

Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, to Akzona Incorporated. Temperature indicating device using a pressure sensitive polyisobutylene adhesive seal. 4,189,942, Cl. 73-356.000.

GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH: *See—*
Kittler, Helmut, 4,189,990, Cl. 98-121.00R.

Gifford-Hill & Company, Inc.: *See—*
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.

Gilbert, Chester L.: *See—*
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., 4,190,227, Cl. 248-636.000.

Gill, Robert A.: *See—*
Drennen, Thomas J.; and Gill, Robert A., 4,190,491, Cl. 162-76.000.

Gillett, Kenneth: *See—*
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Gillette Company, The: *See—*
Harper, Allan C.; and Buras, Edmund M., Jr., 4,189,832, Cl. 30-34.200.
McCarthy, Edward F., 4,190,052, Cl. 128-368.000.

Gist Brocades N.V.: *See—*
Marx, Arthur F.; and Doodewaard, Jean, 4,190,670, Cl. 424-305.000.

Giudicelli, Don Pierre R. L.: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Giurtino, Joel F.: *See—*
Herman, Stephen J.; and Giurtino, Joel F., 4,190,087, Cl. 138-96.00R.

Givaudan Corporation: *See—*
Kaiser, Roman; and Naegeli, Peter, 4,190,591, Cl. 260-347.800.

Glackin, Steven. Mattress. 4,189,797, Cl. 5-448.000.

Glass, Irving J. Track light. 4,190,309, Cl. 339-21.00R.

Glover, Robert C., to Fluid Kinetics Corporation. Fluid flow stabilizer and phase separator. 4,190,403, Cl. 417-543.000.

Gneiding, Donald R.: *See—*
Cameron, Albert R.; and Gneiding, Donald R., 4,190,076, Cl. 137-505.450.

Gobel, Wilhelm: *See—*
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.

Godfrey, Charles J. B. Jack. 4,190,233, Cl. 254-4.00B.

Goffredo, Daniel L., to Chemcut Corporation. Apparatus for ion control of solutions. 4,190,481, Cl. 156-345.000.

Gold Kist, Incorporated: *See—*
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.

Goldsmith, Stephen. Microscope and microscope slide for cytological analysis. 4,190,314, Cl. 350-94.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Polypeptide compositions and methods. 4,190,646, Cl. 424-177.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Polypeptides and methods. 4,190,647, Cl. 424-177.000.

Golomazov, Viktor A.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Gonzales-Dorner, Alberto: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.

Goodbary, Edgar R.; and Bartley, Francis A., to Goodbary Engineering Co. Off-highway vehicle. 4,190,265, Cl. 280-716.000.

Goodbary Engineering Co.: *See—*
Goodbary, Edgar R.; and Bartley, Francis A., 4,190,265, Cl. 280-716.000.

Goodman, Colin H. L.; and Kirkby, Paul A., to International Standard Electric Corporation. Stripe lasers. 4,190,809, Cl. 331-94.50H.

Goodyear Aerospace Corporation: *See—*
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Gordin, Myron K.: *See—*
Drost, James L.; and Gordin, Myron K., 4,190,881, Cl. 362-250.000.

Gordon, Harry W.; and Amanat, Sharif, to Del Laboratories, Inc. Hair treatment composition and method of treating hair with the same. 4,190,064, Cl. 132-7.000.

Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, to Lipton, Thomas J. Composite fruit gel and ice confection. 4,190,676, Cl. 426-100.000.

Gortsema, Frank P., to Union Carbide Corporation. Process for the preparation of fine grain metal carbide powders and sintered articles therefrom. 4,190,439, Cl. 75-211.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Motor-valve apparatus for hydraulic fan drive system. 4,189,919, Cl. 60-420.000.

Goto, John M.: *See—*
Drzewiecki, Tadeusz M.; and Goto, John M., 4,190,083, Cl. 137-838.000.

Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH. Grid welding machine. 4,190,758, Cl. 219-56.000.

Goubeaux, Dale C.: *See—*
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Gould Inc.: *See—*
Berdan, Betty L.; and Luce, Betty M., 4,190,474, Cl. 156-151.000.
Lecklider, Thomas H.; and Bowers, John J., 4,190,797, Cl. 324-61.00R.

Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., to Standard Oil Company. Production of unsaturated nitriles using catalysts promoted with various metals. 4,190,556, Cl. 252-432.000.

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins using catalysts containing various promoter elements. 4,190,608, Cl. 260-604.00R.

Gray, James W., to Eaton, Thomas J., Jr., a part interest. Device to remove concentric knockouts in electrical apparatus. 4,189,964, Cl. 81-3.00R.

Gray, Lewis, to Westinghouse Electric Corp. Condenser vacuum load compensating system. 4,189,927, Cl. 60-687.000.

Grede Foundries Inc.: *See—*
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Hair conditioning compounds. 4,190,644, Cl. 424-70.000.

Greenleaf, John E.; and Delaplaine, Robert W., to United States of America, National Aeronautics and Space Administration. Sweat collection capsule. 4,190,060, Cl. 128-760.000.

Greshes, Martin. Method for molding optical plastic lenses of the standard and bifocal type. 4,190,621, Cl. 264-1.000.

Grifhorst, Norman J. Game apparatus. 4,190,250, Cl. 273-342.000.

Grimsrud, Lars, to A/S Nycotron. Peristaltic pumping means for blood dialysis. 4,190,536, Cl. 210-93.000.

Grip Tite Mfg. Co.: *See—*
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.

Grivsky, Eugene M., to Burroughs Wellcome Co. 3-Fluoro-N-cyclopropylcinnamide. 4,190,674, Cl. 424-324.000.

Grodzka, Philomena G.: *See—*
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

Groshens, Pierre, to Lainiere de Picardie. Complex stitch fabric of fluffy character for lining and reinforcing apparel and method of making same. 4,189,931, Cl. 66-193.000.

Gross, David; and Jorgensen, Hugh V. Friction support device. 4,190,274, Cl. 292-338.000.

Grossman, Norman R.: *See—*
Stahle, Howard L.; and Grossman, Norman R., 4,190,831, Cl. 340-707.000.

Grudzinskas, Charles V.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.

Grumman Aerospace Corporation: *See—*
Marx, Warren G., 4,190,890, Cl. 364-491.000.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt: *See—*
Schenke, Walter; and Krauss, Gerhard, 4,189,788, Cl. 2-209.000.

Grundmann, Edgard: *See—*
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.

GTE Sylvania Incorporated: *See—*
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.
Shaffer, John W.; and Bricker, Daniel W., 4,190,413, Cl. 431-362.000.

Gubser, Donald U.: *See—*
Howe, David G.; and Gubser, Donald U., 4,190,701, Cl. 428-662.000.

Guenther, Joachim, to Xerox Corporation. Sheet receiving apparatus. 4,190,247, Cl. 271-291.000.

Guenther, Joachim: *See—*
Smith, Craig A.; and Guenther, Joachim, 4,190,354, Cl. 355-3.0SH.

Guess, Joe F., to Telex Communications, Inc. Piezoelectric ceramic resonant transducer with stable frequency. 4,190,782, Cl. 310-324.000.

Gulf Oil Corporation: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.

Gulf Research and Development Company: *See—*
Giannetti, Joseph P.; and Swift, Harold E., 4,190,518, Cl. 208-8.0LE.

Gunning, Samuel D., to Kent Air Tool Company. Air hammer and muffler combination. 4,189,917, Cl. 60-370.000.

Gurney, John A.: *See—*
Gander, Robert J.; and Gurney, John A., 4,190,594, Cl. 260-404.000.

Guthmann, Stephen F. Boat mooring apparatus. 4,190,011, Cl. 114-230.000.

Guthohrlein, Gerhard: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.

Gutknecht, James E.: *See—*
Schilling, Jan C.; and Gutknecht, James E., 4,190,397, Cl. 415-112.000.

Gutner, Kenneth H. Adjustable mechanism for guard rail of a bunk bed. 4,189,796, Cl. 5-8.000.

H. K. Porter Company, Inc.: *See—*
Hintz, Carman R.; and Jahns, Warren K., 4,189,977, Cl. 85-70.000.

Haamann, Josef: *See—*
Wenzel, Joerg; and Mai, Erich, 4,190,135, Cl. 187-1.00R.

Haarmann & Reimer GmbH: *See—*
Bauer, Kurt; and Molleken, Reiner, 4,190,583, Cl. 260-340.50R.

Hackett, James E., to Lockheed Corporation. Vortex diffuser. 4,190,219, Cl. 244-199.000.

Hackl, Helmut: *See—*
Brabetz, Bernhard; and Hackl, Helmut, 4,190,386, Cl. 408-1.00R.

Haddad, Adrien, to Officine Cimbali Giuseppe S.p.A. Pressurized fluid supply and control device, particularly for coffee-making machines. 4,189,991, Cl. 99-302.00R.

Hadden, Stephen C.: *See—*
Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, Lee R., 4,189,940, Cl. 73-117.300.

Haga, Kyosuke: *See—*
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.

Hagemann, Hermann: *See—*
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.

Hager, Clarence L.; and Jensen, Ronald P. Posterior lens implant tool. 4,190,049, Cl. 128-303.00R.

Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, to Licentia Patent-Verwaltungs-G.m.b.H. Method and apparatus for braking rail-guided vehicles automatically and accurately with respect to a deceleration distance. 4,190,220, Cl. 246-182.00B.

Haimowitz, Irwin, to Thermo-Seal, Inc. Drinking receptacle cover with a lip operated valve. 4,190,174, Cl. 220-254.000.

Halbfoster, Christopher J., to Ecodyne Corporation. Charged filter aid material and ion exchange bed. 4,190,532, Cl. 210-75.000.

Hall, Raymond M. Bump board marble game. 4,190,251, Cl. 273-124.00R.

Hall, Walter L.; and Humphrey, James S., Jr., to General Electric Company. Method of coating a polycarbonate substrate with glass. 4,190,681, Cl. 427-45.100.

Halliburton Company: *See—*
Loesch, Stanley B., 4,189,941, Cl. 73-231.00R.

Halm Instrument Co., Inc.: *See—*
Harrison, Henry; and Harrison, Henry C., 4,189,882, Cl. 52-222.000.
Harrison, Henry, 4,190,084, Cl. 137-883.000.

Halonen, Tuomo, to Okuli Oy. Strip made up of consecutive package blanks. 4,190,190, Cl. 229-17.00R.

Halton Oy: *See—*
Hasa, Juhani; and Tolmunen, Arvi, 4,190,085, Cl. 138-45.000.

Hamada, Hakusei: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Hamberg, Mats A.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

Hamilton, Alexander; and Nelson, Colin, to Ciba-Geigy Corporation. Dialysis monitored preparation of metal salts of azo pigments. 4,190,578, Cl. 260-150.000.

Hamilton, Floyd E.: *See—*
Geck, Joseph C.; and Hamilton, Floyd E., 4,190,406, Cl. 425-38.000.

Hamlin, Ralston L.: *See—*
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,190,125, Cl. 175-410.000.

Hammann, Ingeborg: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Hammarstrom, Sven R.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

Hammerli, Martin: *See—*
Butler, John P.; and Hammerli, Martin, 4,190,515, Cl. 204-266.000.

Haney, Fred H. Mineral stabilized resin emulsion. 4,190,568, Cl. 260-29.6XA.

Hanlon, Alfred G., to NCR Corporation. Multiple component circuit board cooling device. 4,190,098, Cl. 165-1.000.

Hansson, Hans M. Device for transport of bulk material or the like. 4,190,147, Cl. 198-746.000.

Hanusiak, William M.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.

Harada Industry Co., Ltd.: *See—*
Harada, Jiro, 4,190,841, Cl. 343-903.000.

Harada, Jiro, to Harada Industry Co., Ltd. Car antenna system with bimetallic control means. 4,190,841, Cl. 343-903.000.

Hard af Segerstad, Sverker; and Nilsson, Olle. Device for establishing a condition at the surface of a subject. 4,190,367, Cl. 356-354.000.

Hardman, Harley F.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.

Hardtmann, Goetz E., to Sandoz, Inc. Pharmaceutical preparation and use of 4-hydroxy-2-quinolinone-3-carboxylic acid esters. 4,190,659, Cl. 424-258.000.

Hardy, Terence: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,190,306, Cl. 312-330.00R.

Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., to Corning Glass Works. Photochromic glass. 4,190,451, Cl. 106-47.00Q.

Harman, Galen B.: *See—*
Stroup, Steven L.; and Harman, Galen B., 4,190,407, Cl. 425-110.000.

Harper, Allan C.; and Buras, Edmund M., Jr., to Gillette Company, The. Shaving implement. 4,189,832, Cl. 30-34.200.

Harris, Bernard, to Rexnord Inc. Fabric-lined epoxy resin cylinder with lubricant retaining grooves. 4,189,985, Cl. 92-153.000.

Harrison, Earl K.: *See—*
Mullane, George W.; and Harrison, Earl K., 4,190,388, Cl. 408-188.000.

Harrison, Henry; and Harrison, Henry C., to Halm Instrument Co., Inc. Translucent roofing means. 4,189,882, Cl. 52-222.000.

Harrison, Henry, to Halm Instrument Co., Inc. Flow control means. 4,190,084, Cl. 137-883.000.

Harrison, Henry C.: *See—*
Harrison, Henry; and Harrison, Henry C., 4,189,882, Cl. 52-222.000.

Harrison, Wayne O. Well cleanout tool. 4,190,113, Cl. 166-311.000.

Hart, John A.; and Collyer, John C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Chemical resistant article. 4,190,685, Cl. 427-302.000.

Hart, John A.; and Fsoco, Rolland P., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Flame resistant, gas resistant foam material. 4,190,696, Cl. 428-306.000.

Hartman, Calvin J. Optical testing of surface flatness. 4,190,365, Cl. 356-352.000.

Hartmann, Werner, to Swakopmund AG. Heat exchanger tube base. 4,190,101, Cl. 165-82.000.

Harvey, Robert J.: *See—*
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.

Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W. Diaphragm material for moving coil loudspeaker, may be laminated or integral with surround. 4,190,746, Cl. 179-115.50R.

Hasa, Juhani; and Tolmunen, Arvi, to Halton Oy. Gas flow regulating and measuring apparatus. 4,190,085, Cl. 138-45.000.

Hascoe, Norman, to Semi-Alloys, Inc. Sealing cover unit for a container for a semiconductor device. 4,190,176, Cl. 220-359.000.

Hashimoto, Naoto; and Kishi, Toyokazu, to Takeda Chemical Industries, Ltd. Optically active maytansinoids and maytansinoid production method. 4,190,580, Cl. 260-239.30P.

Hashimoto, Naoto: *See—*
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.

Hatch, Gary L., to Aqua-Chem, Inc. Mixed-form polyhalide resins for disinfecting water. 4,190,529, Cl. 210-29.000.

Hattori, Hiroyuki: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Hauni-Werke Korber & Co. KG.: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Hauser, William C.: *See—*
Casuga, Dennis W.; and Hauser, William C., 4,190,198, Cl. 236-34.500.

Hawker Siddeley Dynamics Engineering, Ltd.: *See—*
Coles, Ernest F., 4,190,081, Cl. 137-624.270.

Hawkins, Donald. Sliding window channel lock. 4,190,271, Cl. 292-145.000.

Hawley, Wilbur W., to Atlantic Richfield Company. Photovoltaic roof construction. 4,189,881, Cl. 52-220.000.

Hay, William D.: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.

Hayden, George S.: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.

Haynes, John A., to Danek Industries, Inc. Grader blade attachment. 4,189,854, Cl. 37-117.500.

Heath Consultants, Incorporated: *See—*
Heim, Paul M., 4,189,938, Cl. 73-40.700.

Heckmaier, Manfred: *See—*
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.

Hedger, Bruce W., to Alpha-Omega Services, Inc. Method for removing metallic seeds from nylon tubing used in interstitial brachytherapy. 4,190,461, Cl. 134-1.000.

Hedges, Rhey W.: *See—*
Parker, Louis W.; and Hedges, Rhey W., 4,190,793, Cl. 318-800.000.

Hedstrom Co.: *See—*
Boucher, Raymond W., 4,190,283, Cl. 297-77.000.

Heger, Adolf: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Hehl, Karl. Apparatus for injecting confluent streams of plastic. 4,190,409, Cl. 425-132.000.

Heiba, El-Ahmadi I.; and Williams, Albert L., to Mobil Oil Corporation. Method of preparing a substituted butyrolactone acetic acid. 4,190,588, Cl. 260-343.600.

Heim, Paul M., to Heath Consultants, Incorporated. Double tracer gas process for locating conduit leaks. 4,189,938, Cl. 73-40.700.

Heinzelmann, Walter: *See—*
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.

Heisterkamp, Wilhelm: *See—*
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Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, to Volkswagenwerk Aktiengesellschaft. Solar heater. 4,190,038, Cl. 126-445.000.

Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, to Hauni-Werke Korber & Co. KG. Method and apparatus for producing a rod-like tobacco filler. 4,190,061, Cl. 131-21.00B.

Helmick, B. J. Patio door roller assembly. 4,189,870, Cl. 49-420.000.

Hendricks, Charles D., to United States of America, Energy. Cryogenic target formation using cold gas jets. 4,190,016, Cl. 118-724.000.

Hennessy, James J., to Hennessy Products, Incorporated. Railway car door moving means. 4,189,869, Cl. 49-358.000.

Hennessy Products, Incorporated: *See—*
Hennessy, James J., 4,189,869, Cl. 49-358.000.

Herman, Stephen J.; and Giurtino, Joel F., to Cobe Laboratories, Inc. Breather cap. 4,190,087, Cl. 138-96.00R.

Hermans, Leonardus A. M.: *See—*
Geus, John W.; and Hermans, Leonardus A. M., 4,190,560, Cl. 252-459.000.

Hernandez Crespo, Mariano, to Empresa Nacional de Ingenieria y Tecnologia, S.A. Adjustable distribution valve. 4,190,082, Cl. 137-625.170.

Hertel, Douglas L., to International Basic Economy Corporation. Process for recovering proteins and polymers from liquids containing same. 4,190,721, Cl. 528-486.000.

Herzog Contracting Corporation: *See—*
Herzog, Stanley M.; and Poggemiller, Randy L., 4,190,394, Cl. 414-786.000.

Herzog, Stanley M.; and Poggemiller, Randy L., to Herzog Contracting Corporation. Method for loading and unloading railroad cars. 4,190,394, Cl. 414-786.000.

Hesky, Hans; and Wunderer, Armin, to Hoechst Aktiengesellschaft. Process for concentrating tritium and/or tritium hydride and separating it from tritium water. 4,190,507, Cl. 204-129.000.

Hewlett-Packard Company: *See—*
Sherman, Allan P., 4,190,886, Cl. 364-415.000.

Hibino, Yutaka: *See—*
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Hickey, Dana, to Ski Tree, Inc. Ski carrier. 4,190,182, Cl. 224-45.00S.

Hicks, James E., to RCA Corporation. Switching regulator for television deflection circuit with improved ultor voltage regulation. 4,190,791, Cl. 315-408.000.

Higley, Faith. Covered, portable insulated plate. 4,190,155, Cl. 206-445.000.

Hill, J. Donald; Harvey, Robert J.; and Downie, David E., to Thoratec Laboratories Corporation. Device for determining the patentcy of a blood vessel. 4,190,057, Cl. 128-675.000.

Hillman, Gary, to Machine Technology, Inc. Apparatus for dispensing liquid to spinning workpieces. 4,190,015, Cl. 118-696.000.

Himmetsberger, Alois; and Wittmann, Heinz, to TMC Corporation. Safety ski binding. 4,190,264, Cl. 280-618.000.

Hintz, Carman R.; and Jahns, Warren K., to H. K. Porter Company, Inc. Weather tight blind fastener. 4,189,977, Cl. 85-70.000.

Hiraide, Takashi: *See—*
Imamura, Tetsuya; and Hiraide, Takashi, 4,190,549, Cl. 252-91.000.

Hirakoso, Keiichiro: *See—*
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.

Hiramatsu, Yoshiharu: *See—*
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.

Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Deformable impact absorbing device for vehicles. 4,190,276, Cl. 293-133.000.

Hirata, Yasuyuki: *See—*
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Hirayama, Kazuyoshi: *See—*
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Hirs, Gene, to AMSTED Industries Incorporated. Filter method. 4,190,533, Cl. 210-80.000.

Hirsch, Peter: *See—*
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.

Hirtz, Russell E.: *See—*
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Hitachi, Ltd.: *See—*
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Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.

Hitzrot, Henry W., Jr., to Bethlehem Steel Corporation. Metallic abrasive produced from a steel mill waste material. 4,190,422, Cl. 51-309.000.

Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, to U.S. Philips Corporation. Tape recorder stopping mechanism. 4,190,215, Cl. 242-186.000.

Hocker, Harvey L.: *See—*
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., 4,189,793, Cl. 4-228.000.

Hodgkin, Jonathan H., to Commonwealth Scientific and Industrial Research Organization. Mercury and copper selective metal chelating resins. 4,190,709, Cl. 521-39.000.

Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, to Smith & Nephew Research Ltd. Disposable column. 4,190,542, Cl. 210-282.000.

Hoechst Aktiengesellschaft: *See—*
Hesky, Hans; and Wunderer, Armin, 4,190,507, Cl. 204-129.000.
Landauer, Franz, 4,190,600, Cl. 260-544.00D.

Hoekje, Howard H.; and May, Russell R., to PPG Industries, Inc. Production of hypochlorous acid. 4,190,638, Cl. 423-473.000.

Hoeksema, Norman L.: *See—*
Bronkema, James W.; and Hoeksema, Norman L., 4,190,408, Cl. 425-145.000.

Hoenig, Stuart A.: *See—*
Smart, William L.; and Hoenig, Stuart A., 4,190,875, Cl. 361-228.000.

Hoese, Thomas C.: *See—*
Turpin, Charles H.; and Hoese, Thomas C., 4,190,757, Cl. 219-10.55E.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with O-phenyl-thionothiolalkanephosphonic acid esters. 4,190,652, Cl. 424-222.000.

Hoffman, Jay; and Ferriss, Lincoln S., to Singer Company, The. Three axis gyro. 4,189,946, Cl. 74-5.400.

Hoffmann-La Roche Inc.: *See—*
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.

Hofmann, Eberhard; and Weyrich, Erwin, to Robert Bosch GmbH. Lock assembly for a drive shaft of a fuel injection pump for internal combustion engines. 4,190,401, Cl. 417-313.000.

Hofstetter, Jack H., to American Hospital Supply Corporation. Urine collection container with coupling for suspension line. 4,189,789, Cl. 4-144.100.

Hogan, Philip J.: *See—*
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.

Hoganas AB Fack: *See—*
Tengzelius, Jan R.; and Fayles, Robert R., 4,190,441, Cl. 75-251.000.

Holdeman John W., to Borg-Warner Corporation. Underdrive transmission with sun gear and carrier slidable as a subassembly. 4,189,960, Cl. 74-781.00R.

Holland, George W.; Jernow, Jane L.; and Rosen, Perry, to Hoffmann-La Roche Inc. 4-(3-Oxo-4-trifluoromethyl-1-octenyl)-2-oxo-2H-cyclopenta[b]furans. 4,190,587, Cl. 260-343.30P.

Holloway, David J., to USM Corporation. Hand operated lockbolt setting tool. 4,189,933, Cl. 72-391.000.

Holstein, Siegbert, to Dr. Johannes Heidenhain GmbH. Scanning unit. 4,189,840, Cl. 33-125.00C.

Holt, Charles P.: *See—*
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Holt, Gregory G., to Colonics Diversified, Inc. Apparatus for colonic lavage and specimen collection. 4,190,059, Cl. 128-750.000.

Holznagel, Uwe: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Homeyer, Bernhard: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Honeywell Inc.: *See—*
Swarbrick, Richard, 4,190,822, Cl. 340-210.000.
Upton, Robert W., Jr., 4,190,318, Cl. 350-96.200.

Honeywell Information Systems Inc.: *See—*
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,190,901, Cl. 365-72.000.
Joyce, Thomas F.; and Panepinto, William, Jr., 4,190,885, Cl. 364-200.000.

Hongo, Mikio; and Nakabayashi, Junichi, to Hitachi, Ltd. Processing of photomask. 4,190,759, Cl. 219-121.0LM.

Honshuseishi Kabushiki Kaisha: *See—*
Ohmori, Koichiro, 4,190,188, Cl. 229-5.600.

Hooker Chemicals & Plastics Corp.: *See—*
Lin, Henry C., 4,190,609, Cl. 260-650.00R.

Hope, Henry F.; and Hope, Stephen F. Mixing pump system. 4,190,617, Cl. 261-28.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 4,190,617, Cl. 261-28.000.

Horak, Josef: *See—*
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

Horie, Ikutaro: *See—*
Naoi, Takashi; and Horie, Ikutaro, 4,190,449, Cl. 430-539.000.
Sera, Hidefumi; and Horie, Ikutaro, 4,190,448, Cl. 430-216.000.

Horlein, Ulrich: *See—*
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Hormel, Thad S.: *See—*
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.

Horn, Stuart B.: *See—*
Dunmire, Howard L.; and Horn, Stuart B., 4,190,106, Cl. 165-185.000.

Hotta, Hiroshi: *See—*
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.

Howe, David G.; and Gubser, Donald U., to United States of America, Navy. V_3Ga Composite superconductor. 4,190,701, Cl. 428-662.000.

Howmet Turbine Components Corporation: *See—*
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.

Hoyt, Jerry L., to Mark Controls Corporation. Encapsulated underground liquid storage tank. 4,190,159, Cl. 206-524.000.

Hrabal, Zdenek: *See—*
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

Hsu, James J., to Westinghouse Electric Corp. Turbine-condenser support system. 4,189,926, Cl. 60-687.000.

Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, to Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic. Thyristor switching matrix. 4,190,743, Cl. 179-18.0GF.

Hughes Aircraft Company: *See—*
Bayley, Allan L., 4,190,810, Cl. 331-94.5PE.
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.
Finnila, Ronald M.; and Su, Stephen C., 4,190,851, Cl. 357-30.000.
Kyle, Nanse R., 4,190,486, Cl. 156-601.000.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,487, Cl. 156-617.0SP.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,640, Cl. 423-500.000.

Hughes, Charles F. M. Word game apparatus. 4,190,255, Cl. 273-272.000.

Hughes, Nathaniel, to Hughes Sciences Group, Inc. Vortex generating device with resonator. 4,190,203, Cl. 239-102.000.

Hughes, Richard S., to United States of America, Navy. Deformable liquid mirror. 4,190,327, Cl. 350-310.000.

Hughes, Robert M. Air mix agitation for the extraction of metals from leachable ores. 4,190,436, Cl. 75-105.000.

Hughes Sciences Group, Inc.: *See—*
Hughes, Nathaniel, 4,190,203, Cl. 239-102.000.

Hughes, Thomas R.: *See—*
Miller, Stephen J.; and Hughes, Thomas R., 4,190,519, Cl. 208-79.000.

Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, Lee R., to RCA Corporation. Engine fault diagnosis. 4,189,940, Cl. 73-117.300.

Humphrey, James S., Jr.: *See—*
Hall, Walter L.; and Humphrey, James S., Jr., 4,190,681, Cl. 427-45.100.

Hunt, Charles T.: *See—*
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.

Hunt, Claude J. L. Vacuum metallizing interior of hollow article with masking shield. 4,190,019, Cl. 118-720.000.

Hunter, Donald N.; and Wyatt, Lesley J., to Rosemount Engineering Company Limited. Casting and moulding compositions. 4,190,453, Cl. 106-85.000.

Hurnik, Helmut: *See—*
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.

Hurst, George T.: *See—*
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Hutson, Jearld L. Multilayer semiconductor switching devices. 4,190,853, Cl. 357-39.000.

Hutson, John W.; and Neal, Robert L. Automated clean-out system for film processors. 4,190,346, Cl. 354-324.000.

Hwa, Chih M., to Chemed Corporation. Fireside treating compositions. 4,190,421, Cl. 44-4.000.

Hyche, Kenneth W.: *See—*
Cook, Mary J.; and Hyche, Kenneth W., 4,190,565, Cl. 260-27.00R.

I.S.C. Alloys Limited: *See—*
Wyatt, Brian S.; and Wassell, Ronald H., 4,190,512, Cl. 204-196.000.

Iantorno, James, to Sealectro Corporation. Female electrical connector. 4,190,308, Cl. 339-19.000.

Ibragimov, Dias A.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, to Kawasaki Steel Corporation. Method for forming forsterite insulating film on an oriented silicon steel sheet. 4,190,469, Cl. 148-113.000.

Ichikawa, Kiyoshi: *See—*
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,189,972, Cl. 84-1.250.

ICI Australia Limited: *See—*
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Ickes, Charles W.: *See—*
Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., 4,190,402, Cl. 417-415.000.

Iglesias, Jose J. Lithotrite for electrohydraulic cystolithotripsy. 4,190,051, Cl. 128-328.000.

Iida, Toshihide: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Iizuka, Yoshikatsu: *See—*
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.

Ikeda, Jiro, to Sony Corporation. Method of manufactureing a record matrix. 4,190,503, Cl. 204-5.000.

Imamura, Eigo, to Sanyo Electric Company, Ltd. Multifrequency superheterodyne receiver with priority channel monitoring. 4,190,803, Cl. 325-455.000.

Imamura, Tetsuya; and Hiraide, Takashi, to Kao Soap Co., Ltd. Soap for scouring pad. 4,190,549, Cl. 252-91.000.

Imperial Chemical Industries Limited: *See—*
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.

Inada, Tetsuro: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Ingalls, Paul H.: *See—*
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.

Inoue, Masakazu: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Inoue, Yukihiro, to Sharp Kabushiki Kaisha. Installation of a semiconductor chip on a glass substrate. 4,190,855, Cl. 357-80.000.

Institut Kibernetiki Akademii Nauk Ukrainskoi S S R: *See—*
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.

Institute of Gas Technology: *See—*
Yie, Gene G., 4,190,202, Cl. 239-101.000.

Instytut Przemysku Organicznega: *See—*
Leszczynska, Halina; and Leszczynski, Jerzy, 4,190,627, Cl. 422-40.000.

International Basic Economy Corporation: *See—*
Hertel, Douglas L., 4,190,721, Cl. 528-486.000.

International Business Machines Corporation: *See—*
Avina, Raymond; and Merrell, Patrick F., 4,190,870, Cl. 360-98.000.
Bhattacharyya, Arup; and Wiedman, Francis W., III, 4,190,466, Cl. 148-1.500.
Cooper, Leon M.; and Wipke, Walter J., 4,190,845, Cl. 346-75.000.
Davies, John E.; and Galli, Guido, 4,190,683, Cl. 427-130.000.
Jones, Robert E., Jr.; and Nystrom, Walther, 4,190,872, Cl. 360-125.000.
Van Voorhis, David C., 4,190,900, Cl. 365-15.000.
Winters, Harold F., 4,190,488, Cl. 156-643.000.

International Computers Limited: *See—*
Berry, George A., 4,190,375, Cl. 403-7.000.

International Harvester Company: *See—*
Amberg, Arthur A.; and Zetterlund, Ture R., 4,189,987, Cl. 98-2.140.

International Standard Electric Corporation: *See—*
Goodman, Colin H. L.; and Kirkby, Paul A., 4,190,809, Cl. 331-94.50H.

Taylor, Terrence F. E., 4,190,844, Cl. 346-75.000.
International Telephone and Telegraph Corporation: *See—*
Dean, Robert H.; and Dyer, Oliver Q., 4,190,071, Cl. 137-115.000.
Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., 4,190,402, Cl. 417-415.000.
Wallace, Charles H., 4,190,100, Cl. 165-48.00R.
Intersil, Inc.: *See—*
Bingham, David, 4,190,805, Cl. 330-9.000.
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, to Hitachi, Ltd. Electronic spark timing advancing apparatus. 4,190,027, Cl. 123-117.00R.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin process containing an aromatic carbonamide condensate. 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin composition containing a dicarbonamide or polycarbonamide condensate. 4,190,715, Cl. 525-163.000.
Ishiguro, Yasuo; and Wakazono, Kenji, to Copal Company Limited. Driving circuit for camera shutters. 4,190,344, Cl. 354-234.000.
Ishihara, Satoshi: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.
Ishii, Akira, to Tokyo Shibaura Electric Company, Limited. Pressure detecting apparatus having linear output characteristic. 4,190,796, Cl. 323-75.00N.
Ishii, Masao: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
Ishizaki, Shunji: *See—*
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.
Iten, Clemens A.; and Campbell, Christopher J., to American Safety Razor Company. Dual purpose cutter package/guard. 4,189,829, Cl. 30-151.000.
Ito, Akira; and Iwata, Kenji, to Mitsui Toatsu Chemicals, Incorporated. Method for the production of low density copolymers of ethylene. 4,190,614, Cl. 525-106.000.
Ito, Shigeyasu: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.
Ito, Takefumi: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Itoh, Takayuki: *See—*
Ogawa, Ryota; and Itoh, Takayuki, 4,190,323, Cl. 350-184.000.
Itoi, Kazuo: *See—*
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.
Iwata, Kenji: *See—*
Ito, Akira; and Iwata, Kenji, 4,190,614, Cl. 525-106.000.
J. M. Voith GmbH: *See—*
Tra, Josef, 4,190,522, Cl. 209-170.000.
Jackes-Evans Manufacturing Company: *See—*
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 4,190,192, Cl. 232-17.000.
Jackson, Harold P.; and Rhinehart, Richard W., to McDonough Power Equipment, Division of Fuqua Industries, Inc. Rotary lawn mower with removable mulching attachment. 4,189,903, Cl. 56-255.000.
Jackson, Norman F.: *See—*
Brettle, Jack; and Jackson, Norman F., 4,190,315, Cl. 350-96.120.
Jacob, Louis, to Compagnie Generale d'Electricite. Laser head. 4,190,812, Cl. 331-94.50P.
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, to University of Utah. Method and apparatus for peritoneal dialysis. 4,190,047, Cl. 128-213.00A.
Jacques, Pierre. Label for returnable and refillable bottle and associated method. 4,190,168, Cl. 215-12.00R.
Jahns, Warren K.: *See—*
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James, Douglas J.: *See—*
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., 4,190,811, Cl. 331-94.50M.
Jancik, Frank, Jr. Panel carrying device. 4,190,278, Cl. 294-26.000.
Janzen, Harlo W. Reel mounting apparatus. 4,190,211, Cl. 242-86.700.
Jenkins, Hugh N.; and Black, Robert P. Industrial dust collector cleaning system and method. 4,190,014, Cl. 116-266.000.
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., to Imperial Chemical Industries Limited. Phosphinite and phosphonite compounds. 4,190,616, Cl. 260-945.000.
Jensen, Ronald P.: *See—*
Hager, Clarence L.; and Jensen, Ronald P., 4,190,049, Cl. 128-303.00R.
Jentoft, Arthur P.; Anghinetti, Joseph P.; and Couture, Paul A., to York Manufacturing, Inc. Expansion joint cover. 4,189,877, Cl. 52-58.000.
Jernow, Jane L.: *See—*
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, to Chemische Fabrik Kalk GmbH. Process for suppressing dust in mines. 4,190,292, Cl. 299-12.000.
Johansson, Kurt E. Device for securing a load on a vehicle. 4,190,262, Cl. 410-37.000.
John Wyeth & Brother Limited: *See—*
Weston, George O., 4,190,584, Cl. 548-236.000.
Johnson, Clarence E.: *See—*
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.
Johnson, Donald R.: *See—*
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.
Johnson & Johnson: *See—*
Gander, Robert J.; and Gurney, John A., 4,190,594, Cl. 260-404.000.
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., to Grip Tite Mfg. Co. Method for anchoring and straightening walls. 4,189,891, Cl. 52-742.000.
Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Printed circuit board apparatus which facilitates fabrication of units comprising a data processing system. 4,190,901, Cl. 365-72.000.
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, to Uddeholms Aktiebolag. Process for the production of ferro alloys. 4,190,435, Cl. 75-12.000.
Jones, Geoffrey G.: *See—*
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.
Jones, Robert E., Jr.; and Nystrom, Walther, to International Business Machines Corporation. Thin film inductive transducer. 4,190,872, Cl. 360-125.000.
Jordan, Lawrence E.: *See—*
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.
Jorgensen, Hugh V.: *See—*
Gross, David; and Jorgensen, Hugh V., 4,190,274, Cl. 292-338.000.
Joy Manufacturing Company: *See—*
Loftis, James B.; and Lewis, Norlin O., 4,190,119, Cl. 173-149.000.
Joyce, Thomas F.; and Panepinto, William, Jr., to Honeywell Information Systems Inc. Out of store indicator for a cache store in test mode. 4,190,885, Cl. 364-200.000.
Jumer, John F. Apparatus for containerless portable electro-polishing. 4,190,513, Cl. 204-224.00R.
Jung, Michel: *See—*
Metcalf, Brian W.; and Jung, Michel, 4,190,586, Cl. 260-326.450.
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., to GTE Automatic Electric Laboratories Incorporated. Call for service and continuity sensor circuit. 4,190,745, Cl. 179-18.0AH.
Kabashima, Ryuichi, to Tokiwa Industrial Co., Ltd. Rotary abrasive drilling bit. 4,190,126, Cl. 175-410.000.
Kabbe, Hans-Joachim: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Kablitz, Carl: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.
Kaburagi, Hisashi: *See—*
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Kabushiki Kaisha Daini Seikosha: *See—*
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Kabushiki Kaisha Morita Seisakusho: *See—*
Sugai, Hiroshi; and Ogawa, Haruo, 4,189,836, Cl. 433-127.000.
Kaebernick, Hartmut: *See—*
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Kaetzel, Pierre, to Samibem, S.A. Mower-conditioner. 4,189,902, Cl. 56-15.600.
Kahl, John S.: *See—*
Fernandez, Ramon J.; and Kahl, John S., 4,190,072, Cl. 137-236.00S.
Kaiser, Roman; and Naegeli, Peter, to Givaudan Corporation. Odorant and flavorant. 4,190,591, Cl. 260-347.800.
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, to Tokuyama Soda Kabushiki Kaisha. Cathode. 4,190,516, Cl. 204-290.00R.
Kalosha, Alexei S.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiation detection element. 4,190,771, Cl. 250-385.000.
Kametani, Hiroshi; and Mitsuma, Tatsuya, to National Research Institute for Metals. Process for removing chalcophile elements from aqueous solutions by electrolysis. 4,190,508, Cl. 204-151.000.
Kanayama, Kaoru: *See—*
Samejima, Hiroshi; and Kanayama, Kaoru, 4,190,719, Cl. 528-103.000.
Kanazawa, Hiroyuki; and Futagami, Mikio, to Sumitomo Chemical Company, Limited; and Nippon Sheet Glass Co., Ltd. Method for the improvement of surface hardness of article by coating. 4,190,699, Cl. 428-412.000.
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of evaluating the corrosion rate of metal. 4,190,502, Cl. 204-1.00T.

Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, to Kobe Steel, Ltd. Welding apparatus with shifting magnetic field. 4,190,760, Cl. 219-128.000.
Kansai Paint Company, Limited: *See—*
Tominaga, Akira; and Hirata, Yasuyuki, 4,190,564, Cl. 260-18.0PT.
Kantlehner, Jerry R.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.
Kao Soap Co., Ltd.: *See—*
Imamura, Tetsuya; and Hiraide, Takashi, 4,190,549, Cl. 252-91.000.
Murata, Moriyasu; and Sai, Fumio, 4,190,551, Cl. 252-99.000.
Ohmura, Hidemasa; and Saito, Masahiro, 4,190,567, Cl. 260-29.2TN.
Kaplan, Leonard, to Union Carbide Corporation. Catalytic process for production of polyhydric alcohols in presence of ammonium carboxylates. 4,190,598, Cl. 260-449.00L.
Kaplan, Roy I., to Nalco Chemical Company. Method of removing iron oxide deposits from heat transfer surfaces. 4,190,463, Cl. 134-3.000.
Kashiwara, Hirofumi: *See—*
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Katayama, Shinji; and Murakami, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup unit and pickup assembly for musical instrument. 4,189,969, Cl. 84-1.140.
Kato, Noboru. Dish carrying system. 4,190,134, Cl. 186-1.00R.
Kato, Takashi: *See—*
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.
Kaufman, John J.; and Luisi, Thomas E., to Witco Chemical Corporation. Cable filler. 4,190,570, Cl. 260-33.6PQ.
Kaufman, Joseph R. Oil splatter screen for a deep fat fryer. 4,189,993, Cl. 99-403.000.
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, to Fujitsu Limited. Driving system for a self-shift type gas discharge panel. 4,190,789, Cl. 315-169.400.
Kawaharada, Minoru: *See—*
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.
Kawamura, Tateo: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo; and Nishimura, Michio, 4,190,023, Cl. 123-41.720.
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, to Toyo Soda Manufacturing Co., Ltd. Electrolysis of alkali metal chloride. 4,190,506, Cl. 204-98.000.
Kawasaki Steel Corporation: *See—*
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.
Kayser, John P., to Airco, Inc. Double valve construction. 4,190,075, Cl. 137-329.100.
Kearney, Dolores C.; and Matz, Bruno, to Ford Motor Company. Vibration welding of expanded bead polystyrene. 4,190,093, Cl. 164-34.000.
Keeler Corporation: *See—*
Flowerday, Dale L., 4,189,804, Cl. 16-126.000.
Keigley, Ronald E. Hydraulic hand tool. 4,189,966, Cl. 83-178.000.
Keller, Nancy: *See—*
Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, 4,190,642, Cl. 424-19.000.
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., to Scientific-Atlanta, Inc. Electrical load management system. 4,190,800, Cl. 325-37.000.
Kelly, Lawrence F. M.: *See—*
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.
Kelly, Thomas R.: *See—*
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.
Kelsey-Hayes Co.: *See—*
Evans, James L.; and Main, John A., 4,190,092, Cl. 152-381.100.
Kemp, James A., to R A Electronics, Inc. Radiation detector. 4,190,838, Cl. 343-18.00E.
Kennedy, Charles R., to United States of America, Energy. Graphite having improved thermal stress resistance and method of preparation. 4,190,637, Cl. 423-448.000.
Kent Air Tool Company: *See—*
Gunning, Samuel D., 4,189,917, Cl. 60-370.000.
Ketzer, Mandred: *See—*
Hochbaum, Istvan; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.
Keul, Robert: *See—*
Fischer, Klaus; and Keul, Robert, 4,190,452, Cl. 106-52.000.
Kewanee Industries, Inc.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,190,644, Cl. 424-70.000.
Keystone International, Inc.: *See—*
Killian, Henry R., 4,189,950, Cl. 74-424.80A.
Kiedrowski, James A.: *See—*
Buckley, Charles G.; and Kiedrowski, James A., 4,189,948, Cl. 74-5.460.
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Phosphonyl vinyl phosphorus compounds as pesticides. 4,190,650, Cl. 424-204.000.
Kikuchi, Yushichi: *See—*
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.
Kilar, Joseph H., to Motorola, Inc. Slide switch actuating apparatus. 4,190,754, Cl. 200-329.000.
Killian, Henry R., to Keystone International, Inc. Manual control apparatus. 4,189,950, Cl. 74-424.80A.
Kimball International, Inc.: *See—*
Doane, Patrick K., 4,189,973, Cl. 84-1.270.
Kimberly-Clark Corporation: *See—*
Krueger, Gary A., 4,190,241, Cl. 270-47.000.
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, to Hitachi, Ltd. Dynamic drive circuit for light-emitting diodes. 4,190,836, Cl. 340-762.000.
Kimura, Koya; Machi, Shinji; and Manabe, Takao, to Toshiba Kikai Kabushiki Kaisha. Programming apparatus of automatic sewing machines. 4,190,007, Cl. 112-121.120.
Kimwood Corporation: *See—*
Evans, F. David, 4,189,872, Cl. 51-135.00R.
Kinda, Frank L.: *See—*
Wells, Richard E.; and Kinda, Frank L., 4,190,167, Cl. 211-184.000.
Kindig, Cleon V., to Atari, Inc. Multiple drop target assembly for amusement game. 4,190,252, Cl. 273-127.00R.
Kinjo, Hisao, to Victor Company of Japan, Ltd. Tracking control apparatus for use in apparatus for reproducing video signals from a rotary recording medium. 4,190,859, Cl. 358-128.500.
Kira, Takehiro, to Ushio Denki Kabushikikaisha. Discharge lamp. 4,190,786, Cl. 313-184.000.
Kirchen, Michel: *See—*
Mailliet, Pierre; and Kirchen, Michel, 4,190,074, Cl. 137-315.000.
Kirchmayr, Rudolf: *See—*
Brunisholz, Jean; and Kirchmayr, Rudolf, 4,190,602, Cl. 260-590.00D.
Kirkby, Paul A.: *See—*
Goodman, Colin H. L.; and Kirkby, Paul A., 4,190,809, Cl. 331-94.50H.
Kishi, Toyokazu: *See—*
Hashimoto, Naoto; and Kishi, Toyokazu, 4,190,580, Cl. 260-239.30P.
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, to Futaba Denshi Kogyo Kabushiki Kaisha. Phosphorus luminescent display tube. 4,190,787, Cl. 313-494.000.
Kitamura, Kiyoyuki: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.
Kitayama, Minoru; and Nakamura, Motoharu, to Nippon Steel Corporation. Process for coating an electrical steel sheet with an anti-sticking layer. 4,190,468, Cl. 148-12.00A.
Kittler, Helmut, to GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH. False ceiling. 4,189,990, Cl. 98-121.00R.
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, to American Can Company. Process for fabricating steel from ferrous metal particles. 4,190,440, Cl. 75-211.000.
Klein, William R.: *See—*
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.
Kleinjans, Peter A. M.: *See—*
Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., 4,190,455, Cl. 106-98.000.
Klokkers, Frits H., to U.S. Philips Corporation. Protective device for an electron tube. 4,190,873, Cl. 361-56.000.
Klope, Lawrence R., to Deere & Company. Fluid control system. 4,190,298, Cl. 303-2.000.
Kluczynski, Achim; and Tabel, Johannes, to AGFA-Gevaert, A.G. Narrow gauge film cassette. 4,190,216, Cl. 242-194.000.
Knapp, Kenneth K., to Eaton Corporation. Hydraulic controller. 4,189,921, Cl. 60-445.000.
Knapp, Paul A. Photographic easel apparatus. 4,190,356, Cl. 355-74.000.
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., to Goodyear Aerospace Corporation. Wave-compliant, bottom tension boom. 4,190,381, Cl. 405-72.000.
Knight, J. Nelson; and Turner, Roger C., to General Electric Company. Structural support for a refrigerator. 4,190,305, Cl. 312-214.000.
Knight, James A.: *See—*
Wade, Thomas B.; and Knight, James A., 4,190,541, Cl. 210-241.000.
Knight, Jerry W.; and Woodward, Mervyn, to Westinghouse Electric Corp. Profile milling machine. 4,190,389, Cl. 409-120.000.
Knight, Philip A., Jr.: *See—*
Bowen, Robert F.; and Knight, Philip A., Jr., 4,190,077, Cl. 137-550.000.
Knowlton, Kenneth C., to Bell Telephone Laboratories, Incorporated. Circuits having substantially parabolic output versus linear input characteristics. 4,190,896, Cl. 364-859.000.
Knuchel, Max, to SIG-Schweizerische Industrie-Gesellschaft. Apparatus for conveying fragile items. 4,190,146, Cl. 198-460.000.
Knutti, David F.: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., to United States of America, Energy. Energy-efficient regenerative liquid desiccant drying process. 4,189,848, Cl. 34-32.000.

Kobe Steel, Ltd.: *See—*
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.

Kodama, Kunio: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Koenig & Bauer Aktiengesellschaft: *See—*
Bolza-Schunemann, Hans B., 4,190,242, Cl. 270-50.000.
Michalik, Horst B.; and Weschenfelder, Otto T., 4,190,243, Cl. 270-66.000.

Kohl, Lou: *See—*
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, 4,190,440, Cl. 75-211.000.

Kohno, Mitsuo: *See—*
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, 4,190,707, Cl. 429-254.000.

Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, to Daiichi Radioisotope Laboratories, Ltd. Cortisol radioimmunoassay method and cortisol derivatives useful therefor. 4,190,593, Cl. 260-397.450.

Kojima, Takahide: *See—*
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.

Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., to Scott Paper Company. Liquid impregnating system. 4,189,896, Cl. 53-431.000.

Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., to Synthelabo. Naphthyridine derivatives. 4,190,657, Cl. 424-256.000.

Kollann, Rolf. Revolving cross cutter. 4,189,965, Cl. 83-155.000.

Komatsubara, Michiro: *See—*
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Method for cleaning a photoconductive surface with liquid toner. 4,190,464, Cl. 134-6.000.

Kompanek, Harry W., to Essex Transducers Corporation. Pressure sensitive signal generator using piezoelectric coating. 4,190,785, Cl. 310-330.000.

Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Electronic watch with alarm mechanism. 4,189,910, Cl. 58-38.00R.

Koninklijke Scholten-Honig N.V.: *See—*
Niemeijer, Klaas B., 4,190,523, Cl. 209-211.000.

Konkle, Phillip E.; and Tinholt, Thomas H., to Eaton Corporation. Fluid coupling device, bimetal clip and method of assembly therefor. 4,190,140, Cl. 192-82.00T.

Konkle, Phillip E.: *See—*
Tinholt, Thomas H.; and Konkle, Phillip E., 4,190,139, Cl. 192-58.00B.

Korger, Heinz, to Carl Stahl GmbH & Co. KG. Back-holding device for auxiliary seats, particularly children's seats, to be placed on conventional vehicle seats. 4,190,288, Cl. 297-488.000.

Korger, Heinz K., to Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei. Adjustable headrest assembly for automotive vehicles. 4,190,291, Cl. 297-408.000.

Korsakov-Bogatkov, Sergei M.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Kosakowski, Henry R., to Bendix Corporation, The. System having a fixed excitation and providing a variable ratio output. 4,190,891, Cl. 364-606.000.

Kostiner, Edward. Photographic enlarging easel. 4,190,357, Cl. 355-74.000.

Kozhevnikov, Nikolai I.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, to Rohm GmbH. Pearl polymer containing hollow pearls. 4,190,713, Cl. 521-149.000.

Kraess, Henri: *See—*
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Krafka, Jerry L.: *See—*
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.

Krakovsky, Boris D.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Kramer, Marvin, to Alenite Corporation, The. Trophy plaque. 4,190,691, Cl. 428-67.000.

Krantz, Karl W., to General Electric Company. Process for transmitting a hydrocarbon fluid through a pipeline. 4,190,069, Cl. 137-13.000.

Krause, Gerhard, to Siemens Aktiengesellschaft. A.C. supplied integrated semi-conductor logic circuit. 4,190,778, Cl. 307-254.000.

Krauss, Gerhard: *See—*
Schenke, Walter; and Krauss, Gerhard, 4,189,788, Cl. 2-209.000.

Krenke, Richard D.: *See—*
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.

Krenzer, John, to Velsicol Chemical Corporation. Substituted oxadiazolidine-3,5-diones. 4,190,431, Cl. 71-92.000.

Krimm, David L.: *See—*
Martin, James O.; Fathergill, Rex D.; and Krimm, David L., 4,189,974, Cl. 84-293.000.

Kristensen, Erling B.: *See—*
Tankred, Hans J.; and Kristensen, Erling B., 4,189,984, Cl. 92-82.000.

Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Baking finishes of low solvent content. 4,190,569, Cl. 260-31.600.

Kroll, Rudolf: *See—*
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.

Krueger, Gary A., to Kimberly-Clark Corporation. Apparatus for converting paper rolls into stacks of individual folded paper sheets. 4,190,241, Cl. 270-47.000.

Krupp-Koppers GmbH: *See—*
Lagemann, Gunther; and Heisterkamp, Wilhelm, 4,190,497, Cl. 202-150.000.

Kubiatowicz, James F., to Custom Concepts Incorporated. Toy timing device. 4,189,911, Cl. 58-106.000.

Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Method and apparatus for insertion of weft threads in jet weaving machines. 4,190,067, Cl. 139-435.000.

Kudamatsu, Akio: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.

Kuhn, Charles J. Pulling apparatus. 4,189,934, Cl. 72-447.000.

Kuhr, Albert F., to United States Gypsum Company. Ceiling runner and panel assembly having sliding lockability. 4,189,893, Cl. 52-779.000.

Kulesha, Vadim A.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Kulik, Stanley; and Smith, Anthony M., to British Petroleum Company Limited, The. Traction fluid. 4,190,546, Cl. 252-49.600.

Kulle, Lee K.; and Rudzena, William L., to Baxter Travenol Laboratories, Inc. Closure with compensating threads. 4,190,171, Cl. 215-329.000.

Kulpa, Walter J., to Remington Products, Inc. Exothermic hair curler. 4,190,065, Cl. 132-33.00R.

Kume, Toyohiko: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.

Kunishima, Mamoru: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, to Monsanto Company. Production of urokinase. 4,190,708, Cl. 435-215.000.

Kuppersbusch Aktiengesellschaft: *See—*
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.

Kuramoto, Nobuyuki: *See—*
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Kuraray Co., Ltd.: *See—*
Fujimoto, Yoshiaki, 4,190,411, Cl. 425-434.000.
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.

Kuroiwa, Hiroyuki: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.

Kurumatani, Masaaki: *See—*
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Kuwik, John J.: *See—*
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.

Kwater, James L., to Weed Eater, Inc. Apparatus for cutting vegetation. 4,189,833, Cl. 30-276.000.

Kyle, Nanse R., to Hughes Aircraft Company. Method for obtaining optically clear, high resistivity II-VI, III-V, and IV-VI compounds by heat treatment. 4,190,486, Cl. 156-601.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.

L. B. (Plastics) Limited: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,190,306, Cl. 312-330.00R.

Laa, Friedrich: *See—*
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.

Laanio, Verena; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Thioester of 1,2-diphenyl-cyclohex-1-ene-4-carboxylic-acid. 4,190,433, Cl. 71-100.000.

Laboratoires Chauvin-Blache: *See—*
Dong, P. Le Hao; and Coquelet, Claude, 4,190,661, Cl. 424-258.000.

Labriola, Daniel J. Hand held pocket size ski repair and maintenance tool. 4,189,874, Cl. 51-181.00R.

Lacefield, William B., to Eli Lilly and Company. 5,6-Diaryl-1,2,4-triazines. 4,190,725, Cl. 544-182.000.

Lachonius, Leif; and Becker, Dieter, to Aktiebolaget SKF. Axial bearing for a roller drill bit. 4,190,301, Cl. 308-8.200.

LaCoste, Bernard L., to Westinghouse Electric Corp. Ocean thermal energy conversion system and method for operation. 4,189,924, Cl. 60-641.000.

Lagemann, Gunther; and Heisterkamp, Wilhelm, to Krupp-Koppers GmbH. Apparatus for heating up a chamber of a coking battery. 4,190,497, Cl. 202-150.000.

Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. Substituted 2-keto-1,4-diazacycloalkanes and UV-light-stabilized compositions containing them. 4,190,571, Cl. 260-45.80N.

Laing, Robert, to Curtis & Marble Machine Company. Method of and apparatus for wrapping products. 4,189,894, Cl. 53-399.000.

Lainiere de Picardie: *See—*
Groshens, Pierre, 4,189,931, Cl. 66-193.000.

Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, to Titeflex Corporation. Chafe or fire sleeve for hose. 4,190,088, Cl. 138-126.000.

Lama, William L.: *See—*
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.

Lambert Anodizing Co. Inc.: *See—*
Lambert, Raymond E., 4,190,333, Cl. 351-95.000.

Lambert, Raymond E., to Lambert Anodizing Co. Inc. Spectacle frames. 4,190,333, Cl. 351-95.000.

Landauer, Franz, to Hoechst Aktiengesellschaft. Process for the manufacture of m-halobenzoyl halides. 4,190,600, Cl. 260-544.00D.

Landes, Wilhelm: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.

Landis, Norris J., to Standard Oil Company (Ohio). Process for prilling urea. 4,190,622, Cl. 264-14.000.

Landow Consulting Associates, Inc.: *See—*
Landow, Herbert T., 4,190,393, Cl. 414-333.000.

Landow, Herbert T., to Landow Consulting Associates, Inc. Wheeled vehicle car loading and unloading system and method therefor. 4,190,393, Cl. 414-333.000.

Lang, Armin; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Feed pressure bypass valving for servomotors. 4,189,982, Cl. 91-400.000.

Lang, Armin: *See—*
Fassbender, Rolf; and Lang, Armin, 4,189,983, Cl. 91-400.000.

Langenbusch, Hans J.: *See—*
Zucker, Friedrich J.; and Langenbusch, Hans J., 4,190,373, Cl. 366-160.000.

Langford, Gordon B., to Rogers Corporation. Keyboard switch assembly. 4,190,748, Cl. 200-5.00A.

Lanman Lithotech, Inc.: *See—*
Cunningham, Bruce B.; and Barfield, Charles R., Jr., 4,190,360, Cl. 355-89.000.

Lansbergen, Simon G. Bath sponge having incorporated therein a core of detergent substances, and method and apparatus for manufacturing same. 4,189,802, Cl. 15-104.930.

Lanusse, Marie M. Fluid product projection apparatus for maintenance and treatment of all surfaces as well as the body. 4,189,801, Cl. 15-29.000.

Larbig, Wolfgang, to Bayer Aktiengesellschaft. Process for the electrophoretic breaking of emulsions. 4,190,510, Cl. 204-180.00R.

Larsen, Max J., to Du Pont de Nemours, E. I., and Company. Centrifuge tube cap. 4,190,196, Cl. 233-26.000.

Larsen, Ronald L., to Conwed Corporation. High strand count plastic net. 4,190,692, Cl. 428-107.000.

LaRue, Mervin W., Jr., to Bell & Howell Company. Optical system for rotary camera. 4,190,353, Cl. 355-24.000.

Laser Precision Corporation: *See—*
Doyle, Walter M., 4,190,366, Cl. 356-346.000.

Lavoisey, Yves, to Saint-Gobain Industries. Apparatus and method for the assembly of glass sheets. 4,189,818, Cl. 29-281.500.

Lawrence, Jackson; and Webb, Harry A., to Cluett, Peabody & Co., Inc. Process and apparatus for removal of ammonia in a liquid ammonia fabric treating system. 4,189,847, Cl. 34-19.000.

Leach, Gale L.: *See—*
Bahl, Surinder K.; and Leach, Gale L., 4,190,489, Cl. 156-664.000.

LeBlanc, Edgar J.: *See—*
LeBlanc, Gerald J.; and LeBlanc, Edgar J., 4,190,224, Cl. 248-229.000.

LeBlanc, Gerald J.; and LeBlanc, Edgar J. Intravenous pole holder. 4,190,224, Cl. 248-229.000.

LeBron, Roderick R., III. Drop shelf vending mechanism. 4,190,178, Cl. 221-90.000.

Lecklider, Thomas H.; and Bowers, John J., to Gould Inc. Capacitive gauging system utilizing a low internal capacitance, high impedance amplifier means. 4,190,797, Cl. 324-61.00R.

Le Devehat, Eugene R., to FMC Corporation. Articulated loading arm control system. 4,190,080, Cl. 137-615.000.

Lee, David Q.: *See—*
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.

Lee, James K.: *See—*
Frank, Lee F.; and Lee, James K., 4,190,336, Cl. 354-50.000.

Leeds, Winthrop M. "Double-chess" game board. 4,190,254, Cl. 273-261.000.

LeFevre, Jean P. G.: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Lehmann, Hans D.: *See—*
Schmidhuber, Karl; and Lehmann, Hans D., 4,190,284, Cl. 297-194.000.

Leichle, Claude, to Regie Nationale des Usines Renault. Interface unit for use between analog sensors and a microprocessor. 4,190,823, Cl. 340-347.0NT.

Leitten, Arthur H., Jr.: *See—*
DePuy, Robert P.; and Leitten, Arthur H., Jr., 4,190,825, Cl. 340-347.0AD.

Lemisch, Ellen; and Rostock, Fredrik. Knee abductor and restrainer. 4,190,287, Cl. 297-466.000.

Lennox Industries Inc.: *See—*
Cawley, Richard E.; and Buckley, Paul K., 4,190,199, Cl. 126-419.000.

Leszczynska, Halina; and Leszczynski, Jerzy, to Instytut Przemysku Organicznega. Method of prilled sulphur storage in the open area. 4,190,627, Cl. 422-40.000.

Leszczynski, Jerzy: *See—*
Leszczynska, Halina; and Leszczynski, Jerzy, 4,190,627, Cl. 422-40.000.

Letournoux, Alain; and Droual, Rene, to Societe Industrielle Bertrand Faure. Vehicle seat slides. 4,190,226, Cl. 248-429.000.

Lever Brothers Company, Inc.: *See—*
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.

Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C. Process for detection of blood-borne parasites. 4,190,328, Cl. 350-320.000.

Levine, Stephen N., to Motorola, Inc. Digital demodulator for phase shift keyed signals. 4,190,802, Cl. 325-320.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,190,432, Cl. 71-93.000.

Lewer, Hans: *See—*
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.

Lewis, Norlin O.: *See—*
Loftis, James B.; and Lewis, Norlin O., 4,190,119, Cl. 173-149.000.

Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Blowing agents based on urea dicarboxylic acid anhydride. 4,190,710, Cl. 521-89.000.

Liautaud, James P., to American Antenna Corporation. Mobile antenna including quick-release mounting. 4,190,839, Cl. 343-715.000.

Liautaud, James P., to American Antenna Corporation. Antenna mounting adaptor. 4,190,840, Cl. 343-715.000.

Libbey-Owens-Ford Company: *See—*
Oelke, Waldemar W.; and Poplawsky, Ralph C., 4,190,184, Cl. 225-2.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.
Wermuth, Jurgen, 4,190,806, Cl. 330-51.000.

Lieber, Derek: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.

Lien, Suei-Yuen P., to Western Electric Co., Inc. Semiconductor device production. 4,190,467, Cl. 148-1.500.

Liljequist, Jon L.: *See—*
Appleton, Arthur I.; Liljequist, Jon L.; and Ylagan, Carlos J., 4,190,222, Cl. 248-56.000.

Lin, Henry C., to Hooker Chemicals & Plastics Corp. Process for the directed chlorination of xylenes. 4,190,609, Cl. 260-650.00R.

Lin, Wen: *See—*
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.

Lindell, Albert H.: *See—*
Dillon, Glenn W.; and Lindell, Albert H., 4,189,824, Cl. 29-522.00R.

Lindell, Stig. Loose-leaf binder. 4,190,374, Cl. 402-3.000.

Lindner, Herbert E.: *See—*
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.

Lindstrom, Rune H.: *See—*
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.

Ling, Andrew T.: *See—*
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
Szarvasi, Etienne; and Festal, Didier, 4,190,665, Cl. 424-274.000.

Lipshutz, Bruce H.: *See—*
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.

Lipton, Thomas J.: *See—*
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.

Litchfield, Leon G.; and Hardy, Terence, to L. B. (Plastics) Limited. Drawer with stop device. 4,190,306, Cl. 312-330.00R.

Litehizer, Melvin P., Jr., to AMP Incorporated. Cable stripping tool. 4,189,799, Cl. 7-107.000.

Litichevsky, Marx I.: *See—*
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.

Litton Industrial Products Inc.: *See—*
Marinkovich, Cedomir S.; and Crimmins, William M., 4,190,774, Cl. 250-446.000.

Liu, Chao Kai: *See—*
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.

Ljung, Bo H. G.; and Gamertsfelder, George R., to Singer Company, The. Ring laser gyroscope. 4,190,364, Cl. 356-350.000.

Lochridge, Joe C.: *See—*
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.

Locke, Frederic J.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.

Locke, Werner: *See—*
Schutze, Siegfried; and Locke, Werner, 4,190,337, Cl. 354-60.00L.

Lockhart Industries, Inc.: *See—*
Casuga, Dennis W.; and Hauser, William C., 4,190,198, Cl. 236-34.500.

Lockheed Corporation: *See—*
Hackett, James E., 4,190,219, Cl. 244-199.000.

Loepfe, Erich, to Aktiengesellschaft Gebruder Loepfe. Method and device for measuring the variations of the cross-sectional dimensions of a moving thread-like structure. 4,189,841, Cl. 33-147.00L.

Loesch, Stanley B., to Halliburton Company. Vane straightener retainer. 4,189,941, Cl. 73-231.00R.

Loftis, James B.; and Lewis, Norlin O., to Joy Manufacturing Company. Earth drilling apparatus. 4,190,119, Cl. 173-149.000.

Logan, Ralph A.; and Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Strip buried heterostructure laser. 4,190,813, Cl. 331-94.50H.

Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, to Kuppersbusch Aktiengesellschaft. Apparatus for heating food. 4,189,995, Cl. 99-447.000.

Long, E. David, to Allied Chemical Corporation. Fuel injection system with correction for incidental system variables. 4,190,022, Cl. 123-32.0EF.

Long, George, to Northern Illinois Gas Company. Method of storing electric power. 4,189,925, Cl. 60-652.000.

Lonza Ltd.: *See—*
Tenud, Leander, 4,190,585, Cl. 260-326.13R.

Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, to Carl Hurth Maschinen-und Zahnradfabrik. Apparatus and tool for precision working, particularly shaving, of gears. 4,190,387, Cl. 409-33.000.

Lopez, Ana. String top. 4,189,862, Cl. 46-63.000.

Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., to GAF Corporation. Process for increasing molecular weight of vinylpyrrolidone polymer. 4,190,718, Cl. 526-207.000.

Louis, Remi: *See—*
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Lucas, George A.: *See—*
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Luce, Betty M.: *See—*
Berdan, Betty L.; and Luce, Betty M., 4,190,474, Cl. 156-151.000.

Luce, Dan G.; Klein, William R.; and Krenke, Richard D., to Tideland Signal Corporation. Position sensor for rotatable lamp changer turret. 4,190,777, Cl. 307-139.000.

Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., to Corning Glass Works. Means for separating lymphocytes and monocytes from anticoagulated blood. 4,190,535, Cl. 210-83.000.

Ludwig, George C., to Tom McGuane Industries, Inc. Combination throttle kicker and deceleration valve. 4,189,981, Cl. 91-52.000.

Luisi, Thomas E.: *See—*
Kaufman, John J.; and Luisi, Thomas E., 4,190,570, Cl. 260-33.6PQ.

Luknar, Amiel. Surveillance device incorporating a television camera. 4,190,866, Cl. 358-229.000.

Lummus Company, The: *See—*
Tsao, Utah, 4,190,639, Cl. 423-491.000.

Lundstrom, Per-Ake: *See—*
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.

Lux, Peter, to U.S. Philips Corporation. Method and arrangement for redundancy-reducing picture coding. 4,190,861, Cl. 358-135.000.

Lybbert, Evart K. Concrete discharge chutes. 4,190,144, Cl. 193-10.000.

Lynn, William F.; and Walker, Gordon M., to Boeing Commercial Airplane Company. Sealed lined bearings. 4,190,302, Cl. 308-36.100.

Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with norbornene. 4,190,611, Cl. 585-361.000.

Lyons, James E.: *See—*
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.

M/A COM, Inc.: *See—*
Walline, Robert E., 4,190,470, Cl. 148-175.000.

Macaluso, Paul J.; and Clifford, Lawrence E., to Pitney-Bowes, Inc. Copying machine with electromechanical scavenger assembly and process. 4,190,351, Cl. 355-15.000.

Machi, Shinji: *See—*
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.

Machida Endoscope Co., Ltd.: *See—*
Chikama, Toshio, 4,190,041, Cl. 128-4.000.

Machida, Masamichi: *See—*
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.

Machine Technology, Inc.: *See—*
Hillman, Gary, 4,190,015, Cl. 118-696.000.

MacIntosh, James L.: *See—*
Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.

MacLean, Donald R. Support and positioner for rock drill. 4,190,117, Cl. 173-43.000.

MacMillan, Kenneth T., to Donald MacMillan & Son, Inc. Heating device for a tire retreading mold. 4,190,405, Cl. 425-20.000.

Madan, Bhim S.: *See—*
Schaeffer, Robert L.; and Madan, Bhim S., 4,190,208, Cl. 241-92.000.

Maddison, Vicki: *See—*
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.

Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, to BASF Aktiengesellschaft. Non-flammable insulating material. 4,190,547, Cl. 252-62.000.

Mai, Erich: *See—*
Wenzel, Joerg; and Mai, Erich, 4,190,135, Cl. 187-1.00R.

Maida, Osamu, to Nippon Kogaku K.K. Motor drive apparatus for photographic camera. 4,190,340, Cl. 354-173.000.

Maile, Graham K.: *See—*
Vanstone, Anthony E.; and Maile, Graham K., 4,190,671, Cl. 424-317.000.

Mailliet, Pierre; and Kirchen, Michel, to Paul Wurth, S.A. Pressure equalization valve and technique for shaft furnace. 4,190,074, Cl. 137-315.000.

Main, John A.: *See—*
Evans, James L.; and Main, John A., 4,190,092, Cl. 152-381.100.

Maitani, Yoshihisa, to Olympus Optical Company, Ltd. Shutter controlling aid means for use with camera. 4,190,335, Cl. 354-34.000.

Makino, Yoshimi: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.

Makita, Satoru: *See—*
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Makuch, John A., to Bunker Ramo Corporation. Fiber optic cable connector pin assembly. 4,190,317, Cl. 350-96.200.

Malinich, Richard M.: *See—*
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., to Deutsch Company, The. Lens connector for optical fibers. 4,190,316, Cl. 350-96.180.

Manabe, Takao: *See—*
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.

Mantani, Rokurota, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument system having independent tone cabinet. 4,189,971, Cl. 84-1.240.

Manuel, John L. Universal orthodontic pliers. 4,189,839, Cl. 433-4.000.

Manuel, Ronald J.: *See—*
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

Marcus, Erich: *See—*
Decker, Quintin W.; and Marcus, Erich, 4,190,601, Cl. 260-583.00R.

Marek, Cecil J.; and Cooper, Larry P., to United States of America, National Aeronautics and Space Administration. Supercritical fuel injection system. 4,189,914, Cl. 60-726.000.

Mares, Frank: *See—*
Diamond, Steven E.; and Mares, Frank, 4,190,595, Cl. 260-429.00R.

Marinkovich, Cedomir S.; and Crimmins, William M., to Litton Industrial Products Inc. Radiographic table system. 4,190,774, Cl. 250-446.000.

Mark Controls Corporation: *See—*
Hoyt, Jerry L., 4,190,159, Cl. 206-524.000.

Mark, Harold W.: *See—*
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.

Markusch, Peter: *See—*
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.

Marquip, Inc.: *See—*
Marschke, Carl R., 4,190,475, Cl. 156-157.000.

Marschke, Carl R., to Marquip, Inc. Paper roll web splicing. 4,190,475, Cl. 156-157.000.

Marshall, Robert M.; and Dardoufas, Kimon C., to Allied Chemical Corporation. Application of fluorocarbon compound to synthetic organic polymer yarn. 4,190,545, Cl. 252-8.750.

Martin, James O.; Fathergill, Rex D.; and Krimm, David L. Guitar neck assembly. 4,189,974, Cl. 84-293.000.

Martin, Niles J.: *See—*
Bains, Gurdip S.; and Martin, Niles J., 4,189,890, Cl. 52-584.000.

Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., to Eastman Kodak Company. Photocrosslinkable, high-temperature-resistant polymers and their use in color imaging devices. 4,190,446, Cl. 430-25.000.

Martorano, Richard; and Brendley, William H., to Rohm and Haas Company. Coating method using compositions comprising acrylic oligomers, high polymers and crosslinkers. 4,190,693, Cl. 428-209.000.

Marum, Steven E., to Texas Instruments Incorporated. Integrated injection logic electronic system with voltage regulator for multiplexed liquid crystal display. 4,189,909, Cl. 58-23.00R.

Marx, Arthur F.; and Doodewaard, Jean, to Gist Brocades N.V. Prostaglandin derivatives. 4,190,670, Cl. 424-305.000.

Marx, Warren G., to Grumman Aerospace Corporation. Programmable light director system. 4,190,890, Cl. 364-491.000.

Mary, Dominique. Air cushion bumper cars. 4,190,129, Cl. 180-119.000.

Masilamani, Divakaran; and Rogic, Milorad M., to Allied Chemical Corporation. Regioselective isomerization at carbon atom vicinal to doubly bonded tertiary carbon atom by sulfur dioxide catalysis. 4,190,612, Cl. 585-378.000.

Mason, LeRoy W.; and Furrer, Frederick J., to Flambeau Products Corporation. Beverage container. 4,190,173, Cl. 220-203.000.

Massa, Frank, to Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The. Electroacoustic transducers of the bi-laminar flexural vibrating type with an acoustic delay line. 4,190,783, Cl. 310-324.000.

Massa, Frank, to Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The. Piezoelectric electroacoustic transducers of the bi-laminar flexural vibrating type. 4,190,784, Cl. 310-324.000.

Massachusetts General Hospital: *See—*
Seldin, Edward B., 4,189,835, Cl. 433-214.000.

Massey, James V., III: *See—*
Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C., 4,190,328, Cl. 350-320.000.

Masson Scott Thrissell Engineering, Ltd.: *See—*
Calvert, Edward G., 4,189,967, Cl. 83-665.000.

Masters, Carson W., III. Shower shield. 4,189,790, Cl. 4-149.000.

Masuda, Yoshinori: *See—*
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.

Masumoto, Hiroki: *See—*
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.

Mathbirk Limited: *See—*
Matthews, Denis, 4,190,009, Cl. 112-262.100.

Matsuda, Akira: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Matsuda, Chiaki, to Mazda Cartex Company, Limited. Random automatic selector. 4,190,164, Cl. 209-610.000.

Matsuda, Mutsuhide: *See—*
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,190,338, Cl. 354-106.000.

Matsui, Mikihiro: *See—*
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.

Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, to Takeda Chemical Industries, Ltd. Uracil derivatives and production thereof. 4,190,656, Cl. 424-251.000.

Matsuo, Takehiko: *See—*
Takahashi, Teruomi; and Matsuo, Takehiko, 4,190,445, Cl. 430-66.000.

Matsushita Electric Corp. of America: *See—*
Dorren, Louis, 4,190,737, Cl. 179-1.0GH.

Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, to Tokuyama Soda Kabushiki Kaisha. Electrolytic cell. 4,190,514, Cl. 204-242.000.

Matsuura, Shunji: *See—*
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.

Matthews, Denis, to Mathbirk Limited. Linking machines. 4,190,009, Cl. 112-262.100.

Matz, Bruno: *See—*
Kearney, Dolores C.; and Matz, Bruno, 4,190,093, Cl. 164-34.000.

Mauer, Dieter, to USM Corporation. Fastener. 4,189,978, Cl. 85-72.000.

Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Maurer, Gernant E.: *See—*
Boesch, William J.; and Maurer, Gernant E., 4,190,437, Cl. 75-122.000.

May, Russell R.: *See—*
Hoekje, Howard H.; and May, Russell R., 4,190,638, Cl. 423-473.000.

Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete: *See—*
Wonisch, Franz, 4,190,034, Cl. 126-25.00B.

Mazda Cartex Company, Limited: *See—*
Matsuda, Chiaki, 4,190,164, Cl. 209-610.000.

Maze, Perry V. Gable ventilators. 4,189,989, Cl. 98-42.00R.

MCA Discovision, Inc.: *See—*
Somers, Frank J.; and Winslow, John S., 4,190,860, Cl. 358-128.500.

McAllister, James E.: *See—*
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

McCarthy, Edward F., to Gillette Company, The. Steam facial apparatus. 4,190,052, Cl. 128-368.000.

McCord Corporation: *See—*
Flanagan, Kirby E. L., 4,190,712, Cl. 521-137.000.

McCord, Michael A.: *See—*
Moulds, Frank G.; and McCord, Michael A., 4,189,898, Cl. 53-446.000.

McCormick, Paul O.: *See—*
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

McCoy, Clifford W.: *See—*
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.

McDaniel, Max P., to Phillips Petroleum Co. Preparation of inorganic xerogels. 4,190,457, Cl. 106-122.000.

McDonough Power Equipment, Division of Fuqua Industries, Inc.: *See—*
Jackson, Harold P.; and Rhinehart, Richard W., 4,189,903, Cl. 56-255.000.

McGarrity, Richard P.: *See—*
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McKay, Dwight L.: *See—*
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.

McKibbin, John R.; and Tyler, Frederick B., Jr. Apparatus for guiding a tool in a linear path relative to a work piece, and method of manufacture thereof. 4,190,236, Cl. 266-69.000.

McKinnon, Alan A.: *See—*
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.

McManamy, Thomas A.: *See—*
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

McManus, Ira J. Composite system for floor frame members. 4,189,883, Cl. 52-250.000.

McNab, Incorporated: *See—*
Diamond, Joseph M., 4,190,827, Cl. 340-500.000.

Mead Corporation, The: *See—*
Bahl, Surinder K.; and Leach, Gale L., 4,190,489, Cl. 156-664.000.
Oliff, James R.; and Watkins, Richard K., 4,190,149, Cl. 206-145.000.

Medici, Italo: *See—*
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.

Medina, Alvaro. Automatic digital water control system. 4,190,884, Cl. 364-104.000.

Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., to International Telephone and Telegraph Corporation. Integrated high capacity compressor. 4,190,402, Cl. 417-415.000.

Mefina S.A.: *See—*
Baruffa, Olindo, 4,190,008, Cl. 112-158.00B.

Meier, Hanspeter: *See—*
Schnellmann, Ferdinand; and Meier, Hanspeter, 4,190,544, Cl. 210-461.000.

Meir, Robert A.: *See—*
Moody, George W.; and Meir, Robert A., 4,189,918, Cl. 60-398.000.

Meisenberg, Ralf, to O. Dorries GmbH. Process and apparatus for production of faced or laminated sheets. 4,190,478, Cl. 156-252.000.

Mellor, Leslie, to Edgar Pickering (Blackburn) Limited. Tufting machines. 4,190,006, Cl. 112-79.00R.

Mena, Andre: *See—*
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Meng, Ilse H. F., heiress: *See—*
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Meng, Karl-August, deceased: *See—*
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Menzel, Paul B. Litter and refuse receptacle and separator. 4,190,525, Cl. 209-235.000.

Mera, Yoichi: *See—*
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Merat, Jean-Pierre; and Wiel, Gaston. Apparatus for de-aerating and vacuuming packing with tight closing anti-pollution device. 4,189,899, Cl. 53-570.000.

Merck & Co., Inc.: *See—*
DeMarco, Joseph; and Brenner, Gerald S., 4,190,655, Cl. 424-250.000.
Veber, Daniel F., 4,190,648, Cl. 424-177.000.

Merianos, John J.: *See—*
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Merrell, Patrick F.: *See—*
Avina, Raymond; and Merrell, Patrick F., 4,190,870, Cl. 360-98.000.

Merrell Toraude et Compagnie: *See—*
Metcalf, Brian W.; and Jung, Michel, 4,190,586, Cl. 260-326.450.

Mesaros, Louis; and Mollard, Paul, to Produits Chimiques Ugine Kuhlmann. Processes for preparing sodium percarbonate. 4,190,635, Cl. 423-415.00P.
Messer Griesheim GmbH: *See—*
Soecknick, Erhard; and Weimar, Erich, 4,190,473, Cl. 156-80.000.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
Bielefeldt, Ernst-August, 4,190,078, Cl. 137-561.00R.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Baum, Werner; and Munding, German, 4,190,121, Cl. 175-14.000.
Metal Bellows Corporation: *See—*
Sampson, Edward J., 4,190,048, Cl. 128-215.000.
Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Acetylenic derivatives of α-amino acids. 4,190,586, Cl. 260-326.450.
Metzger, Karl G.: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Mezogazdasagi Foiskola, Kaposvar: *See—*
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.
Michaels, Robert L.: *See—*
Robillard, David R.; and Michaels, Robert L., 4,189,825, Cl. 29-574.000.
Michalik, Horst B.; and Weschenfelder, Otto T., to Koenig & Bauer Aktiengesellschaft. Folder assembly for book folding. 4,190,243, Cl. 270-66.000.
Microdot Mfg., Inc.: *See—*
Zitting, Gordon T., 4,190,259, Cl. 277-165.000.
Mikelsons, Valdis: *See—*
Dorer, Gary L.; and Mikelsons, Valdis, 4,190,321, Cl. 350-165.000.
Mikulic, Kreso. Alternating current motor with adjustable output torque by means of adjustable magnetic bars. 4,190,794, Cl. 318-831.000.
Miles, Brynley J.: *See—*
Thomson, Alan R.; and Miles, Brynley J., 4,190,576, Cl. 260-122.000.
Miles Laboratories, Inc.: *See—*
Bauer, Robert, 4,190,419, Cl. 23-230.00B.
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., to United States of America, Navy. Protected calcium anode. 4,190,704, Cl. 429-103.000.
Mileti, Robert A., to Fibco Inc. Impact attenuator. 4,190,275, Cl. 293-102.000.
Miller, Arthur F.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Miller, Gabriel L.; and Robinson, David A. H., to Bell Telephone Laboratories, Incorporated. Noncontacting measurement of hall effect in a wafer. 4,190,799, Cl. 324-239.000.
Miller, Joseph N.: *See—*
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 4,190,192, Cl. 232-17.000.
Miller, Miles C.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 4,190,476, Cl. 156-218.000.
Miller, Robert E.: *See—*
Follin, James W.; and Miller, Robert E., 4,190,818, Cl. 367-138.000.
Miller, Stephen H.: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.
Miller, Stephen J.; and Hughes, Thomas R., to Chevron Research Company. Combination process for upgrading naphtha. 4,190,519, Cl. 208-79.000.
Milsco Manufacturing Company: *See—*
Ahrens, John R., 4,190,697, Cl. 428-315.000.
Minnesota Mining and Manufacturing Company: *See—*
Campbell, Douglas D., 4,190,550, Cl. 252-93.000.
Dorer, Gary L.; and Mikelsons, Valdis, 4,190,321, Cl. 350-165.000.
Roswell, Terry E., 4,189,800, Cl. 7-107.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Mobius strip bandsaw blade. 4,189,968, Cl. 83-816.000.
Mitchell, Wayne R., to Prismo Universal Corporation. Road marking apparatus and method. 4,190,205, Cl. 239-129.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.
Mitsubishi Petrochemical Company Limited: *See—*
Samejima, Hiroshi; and Kanayama, Kaoru, 4,190,719, Cl. 528-103.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
Mitsuhashi, Yoshinobu: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Ito, Akira; and Iwata, Kenji, 4,190,614, Cl. 525-106.000.
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.
Mitsuma, Tatsuya: *See—*
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Mitsumi Electric Co., Ltd.: *See—*
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.
Miura, Mitsuo: *See—*
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Miura, Motohisa, to Nippondenso Co., Ltd. Secondary air supply system for an internal combustion engine. 4,189,915, Cl. 60-290.000.
Miyaguchi, Masao: *See—*
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Miyamoto, Koichi: *See—*
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Miyashita, Osamu: *See—*
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Mizuhata, Teruo: *See—*
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Mizuse, Tomio: *See—*
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Mjulendorf, Oleg S.: *See—*
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Mobay Chemical Corporation: *See—*
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Mobil Oil Corporation: *See—*
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,190,588, Cl. 260-343.600.
Moebius, Kurt O. Hydraulic assembly tool for tube fittings. 4,189,817, Cl. 29-237.000.
Mohasco Corporation: *See—*
Crawford, Allan H., 4,190,282, Cl. 297-68.000.
Mohawk Data Sciences Corp.: *See—*
Morreall, Donald R.; and Deuel, Ronald F., 4,189,998, Cl. 101-93.310.
Mohler, Sailor. Polarized windshield indicia reflection display system. 4,190,832, Cl. 340-705.000.
Mollard, Paul: *See—*
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Molleken, Reiner: *See—*
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Monitor Labs, Inc.: *See—*
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Monsanto Company: *See—*
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.
Feiler, William A., 4,190,634, Cl. 423-321.00S.
Forster, Denis, 4,190,729, Cl. 560-232.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., to Bio-Rad Laboratories, Inc. Electrophoresis apparatus. 4,190,517, Cl. 204-299.00R.
Moody, George W.; and Meir, Robert A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the. Devices for extracting energy from wave power. 4,189,918, Cl. 60-398.000.
Moore, Fred H.: *See—*
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Moreno, Isabel L., to Ford Motor Company. Thermal compensator assembly. 4,190,325, Cl. 350-253.000.
Morgan, William A.: *See—*
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Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Preparation of 1,1,1-trihalogeno-4-methyl-3-penten-2-ol. 4,190,730, Cl. 568-845.000.
Mori, Yasunori: *See—*
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Morikawa, Takitaro: *See—*
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Morooka, Tsutomu: *See—*
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Morreall, Donald R.; and Deuel, Ronald F., to Mohawk Data Sciences Corp. Print hammer and interposer captivating linkage. 4,189,998, Cl. 101-93.310.
Morrow, Warren P., to Scotco, Inc. Rail clip assembly. 4,190,200, Cl. 238-349.000.
Morse, David L.: *See—*
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.
Moss, Charles A.; and Andrews, Boley A., to Vendo Company, The. Apparatus for storing and dispensing generally cylindrical products. 4,190,179, Cl. 221-299.000.
Moss, Gerald E.; and Stevens, Everett E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Divider network. 4,190,816, Cl. 333-131.000.
Motegi, Masahiko: *See—*
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Motorola, Inc.: *See—*
Kilar, Joseph H., 4,190,754, Cl. 200-329.000.
Levine, Stephen N., 4,190,802, Cl. 325-320.000.
Powell, Michael W., 4,190,849, Cl. 357-23.000.
Moulds, Frank G.; and McCord, Michael A., to Diamond International Corporation. Egg packer. 4,189,898, Cl. 53-446.000.
Moulin, Pierre A., to Schlumberger Technology Corporation. Method and apparatus for automatically inscribing magnetic marks on a wireline. 4,190,868, Cl. 360-1.000.
Moutz, John A. Coaster-sled board. 4,190,261, Cl. 280-87.010.
Mt. Pitt Company, The: *See—*
Collins, Edward H., 4,190,165, Cl. 211-60.00R.
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, to Vyzkumny ustav kozedelny. Fibered sheet material imitating natural leather and method for continuous manufacture thereof. 4,190,694, Cl. 428-212.000.
Mudge, J. Craig, to Digital Equipment Corporation. High speed parallel multiplication apparatus with single-step summand reduction. 4,190,894, Cl. 364-758.000.
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., to Dow Chemical Company, The. Catalyst activation in oxidation process. 4,190,605, Cl. 260-600.00R.
Mues, Gunther: *See—*
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Muis, Louis H. Protective composition and method. 4,190,686, Cl. 427-317.000.
Mukasa, Kikuei: *See—*
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Mullane, George W.; and Harrison, Earl K. Single-point cutting tool. 4,190,388, Cl. 408-188.000.
Muller, Heinz: *See—*
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Muller, Helmut: *See—*
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Munding, German: *See—*
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Munro, Graham D.: *See—*
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Murakami, Kazuo: *See—*
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Murata, Moriyasu; and Sai, Fumio, to Kao Soap Co., Ltd. Granular or powdery detergent composition of high fluidity. 4,190,551, Cl. 252-99.000.
Murata, Moriyoshi: *See—*
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Muscatine Lighting Manufacturing Co.: *See—*
Drost, James L.; and Gordin, Myron K., 4,190,881, Cl. 362-250.000.
Mustang Services Company: *See—*
Baldwin, John R., 4,189,843, Cl. 33-199.00R.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with pentadiene. 4,190,610, Cl. 585-361.000.
Myers, Harry K., Jr.: *See—*
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Nakakita, Tsuneo: *See—*
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Nakamura, Yoshihiko; and Nagano, Masashi, to Shimano Industrial Company, Limited. Speed control device for a bicycle. 4,189,954, Cl. 74-488.000.
Nakano, Masaaki: *See—*
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Nakashima, Kunimichi: *See—*
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Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, to Nippon Kayaku Kabushiki Kaisha. Coriolin derivatives and process for producing the same. 4,190,589, Cl. 260-343.600.
Nakazawa, Nobuhiko: *See—*
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Nalco Chemical Company: *See—*
Kaplan, Roy I., 4,190,463, Cl. 134-3.000.
Naoi, Takashi; and Horie, Ikutaro, to Fuji Photo Film Co., Ltd. Antiadhesive photographic materials and method of improving antiadhesive property of photographic light-sensitive materials. 4,190,449, Cl. 430-539.000.
National Engineering Company: *See—*
Rikker, Leslie D., 4,190,369, Cl. 366-16.000.
National Research Development Corporation: *See—*
Pyne, Clive R.; and Welsh, Barry L., 4,190,804, Cl. 328-3.000.
National Research Institute for Metals: *See—*
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National Semiconductor Corporation: *See—*
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Nau, Hans-Heinrich: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.
NCR Corporation: *See—*
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Neal, Robert L.: *See—*
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Negishi, Yasuo: *See—*
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Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, to Chemische Werke Huls AG. Process for working up distillation residues from the hydroformylation of propene. 4,190,731, Cl. 568-914.000.
Nelms, Thomas G., to Rolex Paper Company Ltd. Tubular containers. 4,190,187, Cl. 229-5.500.
Nelson, Colin: *See—*
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Nelson, Frank: *See—*
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Nelson, Philip A. Bounceless high pressure drop cascade impactor and a method for determining particle size distribution of an aerosol. 4,189,937, Cl. 73-28.000.
Nelson Research & Development Company: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,190,673, Cl. 424-324.000.
Netes, Leonid Y.: *See—*
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Neufang, Karlheinz: *See—*
Schlichte, Max; and Neufang, Karlheinz, 4,190,740, Cl. 179-15.0AT.
Neumann, Herwig. Concrete construction element system for erecting plant accommodating walls. 4,190,384, Cl. 405-284.000.
Neumann, Werner: *See—*
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.
New Hampshire Ball Bearings, Inc.: *See—*
Scalzi, Louis M., 4,190,300, Cl. 308-4.00A.
Neyenhuys, Theodoor. Method and apparatus for assembling reels. 4,189,823, Cl. 29-464.000.
Nibby, Chester M., Jr.: *See—*
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,190,901, Cl. 365-72.000.
Nicholson, Charles B., to Albany International Corp. Shower nozzle for fabric conditioner. 4,190,204, Cl. 239-109.000.
Nicholson, Terence P., to Corru-Seals Inc. Method of manufacturing metallic spirally wound gaskets. 4,189,819, Cl. 29-417.000.

Nieberle, Juergen: *See—*
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.

Nieder, Charles E. Rock splitting attachment for a breaking hammer. 4,190,293, Cl. 299-23.000.

Niederhauser, Donald O., to Du Pont de Nemours, E. I., and Company. Hydraulically needling fabric of continuous filament textile and staple fibers. 4,190,695, Cl. 428-234.000.

Niedermeyer, William P. Solar energy collector-light emitting panel. 4,190,036, Cl. 126-439.000.

Niedermeyer, William P. Solar energy collector. 4,190,037, Cl. 126-438.000.

Niedziejko, Edward M.: *See—*
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.

Niemeijer, Klaas B., to Koninklijke Scholten-Honig N.V. Radial multihydrocyclone. 4,190,523, Cl. 209-211.000.

Nihon Takushu Noyaku Seizo K.K.: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.

Nikitkin, Vasily D.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Nilsson, Olle: *See—*
Hard af Segerstad, Sverker; and Nilsson, Olle, 4,190,367, Cl. 356-354.000.

Nippon Electric Co., Ltd.: *See—*
Shintaku, Keiichi, 4,190,511, Cl. 204-192.00P.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Katayama, Shinji; and Murakami, Kazuo, 4,189,969, Cl. 84-1.140.
Mantani, Rokurota, 4,189,971, Cl. 84-1.240.
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,189,972, Cl. 84-1.250.

Nippon Kayaku Kabushiki Kaisha: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Nippon Kogaku K.K.: *See—*
Maida, Osamu, 4,190,340, Cl. 354-173.000.
Sugimori, Shiro, 4,190,341, Cl. 354-173.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.

Nippon Steel Bolten Company Ltd.: *See—*
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.

Nippon Steel Corporation: *See—*
Kitayama, Minoru; and Nakamura, Motoharu, 4,190,468, Cl. 148-12.00A.
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.

Nippondenso Co., Ltd.: *See—*
Miura, Motohisa, 4,189,915, Cl. 60-290.000.

Nishida, Takashi: *See—*
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.

Nishimura, Michio: *See—*
Fujikawa, Tetsuzo; and Nishimura, Michio, 4,190,023, Cl. 123-41.720.

Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, to Kuraray Co., Ltd. Method of producing a leather-like sheet with a delicate appearance and a deluxe hand. 4,190,572, Cl. 264-46.400.

Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, to Nippon Steel Corporation; and Nippon Steel Bolten Company Ltd. Screwed connection having improved fatigue strength. 4,189,975, Cl. 85-1.00T.

Nitta, Tomio, to Tokai Seiki Co., Ltd. Disposable cigarette gas lighter with snuffing cover. 4,190,412, Cl. 431-151.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.

NL Industries, Inc.: *See—*
Backus, Harold A., 4,189,805, Cl. 16-130.000.

Noel Bibby Limited: *See—*
Bibby, Noel, 4,190,010, Cl. 112-419.000.

Noerager, Jere A.: *See—*
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Noll, Klaus; and Pedain, Josef, to Bayer Aktiengesellschaft. Water-dispersible polyurethanes. 4,190,566, Cl. 260-29.2TN.

Nomura, Katsuhiko: *See—*
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.

Norberg, Lars-Gunnar: *See—*
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.

North, John W. Process and apparatus for producing cellulated vitreous refractory material in prescribed shapes and products therefrom. 4,190,416, Cl. 432-128.000.

Northern Illinois Gas Company: *See—*
Long, George, 4,189,925, Cl. 60-652.000.

Northwest Sanitation Products, Inc.: *See—*
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., 4,189,793, Cl. 4-228.000.

Nougarede, Francis: *See—*
Despois, Jacques; and Nougarede, Francis, 4,190,099, Cl. 165-45.000.

Noveroske, Robert L.: *See—*
Fenstermacher, Myk R.; and Noveroske, Robert L., 4,190,662, Cl. 424-263.000.

Nozaki, Mineo; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Printer. 4,189,997, Cl. 101-93.090.

NSK-Warner K. K.: *See—*
Ueda, Takeo, 4,190,213, Cl. 242-107.40A.

Nystrom, Walther: *See—*
Jones, Robert E., Jr.; and Nystrom, Walther, 4,190,872, Cl. 360-125.000.

O. Dorries GmbH: *See—*
Meisenberg, Ralf, 4,190,478, Cl. 156-252.000.

O'Connor, William M., to Avco Corporation. Filter system for agricultural aircraft. 4,190,217, Cl. 244-53.00B.

Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, to Mitsumi Electric Co., Ltd. Miniature variable capacitor. 4,190,877, Cl. 361-298.000.

O'Dell, Larry A., to Dresser Industries, Inc. Apparatus for interconnecting segmented cutter drums of a rotary cutter mechanism. 4,190,296, Cl. 299-89.000.

Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., to Baker International Corporation. Well bore apparatus with hydraulically releasable tubing seal unit. 4,190,107, Cl. 166-120.000.

Odstrchel, Gerald: *See—*
Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.

Oelke, Waldemar W.; and Poplawsky, Ralph C., to Libbey-Owens-Ford Company. Method of and apparatus for thermally cutting glass. 4,190,184, Cl. 225-2.000.

Officine Cimbali Giuseppe S.p.A.: *See—*
Haddad, Adrien, 4,189,991, Cl. 99-302.00R.

Ogawa, Haruo: *See—*
Sugai, Hiroshi; and Ogawa, Haruo, 4,189,836, Cl. 433-127.000.

Ogawa, Hiroshi: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.

Ogawa, Ryota; and Itoh, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle zoom lens with high zoom ratio. 4,190,323, Cl. 350-184.000.

Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis of sodium chloride in an ion-exchange membrane cell. 4,190,505, Cl. 204-98.000.

Ohashi, Shin-Ichi: *See—*
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.

Ohmori, Koichiro, to Honshuseishi Kabushiki Kaisha. Container and cone for same. 4,190,188, Cl. 229-5.600.

Ohmura, Hidemasa; and Saito, Masahiro, to Kao Soap Co., Ltd. Aqueous cationic polyurethane emulsion with glycidyl ether curing agent. 4,190,567, Cl. 260-29.2TN.

Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser COM with line deflection mirror inertia compensation. 4,190,867, Cl. 358-285.000.

Ohno, Yukihiro; and Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Slider reciprocating driving apparatus for use with electrophotographic copying machine. 4,190,349, Cl. 355-8.000.

Okamoto, Satoru: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Oku, Toshio: *See—*
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Okuli Oy: *See—*
Halonen, Tuomo, 4,190,190, Cl. 229-17.00R.

Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Data recording camera. 4,190,338, Cl. 354-106.000.

Oliff, James R.; and Watkins, Richard K., to Mead Corporation, The. Article carrier and blank therefor. 4,190,149, Cl. 206-145.000.

Oliva, Richard A. Method for removing restorations from teeth. 4,189,838, Cl. 433-167.000.

Olsen, C. Eric, to California Medical Developments, Inc. Sponge disposal tray. 4,190,153, Cl. 206-362.000.

Olson, Donald N.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 4,190,476, Cl. 156-218.000.

Olsson, Torsten, to Aktiebolaget ASEA-ATOM. Spacer with polygonal interconnetors. 4,190,494, Cl. 176-76.000.

Olympus Optical Company, Ltd.: *See—*
Maitani, Yoshihisa, 4,190,335, Cl. 354-34.000.

O'Meara, William R.: *See—*
Buescher, Eugene J., 4,190,162, Cl. 206-625.000.

O'Melia, Lawrence: *See—*
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.

Omura, Yoshiaki: *See—*
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.

O'Neal, Winston R.; and Richardson, Stephen L., to Black Diamond Service Company, Inc. Mine roof bolter. 4,190,116, Cl. 173-38.000.

O'Neil, Roderick J. Nose pad for eyeglass frames. 4,190,334, Cl. 351-137.000.

Onosovsky, Evgeny V.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Orita, Naoki, to Amada Company, Limited. Method and devices for safety for mechanical presses. 4,190,143, Cl. 192-145.000.

Osaka Gas Company, Ltd.: *See—*
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, 4,190,554, Cl. 252-412.000.

Oshima, Kohei: *See—*
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.

Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, to American Can Company. Pouch. 4,190,477, Cl. 156-244.110.

Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, to AEG-Kanis Turbinenfabrik GmbH. Method for manufacturing single stage geared turbines. 4,189,813, Cl. 29-156.80R.

Ota, Yoshihiko, to Victor Company of Japan, Ltd. Slow motion tape driving system in a recording and/or reproducing apparatus. 4,190,869, Cl. 360-10.000.

Otis, Roger W.; and Otis, Stephen H. Floating dry storage facility for small boats. 4,190,013, Cl. 114-263.000.

Otis, Stephen H.: *See—*
Otis, Roger W.; and Otis, Stephen H., 4,190,013, Cl. 114-263.000.

Ottos, James G., to RCA Corporation. Apparatus and method for automatically aligning a multibeam electron gun assembly with a cathode-ray tube bulb. 4,189,814, Cl. 29-25.160.

Oude Alink, Bernardus A., to Petrolite Corporation. Dithioles. 4,190,727, Cl. 549-36.000.

Owa, Kaoru: *See—*
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, 4,190,889, Cl. 364-474.000.

Owens-Illinois, Inc.: *See—*
Boling, Norman L., 4,190,465, Cl. 136-89.0FC.

Oxy-Catalyst, Inc.: *See—*
Retallick, William B., 4,190,559, Cl. 252-477.00R.

Ozaki, Yasutaka: *See—*
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Paden, Jack R. Smoking device. 4,190,062, Cl. 131-180.000.

Padula, William V., I: *See—*
Padula, William V., II; and Padula, William V., I, 4,190,331, Cl. 351-5.000.

Padula, William V., II; and Padula, William V., I. Ophthalmic measuring instrument with angle measuring means. 4,190,331, Cl. 351-5.000.

Paker, Alexander D. Leaf mulcher attachment for lawn mowers. 4,189,904, Cl. 56-255.000.

Pallaske, James: *See—*
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.

Panepinto, William, Jr.: *See—*
Joyce, Thomas F.; and Panepinto, William, Jr., 4,190,885, Cl. 364-200.000.

Panetti, Romolo, to Speno International S.A.; and Frank Speno Railroad Ballast Cleaning Co. Inc. Machine for truing the bearing surface of the rails of a railroad track. 4,189,873, Cl. 51-178.000.

Pao, Joseph Y. C.: *See—*
Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W., 4,190,746, Cl. 179-115.50R.

Paret, Dana C. Cigarette dispensing apparatus. 4,190,145, Cl. 194-1.00P.

Parker, Louis W.; and Hedges, Rhey W., to Parker, Louis W. Energy economizer for induction motors. 4,190,793, Cl. 318-800.000.

Parker, Raymond E.: *See—*
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.

Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., to Dynapol. Polymeric agent for releasing 5-aminosalicylic acid or its salts into the gastrointestinal tract. 4,190,716, Cl. 525-334.000.

Pasold, Raymond. Anti-static device for clothes dryers. 4,190,874, Cl. 361-212.000.

Passler, Helmar: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Pastor, Antonio C.: *See—*
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,487, Cl. 156-617.0SP.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,640, Cl. 423-500.000.

Pastor, Ricardo C.; and Pastor, Antonio C., to Hughes Aircraft Company. Reactive atmosphere processing method of crystal growth of alkaline earth chlorides. 4,190,487, Cl. 156-617.0SP.

Pastor, Ricardo C.; and Pastor, Antonio C., to Hughes Aircraft Company. Generation of nascent bromine for use in the growth of ultra pure metal bromides. 4,190,640, Cl. 423-500.000.

Patel, Jayantilal N.: *See—*
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.

Patel, Kiritkumar R.: *See—*
Collins, Marcus H.; and Patel, Kiritkumar R., 4,190,136, Cl. 188-367.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,190,442, Cl. 75-252.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,190,443, Cl. 75-252.000.

Patitz, Ellen: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Patterson, Merle W. Earth anchor. 4,189,879, Cl. 52-161.000.

Paul Wurth, S.A.: *See—*
Mailliet, Pierre; and Kirchen, Michel, 4,190,074, Cl. 137-315.000.

Paxall Inc.: *See—*
Silver, Stanley M., 4,189,986, Cl. 93-36.00M.

Payn, Christian: *See—*
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Pearce, Junior B. Wheelbarrow apparatus. 4,190,260, Cl. 280-47.310.

Pebler, Alfred R., to Westinghouse Electric Corp. Combustibles sensor. 4,190,499, Cl. 204-1.00T.

Pecoraro, Irmo. Complex structure obtained from the utilization of particular clamps. 4,189,884, Cl. 52-285.000.

Pedain, Josef: *See—*
Noll, Klaus; and Pedain, Josef, 4,190,566, Cl. 260-29.2TN.

Pederson, Jerard M.; and Beckman, William J., Jr. Waste water treatment apparatus. 4,190,543, Cl. 210-332.000.

Pehr, Harold T. Tamperproof package. 4,190,169, Cl. 215-252.000.

Pentapharm A.G.: *See—*
Svendsen, Lars G., 4,190,574, Cl. 260-112.50R.

Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., to Andrew Adams Developing Corporation. Method of fastening and unfastening snap fasteners. 4,189,822, Cl. 29-453.000.

Peter, Bruno E.: *See—*
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

Peter Wukovich OHG: *See—*
Bleyer, Franz, 4,189,935, Cl. 72-452.000.

Petersen, Uwe: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.

Peterson, Bertil G., to Tobin-Arp Manufacturing Company. Cylinder head support with air cushion and vacuum hold down. 4,190,240, Cl. 269-21.000.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,190,644, Cl. 424-70.000.

Petroleo Brasileiro S.A.-Petrobas: *See—*
Bruening, Wilhelm; and Bruening, Inai M. R. deA., 4,190,425, Cl. 55-67.000.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A., 4,190,727, Cl. 549-36.000.

Pfannmuller, Joachim: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Philippi, George J. Trolley-swing. 4,190,248, Cl. 272-87.000.

Phillips Petroleum Company: *See—*
Barton, Hugh M., Jr., 4,190,109, Cl. 166-270.000.
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.
DeForest, Laurence R., 4,190,189, Cl. 229-5.600.
McDaniel, Max P., 4,190,457, Cl. 106-122.000.

Piber, Earl T., to Eaton Corporation. Snap-action switch of the roller contact type. 4,190,750, Cl. 200-67.0AA.

Pile, Ira: *See—*
Conti, Angelo J.; and Pile, Ira, 4,189,795, Cl. 4-324.000.

Pillsbury Company, The: *See—*
Turpin, Charles H.; and Hoese, Thomas C., 4,190,757, Cl. 219-10.55E.

Pioneer Cover-All, Inc.: *See—*
Bachand, Ernest C., 4,190,526, Cl. 209-245.000.

Pitchon, Esra: *See—*
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.

Pitney-Bowes, Inc.: *See—*
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.
Macaluso, Paul J.; and Clifford, Lawrence E., 4,190,351, Cl. 355-15.000.

Pittinger, Charles B., Jr. Self-threading filament trimmer system. 4,189,830, Cl. 30-276.000.

Plainer, Hermann: *See—*
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.

Platt, Leland H., Jr. Apparatus and method to twist tie articles. 4,189,900, Cl. 53-583.000.

Plattier, Marcel: *See—*
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.

Plessey Handel und Investments A.G.: *See—*
Brettle, Jack; and Jackson, Norman F., 4,190,315, Cl. 350-96.120.

Pleus, Edwin F., to Aunt Nellie's Foods, Inc. Method and apparatus for dewatering vegetables and the like. 4,190,678, Cl. 426-478.000.

Pleuss, Mark E., to American Hospital Supply Corporation. Adjustable column. 4,190,377, Cl. 403-108.000.

Ploeger, Kenneth C. Wheel bearing pressure lubricator. 4,190,133, Cl. 184-1.00D.

Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., to GTE Sylvania Incorporated. Isolator circuit for use with frequency sensitive switching circuit. 4,190,790, Cl. 315-313.000.

Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V. Multipoint measuring device. 4,190,776, Cl. 307-112.000.
Poettgen, Anton J. Flail shredder. 4,189,901, Cl. 56-10.400.
Poggemiller, Randy L.: *See—*
Herzog, Stanley M.; and Poggemiller, Randy L., 4,190,394, Cl. 414-786.000.
Pohl, Andreas P. I., to Duvelius, Rembert; and Von Stosch, Rudiger Graf. Press for producing shaped articles. 4,190,484, Cl. 156-580.000.
Polaroid Corporation: *See—*
Buzzell, Harold O., 4,190,418, Cl. 8-4.000.
Poller, Dieter: *See—*
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.
Poon, Ching C.: *See—*
Pun, Ching W.; and Poon, Ching C., 4,190,702, Cl. 429-4.000.
Poplawsky, Ralph C.: *See—*
Oelke, Waldemar W.; and Poplawsky, Ralph C., 4,190,184, Cl. 225-2.000.
Potter, Robert H., to Auto Specialties Manufacturing Company. Method of manufacturing screw jack tubes. 4,189,821, Cl. 29-432.000.
Powell, Michael W., to Motorola, Inc. Electronic-beam programmable semiconductor device structure. 4,190,849, Cl. 357-23.000.
Powers, Samuel T., to Albuquerque Patents, Ltd. Wheelchair with shock absorber. 4,190,263, Cl. 280-242.0WC.
PPG Industries, Inc.: *See—*
Hoekje, Howard H.; and May, Russell R., 4,190,638, Cl. 423-473.000.
Preston, John L., Jr., to United Technologies Corporation. Method for producing hydrogen. 4,190,641, Cl. 423-653.000.
Prisma Neon AB: *See—*
Ahlgren, Stig B., 4,189,859, Cl. 40-505.000.
Prismo Universal Corporation: *See—*
Mitchell, Wayne R., 4,190,205, Cl. 239-129.000.
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, to Mobay Chemical Corporation; and Bayer Aktiengesellschaft. Process for dyeing and printing sheets. 4,190,417, Cl. 8-2.50R.
Produits Chimiques Ugine Kuhlmann: *See—*
Mesaros, Louis; and Mollard, Paul, 4,190,635, Cl. 423-415.00P.
Pronko, Vladimir G.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Provenzano, Jack. Astrological device. 4,189,853, Cl. 35-44.000.
Prussin, Samuel: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.
Pryke, David S.: *See—*
Pryke, John F. S.; and Pryke, David S., 4,190,383, Cl. 405-252.000.
Pryke, John F. S.; and Pryke, David S., to Pynford Limited. Structural element. 4,190,383, Cl. 405-252.000.
Pun, Ching W.; and Poon, Ching C. Batteries. 4,190,702, Cl. 429-4.000.
Purdy, John W., to Wesgar Industries Ltd. Adapter for exhaust actuated devices. 4,190,269, Cl. 285-38.000.
Pyne, Clive R.; and Welsh, Barry L., to National Research Development Corporation. Signal-conditioning circuits. 4,190,804, Cl. 328-3.000.
Pynford Limited: *See—*
Pryke, John F. S.; and Pryke, David S., 4,190,383, Cl. 405-252.000.
R A Electronics, Inc.: *See—*
Kemp, James A., 4,190,838, Cl. 343-18.00E.
R.W. Hartnett Company: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,189,996, Cl. 101-37.000.
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., to Gallaher, Kantlehner & Associates, Inc. Manufacture of sealed-end tubular thermoplastic net bagging. 4,190,690, Cl. 428-35.000.
Rabinowitz, Mario. Persistent current superconducting method and apparatus. 4,190,817, Cl. 335-216.000.
Racz, Janos A.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.
Rank Xerox Limited: *See—*
Murayama, Yuichi; and Sugiyama, Terumasa, 4,190,359, Cl. 355-75.000.
Sasuga, Kazuyasu, 4,190,246, Cl. 271-145.000.
Sasuga, Kazuyasu, 4,190,358, Cl. 355-75.000.
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., to Exxon Research & Engineering Co. Solid state cell with alkali metal halo-alkali thiocyanate electrolyte. 4,190,706, Cl. 429-191.000.
Rapicom, Inc.: *See—*
Weber, Donald R., 4,190,824, Cl. 340-347.0AD.
Rasche, Peter: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Rauf, James P.: *See—*
Corsmeier, Robert J.; and Rauf, James P., 4,190,398, Cl. 415-114.000.
Ravallo, Robert J., to General Foods Corporation. Plant care composition. 4,190,427, Cl. 71-29.000.
Ravallo, Robert J.: *See—*
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.
Raytheon Company: *See—*
Bowen, Robert F.; and Knight, Philip A., Jr., 4,190,077, Cl. 137-550.000.
Robillard, David R.; and Michaels, Robert L., 4,189,825, Cl. 29-574.000.
RCA Corporation: *See—*
Bendell, Sidney L., 4,190,865, Cl. 358-219.000.
Checki, Angelo, Jr., 4,190,735, Cl. 174-52.0FP.
Dischert, Robert A.; and Thorpe, Laurence J., 4,190,863, Cl. 358-210.000.
Dischert, Robert A., 4,190,864, Cl. 358-210.000.
Hicks, James E., 4,190,791, Cl. 315-408.000.
Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, Lee R., 4,189,940, Cl. 73-117.300.
Ottos, James G., 4,189,814, Cl. 29-25.160.
Spong, Fred W., 4,190,843, Cl. 346-1.100.
Sterzer, Fred, 4,190,053, Cl. 128-399.000.
Recaro GmbH & Co.: *See—*
Schmidhuber, Karl; and Lehmann, Hans D., 4,190,284, Cl. 297-194.000.
Strien, Werner, 4,190,290, Cl. 297-408.000.
Redemann, Peter, to Schering, A.G. Workplace equipment. 4,190,002, Cl. 108-50.000.
Redfern, Thomas P., to National Semiconductor Corporation. Trim structure for integrated capacitors. 4,190,854, Cl. 357-51.000.
Redman, Charles M., to United States of America, Army. Thermal image camera with storage. 4,190,769, Cl. 250-332.000.
Reents, Margaret J.: *See—*
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.
Regan, A. Michael, to Regan Offshore International, Inc. Moveable guide structure for a sub-sea drilling template. 4,190,120, Cl. 175-7.000.
Regan Offshore International, Inc.: *See—*
Regan, A. Michael, 4,190,120, Cl. 175-7.000.
Regie Nationale des Usines Renault: *See—*
Leichle, Claude, 4,190,823, Cl. 340-347.0NT.
Reichert, Gerhard: *See—*
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.
Reinders, Foppe J.: *See—*
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., 4,190,705, Cl. 429-111.000.
Reinhoudt, David N.: *See—*
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.
Reisgies, Rolf W. Automatic stimulation apparatus for milking machines. 4,190,021, Cl. 119-14.440.
Reiter, Richard L. Musical instrument carrying case. 4,190,152, Cl. 206-314.000.
Reliance Electric Company: *See—*
Chung, Jackson, 4,189,962, Cl. 74-802.000.
Remington Products, Inc.: *See—*
Kulpa, Walter J., 4,190,065, Cl. 132-33.00R.
Repla International S.A.H.: *See—*
Sotos, Juan N., 4,189,809, Cl. 24-204.000.
Resch, Werner: *See—*
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.
Research Corporation: *See—*
Curtiss, Roy, III, 4,190,495, Cl. 435-172.000.
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.
Retallick, William B., to Oxy-Catalyst, Inc. Metal catalyst support having rectangular cross-section. 4,190,559, Cl. 252-477.00R.
Reuland, Joachim: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.
Rexnord Inc.: *See—*
Harris, Bernard, 4,189,985, Cl. 92-153.000.
Rheem Manufacturing Company: *See—*
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.
Rhinehart, Richard W.: *See—*
Jackson, Harold P.; and Rhinehart, Richard W., 4,189,903, Cl. 56-255.000.
Rhodes, Herbert C. Cookie forming apparatus. 4,190,410, Cl. 425-239.000.
Ri-El Ricerche Elettroniche S.p.A.: *See—*
Righi, Nardino; and Canni Ferrari, Mario, 4,189,949, Cl. 74-10.330.
Richardson, Daniel E., to Shure Manufacturing Corporation. Transaction drawer. 4,190,004, Cl. 109-19.000.
Richardson, Stephen L.: *See—*
O'Neal, Winston R.; and Richardson, Stephen L., 4,190,116, Cl. 173-38.000.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Amide-containing diisocyanates and preparation thereof. 4,190,599, Cl. 260-453.00P.
Richtmyer, Lawson E.: *See—*
Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.

Rickman, David P.: *See—*
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.
Ricks, Dennis E. Three dimensional television system. 4,190,856, Cl. 358-88.000.
Ricoh Company, Ltd.: *See—*
Ohno, Yukihiro; and Yanagawa, Nobuyuki, 4,190,349, Cl. 355-8.000.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.
Ries, Dieter: *See—*
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.
Riggins, Robert J., Sr. Chalk line protracting tool. 4,189,844, Cl. 33-414.000.
Riggs, Olen L., Jr., to Transworld Drilling Company. Process for measuring internal metal stress. 4,190,501, Cl. 204-1.00T.
Righi, Nardino; and Canni Ferrari, Mario, to Ri-El Ricerche Elettroniche S.p.A. Pushbutton tuner. 4,189,949, Cl. 74-10.330.
Riker Laboratories, Inc.: *See—*
Fletcher, Vernon R., 4,190,590, Cl. 260-346.730.
Rikker, Leslie D., to National Engineering Company. Method and apparatus for making molds. 4,190,369, Cl. 366-16.000.
Rinno, Helmut: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.
Risi, Roberto. Device for picking up sheets from a magazine in a packaging machine. 4,190,244, Cl. 271-33.000.
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., to United States of America, Navy. Faired tow cable with stubs for strum reduction. 4,190,012, Cl. 114-243.000.
Ritten Corporation, Ltd., The: *See—*
Smart, William L.; and Hoenig, Stuart A., 4,190,875, Cl. 361-228.000.
Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.
Ritter, Josef: *See—*
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.
Ritter, Klaus: *See—*
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.
Rizzo, Joseph P.: *See—*
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, to Howmet Turbine Components Corporation. Ceramic cores for manufacturing hollow metal castings. 4,190,450, Cl. 106-38.900.
Robbins Company, The: *See—*
Fikse, Tyman H., 4,190,294, Cl. 299-33.000.
Robert Bosch GmbH: *See—*
Forster, Herbert, 4,190,878, Cl. 361-305.000.
Hofmann, Eberhard; and Weyrich, Erwin, 4,190,401, Cl. 417-313.000.
Robertshaw Controls Company: *See—*
Decker, Cloyd E., 4,190,764, Cl. 219-506.000.
Robillard, David R.; and Michaels, Robert L., to Raytheon Company Integrated test and assembly device. 4,189,825, Cl. 29-574.000.
Robins, John S. Method for producing wood smoke on a charcoal grille. 4,190,677, Cl. 426-315.000.
Robinson, David A. H.: *See—*
Miller, Gabriel L.; and Robinson, David A. H., 4,190,799, Cl. 324-239.000.
Robinson, George W., to Scovill Manufacturing Company. Electric pressing iron having indicating ready light. 4,189,855, Cl. 38-82.000
Robinson, Glen P., Jr.: *See—*
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., 4,190,800, Cl. 325-37.000.
Robinson, William D., to Delta Materials Research Limited. Noise abatement techniques and systems. 4,190,131, Cl. 181-296.000.
Rockwell International Corporation: *See—*
Weber, Robert J., 4,190,807, Cl. 331-1.00A.
Roddy, John. Rock drill bit loading device. 4,190,123, Cl. 175-325.000.
Rogers Corporation: *See—*
Langford, Gordon B., 4,190,748, Cl. 200-5.00A.
Rogers, David W., to General Motors Corporation. Vacuum actuated switch. 4,190,752, Cl. 200-81.500.
Rogers, Edward J., to S & C Electric Company. Switch operator uncoupling mechanism. 4,190,755, Cl. 200-334.000.
Rogic, Milorad M.: *See—*
Masilamani, Divakaran; and Rogic, Milorad M., 4,190,612, Cl. 585-378.000.
Rohm GmbH: *See—*
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.
Rohm and Haas Company: *See—*
Drennen, Thomas J.; and Gill, Robert A., 4,190,491, Cl. 162-76.000.
Martorano, Richard; and Brendley, William H., 4,190,693, Cl. 428-209.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Brandes, Harry, 4,190,245, Cl. 271-278.000.
Rolex Paper Company Ltd.: *See—*
Nelms, Thomas G., 4,190,187, Cl. 229-5.500.
Rolls-Royce Limited: *See—*
Carlisle, Denis R., 4,189,913, Cl. 60-39.14R.
Roloff, Hermann: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.
Rosemount Engineering Company Limited: *See—*
Hunter, Donald N.; and Wyatt, Lesley J., 4,190,453, Cl. 106-85.000.
Rosen, Perry: *See—*
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.
Rosen, Robert: *See—*
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.
Rostock, Fredrik: *See—*
Lemisch, Ellen; and Rostock, Fredrik, 4,190,287, Cl. 297-466.000.
Roswell, Terry E., to Minnesota Mining and Manufacturing Company. Self-contained breadboard wiring tool. 4,189,800, Cl. 7-107.000.
Roth, Jac M.; and Roth nee Werner, Veronika. Electrical contact switch with an extremely small actuating movement. 4,190,751, Cl. 200-67.0DB.
Roth nee Werner, Veronika: *See—*
Roth, Jac M.; and Roth nee Werner, Veronika, 4,190,751, Cl. 200-67.0DB.
Rottenkolber, John J.: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.
Rottenkolber, Michael L.: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.
Rottler Boring Bar Co.: *See—*
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., to Rottler Boring Bar Co. Honing machine. 4,189,871, Cl. 51-34.00J.
Rottler, Donald B.: *See—*
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.
Roussel Uclaf: *See—*
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.
Rovnyak, Richard M.: *See—*
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.
Rowsell, David G.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.
Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Homogeneous enzyme assay for antibodies. 4,190,496, Cl. 435-7.000.
Rudden, Thomas J., Jr. Path forming game. 4,190,256, Cl. 273-275.000.
Rudzena, William L.: *See—*
Kulle, Lee K.; and Rudzena, William L., 4,190,171, Cl. 215-329.000.
Ruschke, Ricky R., to Baxter Travenol Laboratories, Inc. Gas separating and venting filter. 4,190,426, Cl. 55-185.000.
Russell, Frederick S., to Westvaco Corporation. Display hanger. 4,190,151, Cl. 206-281.000.
Russell, Lillard G., to W. A. Brown & Son, Inc. Air conditioning and dehumidification system. 4,189,929, Cl. 62-175.000.
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., to Gulf Oil Corporation. Control of microbial contamination. 4,190,429, Cl. 71-67.000.
Ryan, Ralph L.; and Taitel, Charles M., to Compensating Tension Controls, Inc. Butt splicer. 4,190,483, Cl. 156-504.000.
Ryvkis, Yakov M.: *See—*
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y., 4,190,096, Cl. 164-158.000.
S & C Electric Company: *See—*
Rogers, Edward J., 4,190,755, Cl. 200-334.000.
Sagi, Zsimond L., to Arden Industries, Inc. Device for use in early detection of breast cancer. 4,190,058, Cl. 128-736.000.
Sai, Fumio: *See—*
Murata, Moriyasu; and Sai, Fumio, 4,190,551, Cl. 252-99.000.
Saint-Gobain Industries: *See—*
Fischer, Klaus; and Keul, Robert, 4,190,452, Cl. 106-52.000.
Lavoisey, Yves, 4,189,818, Cl. 29-281.500.
St. Onge, Linda M.: *See—*
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Takushu Noyaku Seizo K.K. Pesticidally active O-ethyl-S-N-propyl-O-2,2,2-trihaloethyl-phosphoro(thiono)thiolates. 4,190,653, Cl. 424-224.000.
Saito, Makoto, to Tomy Kogyo Co., Inc. Self-powered toy vehicle chassis and automatically interchangeable bodies. 4,189,864, Cl. 46-202.000.
Saito, Masahiro: *See—*
Ohmura, Hidemasa; and Saito, Masahiro, 4,190,567, Cl. 260-29.2TN.
Sakakibara, Naoji, to Aisin Seiki Co., Ltd. Automobile speed control method and system. 4,190,026, Cl. 123-102.000.

Sakamaki, Hisashi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Sakamaki, Shozo: *See—*
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.

Sakamoto, Shizuichi: *See—*
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.

Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, to Agency of Industrial Science & Technology. Optical memory playback apparatus. 4,190,775, Cl. 250-570.000.

Salafia, Sebastian J.: *See—*
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.

Salvaudon, Laurence; and Charlot, Jean-Claude, to Thomson-CSF. System for protecting a vehicle-borne tracking radar against an off-target jammer. 4,190,837, Cl. 343-16.00M.

Samejima, Hiroshi; and Kanayama, Kaoru, to Mitsubishi Petrochemical Company Limited. Imidazolidone polyamines as epoxy curing agents. 4,190,719, Cl. 528-103.000.

Samibem, S.A.: *See—*
Kaetzel, Pierre, 4,189,902, Cl. 56-15.600.

Sampson, Edward J., to Metal Bellows Corporation. Infusate injection apparatus. 4,190,048, Cl. 128-215.000.

Samuels, George A. Modular furniture structure. 4,190,738, Cl. 179-1.00E.

Samuelsson, Bengt I.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

Sander, Hans: *See—*
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Sandhu, Mohammad A.: *See—*
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Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 4,190,659, Cl. 424-258.000.

Sandoz Ltd.: *See—*
Funfschilling, Peter, 4,190,603, Cl. 260-590.00B.
Trueb, Werner, 4,190,430, Cl. 71-86.000.

Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, to Toyoda-Koki Kabushiki-Kaisha. Index apparatus for rotary table. 4,189,963, Cl. 74-821.000.

Santer, J. Owen: *See—*
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.

Santiago, Romeo S.; and Decker, Llewellyn, to General Electric Company. Adjustable gap electrode arrangement for electrolytically heated steam iron. 4,190,762, Cl. 219-245.000.

Sanyo Electric Company, Ltd.: *See—*
Imamura, Eigo, 4,190,803, Cl. 325-455.000.

Sarantakis, Dimitrios, to American Home Products Corporation. Polypeptides related to somatostatin. 4,190,575, Cl. 260-112.50S.

Sasaki, Toshikatu: *See—*
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, 4,190,554, Cl. 252-412.000.

Sasuga, Kazuyasu, to Rank Xerox Limited. Paper feeding system. 4,190,246, Cl. 271-145.000.

Sasuga, Kazuyasu, to Rank Xerox Limited. Apparatus for positioning an original in reproducing machines. 4,190,358, Cl. 355-75.000.

Sato, Yuichi: *See—*
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.

Sauerwein, William D.; and Walton, Richard E., II, to Black & Decker Inc. Brush system for a portable electric tool. 4,190,781, Cl. 310-239.000.

Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, to Unit Process Assemblies, Inc. Backscatter instrument having indexing feature for measuring coating thickness of elements on a continuously moving web of substrate material. 4,190,770, Cl. 250-308.000.

Sauter, Charles A., to Bulova Watch Company, Inc. Anti-backlash gear. 4,189,951, Cl. 74-440.000.

Savage, Dennis J.: *See—*
Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., 4,190,446, Cl. 430-25.000.

Sawada, Jiro: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.

Sawada, Kiyoshi; and Yamazaki, Katsuo, to Toshiba Kikai Kabushiki Kaisha. Bidirectional driving mechanism. 4,189,959, Cl. 74-720.000.

Scalzi, Louis M., to New Hampshire Ball Bearings, Inc. Bearing for liner-hanger assembly. 4,190,300, Cl. 308-4.00A.

Schade, Palmer W., II; and Spector, George. Cigarette and cigarette lighter case and cover. 4,190,148, Cl. 206-89.000.

Schaeffer, Ernest. Step motors. 4,190,779, Cl. 310-12.000.

Schaeffer, Robert L.; and Madan, Bhim S., to General Electric Company. Processor and cutter disc. 4,190,208, Cl. 241-92.000.

Schaenzer, Gordon N. Method and apparatus for reloading a centerfire cartridge. 4,189,980, Cl. 86-24.000.

Schaffrin, Carl E., to United States of America, Air Force. Cabinet lock assembly. 4,190,273, Cl. 292-288.000.

Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, to AGFA-Gevaert, A.G. Wet-processing apparatus for photographic emulsion carriers with novel disposal of drier-unit exhaust air. 4,189,803, Cl. 15-302.000.

Scheingold, William S.: *See—*
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., 4,190,310, Cl. 339-45.00R.

Schenke, Walter; and Krauss, Gerhard, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt. Headset. 4,189,788, Cl. 2-209.000.

Schering, A.G.: *See—*
Redemann, Peter, 4,190,002, Cl. 108-50.000.

Schick, Walter H.: *See—*
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.

Schilling, Jan C.; and Gutknecht, James E., to General Electric Company. Windage shield. 4,190,397, Cl. 415-112.000.

Schleier, Waldemar: *See—*
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.

Schlesinger, David H.: *See—*
Goldstein, Gideon; and Schlesinger, David H., 4,190,646, Cl. 424-177.000.
Goldstein, Gideon; and Schlesinger, David H., 4,190,647, Cl. 424-177.000.

Schlichte, Max; and Neufang, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for receiving and transmitting switching data in telecommunication exchanges. 4,190,740, Cl. 179-15.0AT.

Schliermann, Erich: *See—*
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.

Schlumberger Technology Corporation: *See—*
Moulin, Pierre A., 4,190,868, Cl. 360-1.000.

Schmader, Richard W. Method and apparatus for use in frying doughnuts. 4,189,994, Cl. 99-405.000.

Schmerling, Donald W.; and Giacobbe, Frederick, to Chemetron Corporation. Production of carbon monoxide in a plasma arc reactor. 4,190,636, Cl. 423-415.00A.

Schmidhuber, Karl; and Lehmann, Hans D., to Recaro GmbH & Co. Vehicle seats. 4,190,284, Cl. 297-194.000.

Schmidt, Walter, to Swiss Aluminium Ltd. Wheel for air or gas filled tires for motor vehicles. 4,190,297, Cl. 301-63.00R.

Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., to General Electric Company. Current/flow comparator. 4,190,829, Cl. 340-606.000.

Schmitz, Thomas R.; Srivastav. Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., to Brown & Root, Inc. Separable trenching apparatus. 4,190,382, Cl. 405-159.000.

Schneck, Stuart. Hydroponic unit. 4,189,867, Cl. 47-62.000.

Schneider, Abraham: *See—*
Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,190,611, Cl. 585-361.000.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.

Schneider, Robert J. Apparatus for use in the construction and decoration of upholstered furniture and the like. 4,190,304, Cl. 312-204.000.

Schnellmann, Ferdinand; and Meier, Hanspeter, to Chemap A.G. Filter element for a rotatable disc filter. 4,190,544, Cl. 210-461.000.

Schnetger, Jochen: *See—*
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.

Schnitzler, Danny L., to Union Carbide Corporation. Packing ring containing flexible graphite. 4,190,257, Cl. 277-102.000.

Schoeller & Co. Elektrotechnische Fabrik GmbH & Co.: *See—*
Seibel, Georg; and Mues, Gunther, 4,190,763, Cl. 219-265.000.

Schoop, Josef; Resch, Werner; and Damme, Heinz, to Stahlwerke Peine-Salzgitter AG. Lance head for a fining lance. 4,190,238, Cl. 266-270.000.

Schrepfer, Hans J.: *See—*
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, 4,190,650, Cl. 424-204.000.

Schroder, Rolf: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Schulmeister, Lee F.: *See—*
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.

Schulte, Rudolf R., to American Hospital Supply Corporation. Resealable puncture housing for surgical implantation. 4,190,040, Cl. 128-1.00R.

Schultheis, Stephen M., to Coberly & Associates. Constant intensity light source. 4,190,795, Cl. 323-17.000.

Schultz, Herman S.: *See—*
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.

Schultz, Richard P., to American Optical Corporation. Support for a microscope objective. 4,190,313, Cl. 350-84.000.

Schurter, Rolf: *See—*
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.

Schutze, Detlef-Ingo; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Polycyclic dyestuffs. 4,190,726, Cl. 546-27.000.

Schutze, Siegfried; and Locke, Werner, to VEB Pentacon Dresden Kamera- und Kinowerke. Exposure measurement circuit. 4,190,337, Cl. 354-60.00L.

Schwankhart, Gerhard, to Sticht, Walter. Shock absorber assembly and installation. 4,190,239, Cl. 267-65.00R.

Schwind, Adolf-Ernst: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Scientific-Atlanta, Inc.: *See—*
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., 4,190,800, Cl. 325-37.000.

Scotco, Inc.: *See—*
Morrow, Warren P., 4,190,200, Cl. 238-349.000.

Scott Paper Company: *See—*
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.
Taylor, Alfred S., 4,190,345, Cl. 354-318.000.

Scovill Manufacturing Company: *See—*
Robinson, George W., 4,189,855, Cl. 38-82.000.

Sealectro Corporation: *See—*
Iantorno, James, 4,190,308, Cl. 339-19.000.

Sears, Barry D., to Boston University, Trustees of. Kit for determining the level of LDL cholesterol in body fluids. 4,190,628, Cl. 422-61.000.

Seelenbinder, Terry G., to AM International, Inc. Developer transport roll. 4,189,815, Cl. 29-121.800.

Seibel, Georg; and Mues, Gunther, to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co. Electrical cigar lighter for automotive vehicle with snap disc bimetallic switch means. 4,190,763, Cl. 219-265.000.

Seifert, Gunther: *See—*
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.

Seitzer, Walter H., to Suntech, Inc. Catalysts for preparing aromatics from synthesis gas. 4,190,558, Cl. 252-455.00Z.

Seki, Mitsuaki: *See—*
Nozaki, Mineo; and Seki, Mitsuaki, 4,189,997, Cl. 101-93.090.

Sekiya, Fukuo: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.

Seko, Atsuya: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

Seldin, Edward B., to Massachusetts General Hospital. Method of dental surveying. 4,189,835, Cl. 433-214.000.

Semi-Alloys, Inc.: *See—*
Hascoe, Norman, 4,190,176, Cl. 220-359.000.

Semi-Mask, Inc.: *See—*
Alter, David L., 4,189,842, Cl. 33-149.00J.

SemPrex Corporation: *See—*
Volk, Karl G., 4,189,953, Cl. 74-479.000.

Seppi, Edward J.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.

Septier, Louis: *See—*
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Sera, Hidefumi; and Horie, Ikutaro, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic material having a crosslinked carboxylic acid polymer layer. 4,190,448, Cl. 430-216.000.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for checking that the bands joining filters to cigarettes have been sealed down. 4,190,163, Cl. 209-535.000.

Sesser, George L.; and Furtado, Anthony E., to Sperry Rand Corporation. Bale retainer means on a bale wagon. 4,190,391, Cl. 414-39.000.

Seuter, Friedel: *See—*
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Sever Ezcurra, Jose L.: *See—*
Toro Sosa, German; and Sever Ezcurra, Jose L., 4,190,379, Cl. 404-6.000.

Seward, Thomas P., III: *See—*
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.

Sguazzin, Aldo. Clam rake. 4,190,279, Cl. 294-49.000.

Shaffer, John W.; and Bricker, Daniel W., to GTE Sylvania Incorporated. Photoflash lamp. 4,190,413, Cl. 431-362.000.

Shah, Jagdish K.: *See—*
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.

Shalaby, Shalaby W., to Ethicon, Inc. Isomorphic copolymers of ε-caprolactone and 1,5-dioxepan-2-one. 4,190,720, Cl. 528-354.000.

Sharp Kabushiki Kaisha: *See—*
Inoue, Yukihiro, 4,190,855, Cl. 357-80.000.
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, 4,189,912, Cl. 58-152.00R.
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.
Yamamoto, Yoichi; and Shimazawa, Yoichi, 4,190,846, Cl. 346-140.00R.

Sharpe, Thomas R.: *See—*
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,190,666, Cl. 424-274.000.

Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., to United States of America, Army. Mine proximity fuse. 4,190,000, Cl. 102-19.200.

Shaver, Noah. Insulation and ventilation system for mobile homes. 4,189,988, Cl. 98-31.000.

Shaw, David G., to General Electric Company. Process for impregnating a capacitor with a non-halogenated impregnant. 4,190,682, Cl. 427-79.000.

Sheffer, Timothy K., to General Motors Corporation. Carburetor. 4,190,618, Cl. 261-50.00R.

Shell Oil Company: *See—*
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., 4,190,705, Cl. 429-111.000.
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.

Sheller-Globe Corporation: *See—*
Brubaker, James E., 4,189,956, Cl. 74-501.00M.

Sherman, Allan P., to Hewlett-Packard Company. Derivation of steady values of blood pressures. 4,190,886, Cl. 364-415.000.

Sherman & Reilly, Inc.: *See—*
Chadwick, William H., Jr., 4,189,828, Cl. 29-762.000.

Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, to Dainichi-Nippon Cables, Ltd.; and Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for deicing of trolley wires. 4,190,137, Cl. 191-27.000.

Shimada, Junichi: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

Shimadzu, Hiroshi: *See—*
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.

Shimanaka, Hiroshi: *See—*
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.

Shimano Industrial Company, Limited: *See—*
Nakamura, Yoshihiko; and Nagano, Masashi, 4,189,954, Cl. 74-488.000.

Shimazawa, Yoichi: *See—*
Yamamoto, Yoichi; and Shimazawa, Yoichi, 4,190,846, Cl. 346-140.00R.

Shintaku, Keiichi, to Nippon Electric Co., Ltd. Method of manufacturing an internal mirror type gas laser tube. 4,190,511, Cl. 204-192.00P.

Shionogi & Co., Ltd.: *See—*
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.

Shirayama, Shimpey: *See—*
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.

Shiroki, Hiroyuki: *See—*
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,190,505, Cl. 204-98.000.

Shure Manufacturing Corporation: *See—*
Richardson, Daniel E., 4,190,004, Cl. 109-19.000.

Siegmund, Walter P., to American Optical Corporation. Line illuminator. 4,190,347, Cl. 355-1.000.

Siemens Aktiengesellschaft: *See—*
Brabetz, Bernhard; and Hackl, Helmut, 4,190,386, Cl. 408-1.00R.
Frank, Richard J., 4,190,744, Cl. 179-18.0BC.
Krause, Gerhard, 4,190,778, Cl. 307-254.000.
Schlichte, Max; and Neufang, Karlheinz, 4,190,740, Cl. 179-15.0AT.
Southard, Gary D., 4,190,742, Cl. 179-18.0BC.
Tihanyi, Jenoe; and Bell, Guido, 4,190,850, Cl. 357-23.000.

SIG-Schweizerische Industrie-Gesellschaft: *See—*
Knuchel, Max, 4,190,146, Cl. 198-460.000.

Sigwald, Jacques; and Achard, Michel, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Devices for re-cycling the exhaust gases of an internal combustion engine. 4,190,031, Cl. 123-119.00A.

Silbernagel, Bernard G.: *See—*
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,190,706, Cl. 429-191.000.

Silberzahn, Hermann: *See—*
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.

Silver, Stanley M., to Paxall Inc. Method and apparatus for heat sealing a package blank. 4,189,986, Cl. 93-36.00M.

Silverwood, Colin, to British Screw Company Limited. Fastener for securing and sealing sheet material in spaced relation to a support. 4,189,979, Cl. 85-74.000.

Simes Societa Italiana Medicinali e Sintatici S.p.A.: *See—*
Gherardi, Paolo; and Ferrari, Giorgio, 4,190,654, Cl. 424-244.000.

Singer Company, The: *See—*
Cameron, Albert R.; and Gneiding, Donald R., 4,190,076, Cl. 137-505.450.
Friedland, Bernard, 4,189,947, Cl. 74-5.500.
Hoffman, Jay; and Ferriss, Lincoln S., 4,189,946, Cl. 74-5.400.
Ljung, Bo H. G.; and Gamertsfelder, George R., 4,190,364, Cl. 356-350.000.
Stahle, Howard L.; and Grossman, Norman R., 4,190,831, Cl. 340-707.000.

Singrey, Raymond E. Chip drying and cleaning device. 4,190,415, Cl. 432-58.000.

Sinnreich, Manfred. Surgical retractor for endoscopes. 4,190,042, Cl. 128-20.000.

Sirasawa, Minoru: *See—*
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.

Siu, Patrick M. Anti-drug withdrawal syndrome composition and method of use. 4,190,660, Cl. 424-258.000.

Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., to Alcan Research and Development Limited. Continuous casting of metal strip between moving belts. 4,190,103, Cl. 165-120.000.

Skala, Stephen F. Vehicle system for NaK-water-air internal combustion engines. 4,189,916, Cl. 60-311.000.

Ski Tree, Inc.: *See—*
Hickey, Dana, 4,190,182, Cl. 224-45.00S.

Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., to Institut Kibernetiki Akademii Nauk Ukrainskoi S S R. Digital device for determining carbon content in iron-carbon melts. 4,190,888, Cl. 364-497.000.

Slack, Otto G. Template pattern alignment. 4,189,820, Cl. 29-425.000.

Sloan, Albert H. Integral pump and drive shaft assembly. 4,190,400, Cl. 415-170.00A.

Sloan-Kettering Institute for Cancer Research: *See—*
Goldstein, Gideon; and Schlesinger, David H., 4,190,646, Cl. 424-177.000.
Goldstein, Gideon; and Schlesinger, David H., 4,190,647, Cl. 424-177.000.

Slonicki, Alex. Automated system for the application of coverglasses on histological and cytological slides. 4,190,472, Cl. 156-57.000.

Smart, William L.; and Hoenig, Stuart A., to Ritten Corporation, Ltd., The. Apparatus for removing particulate matter from an atmosphere. 4,190,875, Cl. 361-228.000.

Smith, Andrew J. Dental reinforcing pins. 4,189,834, Cl. 433-225.000.

Smith, Anthony M.: *See—*
Kulik, Stanley; and Smith, Anthony M., 4,190,546, Cl. 252-49.600.

Smith, Craig A.; and Guenther, Joachim, to Xerox Corporation. Copier job recovery system. 4,190,354, Cl. 355-3.0SH.

Smith, David L.: *See—*
Smith, Dwight H.; and Smith, David L., 4,190,899, Cl. 364-900.000.

Smith, Dennis W.: *See—*
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.

Smith, Derek R., to Union Carbide Corporation. Method of producing a joint capable of transmitting high torque. 4,190,479, Cl. 156-294.000.

Smith, Dwight H.; and Smith, David L., to Computer Microfilm International Corporation. Card retrieval device. 4,190,899, Cl. 364-900.000.

Smith, Frank T. J., to Eastman Kodak Company. Silicon charge-handling device employing SiC electrodes. 4,189,826, Cl. 29-590.000.

Smith, George T. Self-contained clamp-mounted pivotal arm mailbox signal device assembly. 4,190,193, Cl. 232-35.000.

Smith, Harlan B., to Erickson Air Crane Co. Angle guide apparatus. 4,189,892, Cl. 52-749.000.

Smith, Harry D., Jr.: *See—*
Arnold, Dan M.; and Smith, Harry D., Jr., 4,190,768, Cl. 250-270.000.

Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., to Freeport Minerals Company. Crud handling circuit. 4,190,633, Cl. 423-321.00S.

Smith, John L.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.

Smith, Kenneth C.: *See—*
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 56-58.000.

Smith & Nephew Research Ltd.: *See—*
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.

SmithKline & French Laboratories Limited: *See—*
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,664, Cl. 424-270.000.

Snamprogetti S.p.A.: *See—*
Bellofatto, Oreste, 4,189,922, Cl. 60-641.000.

Snezhnoi, Rostislav L.: *See—*
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y., 4,190,096, Cl. 164-158.000.

Societe Anonyme Automobiles Citroen: *See—*
Sigwald, Jacques; and Achard, Michel, 4,190,031, Cl. 123-119.00A.

Societe Anonyme de Telecommunications: *See—*
Cointot, Denis F., 4,190,741, Cl. 179-15.0BS.
Dubrunfaut, Gerard H., 4,190,361, Cl. 356-5.000.
Dubrunfaut, Gerard H., 4,190,362, Cl. 356-5.000.

Societe Anonyme Dite: Ceraver: *See—*
Warnet, Henri; and Fouinat, Paul, 4,190,736, Cl. 174-209.000.

Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic: *See—*
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Societe Anonyme Francaise du Ferodo: *See—*
Berlioux, Jacques, 4,190,142, Cl. 192-106.200.

Societe Anonyme Roure Bertrand Dupont: *See—*
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.

Societe Francaise d'Electrometallurgie "Sofrem": *See—*
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Societe Hygiaphone V.B.: *See—*
Bourlier, Claude, 4,190,003, Cl. 109-19.000.

Societe Industrielle Bertrand Faure: *See—*
Letournoux, Alain; and Droual, Rene, 4,190,226, Cl. 248-429.000.

Societe Nationale elf Aquitaine: *See—*
Despois, Jacques; and Nougarede, Francis, 4,190,099, Cl. 165-45.000.

Societe Nouvelle de Roulements: *See—*
Chalansonnet, M. Roger, 4,189,816, Cl. 29-148.40C.

Societe Nouvelle des Echafaudages Tubulaires Mills: *See—*
Beziat, Bernard, 4,189,810, Cl. 24-249.00R.

Soda, Atsuhiko: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Soecknick, Erhard; and Weimar, Erich, to Messer Griesheim GmbH. Process for accelerating the hardening of joints glued with crystalline hardening adhesives. 4,190,473, Cl. 156-80.000.

Sokolov, Sergei S.: *See—*
Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V., 4,190,776, Cl. 307-112.000.

Solvay & Cie.: *See—*
Alard, Joseph; and Derroitte, Jean-Louis, 4,190,624, Cl. 264-146.000.

Somers, Frank J.; and Winslow, John S., to MCA Discovision, Inc. Digital method and apparatus for rotating an information storage disk. 4,190,860, Cl. 358-128.500.

Someshwar, Ashok H., to Texas Instruments Incorporated. Binary coded decimal addressed Read-Only-Memory. 4,190,897, Cl. 364-900.000.

Son, Pyong N.: *See—*
Lai, John T.; and Son, Pyong N., 4,190,571, Cl. 260-45.80N.

Sone, Hisao: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.

Sonntag, Paul A., to Western Electric Company, Incorporated. Industrial scissors. 4,189,831, Cl. 30-232.000.

Sony Corporation: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.
Ikeda, Jiro, 4,190,503, Cl. 204-5.000.

Sotchenko, Vladimir P.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Sotos, Juan N., to Repla International S.A.H. Fastener device and method of manufacturing. 4,189,809, Cl. 24-204.000.

Southard, Gary D., to Siemens Aktiengesellschaft. Process and apparatus for producing conference connections in a PCM time multiplex switching system. 4,190,742, Cl. 179-18.0BC.

Special Metals Corporation: *See—*
Boesch, William J.; and Maurer, Gernant E., 4,190,437, Cl. 75-122.000.

Spector, George: *See—*
Schade, Palmer W., II; and Spector, George, 4,190,148, Cl. 206-89.000.

Speno International S.A.: *See—*
Panetti, Romolo, 4,189,873, Cl. 51-178.000.

Sperry Corporation: *See—*
Buckley, Charles G.; and Kiedrowski, James A., 4,189,948, Cl. 74-5.460.
Farnsworth, David L.; and Thomas, Ronald E., 4,190,898, Cl. 364-900.000.

Sperry Rand Corporation: *See—*
Butler, L. Dennis, 4,190,392, Cl. 414-39.000.
Sesser, George L.; and Furtado, Anthony E., 4,190,391, Cl. 414-39.000.

Spiller, Clifford M. Interlocking screen elements. 4,190,527, Cl. 209-363.000.

Spitz, George T.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.

Spodig, Heinrich. Permanent magnetic separator for liquids. 4,190,540, Cl. 210-222.000.

Spong, Fred W., to RCA Corporation. Recording methods for a multilayer optical record. 4,190,843, Cl. 346-1.100.

Spring, David J.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.

Srivastav, Avadhesh N. L.: *See—*
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.

Staalkat B.V.: *See—*
van der Schoot, Jelle, 4,189,849, Cl. 34-33.000.

Stadler, Peter: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.

Stahl, Harold M.: *See—*
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.

Stahle, Howard L.; and Grossman, Norman R., to Singer Company, The. Light pen detection system for CRT image display. 4,190,831, Cl. 340-707.000.

Stahlwerke Peine-Salzgitter AG: *See—*
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.

Stamicarbon, B.V.: *See—*
Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., 4,190,455, Cl. 106-98.000.
Dassen, Bernardus H. N., 4,190,528, Cl. 210-8.000.
Geus, John W.; and Hermans, Leonardus A. M., 4,190,560, Cl. 252-459.000.

Standard Oil Company: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.

Standard Oil Company (Ohio): *See—*
Landis, Norris J., 4,190,622, Cl. 264-14.000.

Stanford Research Institute International: *See—*
Crane, Hewitt D.; and Wolf, Daniel E., 4,190,820, Cl. 340-146.3SG.

Stansbury, Benjamin, to American Hospital Supply Corporation. Highly stretchable glove and form for making same. 4,189,787, Cl. 2-163.000.

Starchenko, Vitaly S.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Stasiewicz, John: *See—*
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.

Stebbings, David W.: *See—*
Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W., 4,190,746, Cl. 179-115.50R.

Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in preselected compressed state. 4,190,378, Cl. 403-146.000.

Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., to Gold Kist, Incorporated. Low fat peanut flour prepared by solvent extraction of oil from peanut flakes. 4,190,577, Cl. 260-123.500.

Steer, David E.: *See—*
Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.

Steiniger, Wolfgang: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Stele, Aaron. Dental jaw simulator. 4,189,837, Cl. 433-57.000.

Stendel, Wilhelm: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Stenudd, Sven G. V., to Facit Aktiebolag. Stray ink collector for impact printer. 4,190,847, Cl. 346-141.000.

Stephen, Robert L.: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.

Stephenson, Robert L., to Allied Chemical Corporation. Passive seat belt system. 4,190,267, Cl. 280-803.000.

Sterzer, Fred, to RCA Corporation. Apparatus and method for hyperthermia treatment. 4,190,053, Cl. 128-399.000.

Stevens, Everett E.: *See—*
Moss, Gerald E.; and Stevens, Everett E., 4,190,816, Cl. 333-131.000.

Stewart, Olivia D.: *See—*
Eckert, Lewis W.; and Stewart, Olivia D., 4,190,492, Cl. 162-145.000.

Stewart, William F.; and Baldwin, Charles W. Process for growing sprouts. 4,189,865, Cl. 47-14.000.

Sticht, Walter: *See—*
Schwankhart, Gerhard, 4,190,239, Cl. 267-65.00R.

Stiebitz, Paul H.: *See—*
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.

Stiefel, Frank J., to Carter-Wallace, Inc. Method for the preparation of 2,3-dimethyl-pent-4en-aldehyde. 4,190,607, Cl. 260-601.00R.

Stiegler, Erwin: *See—*
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.

Stock Equipment Company: *See—*
Dillon, Glenn W.; and Lindell, Albert H., 4,189,824, Cl. 29-522.00R.

Stock, Thomas A. C.: *See—*
Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.

Stolle, Herbert D.: *See—*
Bruenig, Matthias M.; and Stolle, Herbert D., 4,190,289, Cl. 297-391.000.

Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The: *See—*
Massa, Frank, 4,190,783, Cl. 310-324.000.
Massa, Frank, 4,190,784, Cl. 310-324.000.

Stopler, Leonid M.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Strachan, John B., to Domino Equipment Pty. Ltd. Emission control apparatus for diesel engines. 4,190,629, Cl. 422-169.000.

Strand, Glen O.: *See—*
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.

Strecker, Johannes: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.

Strien, Werner, to Recaro GmbH & Co. Headrest for vehicle seats. 4,190,290, Cl. 297-408.000.

Stroup, Steven L.; and Harman, Galen B., to Burr Oak Tool & Gauge Company. Apparatus for filling heating tube. 4,190,407, Cl. 425-110.000.

Su, Stephen C.: *See—*
Finnila, Ronald M.; and Su, Stephen C., 4,190,851, Cl. 357-30.000.

Suchanek, Borivoj: *See—*
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.

Suda, Seiji: *See—*
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.

Sugai, Hiroshi; and Ogawa, Haruo, to Kabushiki Kaisha Morita Seisakusho. Chuck for dental hand-piece. 4,189,836, Cl. 433-127.000.

Sugimori, Shiro, to Nippon Kogaku K.K. Motor drive device for camera. 4,190,341, Cl. 354-173.000.

Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, to Sumitomo Chemical Company, Limited. Method for treating leather. 4,190,687, Cl. 427-389.000.

Sugiyama, Terumasa: *See—*
Murayama, Yuichi; and Sugiyama, Terumasa, 4,190,359, Cl. 355-75.000.

Sulzer Brothers Limited: *See—*
Frei, Arno, 4,190,104, Cl. 165-162.000.
Yee, Kim S., 4,190,493, Cl. 176-60.000.

Sumitomo Chemical Company, Limited: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.

Sumitomo Electric Industries, Ltd.: *See—*
Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, 4,190,485, Cl. 156-583.900.

Sun Oil Company of Pennsylvania: *See—*
Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,190,611, Cl. 585-361.000.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.

Suntech, Inc.: *See—*
Cassar, Richard D., 4,190,460, Cl. 106-287.320.
Seitzer, Walter H., 4,190,558, Cl. 252-455.00Z.

Supraton F. J. Zucker KG: *See—*
Zucker, Friedrich J.; and Langenbusch, Hans J., 4,190,373, Cl. 366-160.000.

Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.

Suzuki, Akira: *See—*
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.

Suzuki, Masayuki: *See—*
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.

Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Process for producing polymer from quaternized acrylate monomer. 4,190,717, Cl. 526-62.000.

Svendsen, Lars G., to Pentapharm A.G. Substrate for the quantitative determination of plasminogen activators. 4,190,574, Cl. 260-112.50R.

Swakopmund AG: *See—*
Hartmann, Werner, 4,190,101, Cl. 165-82.000.

Swanson, Kenneth R.; and Beilfuss, Richard J., to Aeroquip Corporation. Bracing strut for flexible conduits. 4,190,223, Cl. 248-68.00R.

Swanson, Roy E., Jr.: *See—*
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.

Swarbrick, Richard, to Honeywell Inc. Current telemetering interface apparatus. 4,190,822, Cl. 340-210.000.

Sweeney, Lawrence J., to Franklin Steel Company. Drive cap. 4,190,118, Cl. 173-130.000.

Swift Canadian Co., Limited: *See—*
Van Heyningen, Woeldrik P., 4,189,806, Cl. 17-52.000.

Swift, Harold E.: *See—*
Giannetti, Joseph P.; and Swift, Harold E., 4,190,518, Cl. 208-8.0LE.

Swiss Aluminium Ltd.: *See—*
Schmidt, Walter, 4,190,297, Cl. 301-63.00R.

Sylvester, Robert A.: *See—*
Coil, Michael K.; and Sylvester, Robert A., 4,190,447, Cl. 430-214.000.

Synthelabo: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Syva Company: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,190,496, Cl. 435-7.000.

Szarvasi, Etienne; and Festal, Didier, to Lipha, Lyonnaise Industrielle Pharmaceutique. Substituted arylaliphatic acids. 4,190,665, Cl. 424-274.000.

Tabel, Johannes: *See—*
Kluczynski, Achim; and Tabel, Johannes, 4,190,216, Cl. 242-194.000.

Tachibana, Seiji: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.

Taisho Pharmaceutical Co., Ltd.: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.

Taitel, Charles M.: *See—*
Ryan, Ralph L.; and Taitel, Charles M., 4,190,483, Cl. 156-504.000.

Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, to Takenaka Komuten Co., Inc. Apparatus for treatment of sludge deposit. 4,190,372, Cl. 366-141.000.

Takahashi, Teruomi; and Matsuo, Takehiko, to Canon Kabushiki Kaisha. Electrophotographic photosensitive media and process for manufacturing thereof. 4,190,445, Cl. 430-66.000.

Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, to Mitsui Toatsu Chemicals, Incorporated. Catalyst system for polymerizing alpha-olefins and method of making same. 4,190,555, Cl. 252-429.00B.

Takeda Chemical Industries, Ltd.: *See—*
Hashimoto, Naoto; and Kishi, Toyokazu, 4,190,580, Cl. 260-239.30P.
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.

Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, to Sumitomo Electric Industries, Ltd. Method of welding a thermoshrinkable sheet and a device for use in the method. 4,190,485, Cl. 156-583.900.

Takenaka Komuten Co., Inc.: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.

Takeuchi, Tomio: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Talbert, Stephen B.: *See—*
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.

Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, to Mezogazdasagi Foiskola, Kaposvar. Process and equipment for machine milking to provide sterile milk free from blood and pus. 4,190,020, Cl. 119-14.080.

Tamura, Hidemasa: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.

Tankred, Hans J.; and Kristensen, Erling B., to Danfoss A/S. Piston-cylinder arrangement for a compressor. 4,189,984, Cl. 92-82.000.

Taplin, Lael B., to Bendix Corporation, The. Control of EGR in a closed loop EFI engine. 4,190,029, Cl. 123-119.00A.

Tappe, Horst, to Cassella Aktiengesellschaft. Substituted pyridines and process for making them. 4,190,723, Cl. 542-422.000.

Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., to General Medical Company. Method and means for recording sweat gland activity. 4,190,056, Cl. 128-630.000.

Tashma, Zeav: *See—*
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,664, Cl. 424-270.000.

Tawata, Shinkichi: *See—*
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.

Taylor, Alfred S., to Scott Paper Company. Lithographic plate processing apparatus. 4,190,345, Cl. 354-318.000.

Taylor, Paul D.: *See—*
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,190,620, Cl. 261-148.000.

Taylor, Samuel K.: *See—*
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.

Taylor, Terrence F. E., to International Standard Electric Corporation. Ink-jet printer with pneumatic deflector. 4,190,844, Cl. 346-75.000.

Taylor, Thomas L.: *See—*
Terry, Robert G., 4,190,124, Cl. 175-406.000.

Teisseire, Paul J.: *See—*
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.

Tektronix, Inc.: *See—*
Basta, Thomas P., 4,190,311, Cl. 339-75.0MP.
Doornink, Douglas J., 4,190,834, Cl. 340-709.000.

Teledyne Industries, Inc.: *See—*
Fienhold, Stephen C.; and Cammack, Michael A., 4,190,207, Cl. 239-381.000.

Telex Communications, Inc.: *See—*
Guess, Joe F., 4,190,782, Cl. 310-324.000.

Tengzelius, Jan R.; and Fayles, Robert R., to Hoganas AB Fack. Powder intended for powder metallurgical manufacturing of soft magnetic components. 4,190,441, Cl. 75-251.000.

Tenud, Leander, to Lonza Ltd. Process for the production of indolyl lactic acid. 4,190,585, Cl. 260-326.13R.

Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y. Manipulator for separating coated permanent moulds. 4,190,096, Cl. 164-158.000.

Teramura, Satoshi: *See—*
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.

Terlecky, Boris S.: *See—*
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.

Terry, Robert G., to Taylor, Thomas L. Stabilizer and blade attachment means therefor. 4,190,124, Cl. 175-406.000.

Teschner, Wolfgang; and Bierbaum, Dieter, to Carl Still, Firma. System to acquire and monitor operating machinery positions for horizontal coke oven batteries. 4,190,498, Cl. 202-262.000.

Texaco Inc.: *See—*
Arnold, Dan M.; and Smith, Harry D., Jr., 4,190,768, Cl. 250-270.000.

Texas Instruments Incorporated: *See—*
Marum, Steven E., 4,189,909, Cl. 58-23.00R.
Someshwar, Ashok H., 4,190,897, Cl. 364-900.000.

Thate, Kurt, to AGFA-Gevaert, A.G. Arrangement for transporting photographic film, and the like. 4,190,185, Cl. 226-172.000.

Thermo-Seal, Inc.: *See—*
Haimowitz, Irwin, 4,190,174, Cl. 220-254.000.

Thiokol Corporation: *See—*
Ellerstein, Stuart M., 4,190,625, Cl. 264-176.00R.

Thomas, Ronald E.: *See—*
Farnsworth, David L.; and Thomas, Ronald E., 4,190,898, Cl. 364-900.000.

Thompson, Harold L.: *See—*
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.

Thompson, Terry D. Massage table drive system. 4,190,043, Cl. 128-33.000.

Thomson, Alan R.; and Miles, Brynley J., to United Kingdom Atomic Energy Authority. Separation of macromolecules. 4,190,576, Cl. 260-122.000.

Thomson-CSF: *See—*
Salvaudon, Laurence; and Charlot, Jean-Claude, 4,190,837, Cl. 343-16.00M.

Thoratec Laboratories Corporation: *See—*
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.

Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Separating agent for rubber powders. 4,190,613, Cl. 525-215.000.

Thorpe, Laurence J.: *See—*
Dischert, Robert A.; and Thorpe, Laurence J., 4,190,863, Cl. 358-210.000.

Tideland Signal Corporation: *See—*
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.

Tiep, Brian L., to City of Hope National Medical Center. Variable capacitors. 4,190,876, Cl. 361-278.000.

Tihanyi, Jenoe; and Bell, Guido, to Siemens Aktiengesellschaft. MIS field effect transistor having a short channel length. 4,190,850, Cl. 357-23.000.

Tinholt, Thomas H.; and Konkle, Phillip E., to Eaton Corporation. Centering abutment for viscous fluid drive. 4,190,139, Cl. 192-58.00B.

Tinholt, Thomas H.: *See—*
Konkle, Phillip E.; and Tinholt, Thomas H., 4,190,140, Cl. 192-82.00T.

Tissot, Pierre L. Plastic chassis with magnetic holding means for electronic components. 4,190,879, Cl. 361-386.000.

Titeflex Corporation: *See—*
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.

TMC Corporation: *See—*
Himmetsberger, Alois; and Wittmann, Heinz, 4,190,264, Cl. 280-618.000.

Tobin-Arp Manufacturing Company: *See—*
Peterson, Bertil G., 4,190,240, Cl. 269-21.000.

Todd, Maurice C.: *See—*
Agers, Brian M.; and Todd, Maurice C., 4,189,812, Cl. 28-272.000.

Tokai Seiki Co., Ltd.: *See—*
Nitta, Tomio, 4,190,412, Cl. 431-151.000.

Tokiwa Industrial Co., Ltd.: *See—*
Kabashima, Ryuichi, 4,190,126, Cl. 175-410.000.

Tokuyama Soda Kabushiki Kaisha: *See—*
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.

Tokyo Shibaura Electric Company, Limited: *See—*
Ishii, Akira, 4,190,796, Cl. 323-75.00N.

Tolmunen, Arvi: *See—*
Hasa, Juhani; and Tolmunen, Arvi, 4,190,085, Cl. 138-45.000.

Tom McGuane Industries, Inc.: *See—*
Ludwig, George C., 4,189,981, Cl. 91-52.000.

Tomczak, Roman M.: *See—*
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.

Tominaga, Akira; and Hirata, Yasuyuki, to Kansai Paint Company, Limited. Cationic electrophoretic coating compositions. 4,190,564, Cl. 260-18.0PT.

Tomino, Tadashi: *See—*
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, 4,189,912, Cl. 58-152.00R.

Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, to Hitachi, Ltd. Sodium turbine pump. 4,190,396, Cl. 415-110.000.

Tomlinson, George H., II, to Domtar Inc. Impregnation and digestion of wood chips. 4,190,490, Cl. 162-19.000.

Tomy Kogyo Co., Inc.: *See—*
Saito, Makoto, 4,189,864, Cl. 46-202.000.

Tonai, Koichi: *See—*
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.

Tondreau, Raymond A.; and Bray, Donald T., to Desalination Systems, Inc. Water storage control for reverse osmosis system. 4,190,537, Cl. 210-98.000.

Toray Industries, Inc.: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Torffield, Marvin. High-fidelity stereo sound system. 4,190,739, Cl. 179-1.0GA.

Torny-Schutte, Gerridina J.: *See—*
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.

Toro Sosa, German; and Sever Ezcurra, Jose L. Device for reserving individual parking areas. 4,190,379, Cl. 404-6.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.
Sawada, Kiyoshi; and Yamazaki, Katsuo, 4,189,959, Cl. 74-720.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, 4,190,889, Cl. 364-474.000.
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.

Tra, Josef, to J. M. Voith GmbH. Apparatus for purifying a suspension of fibrous material. 4,190,522, Cl. 209-170.000.

Trailer Train Company: *See—*
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.

Transworld Drilling Company: *See—*
Riggs, Olen L., Jr., 4,190,501, Cl. 204-1.00T.

Trapido, Leonard: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.

Trautz, Volker: *See—*
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.

Traver, Frank J.; and Cietek, Timothy J., to General Electric Company. Silicone paper release compositions. 4,190,688, Cl. 427-391.000.

Treadaway, Michael F., to British Petroleum Company Limited, The. Polymer-optical brightener combinations in transparent film form useful as glazing materials capable of modifying plant growth rate. 4,189,866, Cl. 47-58.000.

Tregillus, Kenneth C.: *See—*
Atkinson, Gordon E.; and Tregillus, Kenneth C., 4,190,206, Cl. 239-271.000.

Triani, Ronald J.: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.

Troxler, Richard J.: *See—*
Burckhardt, Urs; and Troxler, Richard J., 4,190,604, Cl. 260-592.000.

Trueb, Werner, to Sandoz Ltd. Di-(cyanoalkyl)-β-haloethanephosphonates and dithiophosphonates and use as plant growth regulators. 4,190,430, Cl. 71-86.000.

TRW Inc.: *See—*
Crouse, Ronald J., 4,190,767, Cl. 250-231.0SE.
DiBugnara, Raymond, 4,190,458, Cl. 106-287.160.

Tsang, Won-Tien: *See—*
Logan, Ralph A.; and Tsang, Won-Tien, 4,190,813, Cl. 331-94.50H.

Tsao, Utah, to Lummus Company, The. Recovery of hydrogen chloride in carbo-chlorination of metal oxides. 4,190,639, Cl. 423-491.000.

Tschek, Wolfgang: *See—*
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.

Tsuboi, Shinichi: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.

Tsugei, Shinji: *See—*
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.

Tucker, Archie J.: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.

Tucker, Benjamin W.: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.

Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,190,582, Cl. 260-239.30R.

Turk, Gunter: *See—*
Achenbach, Karl; and Turk, Gunter, 4,190,632, Cl. 423-118.000.

Turner, Denver R. Smoker's pipe. 4,190,063, Cl. 131-195.000.

Turner, Roger C.: *See—*
Knight, J. Nelson; and Turner, Roger C., 4,190,305, Cl. 312-214.000.

Turpin, Charles H.; and Hoese, Thomas C., to Pillsbury Company, The. Microwave heating package and method. 4,190,757, Cl. 219-10.55E.

Tuson, Samuel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Equipment serving to connect oil-tankers to marine towers. 4,190,090, Cl. 141-387.000.

Tyler, Frederick B., Jr.: *See—*
McKibbin, John R.; and Tyler, Frederick B., Jr., 4,190,236, Cl. 266-69.000.

Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., to General Mills, Inc. Package for perishable produce. 4,189,868, Cl. 47-84.000.

Uddeholms Aktiebolag: *See—*
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.

Ueda, Takeo, to NSK-Warner K. K. Safety belt take-up device. 4,190,213, Cl. 242-107.40A.

Uedaira, Satoru: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.

Ullman, Edwin F.: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,190,496, Cl. 435-7.000.

Ulrich, Henri: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.

Umezawa, Hamao: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Union Carbide Corporation: *See—*
Decker, Quintin W.; and Marcus, Erich, 4,190,601, Cl. 260-583.00R.
Gortsema, Frank P., 4,190,439, Cl. 75-211.000.
Kaplan, Leonard, 4,190,598, Cl. 260-449.00L.
Schnitzler, Danny L., 4,190,257, Cl. 277-102.000.
Smith, Derek R., 4,190,479, Cl. 156-294.000.
Zdrahala, Richard J.; and Critchfield, Frank E., 4,190,711, Cl. 521-112.000.

Union Oil Company of California: *See—*
Ward, John W., 4,190,553, Cl. 252-412.000.

Unique Tool & Die Co.: *See—*
Bronkema, James W.; and Hoeksema, Norman L., 4,190,408, Cl. 425-145.000.

Uniroyal, Inc.: *See—*
Geck, Joseph C.; and Hamilton, Floyd E., 4,190,406, Cl. 425-38.000.

Unit Process Assemblies, Inc.: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.

Unit Rig & Equipment Co.: *See—*
Beck, Earl, 4,190,130, Cl. 180-133.000.

United Kingdom Atomic Energy Authority: *See—*
Thomson, Alan R.; and Miles, Brynley J., 4,190,576, Cl. 260-122.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the: *See—*
Moody, George W.; and Meir, Robert A., 4,189,918, Cl. 60-398.000.

United States Gypsum Company: *See—*
Kuhr, Albert F., 4,189,893, Cl. 52-779.000.

United States of America
Air Force: *See—*
Albanese, Victor J., 4,190,815, Cl. 333-101.000.
Cross, Edward F.; and Garber, Wilbur A., 4,190,858, Cl. 358-113.000.
Fajen, Lyle A., 4,190,808, Cl. 331-59.000.
Schaffrin, Carl E., 4,190,273, Cl. 292-288.000.
Van Workum, John A., 4,190,814, Cl. 331-94.50C.
Army: *See—*
Cowett, Philip M., Jr., 4,190,883, Cl. 363-26.000.
Drzewiecki, Tadeusz M.; and Goto, John M., 4,190,083, Cl. 137-838.000.
Dunmire, Howard L.; and Horn, Stuart B., 4,190,106, Cl. 165-185.000.
Redman, Charles M., 4,190,769, Cl. 250-332.000.
Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.
Energy: *See—*
Andersen, John A.; and Cole, James K., 4,190,160, Cl. 206-591.000.

Day, Robert A.; and Conti, Armond E., 4,189,944, Cl. 73-623.000.
Eberhart, James G.; and Battles, James E., 4,189,827, Cl. 29-623.100.
Hendricks, Charles D., 4,190,016, Cl. 118-724.000.
Kennedy, Charles R., 4,190,637, Cl. 423-448.000.
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

National Aeronautics and Space Administration: *See*—
Greenleaf, John E.; and Delaplaine, Robert W., 4,190,060, Cl. 128-760.000.
Marek, Cecil J.; and Cooper, Larry P., 4,189,914, Cl. 60-726.000.
Weyler, George M., Jr., 4,190,626, Cl. 264-229.000.

Navy: *See*—
Anderson, Lloyd D., 4,189,999, Cl. 102-18.00R.
Follin, James W.; and Miller, Robert E., 4,190,818, Cl. 367-138.000.
Howe, David G.; and Gubser, Donald U., 4,190,701, Cl. 428-662.000.
Hughes, Richard S., 4,190,327, Cl. 350-310.000.
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.

U.S. Philips Corporation: *See*—
Buynak, William J., 4,190,835, Cl. 340-750.000.
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.
Klokkers, Frits H., 4,190,873, Cl. 361-56.000.
Lux, Peter, 4,190,861, Cl. 358-135.000.
Walraven, Anthonie, 4,190,871, Cl. 360-113.000.

United States Tobacco Company: *See*—
Boyd, Eugene J., 4,190,170, Cl. 215-307.000.

United Technologies Corporation: *See*—
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.
Giamei, Anthony F., 4,190,094, Cl. 164-60.000.
Preston, John L., Jr., 4,190,641, Cl. 423-653.000.

University of Michigan, The Regents of the: *See*—
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

University of Utah: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.

UOP Inc.: *See*—
Antos, George J., 4,190,521, Cl. 208-139.000.
Antos, George J., 4,190,557, Cl. 252-441.000.
Gewartowski, Steve A., 4,190,520, Cl. 208-95.000.

Updike, Peter E. Security mounting. 4,190,221, Cl. 248-551.000.

Upjohn Company, The: *See*—
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.

Upton, Robert W., Jr., to Honeywell Inc. Optical slip ring apparatus utilizing radial light signals. 4,190,318, Cl. 350-96.200.

Urashima, Chikayuki: *See*—
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.

Urlberger, Hans. Fastening device for a safety fence beam. 4,190,376, Cl. 403-14.000.

Usami, Katuyuki: *See*—
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190.555, Cl. 252-429.00B.

Ushio Denki Kabushikikaisha: *See*—
Kira, Takehiro, 4,190,786, Cl. 313-184.000.

USM Corporation: *See*—
Holloway, David J., 4,189,933, Cl. 72-391.000.
Mauer, Dieter, 4,189,978, Cl. 85-72.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
Usui, Masayoshi, 4,190,504, Cl. 204-35.00R.

Usui, Masayoshi, to Usui Kokusai Sangyo Kabushiki Kaisha. Anticorrosive overlap-coated steel material. 4,190,504, Cl. 204-35.00R.

Vanderford, Delbert E., to Cameron Iron Works, Inc. Tubing hanger for temperature variations and extremes. 4,190,270, Cl. 285-142.000.

van der Schoot, Jelle, to Staalkat B.V. Method and apparatus for drying a roller conveyor loaded with articles, such as eggs, and apparatus for washing, drying and candling eggs loaded on a roller conveyor. 4,189,849, Cl. 34-33.000.

Vanderspurt, Thomas H.; and Taylor, Paul D., to Celanese Corporation. Device for generating super atmospheric pressures of sensitive materials in a gas stream. 4,190,620, Cl. 261-148.000.

Van Heyningen, Woeldrik P., to Swift Canadian Co., Limited. Removing back fat from loin. 4,189,806, Cl. 17-52.000.

van Houwelingen, Gerrit D. B.: *See*—
Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.

Van Ryn, Arthur L.: *See*—
Crossman, Philip E.; and Van Ryn, Arthur L., 4,189,876, Cl. 52-9.000.

Vanstone, Anthony E.; and Maile, Graham K., to Biorex Laboratories Limited. Chalcone derivatives. 4,190,671, Cl. 424-317.000.

Van Voorhis, David C., to International Business Machines Corporation. Major/minor loop bubble memory with timing loop. 4,190,900, Cl. 365-15.000.

Van Workum, John A., to United States of America, Air Force. Single axis resonator for laser. 4,190,814, Cl. 331-94.50C.

Varcoe, Gordon G.: *See*—
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.

Varian Associates, Inc.: *See*—
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.

Vasicek, Vladimir: *See*—
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.

Veach, Carlos W. Push button controlled water system. 4,189,792, Cl. 4-192.000.

VEB Pentacon Dresden Kamera- und Kinowerke: *See*—
Schutze, Siegfried; and Locke, Werner, 4,190,337, Cl. 354-60.00L.

Veber, Daniel F., to Merck & Co., Inc. Peptides having somatostatin activity. 4,190,648, Cl. 424-177.000.

Veeder Industries Inc.: *See*—
Fleischer, Donald W., 4,190,765, Cl. 235-92.00C.

Vegezzi, Davide, to Enrico Corvi Mora. Method for the preparation of verbenone, myrtenal and pinocarveol and their therapeutical use. 4,190,675, Cl. 424-331.000.

Veigl, Johann: *See*—
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.

Velsicol Chemical Corporation: *See*—
Krenzer, John, 4,190,431, Cl. 71-92.000.

Vendo Company, The: *See*—
Moss, Charles A.; and Andrews, Boley A., 4,190,179, Cl. 221-299.000.

Verfahrenstechnik Dr. Ing. Kurt Baum: *See*—
Baum, Jorg P., 4,190,237, Cl. 266-80.000.

Vernay Laboratories, Inc.: *See*—
Atkinson, Gordon E.; and Tregillus, Kenneth C., 4,190,206, Cl. 239-271.000.

Vessey, Donald C. Foam mattress with floatation torso support. 4,189,798, Cl. 5-451.000.

Victor Company of Japan, Ltd.: *See*—
Kinjo, Hisao, 4,190,859, Cl. 358-128.500.
Ota, Yoshihiko, 4,190,869, Cl. 360-10.000.

Vidonne, Louis: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Viking Industries, Inc.: *See*—
Byerly, Robert M., 4,189,807, Cl. 24-16.00R.

Vimercati, Ettore. Bilaterally balanced fluid control valve. 4,190,231, Cl. 251-118.000.

Virag, Robert A., to Baxter Travenol Laboratories, Inc. Nebulizer cap system having heating means. 4,190,046, Cl. 128-200.210.

Volk, Karl G., to SemPrex Corporation. Drive system for mensuration stages or the like. 4,189,953, Cl. 74-479.000.

Volkert, John K.; and Volkert, Robert B., to Compak Systems, Inc. Method and apparatus for making envelope assemblies. 4,189,895, Cl. 53-429.000.

Volkert, Robert B.: *See*—
Volkert, John K.; and Volkert, Robert B., 4,189,895, Cl. 53-429.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.

Vondall, Ronald J.: *See*—
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.

Von Stosch, Rudiger Graf: *See*—
Pohl, Andreas P. I., 4,190,484, Cl. 156-580.000.

Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., to University of Michigan, The Regents of the. Method for treating psoriasis. 4,190,669, Cl. 424-305.000.

Voros, Ferenc: *See*—
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.

Vorwerk Interholding GmbH: *See*—
Eckart, Manfred, 4,190,307, Cl. 339-6.00R.

Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 4,6-Di-O-(aminoglycosyl)-1,3-diaminocyclitols, process for their production and their use. 4,190,722, Cl. 536-17.00R.

Vsesojuzny Nauchno-Isslekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv: *See*—
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See*—
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.

Vyzkumny ustav kozedelny: *See*—
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

W. A. Brown & Son, Inc.: *See*—
Russell, Lillard G., 4,189,929, Cl. 62-175.000.

W. M. Cissell Manufacturing Company: *See*—
Elmy, Richard A., 4,190,414, Cl. 432-46.000.

W. R. Grace & Co.: *See*—
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.

Waaben, Sigurd G.: *See*—
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.

Wada, Yoji: *See*—
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.

Wade, Thomas B.; and Knight, James A., to Aqua-Aerobic Systems, Inc. Waste water treatment apparatus. 4,190,541, Cl. 210-241.000.

Wagensonner, Eduard, to Agfa-Gevaert AG. Photographic camera with exposure control utilizing a phase controllable crystal. 4,190,343, Cl. 354-227.000.

Wahl, Heinz. Timing chain tensioners. 4,190,025, Cl. 123-90.310.

Wakazono, Kenji: *See*—
Ishiguro, Yasuo; and Wakazono, Kenji, 4,190,344, Cl. 354-234.000.

Walker, Gordon M.: *See*—
Lynn, William F.; and Walker, Gordon M., 4,190,302, Cl. 308-36.100.

Wallace, Charles H., to International Telephone and Telegraph Corporation. Internal heat exchanger for meat. 4,190,100, Cl. 165-48.00R.

Wallace, Eric G.: *See*—
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.

Walline, Robert E., to M/A COM, Inc. Production of epitaxial layers by vapor deposition utilizing dynamically adjusted flow rates and gas phase concentrations. 4,190,470, Cl. 148-175.000.

Walraven, Anthonie, to U.S. Philips Corporation. Magnetic converter having a magnetoresistive element. 4,190,871, Cl. 360-113.000.

Walters, Robert A.; and Hirtz, Russell E., to ARCO Medical Products Company. Circuit for determining the parameter control states of an implanted pacer. 4,190,055, Cl. 128-419.0PT.

Walton, Richard E., II: *See*—
Sauerwein, William D.; and Walton, Richard E., II, 4,190,781, Cl. 310-239.000.

Ward, John W., to Union Oil Company of California. Rejuvenation of damaged zeolite-supported metal catalysts. 4,190,553, Cl. 252-412.000.

Wardlaw, Stephen C.: *See*—
Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C., 4,190,328, Cl. 350-320.000.

Warmbier, Henry: *See*—
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.

Warnant, Julien; Farcilli, Andre; and Medici, Italo, to Roussel Uclaf. 14-Imino-(15H)-eburnamine compounds, compositions, methods of use and process of synthesis. 4,190,658, Cl. 424-256.000.

Warner, Raymond M., Jr. Photovoltaic semiconductor device and method of making same. 4,190,852, Cl. 357-30.000.

Warnet, Henri; and Fouinat, Paul, to Societe Anonyme Dite: Ceraver. Electrical insulator and method of making same. 4,190,736, Cl. 174-209.000.

Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, to Sharp Kabushiki Kaisha. Combination calculator and timepiece. 4,189,912, Cl. 58-152.00R.

Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, to Sharp Kabushiki Kaisha. Liquid crystal display cell of the reflection type. 4,190,329, Cl. 350-338.000.

Wassell, Ronald H.: *See*—
Wyatt, Brian S.; and Wassell, Ronald H., 4,190,512, Cl. 204-196.000.

Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., to Research Corporation. Synthesis of beta-lactams from azetidine carboxylic acid esters. 4,190,579, Cl. 260-239.00A.

Watanabe, Kouichi: *See*—
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.

Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, to Taisho Pharmaceutical Co., Ltd. Novel penicillin derivatives. 4,190,581, Cl. 260-239.100.

Watkins, Richard K.: *See*—
Oliff, James R.; and Watkins, Richard K., 4,190,149, Cl. 206-145.000.

Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. Compositions having a physiological cooling effect. 4,190,643, Cl. 424-54.000.

Watson, James H. P., to English Clays Lovering Pochin & Co., Ltd. Magnetic separators. 4,190,524, Cl. 209-213.000.

Webb, Harry A.: *See*—
Lawrence, Jackson; and Webb, Harry A., 4,189,847, Cl. 34-19.000.

Webber, David A.: *See*—
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 55-58.000.

Webber, Jack C. Swab. 4,190,108, Cl. 166-202.000.

Weber, Donald R., to Rapicom, Inc. Data transmission system using a sequential approximation encoding and decoding technique. 4,190,824, Cl. 340-347.0AD.

Weber, Heinz: *See*—
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.

Weber, Robert J., to Rockwell International Corporation. Sampled error phaselock or frequencylock systems. 4,190,807, Cl. 331-1.00A.

Webster, Bruce L.: *See*—
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.

Webster, David F. Means for recording patient care. 4,190,268, Cl. 282-3.00R.

Weed Eater, Inc.: *See*—
Kwater, James L., 4,189,833, Cl. 30-276.000.

Weimar, Erich: *See*—
Soecknick, Erhard; and Weimar, Erich, 4,190,473, Cl. 156-80.000.

Weinstock, Jacques: *See*—
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.

Weiss, Martin J.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.

Wells, Richard E.; and Kinda, Frank L. Adjustable wire divider. 4,190,167, Cl. 211-184.000.

Welsh, Barry L.: *See*—
Pyne, Clive R.; and Welsh, Barry L., 4,190,804, Cl. 328-3.000.

Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, to Bayer Aktiengesellschaft. Process for the production of mineral fiber mats. 4,190,459, Cl. 106-287.250.

Wenzel, Joerg; and Mai, Erich, to Haamann, Josef. Gear rack hoist. 4,190,135, Cl. 187-1.00R.

Wermuth, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for the selective compression or expansion of the dynamic range of a signal. 4,190,806, Cl. 330-51.000.

Wern, Lars A.: *See*—
Bejting, Anders M. T.; and Wern, Lars A., 4,190,833, Cl. 340-707.000.

Werne, Stig. Device for draft control. 4,190,197, Cl. 236-1.00G.

Weschenfelder, Otto T.: *See*—
Michalik, Horst B.; and Weschenfelder, Otto T., 4,190,243, Cl. 270-66.000.

Wesgar Industries Ltd.: *See*—
Purdy, John W., 4,190,269, Cl. 285-38.000.

West Electric Company, Ltd.: *See*—
Esaki, Koreaki, 4,190,880, Cl. 362-18.000.

West, Harrison; and Delaney, Bobby R., to General Electric Company. Compact multimission aircraft propulsion simulator. 4,189,939, Cl. 73-116.000.

West & Son (Engineers) Limited: *See*—
Brown, John E., 4,190,299, Cl. 308-3.500.

Westerman, Ira J., to B. F. Goodrich Company, The. Improved water absorbent copolymers of copolymerizable carboxylic acids and acrylic or methacrylic esters. 4,190,562, Cl. 260-17.4UC.

Western Company of North America, The: *See*—
Beirute, Robert M., 4,190,110, Cl. 166-291.000.

Western Electric Company, Incorporated: *See*—
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.
Lien, Suei-Yuen P., 4,190,467, Cl. 148-1.500.
Sonntag, Paul A., 4,189,831, Cl. 30-232.000.

Westinghouse Electric Corp.: *See*—
Bains, Gurdip S.; and Martin, Niles J., 4,189,890, Cl. 52-584.000.
Gainer, Robert E., 4,190,753, Cl. 200-144.00B.
Galloway, Dudley L.; and Donoghue, Robert E., 4,190,732, Cl. 174-17.0LF.
Gray, Lewis, 4,189,927, Cl. 60-687.000.
Hsu, James J., 4,189,926, Cl. 60-687.000.
Knight, Jerry W.; and Woodward, Mervyn, 4,190,389, Cl. 409-120.000.
LaCoste, Bernard L., 4,189,924, Cl. 60-641.000.
Pebler, Alfred R., 4,190,499, Cl. 204-1.00T.
Wootton, Roy E., 4,190,733, Cl. 174-28.000.

Weston, George O., to John Wyeth & Brother Limited. Process for preparing oxazoles. 4,190,584, Cl. 548-236.000.

Westvaco Corporation: *See*—
Forbes, Hampton E., Jr., 4,190,191, Cl. 229-43.000.
Gendron, Wilfred H., 4,190,161, Cl. 206-620.000.
Russell, Frederick S., 4,190,151, Cl. 206-281.000.

Weyerhaeuser Company: *See*—
Brookhyser, Byron B., 4,189,851, Cl. 34-236.000.

Weyler, George M., Jr., to United States of America, National Aeronautics and Space Administration. Method of manufacture of bonded fiber flywheel. 4,190,626, Cl. 264-229.000.

Weyrich, Erwin: *See*—
Hofmann, Eberhard; and Weyrich, Erwin, 4,190,401, Cl. 417-313.000.

White, Eugene W.; Hanusiak, William M.; and White, Rodney A., to Research Corporation. High surface area permeable material. 4,190,079, Cl. 137-561.00R.

White, Rodney A.: *See*—
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.

Whiteley, Eric, to Canadian General Electric Company Limited. Liquid cooled disc machines. 4,190,780, Cl. 310-59.000.

Whiting, Sheldon G. Seismic responsive operating device. 4,189,945, Cl. 73-652.000.

Wiedman, Francis W., III: *See*—
Bhattacharyya, Arup; and Wiedman, Francis W., III, 4,190,466, Cl. 148-1.500.

Wiel, Gaston: *See*—
Merat, Jean-Pierre; and Wiel, Gaston, 4,189,899, Cl. 53-570.000.

Wielesiuk, Aleksander: *See*—
Barwell, John H.; and Wielesiuk, Aleksander, 4,190,684, Cl. 427-194.000.

Wildenberg, Thomas S.: *See*—
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.

Wilkinson Sword Limited: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.
Williams, Albert L.: *See—*
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,190,588, Cl. 260-343.600.
Williams, Earl P.: *See—*
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., to Northwest Sanitation Products, Inc. Automatic liquid dispenser for an inverted bottle. 4,189,793, Cl. 4-228.000.
Wilson, Charles A.: *See—*
Burk, George A.; and Wilson, Charles A., 4,190,668, Cl. 424-304.000.
Wingard, Robert E., Jr.: *See—*
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.
Winslow, John S.: *See—*
Somers, Frank J.; and Winslow, John S., 4,190,860, Cl. 358-128.500.
Winter, Karl, to CEAG Ceagfilter und Entstaubungstechnik GmbH. Method of operating an adsorption filter. 4,190,423, Cl. 55-20.000.
Winterhoff, Gunter: *See—*
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.
Winters, Harold F., to International Business Machines Corporation. Etching method using noble gas halides. 4,190,488, Cl. 156-643.000.
Winterscheid, Josef: *See—*
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Wipke, Walter J.: *See—*
Cooper, Leon M.; and Wipke, Walter J., 4,190,845, Cl. 346-75.000.
Witco Chemical Corporation: *See—*
Kaufman, John J.; and Luisi, Thomas E., 4,190,570, Cl. 260-33.6PQ.
Wittmann, Heinz: *See—*
Himmetsberger, Alois; and Wittmann, Heinz, 4,190,264, Cl. 280-618.000.
Wolf, Daniel E.: *See—*
Crane, Hewitt D.; and Wolf, Daniel E., 4,190,820, Cl. 340-146.3SG.
Wolf, Daniel H. Movement sensitive anti-theft alarm. 4,190,828, Cl. 340-571.000.
Wolf, David L.: *See—*
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Wolf, Isaac M. Brazing inserts. 4,190,127, Cl. 175-410.000.
Wolfes, Wolfgang: *See—*
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Wolverine Aluminum Corporation: *See—*
Fritz, Jack E., 4,189,885, Cl. 52-287.000.
Wombold, Harry A. E.: *See—*
Allen, David O.; and Wombold, Harry A. E., 4,190,175, Cl. 220-270.000.
Wonisch, Franz, to Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete. Apparatus for starting and fanning a fire. 4,190,034, Cl. 126-25.00B.
Wood, Eugene W. Telescoping intermedullary pin. 4,190,044, Cl. 128-92.0BC.
Woodward, Mervyn: *See—*
Knight, Jerry W.; and Woodward, Mervyn, 4,190,389, Cl. 409-120.000.
Woodward, Thomas R., to Burroughs Corporation. Self-healing loop communications system. 4,190,821, Cl. 340-147.0SC.
Wootton, Roy E., to Westinghouse Electric Corp. High-voltage electrical apparatus utilizing an insulating gas of sulfur hexafluoride and helium. 4,190,733, Cl. 174-28.000.
Worboys, John C.: *See—*
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.
Woron, Robert P., to Allen Organ Company. Method and apparatus for achieving timbre modulation in an electronic musical instrument. 4,189,970, Cl. 84-1.190.
Wortley, Stewart W. Magnifying means. 4,190,322, Cl. 350-181.000.
Wright, Albert T. Flow homogenizer. 4,190,032, Cl. 123-141.000.
Wright, John L.: *See—*
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.
Wright, John V.: *See—*
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.
Wu, James S.: *See—*
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.
Wunderer, Armin: *See—*
Hesky, Hans; and Wunderer, Armin, 4,190,507, Cl. 204-129.000.
Wunderlich, Klaus: *See—*
Schutze, Detlef-Ingo; and Wunderlich, Klaus, 4,190,726, Cl. 546-27.000.
Wyatt, Brian S.; and Wassell, Ronald H., to I.S.C. Alloys Limited. Sacrificial anodes. 4,190,512, Cl. 204-196.000.
Wyatt, Everette L., to Armco Steel Corporation. Waste water filtration and sludge removal system. 4,190,534, Cl. 210-80.000.
Wyatt, Lesley J.: *See—*
Hunter, Donald N.; and Wyatt, Lesley J., 4,190,453, Cl. 106-85.000.
Xerox Corporation: *See—*
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.
Friday, Bruce W., 4,190,348, Cl. 355-3.0TR.
Guenther, Joachim, 4,190,247, Cl. 271-291.000.
Smith, Craig A.; and Guenther, Joachim, 4,190,354, Cl. 355-3.0SH.
Yabe, Toshinori, to Bridgestone Tire Company Limited. Tire building apparatus. 4,190,482, Cl. 156-403.000.
Yaker, Charles: *See—*
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.
Yamada, Shigeru; and Ichikawa, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of numerical value processing type. 4,189,972, Cl. 84-1.250.
Yamada, Takashi: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, to Denki Kagaku Kogyo Kabushiki Kaisha. Cement retarder and rapid hardening cement containing the same. 4,190,454, Cl. 106-90.000.
Yamaguchi, Hisashi: *See—*
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Yamamori, Teruo: *See—*
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.
Yamamoto, Yoichi; and Shimazawa, Yoichi, to Sharp Kabushiki Kaisha. Ink liquid concentration control in an ink liquid supply system for an ink jet system printer. 4,190,846, Cl. 346-140.00R.
Yamanaka, Akira: *See—*
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.
Yamashita, Toshio; and Kaburagi, Hisashi. Speed reduction means. 4,189,961, Cl. 74-798.000.
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, to Osaka Gas Company, Ltd. Method for reactivation of platinum group metal catalyst with aqueous alkaline and/or reducing solutions. 4,190,554, Cl. 252-412.000.
Yamazaki, Katsuo: *See—*
Sawada, Kiyoshi; and Yamazaki, Katsuo, 4,189,959, Cl. 74-720.000.
Yanagawa, Nobuyuki: *See—*
Ohno, Yukihiro; and Yanagawa, Nobuyuki, 4,190,349, Cl. 355-8.000.
Yanagimoto, Samon: *See—*
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.
Yanoh, Tomoo. Shaped metallic roofing plate. 4,189,889, Cl. 52-530.000.
Yasuhira, Tetsutaro: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.
Yates, Donald. Hand gun case. 4,190,183, Cl. 224-238.000.
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., to Trailer Train Company. Apparatus for machining critical surfaces of railroad truck side frames. 4,190,390, Cl. 409-198.000.
Yee, Kim S., to Sulzer Brothers Limited. Coated structural component for a high temperature nuclear reactor. 4,190,493, Cl. 176-60.000.
Yie, Gene G., to Institute of Gas Technology. High pressure pulsed water jet. 4,190,202, Cl. 239-101.000.
Ylagan, Carlos J.: *See—*
Appleton, Arthur I.; Liljequist, Jon L.; and Ylagan, Carlos J., 4,190,222, Cl. 248-56.000.
Yokoo, Chihiro: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.
Yokota, Hideo: *See—*
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,190,338, Cl. 354-106.000.
York Manufacturing, Inc.: *See—*
Jentoft, Arthur P.; Anghinetti, Joseph P.; and Couture, Paul A., 4,189,877, Cl. 52-58.000.
Yoshida, Mitsuo: *See—*
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,190,505, Cl. 204-98.000.
Yoshida, Naoki: *See—*
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.
Yoshikawa, Kazuo; and Andoh, Shizuo, to Fujitsu Limited. Gas discharge panel. 4,190,788, Cl. 315-169.400.
Yoshioka, Kengo: *See—*
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.
Yoshitake, Katsumi: *See—*
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, 4,190,707, Cl. 429-254.000.
Yoshitugu, Takashi: *See—*
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, to Nippon Steel Corporation. Press roll piercing method. 4,190,887, Cl. 364-472.000.
Young, Danny J., to Fair, James W. Sun tracking system. 4,190,766, Cl. 250-203.00R.

Young, Prussin, Mgk, J. V.: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., to Young, Prussin, Mgk, J. V. Adherent controlled release pesticides. 4,190,680, Cl. 427-4.000.
Young, Rodney C.: *See—*
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,664, Cl. 424-270.000.
Zahnradfabrik Friedrichshafen AG: *See—*
Fassbender, Rolf; and Lang, Armin, 4,189,983, Cl. 91-400.000.
Lang, Armin; and Fassbender, Rolf, 4,189,982, Cl. 91-400.000.
Zajichek, William J., to Allis-Chalmers Corporation. Vehicle transmission shifting mechanism. 4,189,952, Cl. 74-477.000.
Zani, David A. Solar energy liquid heating device. 4,190,039, Cl. 126-450.000.
Zaromb, Solomon. Fluidized-bed electrodes and related apparatus and methods. 4,190,703, Cl. 429-15.000.
Zdrahala, Richard J.; and Critchfield, Frank E., to Union Carbide Corporation. Thermoplastic polyether polyurethane elastomers. 4,190,711, Cl. 521-112.000.
Zenith Radio Corporation: *See—*
Citta, Richard W., 4,190,862, Cl. 358-195.000.
Zetterlund, Ture R.: *See—*
Amberg, Arthur A.; and Zetterlund, Ture R., 4,189,987, Cl. 98-2.140.
Zhitetsky, Leonid S.: *See—*
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.
Zilinski, Erwin: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.
Zine, Anthony R., Jr.: *See—*
Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.
Zinkin, Arthur S.: *See—*
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.
Zitting, Gordon T., to Microdot Mfg., Inc. Single apex two element fluid pressure seal assembly. 4,190,259, Cl. 277-165.000.
Zucker, Friedrich J.; and Langenbusch, Hans J., to Supraton F. J. Zucker KG. Method and apparatus for mixing pulverulent drying substances and/or fluent media with one or more liquids. 4,190,373, Cl. 366-160.000.
Zuppichin, Sebastian: *See—*
Colognori, Aldo, 4,190,091, Cl. 145-52.000.
zur Hausen, Manfred: *See—*
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, to Behringwerke Aktiengesellschaft. Process for the isolation of the polyvalent proteinase inhibitor. 4,190,573, Cl. 260-112.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Moreno, Isabel L., to Ruiz, Edward F. Dough sheet spreader. Re. 30,221, Cl. 425-190.000.

Moreno, Isabel L.: *See*—
Ruiz, Edward F.; and Moreno, Isabel L., Re. 30,222, Cl. 425-190.000.

Ruiz, Edward F.; and Moreno, Isabel L., to Ruiz, Edward F. Dough sheet spreader. Re. 30,222, Cl. 425-190.000.

Ruiz, Edward F.: *See*—
Moreno, Isabel L., Re. 30,221, Cl. 425-190.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,505, Cl. 76.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,506, Cl. 78.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,505, 2-26-80, Cl. 76.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,506, 2-26-80, Cl. 78.000.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,505, Cl. 76.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,506, Cl. 78.000.

LIST OF DESIGN PATENTEES

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Ink cartridge with rupturable sealing element. 254,316, 2-26-80, Cl. D19-54.000.

Appleman, Donald T., to Procter & Gamble Company, The. Paper tissue. 254,333, 2-26-80, Cl. D59-2.00B.

Aprahamian, Vaughn, to Le-Bo Products Company, Inc. Storage receptacle for tape cartridges and cassettes. 254,282, 2-26-80, Cl. D6-188.000.

Arfert, Horst F. W.: *See*—
Reynolds, William G.; and Arfert, Horst F. W., 254,294, Cl. D9-216.000.
Reynolds, William G.; and Arfert, Horst F. W., 254,295, Cl. D9-220.000.

Bartasevich, William E., Jr.: *See*—
Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., 254,321, Cl. D23-18.000.

Beall, Lester, Jr., to Trend Line Furniture Corporation. Seat. 254,280, 2-26-80, Cl. D6-62.000.

Behrmann, Helga I. Sweater. 254,276, 2-26-80, Cl. D2-44.000.

Benty, John L., to Sunbeam Corporation. Hair dryer. 254,328, 2-26-80, Cl. D28-13.000.

Blanchard, Russell O.: *See*—
Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., 254,321, Cl. D23-18.000.

Buddy L Corporation: *See*—
Herstein, Barry S., 254,320, Cl. D21-134.000.

Carre, Alain, to Waterman S.A. Pen. 254,315, 2-26-80, Cl. D19-51.000.

Carter, William H. Garden plow with seed and fertilizer distributor. 254,306, 2-26-80, Cl. D15-12.000.

Chicone, Carmen P. Desk caddy. 254,317, 2-26-80, Cl. D19-75.000.

Chromcraft Corporation: *See*—
Wilson, Robert L., 254,278, Cl. D6-31.000.

Colish, William J. Antenna support for model airplane radio transmittors. 254,305, 2-26-80, Cl. D14-91.000.

Combo, Thomas J. Reversible motorcycle bracket for pickup truck bed. 254,301, 2-26-80, Cl. D12-115.000.

Corning Glass Works: *See*—
Gerow, Cynthia S., 254,284, Cl. D7-39.000.

Daniel, Hugh O. Debris receptacle. 254,286, 2-26-80, Cl. D7-186.000.

Denslow, John M. Electronic timing and logic drafting template. 254,314, 2-26-80, Cl. D19-39.000.

DePamphilis, Richard L. Combined cleaning and polishing brush. 254,277, 2-26-80, Cl. D4-06.000.

Designs for Vision, Inc.: *See*—
Morgan, Richard L.; and Feinbloom, Richard E., 254,311, Cl. D16-57.000.

Dick Blick Company: *See*—
Goodrich, William F.; Ingersoll, Robert C.; and Doman, Donald W., 254,325, Cl. D24-22.000.

Dolphin, Gary A., Sr.; Hampshire, James F.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Cabinet for a card file drawer. 254,283, 2-26-80, Cl. D6-191.000.

Doman, Donald W.: *See*—
Goodrich, William F.; Ingersoll, Robert C.; and Doman, Donald W., 254,325, Cl. D24-22.000.

Doneaux, Robert G. Nipple and bottle cap retainer. 254,296, 2-26-80, Cl. D9-294.000.

Dundore, Mark B. Drafting parallel. 254,313, 2-26-80, Cl. D19-35.000.

Easom, William N., Jr. Axle bending device. 254,309, 2-26-80, Cl. D15-123.000.

Ernest, Robert O.: *See*—
Lee, Ernest; and Ernest, Robert O., 254,285, Cl. D7-41.000.

Farbstein, Martin N.; and Schaffer, Leon. Ignition switch lock. 254,289, 2-26-80, Cl. D8-333.000.

Feinbloom, Richard E.: *See*—
Morgan, Richard L.; and Feinbloom, Richard E., 254,311, Cl. D16-57.000.

Fortuna, Vincent E.; and Lerner, Matt, to Vercon Inc. Plastic container for liquids or the like. 254,293, 2-26-80, Cl. D9-125.000.

GAF Corporation: *See*—
Zick, David L., 254,310, Cl. D16-31.000.

Gerow, Cynthia S., to Corning Glass Works. Decal for culinary ware or the like. 254,284, 2-26-80, Cl. D7-39.000.

Goodrich, William F.; Ingersoll, Robert C.; and Doman, Donald W., to Dick Blick Company. Housing for centrifugal casting machine. 254,325, 2-26-80, Cl. D24-22.000.

Hampshire, James F.: *See*—
Dolphin, Gary A., Sr.; Hampshire, James F.; and Terek, Greg P., 254,283, Cl. D6-191.000.

Herstein, Barry S., to Buddy L Corporation. Toy truck cab. 254,320, 2-26-80, Cl. D21-134.000.

Hodge, Joel W. Combined newspaper delivery box and mailbox support. 254,334, 2-26-80, Cl. D99-29.000.

Hodge, Joel W. Combined newspaper delivery box and mailbox support. 254,335, 2-26-80, Cl. D99-29.000.

Hutchinson, Roger E. Face for a clock or similar article. 254,299, 2-26-80, Cl. D10-126.000.

Igo, Toshio; Ohta, Kikuo; Murakami, Tsutomu; and Taguchi, Shuhei, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,303, 2-26-80, Cl. D14-68.000.

Igo, Toshio, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,304, 2-26-80, Cl. D14-68.000.

Ingersoll, Robert C.: *See*—
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International Harvester Company: *See*—
Staiert, Richard W.; and Krukow, Eugene J., 254,297, Cl. D10-98.000.

Kabushiki Kaisha Izumi Seisakusho: *See*—
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Kayfes, Joe M. Combined cutting board and portable food preparation table. 254,281, 2-26-80, Cl. D6-179.000.

Kintex, Inc.: *See*—
Kruger, Thomas F., 254,292, Cl. D8-397.000.

Koenig, Jerome. Volume-control valve. 254,322, 2-26-80, Cl. D23-19.000.

Koh-I-Noor Rapidograph, Inc.: *See*—
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Kruger, Thomas F., to Kintex, Inc. Locking wheel nut. 254,292, 2-26-80, Cl. D8-397.000.

Krukow, Eugene J.: *See*—
Staiert, Richard W.; and Krukow, Eugene J., 254,297, Cl. D10-98.000.

Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 254,318, Cl. D21-91.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Toy parachute frame. 254,318, 2-26-80, Cl. D21-91.000.

Le-Bo Products Company, Inc.: *See*—
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Lee, Ernest; and Ernest, Robert O., to Sunbeam Corporation. Coffeemaker. 254,285, 2-26-80, Cl. D7-41.000.

Leigh Products, Inc.: *See*—
Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., 254,321, Cl. D23-18.000.

Lerner, Matt: *See*—
Fortuna, Vincent E.; and Lerner, Matt, 254,293, Cl. D9-125.000.

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Nakano, Koji; and Maeda, Yoshikazu, 254,332, Cl. D48-32.00A.

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Ohta, Kikuo, 254,302, Cl. D14-68.000.

Minassian, Gary E. Ring. 254,300, 2-26-80, Cl. D11-28.000.

Morgan, Richard L.; and Feinbloom, Richard E., to Designs for Vision, Inc. Microscope illuminator housing. 254,311, 2-26-80, Cl. D16-57.000.

Murakami, Tsutomu: *See*—
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Nakano, Koji; and Maeda, Yoshikazu, to Stanley Electric Co., Ltd. Lens for a lamp. 254,332, 2-26-80, Cl. D48-32.00A.

Nevrekar, Venkatesh R. Tongue cleaning device. 254,326, 2-26-80, Cl. D24-28.000.

Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,302, 2-26-80, Cl. D14-68.000.

Ohta, Kikuo: *See*—
Igo, Toshio; Ohta, Kikuo; Murakami, Tsutomu; and Taguchi, Shuhei, 254,303, Cl. D14-68.000.

Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 254,291, 2-26-80, Cl. D8-397.000.

Pharr, Cecil O., Jr. Pocket knife. 254,288, 2-26-80, Cl. D8-99.000.

Phillips, P. Lewis, to Trend Line Furniture Corporation. Ottoman. 254,279, 2-26-80, Cl. D6-36.000.

Polak, Joseph S.; and Sidlo, Joseph J., to Prince Castle, Inc. Food warmer. 254,308, 2-26-80, Cl. D15-108.000.

Polc, John. Blade for a mortar hoe. 254,287, 2-26-80, Cl. D8-11.000.

Powell, William N. Bathtub. 254,323, 2-26-80, Cl. D23-55.000.

Prince Castle, Inc.: *See*—
Polak, Joseph S.; and Sidlo, Joseph J., 254,308, Cl. D15-108.000.

Procter & Gamble Company, The: *See*—
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RB Toy Development Co.: *See*—
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Reynolds Metals Company: *See*—
Reynolds, William G.; and Arfert, Horst F. W., 254,294, Cl. D9-216.000.
Reynolds, William G.; and Arfert, Horst F. W., 254,295, Cl. D9-220.000.

Reynolds, William G.; and Arfert, Horst F. W., to Reynolds Metals Company. Container for food products or the like. 254,294, 2-26-80, Cl. D9-216.000.

Reynolds, William G.; and Arfert, Horst F. W., to Reynolds Metals Company. Container for food products or the like. 254,295, 2-26-80, Cl. D9-220.000.

Rubbermaid Commercial Products Inc.: *See*—
Dolphin, Gary A., Sr.; Hampshire, James F.; and Terek, Greg P., 254,283, Cl. D6-191.000.

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Farbstein, Martin N.; and Schaffer, Leon, 254,289, Cl. D8-333.000.

Sexton, Judy C.: *See*—
Sexton, William H.; and Sexton, Judy C., 254,298, Cl. D10-114.000.

Sexton, William H.; and Sexton, Judy C. Emergency flasher. 254,298, 2-26-80, Cl. D10-114.000.

Shader, Keith: *See*—
Thayer, James E.; and Shader, Keith, 254,307, Cl. D15-13.000.

Shemitz, Sylvan R. Fluorescent desk lamp. 254,330, 2-26-80, Cl. D48-20.00F.

Shemitz, Sylvan R. Fluorescent desk lamp. 254,331, 2-26-80, Cl. D48-20.00F.

Shiraishi, Masami, to Tomy Kogyo Co., Inc. Simulative toy typewriter. 254,319, 2-26-80, Cl. D21-127.000.

Sidlo, Joseph J.: *See*—
Polak, Joseph S.; and Sidlo, Joseph J., 254,308, Cl. D15-108.000.

Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., to Leigh Products, Inc. Portable powered sprayer. 254,321, 2-26-80, Cl. D23-18.000.

Smith, Richard C., to R. C. Smith Company. Shelf bracket. 254,290, 2-26-80, Cl. D8-381.000.

Staiert, Richard W.; and Krukow, Eugene J., to International Harvester Company. Tachometer. 254,297, 2-26-80, Cl. D10-98.000.

Stanley Electric Co., Ltd.: *See*—
Nakano, Koji; and Maeda, Yoshikazu, 254,332, Cl. D48-32.00A.

Stelling, Geoffrey H. Banjo resonator flange. 254,312, 2-26-80, Cl. D17-20.000.

Sunbeam Corporation: *See*—
Benty, John L., 254,328, Cl. D28-13.000.
Lee, Ernest; and Ernest, Robert O., 254,285, Cl. D7-41.000.

Taguchi, Shuhei: *See*—
Igo, Toshio; Ohta, Kikuo; Murakami, Tsutomu; and Taguchi, Shuhei, 254,303, Cl. D14-68.000.

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Dolphin, Gary A., Sr.; Hampshire, James F.; and Terek, Greg P., 254,283, Cl. D6-191.000.

Thayer, James E.; and Shader, Keith. Material spreader and distributor. 254,307, 2-26-80, Cl. D15-13.000.

Thead, William H., Jr. Respiratory exerciser and the like. 254,324, 2-26-80, Cl. D24-17.000.

Tomy Kogyo Co., Inc.: *See*—
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Trend Line Furniture Corporation: *See*—
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Tsukamoto, Moriko; and Tsukamoto, Chihiro. Fingernail polishing tool. 254,329, 2-26-80, Cl. D28-59.000.

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Waterman S.A.: *See*—
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Wilson, Robert L., to Chromcraft Corporation. Chair. 254,278, 2-26-80, Cl. D6-31.000.

Zick, David L., to GAF Corporation. Diazo developer apparatus. 254,310, 2-26-80, Cl. D16-31.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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